



Migration of Single Chassis to Multi Chassis for Cisco NCS 4000 Series

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CHAPTER 1

Overview for Cisco NCS 4000 Single Chassis to Multi Chassis Migration

This chapter provides an overview for the NCS 4000 single chassis to multi chassis migration.

- [Setup Multi-chassis Configuration](#) , on page 1

Setup Multi-chassis Configuration

Multiple Cisco NCS 4016 single chassis (SC) are connected to one or more NCS 4000 fabric card chassis to form a multi chassis (MC) system. This enables scalability with a single admin and control plane. The MC system contains two types of chassis - line card chassis (LCC) which is the NCS 4016, and the fabric card chassis (FCC).

The fabric cards in the LCC are different from the fabric cards in the FCC. All the LCCs are connected to the FCC, and traffic flows from one LCC to another LCC through the FCC.

To form a MC system, two types of connections are required:

- Control Ethernet Connectivity - the racks are interconnected to form a network.
- Fabric Connectivity - the FCC and LCC are connected to form a fabric plane.

Upgrade Process

The upgrade process involves the following steps:

- Pre-maintenance window tasks - the latest Cisco IOS XR software is updated on the MC system. The new LCC(s) and FCC(s) are not connected to the production network at this stage.
- Maintenance window tasks - the existing SC system (LCC) is upgraded to the latest software version by upgrading the packages, SMUs and installing the golden RPs. The existing SC system is connected with the other LCC(s) and FCC(s) to arrive at the required MC system.
- ECU2 upgrade - the ECU (used in the SC system) needs to be upgraded to ECU2 to support MC configuration. For the details regarding the ECU to ECU2 migration, see [Migrate from NCS4K-ECU to NCS4K-ECU2](#).

For details about inter-rack timing, after the migration from a single chassis system to a multi chassis system is complete, see [Inter-rack Timing](#).

Assign Rack Number to Chassis

In a multi chassis system, each chassis must have a unique rack number. This rack number is used to identify a chassis in the system.

Complete this task to identify the chassis and its connections and to establish a multi-chassis network.

Prerequisites

- Install the hardware components of the MC system.
- Connect all the chassis in the MC system using control ethernet cables. The control ethernet cables provide inter-connectivity between the chassis.
- Connect the fabric cards on the FCC and the LCC using fabric cables. This is used for data traffic.

Procedure

- Step 1** **admin**
Step 2 **configure**
Step 3 **chassis serial** *serial_number*

Example:

```
systemadmin-vm:0_RP) (config) # chassis serial ABC12345
```

Enters the chassis serial configuration mode.

- Step 4** **rack** *rack_number*

Example:

```
systemadmin-vm:0_RP) (config-serial-ABC12345) # rack 0
```

Type a rack number to associate the rack number to the chassis.

Note Rack numbers must be provisioned for all the LCCs and FCCs before proceeding with the migration to a multi chassis configuration. Make sure all the rack numbers are unique.

- LCC1 should be rack 1
- LCC2 should be rack 2
- LCC3 should be rack 3
- LCC4 should be rack 4
- LCC5 should be rack 5
- LCC6 should be rack 6
- LCC7 should be rack 7
- LCC8 should be rack 8
- LCC9 should be rack 9
- LCC10 should be rack 10
- LCC11 should be rack 11
- FCC1 should be rack F1
- FCC2 should be rack F2
- FCC3 should be rack F3

Step 5 **commit**

Associate a Fabric Card in a Fabric Card Chassis to a Fabric Plane

The fabric cards in the FCC must be associated to a fabric plane in the multi-chassis system. The system fabric is divided into four fabric planes that are used to evenly distribute traffic across the fabric. The location of each fabric card in the fabric plane is identified by an instance number.

•

Procedure

Step 1 **admin**

Step 2 **configure**

Step 3 **controller fabric plane** *plane_id*

Example:

```
sysadmin-vm:0_RP0 (config) # controller fabric plane 1
```

Enters the fabric plane configuration mode.

Step 4 **instance** *instance_number*

Example:

```
sysadmin-vm:0_RP0 (config-plane-1) # instance 0
```

Creates an instance number, to which the FC will be mapped.

Step 5 **location** *fabric_chassis_number / fabric_card_number***Example:**

```
sysadmin-vm:0_RP0 (config-instance 0) # location F0/FC1
```

Associates the location of the fabric card to the created instance.

Step 6 **commit**



CHAPTER 2

Prerequisites for the Cisco NCS 4000 Single Chassis to Multi Chassis Migration

This chapter details the prerequisites required for the migration of a single chassis system to a multi chassis system.

- [Prerequisite: General Setup, on page 5](#)
- [Prerequisite: Updating the Software Image, on page 7](#)
- [Prerequisite: Validating the System, on page 12](#)

Prerequisite: General Setup

The complex multi chassis upgrade requires setting the necessary environment at the customer location prior to the migration window. These are critical for the overall preparation of the upgrade and should be completed at every site that will required deployment topology upgrade.

Following are the pre-requisites that should be completed before the migration activity can begin:

- **Environment Variables**

There are environmental factors that should be considered prior to the deployment of the NCS4K Multi-Chassis. This includes completion of the Site Survey for power, cooling and floor space requirements needed to deploy the additional NCS chassis as this is the first step to be completed prior to the chassis being installed into the specific location(s).

- **Chassis Setup and Installation**

The additional chassis will be installed as per the Cisco space and power specifications. The FCC chassis should have the required LCC and FCC fabric cards inserted and use MPO fabric cables.

This design requires that (4) fabric cards serve as a single plane. Each LCC fabric card (plane) connects to (4) FCC fabric cards.

Example:

For a 2+2 upgrade, one LCC and two FCC to an existing production LCC running a current release.

Table 1: Fabric Plane FCC Distribution(Horizontal Plane Mode)

Plane	FCC0 FC	Plane	FCC1 FC
Plane 0	0	Plane 2	0
	1		1
	2		2
	3		3
Plane 1	4	Plane 3	4
	5		5
	6		6
	7		7

Table 2: Fabric Plane FCC Distribution(Vertical Plane Mode)

Plane	FCC0 FC	Plane	FCC1 FC
Plane 0	0	Plane 2	0
	1		1
	4		4
	5		5
Plane 1	2	Plane 3	2
	3		3
	6		6
	7		7

Table 3: RP Cards to SC-SW Card Connections (2+2 Configuration)

From Line Card Chassis	LCC RP Port	To SC-SW cards in Fabric Card Chassis
LCC0	RP0 EXP0	FCC0, SC0 any switch port
	RP1 EXP0	FCC0, SC0 any switch port
	RP0 EXP1	FCC1, SC0 any switch port
	RP1 EXP1	FCC1, SC0 any switch port

From Line Card Chassis	LCC RP Port	To SC-SW cards in Fabric Card Chassis
LCC1	RP0 EXP0	FCC0, SC0 any switch port
	RP1 EXP0	FCC0, SC0 any switch port
	RP0 EXP1	FCC1, SC0 any switch port
	RP1 EXP1	FCC1, SC0 any switch port

Table 4: SC-SW and SC Card Connections (2+2 Configuration)

From SC-SW Card	To SC-SW Card
FCC0, SC0 EXP0	FCC0, SC0 any switch port
FCC0, SC0 EXP1	FCC1, SC0 any switch port
FCC1, SC0 EXP0	FCC0, SC0 any switch port
FCC1, SC0 EXP1	FCC1, SC0 any switch port
FCC0, SC0 HS0 (40 GE)	FCC1, SC0 HS0 (40 GE)
FCC0, SC0 HS1 (40 GE)	FCC1, SC0 HS1 (40 GE)

From SC Card	From SC-SW Card
FCC0, SC1 EXP0	FCC0, SC0 any switch port
FCC0, SC1 EXP1	FCC1, SC0 any switch port
FCC1, SC1 EXP0	FCC0, SC0 any switch port
FCC1, SC1 EXP1	FCC1, SC0 any switch port

Prerequisite: Updating the Software Image

This task enables the user to update the LCC and the FCC to the latest image with MC support. These are the supported number of LCCs and FCCs for the various MC configurations.

- 1+1 MC configuration - 1 LCC and 1 FCC
- 2+1 MC configuration - 2 LCCs (LCC0, LCC1) and 1 FCC
- 3+1 MC configuration - 3 LCCs (LCC0, LCC1, LCC2) and 1 FCC
- 4+1 MC configuration - 4 LCCs (LCC0, LCC1, LCC2, LCC3) and 1 FCC
- 1+2 MC configuration - 1 LCC (LCC0) and 2 FCCs (FCC0, FCC1)
- 2+2 MC configuration - 2 LCCs (LCC0, LCC1) and 2 FCCs (FCC0, FCC1)

- 3+2 MC configuration - 3 LCCs (LCC0, LCC1, LCC2) and 2 FCCs (FCC0, FCC1)
- 4+2 MC configuration - 4 LCCs (LCC0, LCC1, LCC2, LCC3) and 2 FCCs (FCC0, FCC1)
- 1+3 MC configuration - 1 LCC (LCC0) and 3 FCCs (FCC0, FCC1, FCC2)
- 8+3 MC configuration - 8 LCCs (LCC0, LCC1, LCC2, LCC3, LCC4, LCC5, LCC6, LCC7) and 3 FCCs (FCC0, FCC1, FCC2)
- 12+3 MC configuration - 12 LCCs (LCC0, LCC1, LCC2, LCC3, LCC4, LCC5, LCC6, LCC7, LCC8, LCC9, LCC10, LCC11) and 3 FCCs (FCC0, FCC1, FCC2)

Procedure

Step 1 Power up the LCC and FCC (see the list above to check the number of supported LCCs and FCCs for the multi chassis configurations).

Step 2 Connect to console port 1 and verify the current software version and hardware function in the XR VM and sysadmin modes.

Use the following commands:

```
SysAdmin
term le 0
term width 400
show clock
sh chassis (capture Serial Number for Admin config)
sh inventory
sh alarm br (please check alarms light on the front display and the RPs also). If there
are PMs that are not terminated with DC power unseat these PMs and run "sh inventory" again
sh run
sh hw-module fpd
sh platform
sh platform slices
sh install active (shows SMUs for SysAdmin, PIEs shown in XR-VM see command below)
sh install inactive
sh install commit
sh install repository all
```

```
XR-VM
term le 0
term width 400
show clock
term exec prompt timestamp
sh install active
sh install inactive
sh install commit
sh platform
sh platform vm
sh inventory
sh redundancy summary
```

Step 3 Install the latest image using USB boot. Connect to the console port 0 on both the RPs. The RP that is not going through the USB boot is referred to as the *other* RP. Disengage or suspend boot via Boot Manager, so that the other RP is not booting. Confirm that only one RP per LCC/FCC is booting. The boot process is restarted later to allow software sync. More USB drives with usb-boot software can be run simultaneously in more than one chassis. This will save time but error logs are not captured consistently. The USB can be inserted into any of the RPs.

Step 4 Prepare the RP for USB boot. For the RP boot disk to be baked by the USB, it has to be reloaded with the USB inserted. Only LCC1 is up. Pull out RP1 from LCC1 midway out to prevent it from booting.

Step 5 RP booting through USB boot. When the RP with the USB reloads, it will by default choose the bootable USB as its boot media and automatically start the disk baking process.

```

Booting from USB..
Loading Kernel..
Loading initrd..
Starting udev: [ OK ]
Setting hostname host: [ OK ]
Checking filesystems:[ OK ]
Remounting root filesystem in read-write mode: [ OK ]
Entering non-interactive startup
Bringing up loopback interface: [ OK ]
Starting system logger: [ OK ]
Starting kernel logger: [ OK ]
Starting kdump:[ OK ]
Starting system message bus: [ OK ]
Starting smartd: [ OK ]
Generating SSH1 RSA host key: [ OK ]
Generating SSH2 RSA host key: [ OK ]
Generating SSH2 DSA host key: [ OK ]
Starting sshd: [ OK ]
Starting xinetd: [ OK ]
Running in Data LV support model
Running in LVM support model
Installer will install image on sda
Partition creation on /dev/sda took 0 seconds
File system creation on /dev/sda1 took 1 seconds
Install host image on /dev/sda1
Installing host image size of 199M took 3 seconds
File system creation on /dev/sda2 took 5 seconds
Copying XR iso to repository took 17 seconds
Partitioning PCI block device /dev/sdb
Copying Pxeboot files from USB took 38 seconds
File system creation on /dev/panini_vol_grp/calvados_lv0 took 7 seconds
Install calvados image on /dev/panini_vol_grp/calvados_lv0
Calvados: RP based installation
Installing calvados image size of 392M took 31 seconds
Install EFI on /dev/sda4
Install finished on sda
Usb booted system: Running install image, reboot required ...
Running install image: Please remove the USB and reboot the system
Starting crond: [ OK ]
getaddrinfo failed for 'host': Bad value for ai_flags [ OK ]
Spirit programs are not started for install image: [ OK ]
serial (/dev/ttyserial (/dev/ttyS1) start/running, process 6592

host login:
Running install image: Please remove the USB and reboot the system
Running install image: Please remove the USB and reboot the system
Running install image: Please remove the USB and reboot the system

```

After the process is complete, at the host login prompt, remove the USB. the default username and password for at the host login prompt is root and lab. When *Remove the USB and reboot system* message is displayed, remove the USB and run the **reboot** command.

Step 6 Bring up RP0 with the new version.

After reload, the RP comes up with the new version of OS from the local disk. Once the Host OS comes up, it brings up the Admin VM, which in turn prepares the XR VM partition and brings up the XR VM. Since

the original configuration was erased as part of the process, the RP XR VM console will prompt to define a new username and password: root/lab

Step 7 Bring up RP1 and check for redundancy.

Step 8 Verify chassis stability.

Use the following commands:

```
XR-VM:
show redundancy
show platform

Admin VM:
show platform
show platform slice
show vm
show version
show install commit
show install active
show install inactive
```

Step 9 Verify and upgrade FPD version.

Step 10 Power down LCC.

Step 11 USB boot for SC0.

In the FCC - FCC0, SC0 and SC1 are USB-Booted. Insert USB drive to SC0, and pull out SC1 half way. Power up FCC0. Follow the procedure to upgrade the chassis RP using USB boot for all the nodes that require an upgrade.

Step 12 Verify FCC stability using the **show platform** command in the XR and sysadmin VM.

Step 13 Power down FCC0 and pull out SC0 and insert the USB in SC1. Power up the FCC0. After the USB boot for the SC1 is complete, power down FCC0, insert both the SCs and power up FCC0.

Step 14 Verify FCC stability after reboot, using the **show platform** command in the XR and sysadmin VM.

Step 15 Power down FCC0 and follow the USB boot procedure for FCC1.

Step 16 Power down FCC1.

Step 17 Follow ISSU to upgrade the software image.

Step 18 Check the system stability.

Use the following commands:

```
Admin
term len 0
term width 400
show clock
show chassis (note LCC0 Serial number for use in MC admin config)
show platform
show platform slice
show vm
show version
show install commit
show install active
show install inactive
sh vm

XR VM
term len 0
term width 400
```

```
show clock
term exec prompt timestamp
show redundancy
show platform
show platform vm
```

Step 19 Verify the SDR memory for the line card. The VM memory should be 17G.

Use the **show running-config sdr** command.

```
sysadmin-vm:F0_SC0# sh running-config sdr
Tue Jul 21 15:36:52.732 UTC
sdr default-sdr
resources card-type RP
  vm-memory 9
  vm-cpu 3
!
resources card-type LC
  vm-memory 17
  vm-cpu 5
!
location all
```

Step 20 Back-up the configurations.

a) Copy configurations to the hard disk using these commands.

```
Mkdir harddisk:/configs
cd harddisk:/configs
dir
copy running-config harddisk:/configs/<filename_admin.traffic.cfg>
```

```
dir harddisk:/configs/ | i <filename_admin.traffic.cfg>
```

```
XR:
mkdir harddisk:/configs
cd harddisk:/configs
dir
copy running-config harddisk:/configs/<filename_XR.traffic.cfg>
```

b) Copy running configurations from the harddisk to the USB.

```
sh vm location <rp>
run
cd /harddisk:/configs
chvrf 0 bash
scp <filename_admin.traffic.cfg> <XRvm_ip>:/disk2:/
```

```
XR
copy harddisk:/configs/<filename_XR.traffic.cfg> disk2:
```

c) Save the router database.

Use the **save configuration database** command.

```
save configuration database <database_filename.tgz>
Configuration database successfully backed up at: /harddisk:/ <database_filename.tgz>
```

d) Copy the database from harddisk to the USB.

```
cd /harddisk:
ls -lrt <database_filename.tgz>
copy <database_filename.tgz> disk2:
```

Prerequisite: Validating the System

The system validation is done for the system in the SC mode.

Procedure

Step 1 Login to the chassis in SC mode using the root-system username and password in the admin-VM.

Step 2 Verify the status of LCC0.

Use the following commands:

```
XR-VM:
show redundancy
show platform
show platform vm
```

```
Admin VM:
show platform
show vm
show chassis
```

Step 3 Verify the software image.

Use the following commands:

```
show version
show install commit (in XR and sysadmin verify sw/pkg/SMUs on each card)
show install active (in XR and sysadmin verify sw/pkg/SMUs on each card)
show install inactive (in XR and sysadmin)
```

Step 4 Verify FPD using the **show hw-module fpd** command. Perform FPD upgrade, if required.



CHAPTER 3

Migrate Single Chassis to a Multi Chassis System

This chapter contains procedures which enable the user to migrate from a single chassis system to a multi chassis system.

Table 5: Feature History

Feature Name	Release Information	Feature Description
12+3 Multi-chassis configuration	Cisco IOS XR Release 6.5.32	Twelve NCS 4016 chassis are connected to three NCS 4000 fabric chassis to form a multi-chassis system. This multi-chassis system enables scalability by supporting 192 line cards using a single admin and control plane. This ensures seamless switching across the racks.

- [Migrating a Single Chassis System to a Multi Chassis System \(1+1\)](#), on page 13
- [Migrating 1+1 Multi Chassis System to a 4+1 Multi Chassis System](#), on page 16
- [Migrating a Single Chassis System to a Multi Chassis System \(1+2\)](#), on page 22
- [Migrating a 1+2 Multi Chassis System to 2+2 Multi Chassis System](#), on page 24
- [Migrating a 1+2 Multi Chassis System to 4+2 Multi Chassis System](#), on page 29
- [Migrating a 2+2 Multi Chassis System to 4+2 Multi Chassis System](#), on page 33
- [Migrating a Single Chassis System to a Multi Chassis System \(1+3\)](#), on page 40
- [Migrating a 1+3 Multi Chassis System to 8+3 Multi Chassis System](#), on page 43
- [Migrating a 1+3 Multi Chassis System to 12+3 Multi Chassis System](#), on page 51
- [Verify CE Links](#), on page 62

Migrating a Single Chassis System to a Multi Chassis System (1+1)

The following upgrade procedure is for migrating a SC system to a 1+1 MC system. The MC system comprises, one LCC (LCC0) and one FCC (FCC0).

Before you begin

The following tasks need to be carried out for upgrading a single chassis system to a 1+1 multi chassis configuration.

- Login to Admin-VM using the root-system username and password.
- Verify the status of the LCC0. The commands to be run on the XR VM are: **show redundancy**, **show platform**, **show platform vm**. The commands to be run on the Admin VM are: **show platform**, **show chassis**, **show vm**.
- Verify the SMUs (for the upcoming release). The commands to be used are: **show version**, **show install commit**, **show install active**, **show install inactive**.
- Verify the FPD. The commands to be used in the Admin VM are: **show hw-module fpd**.



Note If any FPD state indicates NEED UPGD or RLOAD REQ, then an FPD upgrade must be performed using the FPD upgrade commands.

Procedure

-
- Step 1** Check the FCC0.
- Step 2** Connect the control ethernet cables between LCC0 and FCC0.
- Step 3** Add the chassis serial number in system admin configuration mode of LCC0 using the **chassis serial serial-number rack rack-id** command.
- Step 4** Switch on FCC0.
- Step 5** Verify the 1+1 MC chassis state using the **show chassis** and **show platform** commands in admin mode and the **show platform** command in XR mode.
- Step 6** Perform plane by plane upgrade of the fabric planes. The upgrade for plane 0 is discussed here in detail. Follow the same steps for plane 1, plane 2, plane 3.
- Check the controller fabric state for the 1+1 MC system using the **show chassis** command.
 - Check if the LCC0 fabric is in single chassis mode using the **show controller fabric plane detail all** command.
 - Shutdown plane 0 using the **controller fabric plane 0 shutdown** command.
 - Check if the plane is in the DOWN state using the command **show controller fabric plane plane_id** command. This may take a few minutes.
 - Add the 1+1 fabric instance configuration as indicated here.

```
config
controller fabric plane 0
instance 0
location F0/FC0
Instance 1
location F0/FC4
commit
exit
```

- Wait for the card to reload. This may take a few minutes. Verify if the card state is indicated as OPERATIONAL.

- g) Verify if the LCC fabric cards are in MC mode using the **show controller fabric plane** *plane_id* command.
- h) Insert the CXP2 pluggables and wait for a few minutes. Check if the pluggables are initialized using the **show controller fabric exp summary rack** *rack_id*

The states of the pluggables are indicated as follows:

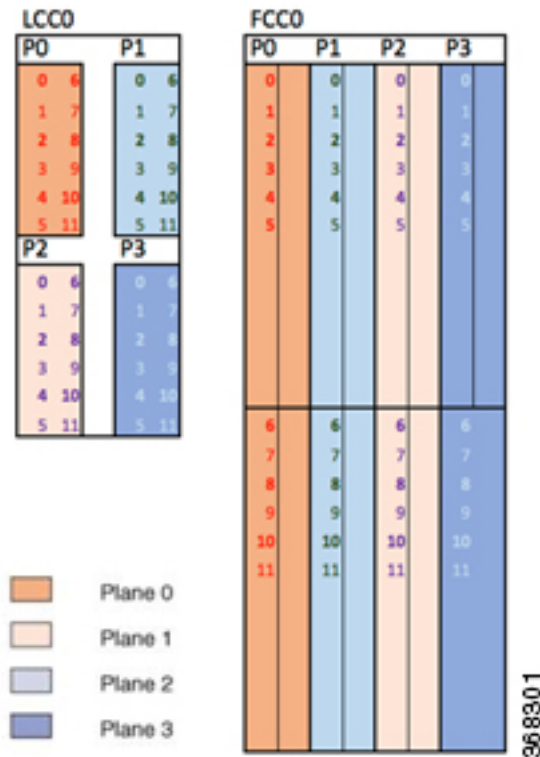
```

sysadmin-vm:0_RP0:PE2# show controller fabric exp summary rack 0
=====
                          Fabric side CXP Port Initialization Status Summary
=====
Active functional role of the Rack [R/S] : 0/RP0
. - CXP is not present
p - CXP is not powered
I - CXP is not Initialized
U - CXP is not Supported
T - One or more Tx channel is disabled on the CXP
R - One or more Rx channel is disabled on the CXP
G - CXP is Initialized properly

```

- i) Perform the data path cabling between LCC0, FCC0 plane 0 fabric cards.
- Verify if all the FCC fabric cards configured for this plane (the ports where the CXP2s are inserted and connected with the LCC fabric card ports) are initialised.
- j) Unshut plane 0 if the CXP2s are in G state.
- G state indicates that the CXP2s are initialized properly.
- k) Unshut plane 0 by using the **controller fabric plane 0 no shutdown** command in system admin configuration mode.
- l) Verify the datapath cabling connections using the CTC cable management tool.
- m) Verify the fabric state details using the following commands:
- **show controller fabric state all detail** in system admin mode.
 - **show controller fabric bundle all detail** in system admin mode.
 - **show platform** in system admin and XR mode.
 - **show redundancy** in XR mode.
 - **show platform vm** in XR mode.
 - **show install commit** in XR mode.
 - **show install active** in XR mode.
 - **show install inactive** in XR mode.

Figure 1: Fabric Cable Connections for 1+1 MC Configuration



Migrating 1+1 Multi Chassis System to a 4+1 Multi Chassis System

The following upgrade procedure is for migrating a 1+1 MC system to a 4+1 MC system. The MC system comprises, four LCC's (LCC0, LCC1, LCC2, LCC3) and one FCC (FCC0).



Note No plane by plane shutdown and un-shut is required for adding new LCC to MC.

Before you begin

Complete the 1+1 multi chassis configuration.



Note The migration of a 1+1 system to a 2+1 or a 3+1 MC system follows the same procedure as discussed below. The 2+1 MC system includes LCC0 and LCC1; the 3+1 MC system includes LCC0, LCC1 and LCC2.

Procedure

Step 1 Check that LCC1, LCC2, LCC3 are in switched-off state.

Note The LCCs should not have any line cards on the chassis.

During the addition of an LCCs, when the line cards are not yet inserted, the display outputs showing the plane status information is different for the show fabric health and show controller fabric commands. After the line cards are inserted into the newly added LCC, the display outputs showing the plane status is identical.

Step 2 Perform the Control Cable connection between LCC1, LCC2, LCC3, FCC0 configuration

Step 3 Add the Chassis Serial Number in the Sysadmin config mode of LCC0.

Always use the appropriate Serial Numbers.

```
chassis serial FLM184322M1 rack 1
chassis serial FLM184322M2 rack 2
chassis serial FLM184322M3 rack 3
```

Step 4 Connect the datapath fabric connections for all the planes, as per the instance configuration of 4+1 MC system.

Fabric Connection can be done together for all the planes for the new LCCs.

Note For adding new LCC, there is no change required in fabric instance configuration.

Step 5 Switch on LCC1, LCC2, LCC3.

Step 6 Verify the 4+1 MC chassis state using the following commands:

- **show chassis**
- **show platform**
- **show controller fabric plane all detail**
- **show controller fabric bundle all detail**

Figure 2: Cisco NCS 4000 Multi Chassis 4+1 Configuration

LCC0

P0		P1	
0	6	0	6
1	7	1	7
2	8	2	8
3	9	3	9
4	10	4	10
5	11	5	11

P2		P3	
0	6	0	6
1	7	1	7
2	8	2	8
3	9	3	9
4	10	4	10
5	11	5	11

FCC0

P0	P1	P2	P3
0	0	0	0
1	1	1	1
2	2	2	2
3	3	3	3
4	4	4	4
5	5	5	5
6	6	6	6
7	7	7	7
8	8	8	8
9	9	9	9
10	10	10	10
11	11	11	11

LCC1

P0		P1	
0	6	0	6
1	7	1	7
2	8	2	8
3	9	3	9
4	10	4	10
5	11	5	11

P2		P3	
0	6	0	6
1	7	1	7
2	8	2	8
3	9	3	9
4	10	4	10
5	11	5	11

LCC2

P0		P1	
0	6	0	6
1	7	1	7
2	8	2	8
3	9	3	9
4	10	4	10
5	11	5	11

P2		P3	
0	6	0	6
1	7	1	7
2	8	2	8
3	9	3	9
4	10	4	10
5	11	5	11

LCC3

P0		P1	
0	6	0	6
1	7	1	7
2	8	2	8
3	9	3	9
4	10	4	10
5	11	5	11

P2		P3	
0	6	0	6
1	7	1	7
2	8	2	8
3	9	3	9
4	10	4	10
5	11	5	11

-  Plane 0
-  Plane 1
-  Plane 2
-  Plane 3

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Cabling Plan for the 4+1 MC Configuration

The following tables show the cabling plan for a 4+1 multi-chassis configuration.

Table 6: Cabling Plan for LCC0 in a 4+1 Multi-Chassis Configuration

Plane 0		Plane 1		Plane 2		Plane 3	
LCC slot/port	FCC slot/port/ chassis	LCC slot/port	FCC slot/port/ chassis	LCC slot/port	FCC slot/port/ chassis	LCC slot/port	FCC slot/port/ chassis
0/FC0/0	F0/FC0/0	0/FC1/0	F0/FC1/0	0/FC2/0	F0/FC2/0	0/FC3/0	F0/FC3/0
0/FC0/1	F0/FC0/1	0/FC1/1	F0/FC1/1	0/FC2/1	F0/FC2/1	0/FC3/1	F0/FC3/1
0/FC0/2	F0/FC0/2	0/FC1/2	F0/FC1/2	0/FC2/2	F0/FC2/2	0/FC3/2	F0/FC3/2
0/FC0/3	F0/FC0/3	0/FC1/3	F0/FC1/3	0/FC2/3	F0/FC2/3	0/FC3/3	F0/FC3/3
0/FC0/4	F0/FC0/4	0/FC1/4	F0/FC1/4	0/FC2/4	F0/FC2/4	0/FC3/4	F0/FC3/4
0/FC0/5	F0/FC0/5	0/FC1/5	F0/FC1/5	0/FC2/5	F0/FC2/5	0/FC3/5	F0/FC3/5
0/FC0/6	F0/FC4/0	0/FC1/6	F0/FC5/0	0/FC2/6	F0/FC6/0	0/FC3/6	F0/FC7/0
0/FC0/7	F0/FC4/1	0/FC1/7	F0/FC5/1	0/FC2/7	F0/FC6/1	0/FC3/7	F0/FC7/1
0/FC0/8	F0/FC4/2	0/FC1/8	F0/FC5/2	0/FC2/8	F0/FC6/2	0/FC3/8	F0/FC7/2
0/FC0/9	F0/FC4/3	0/FC1/9	F0/FC5/3	0/FC2/9	F0/FC6/3	0/FC3/9	F0/FC7/3
0/FC0/10	F0/FC4/4	0/FC1/10	F0/FC5/4	0/FC2/10	F0/FC6/4	0/FC3/10	F0/FC7/4
0/FC0/11	F0/FC4/5	0/FC1/11	F0/FC5/5	0/FC2/11	F0/FC6/5	0/FC3/11	F0/FC7/5

Table 7: Cabling Plan for LCC1 in a 4+1 Multi-Chassis Configuration

Plane 0		Plane 1		Plane 2		Plane 3	
LCC slot/port	FCC slot/port/ chassis	LCC slot/port	FCC slot/port/ chassis	LCC slot/port	FCC slot/port/ chassis	LCC slot/port	FCC slot/port/ chassis
1/FC0/0	F0/FC0/6	1/FC1/0	F0/FC1/6	1/FC2/0	F0/FC2/6	1/FC3/0	F0/FC3/6
1/FC0/1	F0/FC0/7	1/FC1/1	F0/FC1/7	1/FC2/1	F0/FC2/7	2/FC3/1	F0/FC3/7
1/FC0/2	F0/FC0/8	1/FC1/2	F0/FC1/8	1/FC2/2	F0/FC2/8	1/FC3/2	F0/FC3/8
1/FC0/3	F0/FC0/9	1/FC1/3	F0/FC1/9	1/FC2/3	F0/FC2/9	1/FC3/3	F0/FC3/9
1/FC0/4	F0/FC0/10	1/FC1/4	F0/FC1/10	1/FC2/4	F0/FC2/10	1/FC3/4	F0/FC3/10

Plane 0		Plane 1		Plane 2		Plane 3	
LCC slot/port	FCC slot/port/ chassis	LCC slot/port	FCC slot/port/ chassis	LCC slot/port	FCC slot/port/ chassis	LCC slot/port	FCC slot/port/ chassis
1/FC0/5	F0/FC0/11	1/FC1/5	F0/FC1/11	1/FC2/5	F0/FC2/11	1/FC3/5	F0/FC3/11
1/FC0/6	F0/FC4/6	1/FC1/6	F0/FC5/6	1/FC2/6	F0/FC6/6	1/FC3/6	F0/FC7/6
1/FC0/7	F0/FC4/7	1/FC1/7	F0/FC5/7	1/FC2/7	F0/FC6/7	1/FC3/7	F0/FC7/7
1/FC0/8	F0/FC4/8	1/FC1/8	F0/FC5/8	1/FC2/8	F0/FC6/8	1/FC3/8	F0/FC7/8
1/FC0/9	F0/FC4/9	1/FC1/9	F0/FC5/9	1/FC2/9	F0/FC6/9	1/FC3/9	F0/FC7/9
1/FC0/10	F0/FC4/10	1/FC1/10	F0/FC5/10	1/FC2/10	F0/FC6/10	1/FC3/10	F0/FC7/10
1/FC0/11	F0/FC4/11	1/FC1/11	F0/FC5/11	1/FC2/11	F0/FC6/11	1/FC3/11	F2/FC7/11

Table 8: Cabling Plan for LCC2 in a 4+1 Multi-Chassis Configuration

Plane 0		Plane 1		Plane 2		Plane 3	
LCC slot/port	FCC slot/port/ chassis	LCC slot/port	FCC slot/port/ chassis	LCC slot/port	FCC slot/port/ chassis	LCC slot/port	FCC slot/port/ chassis
2/FC0/0	F0/FC0/12	2/FC1/0	F0/FC1/12	2/FC2/0	F0/FC2/12	2/FC3/0	F0/FC3/12
2/FC0/1	F0/FC0/13	2/FC1/1	F0/FC1/13	2/FC2/1	F0/FC2/13	2/FC3/1	F0/FC3/13
2/FC0/2	F0/FC0/14	2/FC1/2	F0/FC1/14	2/FC2/2	F0/FC2/14	2/FC3/2	F0/FC3/14
2/FC0/3	F0/FC0/15	2/FC1/3	F0/FC1/15	2/FC2/3	F0/FC2/15	2/FC3/3	F0/FC3/15
2/FC0/4	F0/FC0/16	2/FC1/4	F0/FC1/16	2/FC2/4	F0/FC2/16	2/FC3/4	F0/FC3/16
2/FC0/5	F0/FC0/17	2/FC1/5	F0/FC1/17	2/FC2/5	F0/FC2/17	2/FC3/5	F0/FC3/17
2/FC0/6	F0/FC4/12	2/FC1/6	F0/FC5/12	2/FC2/6	F0/FC6/12	2/FC3/6	F0/FC7/12
2/FC0/7	F0/FC4/13	2/FC1/7	F0/FC5/13	2/FC2/7	F0/FC6/13	2/FC3/7	F0/FC7/13
2/FC0/8	F0/FC4/14	2/FC1/8	F0/FC5/14	2/FC2/8	F0/FC6/14	2/FC3/8	F0/FC7/14
2/FC0/9	F0/FC4/15	2/FC1/9	F0/FC5/15	2/FC2/9	F0/FC6/15	2/FC3/9	F0/FC7/15
2/FC0/10	F0/FC4/16	2/FC1/10	F0/FC5/16	2/FC2/10	F0/FC6/16	2/FC3/10	F0/FC7/16
2/FC0/11	F0/FC4/17	2/FC1/11	F0/FC5/17	2/FC2/11	F0/FC6/17	2/FC3/11	F0/FC7/17

Table 9: Cabling Plan for LCC3 in a 4+1 Multi-Chassis Configuration

Plane 0		Plane 1		Plane 2		Plane 3	
LCC slot/port	FCC slot/port/ chassis	LCC slot/port	FCC slot/port/ chassis	LCC slot/port	FCC slot/port/ chassis	LCC slot/port	FCC slot/port/ chassis
3/FC0/0	F0/FC0/18	3/FC1/0	F0/FC1/18	3/FC2/0	F0/FC2/18	3/FC3/0	F0/FC3/18
3/FC0/1	F0/FC0/19	3/FC1/1	F0/FC1/19	3/FC2/1	F0/FC2/19	3/FC3/1	F0/FC3/19
3/FC0/2	F0/FC0/20	3/FC1/2	F0/FC1/20	3/FC2/2	F0/FC2/20	3/FC3/2	F0/FC3/20
3/FC0/3	F0/FC0/21	3/FC1/3	F0/FC1/21	3/FC2/3	F0/FC2/21	3/FC3/3	F0/FC3/21
3/FC0/4	F0/FC0/22	3/FC1/4	F0/FC1/22	3/FC2/4	F0/FC2/22	3/FC3/4	F0/FC3/22
3/FC0/5	F0/FC0/23	3/FC1/5	F0/FC1/23	3/FC2/5	F0/FC2/23	3/FC3/5	F0/FC3/23
3/FC0/6	F0/FC4/18	3/FC1/6	F0/FC5/18	3/FC2/6	F0/FC6/18	3/FC3/6	F0/FC7/18
3/FC0/7	F0/FC4/19	3/FC1/7	F0/FC5/19	3/FC2/7	F0/FC6/19	3/FC3/7	F0/FC7/19
3/FC0/8	F0/FC4/20	3/FC1/8	F0/FC5/20	3/FC2/8	F0/FC6/20	3/FC3/8	F0/FC7/20
3/FC0/9	F0/FC4/21	3/FC1/9	F0/FC5/21	3/FC2/9	F0/FC6/21	3/FC3/9	F0/FC7/21
3/FC0/10	F0/FC4/22	3/FC1/10	F0/FC5/22	3/FC2/10	F0/FC6/22	3/FC3/10	F0/FC7/22
3/FC0/11	F0/FC4/23	3/FC1/11	F0/FC5/23	3/FC2/11	F0/FC6/23	3/FC3/11	F0/FC7/23

Migrating a Single Chassis System to a Multi Chassis System (1+2)

The following upgrade procedure is for migrating a SC system to a 1+2 MC system. The MC system comprises, one LCC (LCC0) and two FCCs (FCC0 , FCC1).

Before you begin

The following tasks need to be carried out for upgrading a single chassis system to a 1+2 multi chassis configuration.

- Login to Admin-VM using the root-system username and password.
- Verify the status of the LCC0. The commands to be run on the XR VM are: **show redundancy, show platform , show platform vm**. The commands to be run on the Admin VM are: **show platform, show chassis, show vm**.
- Verify the SMUs of the upcoming release. The commands to be used are: **show version, show install commit, show install active, show install inactive** .
- Verify the FPD. The commands to be used in the Admin VM are: **show hw-module fpd**.



Note If any FPD state indicates NEED UPGD or RLOAD REQ, then an FPD upgrade must be performed using the FPD upgrade commands.

Procedure

- Step 1** Check the FCC0 and FCC1 are not powered-on.
- Step 2** Connect the control ethernet cables between LCC0, FCC0 and FCC1.
- Step 3** Add the chassis serial number in system admin configuration mode of LCC0 using the **chassis serial serial-number rack rack-id** command.
- Step 4** Switch on FCC0 and FCC1.
- Step 5** Verify the 1+2 MC chassis state using the **show chassis** and **show platform** commands in admin mode and the **show platform** command in XR mode.
- Step 6** Perform plane by plane upgrade of the fabric planes. The upgrade for plane 0 is discussed here in detail. Follow the same steps for plane 1, plane 2, plane 3.
- Check the controller fabric state for the 1+2 MC system using the **show chassis** command.
 - Check if the LCC0 fabric is in single chassis mode using the **show controller fabric plane detail all** command.
 - Shutdown plane 0 using the **controller fabric plane 0 shutdown** command.
 - Check if the plane is in the DOWN state using the command **show controller fabric plane plane_id** command. This may take a few minutes.
 - Add the 1+2 fabric instance configuration as indicated here.
 - Wait for the card to reload. This may take a few minutes. Verify if the card state is indicated as OPERATIONAL.
 - Verify if the LCC fabric cards are in MC mode using the **show controller fabric plane plane_id** command.
 - Insert the CXP2 pluggables and wait for a few minutes. Check if the pluggables are initialized using the **show controller fabric exp summary rack rack_id**

The states of the pluggables are indicated as follows:

```

sysadmin-vm:0_RP0:PE2# show controller fabric exp summary rack 0
=====
Fabric side CXP Port Initialization Status Summary
=====
Active functional role of the Rack [R/S] : 0/RP0
. - CXP is not present
p - CXP is not powered
I - CXP is not Initialized
U - CXP is not Supported
T - One or more Tx channel is disabled on the CXP
R - One or more Rx channel is disabled on the CXP
G - CXP is Initialized properly

```

- Perform the data path cabling between LCC0, FCC0, FCC1 plane 0 fabric cards.
- Unshut plane 0 if the CXP2s are in G state.
G state indicates that the CXP2s are initialized properly.
- Unshut plane 0 by using the **controller fabric plane 0 no shutdown** command in system admin configuration mode.

- l) Verify the fabric state details using the following commands:
- **show controller fabric state all detail** in system admin mode.
 - **show controller fabric bundle all detail** in system admin mode.
 - **show platform** in system admin and XR mode.
 - **show redundancy** in XR mode.
 - **show platform vm** in XR mode.
 - **show install commit** in XR mode.
 - **show install active** in XR mode.
 - **show install inactive** in XR mode.

Migrating a 1+2 Multi Chassis System to 2+2 Multi Chassis System

The following upgrade procedure is for migrating a 1+2 MC system to a 2+2 MC system. The MC system comprises, two LCC's (LCC0, LCC1)) and two FCCs (FCC0 , FCC1).



Note No plane by plane shutdown and un-shut is required for adding new LCC to MC.

Before you begin

Complete the 1+2 Multi Chassis (MC) configuration.

Procedure

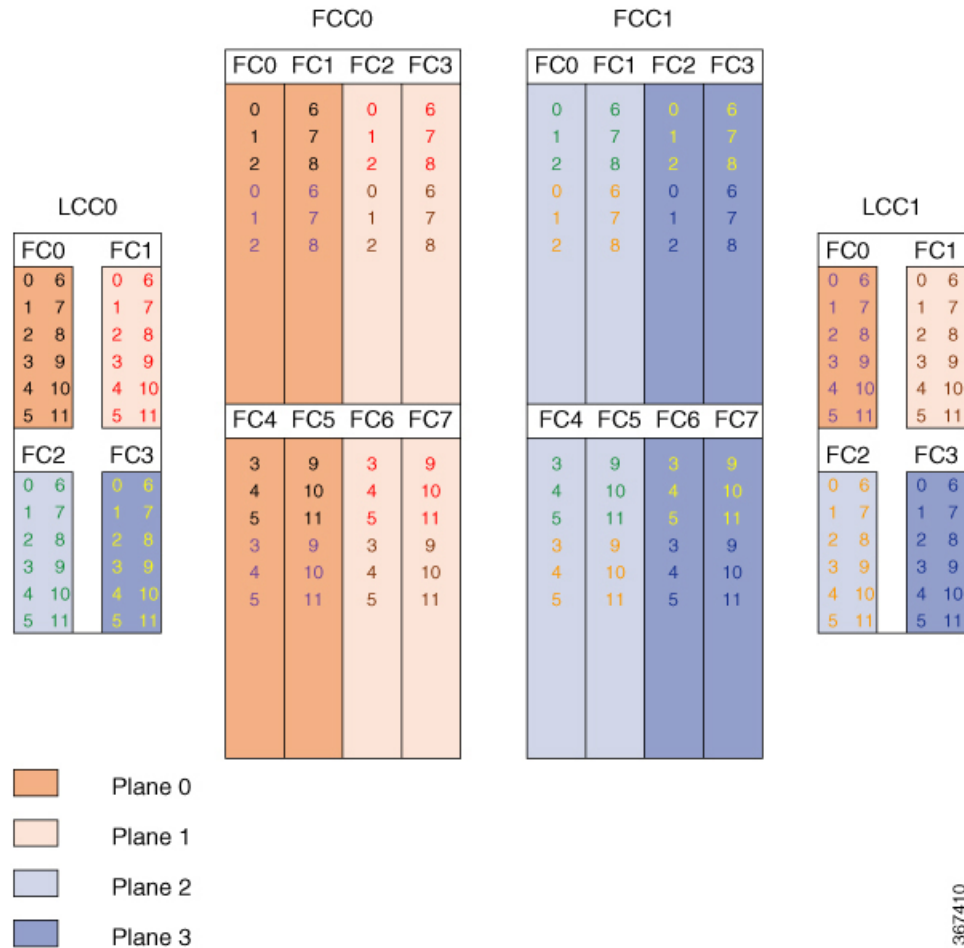
- Step 1** Check that LCC1 is switched-off state.
- Note** The LCC1 should not have any Line Cards on the Chassis.
- Step 2** Perform the control cable connection between LCC1, FCC0 and FCC1 for a 2+2 configuration
- Step 3** Add the Chassis Serial Number in SysAdmin Config of LCC0.
Always use the appropriate Serial Numbers.
- Step 4** Connect the datapath fabric connections for all the planes, as per the instance configuration of 1+2 MC system.
Fabric Connection can be done together for all the planes for the new LCC.
- Note** For adding new LCC, there is no change required in fabric instance configuration.

- Step 5** Switch on LCC1.
- Step 6** Verify the 2+2 MC chassis state using the following commands:
- show chassis**
 - show platform**
 - show controller fabric plane all detail**
 - show controller fabric bundle all detail**
 - show platform**

Example:

```
RP/0/RP0:hostname# admin
sysadmin-vm:0_RP0# show chassis
sysadmin-vm:0_RP0# show platform
sysadmin-vm:0_RP0# show controller fabric plane all detail
sysadmin-vm:0_RP0# show controller fabric bundle all detail
sysadmin-vm:0_RP0# exit
RP/0/RP0:hostname# show platform
```

Figure 3: Cisco NCS 4000 Multi-Chassis 2+2 Configuration



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The following table shows the cabling plan for a 2+2 multi-chassis configuration. The FCC0 has the fabric instances 0 through 3 for planes 0 and 1. The FCC1 has the fabric instances 0 through 3 for planes 2 and 3.

Table 10: Cabling Plan for LCC0 in a 2+2 Multi-Chassis Configuration

Plane 0		Plane 1		Plane 2		Plane 3	
LCC0 slot/port	FCC slot/port/ chassis	LCC0 slot/port	FCC slot/port/ chassis	LCC0 slot/port	FCC slot/port/ chassis	LCC0 slot/port	FCC slot/port/ chassis
FC0/0 to FC0/0 (FCC0)		FC1/0 to FC2/0 (FCC0)		FC2/0 to FC0/0 (FCC1)		FC3/0 to FC2/0 (FCC1)	
FC0/1 to FC0/1 (FCC0)		FC1/1 to FC2/1 (FCC0)		FC2/1 to FC0/1 (FCC1)		FC3/1 to FC2/1 (FCC1)	
FC0/2 to FC0/2 (FCC0)		FC1/2 to FC2/2 (FCC0)		FC2/2 to FC0/2 (FCC1)		FC3/2 to FC2/2 (FCC1)	
FC0/3 to FC4/0 (FCC0)		FC1/3 to FC6/0 (FCC0)		FC2/3 to FC4/0 (FCC1)		FC3/3 to FC6/0 (FCC1)	
FC0/4 to FC4/1 (FCC0)		FC1/4 to FC6/1 (FCC0)		FC2/4 to FC4/1 (FCC1)		FC3/4 to FC6/1 (FCC1)	
FC0/5 to FC4/2 (FCC0)		FC1/5 to FC6/2 (FCC0)		FC2/5 to FC4/2 (FCC1)		FC3/5 to FC6/2 (FCC1)	
FC0/6 to FC1/0 (FCC0)		FC1/6 to FC3/0 (FCC0)		FC2/6 to FC1/0 (FCC1)		FC3/6 to FC3/0 (FCC1)	
FC0/7 to FC1/1 (FCC0)		FC1/7 to FC3/1 (FCC0)		FC2/7 to FC1/1 (FCC1)		FC3/7 to FC3/1 (FCC1)	
FC0/8 to FC1/2 (FCC0)		FC1/8 to FC3/2 (FCC0)		FC2/8 to FC1/2 (FCC1)		FC3/8 to FC3/2 (FCC1)	
FC0/9 to FC5/0 (FCC0)		FC1/9 to FC7/0 (FCC0)		FC2/9 to FC5/0 (FCC1)		FC3/9 to FC7/0 (FCC1)	
FC0/10 to FC5/1 (FCC0)		FC1/10 to FC7/1 (FCC0)		FC2/10 to FC5/1 (FCC1)		FC3/10 to FC7/1 (FCC1)	
FC0/11 to FC5/2 (FCC0)		FC1/11 to FC7/2 (FCC0)		FC2/11 to FC5/2 (FCC1)		FC3/11 to FC7/2 (FCC1)	

Table 11: Cabling Plan for LCC1 in a 2+2 Multi-Chassis Configuration

Plane 0		Plane 1		Plane 2		Plane 3	
LCC1 slot/port	FCC slot/port/ chassis	LCC1 slot/port	FCC slot/port/ chassis	LCC1 slot/port	FCC slot/port/ chassis	LCC1 slot/port	FCC slot/port/ chassis
FC0/0 to FC0/3 (FCC0)		FC1/0 to FC2/3 (FCC0)		FC2/0 to FC0/3 (FCC1)		FC3/0 to FC2/3 (FCC1)	
FC0/1 to FC0/4 (FCC0)		FC1/1 to FC2/4 (FCC0)		FC2/1 to FC0/4 (FCC1)		FC3/1 to FC2/4 (FCC1)	
FC0/2 to FC05 (FCC0)		FC1/2 to FC2/5 (FCC0)		FC2/2 to FC0/5 (FCC1)		FC3/2 to FC2/5 (FCC1)	
FC0/3 to FC4/3 (FCC0)		FC1/3 to FC6/3 (FCC0)		FC2/3 to FC4/3 (FCC1)		FC3/3 to FC6/3 (FCC1)	
FC0/4 to FC4/4 (FCC0)		FC1/4 to FC6/4 (FCC0)		FC2/4 to FC4/4 (FCC1)		FC3/4 to FC6/4 (FCC1)	
FC0/5 to FC4/5 (FCC0)		FC1/5 to FC6/5 (FCC0)		FC2/5 to FC4/5 (FCC1)		FC3/5 to FC6/5 (FCC1)	
FC0/6 to FC1/3 (FCC0)		FC1/6 to FC3/3 (FCC0)		FC2/6 to FC1/3 (FCC1)		FC3/6 to FC3/3 (FCC1)	
FC0/7 to FC1/4 (FCC0)		FC1/7 to FC3/4 (FCC0)		FC2/7 to FC1/4 (FCC1)		FC3/7 to FC3/4 (FCC1)	
FC0/8 to FC1/5 (FCC0)		FC1/8 to FC3/5 (FCC0)		FC2/8 to FC1/5 (FCC1)		FC3/8 to FC3/5 (FCC1)	

Plane 0		Plane 1		Plane 2		Plane 3	
LCC1 slot/port	FCC slot/port/ chassis	LCC1 slot/port	FCC slot/port/ chassis	LCC1 slot/port	FCC slot/port/ chassis	LCC1 slot/port	FCC slot/port/ chassis
FC0/9 to FC5/3 (FCC0)		FC1/9 to FC7/3 (FCC0)		FC2/9 to FC5/3 (FCC1)		FC3/9 to FC7/3 (FCC1)	
FC0/10 to FC5/4 (FCC0)		FC1/10 to FC7/4 (FCC0)		FC2/10 to FC5/4 (FCC1)		FC3/10 to FC7/4 (FCC1)	
FC0/11 to FC5/5 (FCC0)		FC1/11 to FC7/5 (FCC0)		FC2/11 to FC5/5 (FCC1)		FC3/11 to FC7/5 (FCC1)	

Vertical Plane Configuration for 2+2

This section describes how to configure a multi chassis 2+2 configuration. In this configuration, two line card chassis (LCC0 and LCC1) are connected to two fabric card chassis (FCC0 and FCC1).

Chassis Serial Configurations for 2+2

LCC0 and LCC1 are on rack0 and rack1 respectively. FCC0 and FCC1 are on rack F0 and F1 respectively. Use the **chassis serial** *serial_number* **rack** *rack_id* command. For a detailed procedure, see [Assign Rack Number to Chassis](#) , on page 2

```
Chassis serial <serial number> rack 1
chassis serial <serial number> rack F0
chassis serial <serial number> rack F1
chassis serial <serial number> rack 0
```

Fabric Instance Configuration for 2+2

The following configurations indicate the instances for fabric plane 0,1,2,3. For a detailed procedure, see [Associate a Fabric Card in a Fabric Card Chassis to a Fabric Plane](#) , on page 3

- Fabric instance configuration for fabric plane 0.

```
config
controller fabric plane 0
instance 0
location F0/FC0

instance 1
location F0/FC4

instance 2
location F0/FC1

instance 3
location F0/FC5

commit
exit
```

- Fabric instance configuration for fabric plane 1.

```
config
controller fabric plane 1
instance 0
location F0/FC2

instance 1
location F0/FC6

instance 2
location F0/FC3

instance 3
location F0/FC7

commit
exit
```

- Fabric instance configuration for fabric plane 2.

```
config
controller fabric plane 2
instance 0
location F1/FC0

instance 1
location F1/FC4

instance 2
location F1/FC1

instance 3
location F1/FC5

commit
exit
```

- Fabric instance configuration for fabric plane 3.

```
config
controller fabric plane 3
instance 0
location F1/FC2

instance 1
location F1/FC6

instance 2
location F1/FC3

instance 3
location F1/FC7

commit
exit
```

Migrating a 1+2 Multi Chassis System to 4+2 Multi Chassis System

The following upgrade procedure is for migrating a 1+2 MC system to a 4+2 MC system. The MC system comprises, four LCC's (LCC0, LCC1, LCC2, and LCC3) and two FCCs (FCC0 , FCC1).



Note No plane by plane shutdown and un-shut is required for adding new LCC to MC system.

Before you begin

Complete the 1+2 Multi Chassis (MC) configuration.



Note The migration of a 1+2 system to 3+2 system follows the same procedure as discussed below. The 3+2 MC system includes LCC0, LCC1 and LCC2 and FCC0 and FCC1.

Procedure

- Step 1** Check that LCC1, LCC2 and LCC3 are not powered-on.
- Note** The LCC1, LCC2 and LCC3 should not have any line cards on the chassis.
- Step 2** Perform the Control Cable connection between LCC1, LCC2, LCC3 and FCC0/FCC1 for a 4+2 configuration.
- Step 3** Add the Chassis Serial Number in SysAdmin Config of LCC0.
Always use the appropriate Serial Numbers.
- Step 4** Connect the datapath fabric connections for all the planes, as per the instance configuration of 2+2 MC system.
Fabric Connection can be done together for all the planes for the new LCC.
- Note** For adding new LCC, there is no change required in fabric instance configuration.
- Step 5** Switch LCC1, LCC2 and LCC3..
- Step 6** Verify the 4+2 MC chassis state using following commands:
- show chassis
 - show platform
 - show controller fabric plane all detail
 - show controller fabric bundle all detail
 - show platform

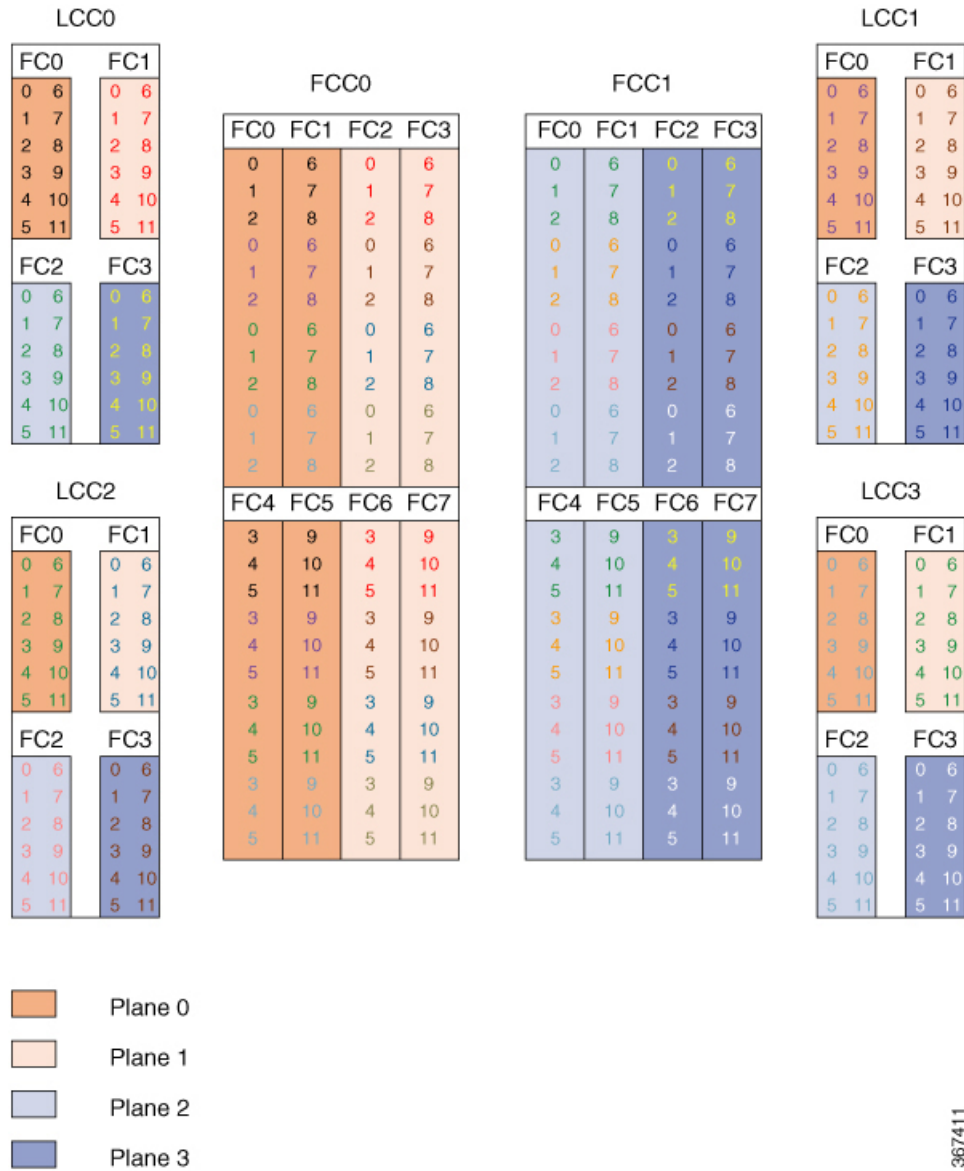
Example:

```
RP/0/RP0:hostname# admin
sysadmin-vm:0_RP0# show chassis
```

```

sysadmin-vm:0_RP0# show platform
sysadmin-vm:0_RP0# show controller fabric plane all detail
sysadmin-vm:0_RP0# show controller fabric bundle all detail
sysadmin-vm:0_RP0# exit
RP/0/RP0:hostname# show platform
    
```

Figure 4: Cisco NCS 4000 Multi-Chassis 4+2 Configuration



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The following tables show the cabling plan for a 4+2 multi-chassis configuration. The FCC0 has the fabric instances 0 through 3 for planes 0, and 1. The FCC1 has the fabric instances 0 through 3 for planes 2 and 3.

Table 12: Cabling Plan for LCC0 in a 4+2 Multi-Chassis Configuration

Plane 0		Plane 1		Plane 2		Plane 3	
LCC0 slot/port	FCC slot/port/ chassis	LCC0 slot/port	FCC slot/port/ chassis	LCC0 slot/port	FCC slot/port/ chassis	LCC0 slot/port	FCC slot/port/ chassis
FC0/0 to FC0/0 (FCC0)		FC1/0 to FC2/0 (FCC0)		FC2/0 to FC0/0 (FCC1)		FC3/0 to FC2/0 (FCC1)	
FC0/1 to FC0/1 (FCC0)		FC1/1 to FC2/1 (FCC0)		FC2/1 to FC0/1 (FCC1)		FC3/1 to FC2/1 (FCC1)	
FC0/2 to FC0/2 (FCC0)		FC1/2 to FC2/2 (FCC0)		FC2/2 to FC0/2 (FCC1)		FC3/2 to FC2/2 (FCC1)	
FC0/3 to FC4/0 (FCC0)		FC1/3 to FC6/0 (FCC0)		FC2/3 to FC4/0 (FCC1)		FC3/3 to FC6/0 (FCC1)	
FC0/4 to FC4/1 (FCC0)		FC1/4 to FC6/1 (FCC0)		FC2/4 to FC4/1 (FCC1)		FC3/4 to FC6/1 (FCC1)	
FC0/5 to FC4/2 (FCC0)		FC1/5 to FC6/2 (FCC0)		FC2/5 to FC4/2 (FCC1)		FC3/5 to FC6/2 (FCC1)	
FC0/6 to FC1/0 (FCC0)		FC1/6 to FC3/0 (FCC0)		FC2/6 to FC1/0 (FCC1)		FC3/6 to FC3/0 (FCC1)	
FC0/7 to FC1/1 (FCC0)		FC1/7 to FC3/1 (FCC0)		FC2/7 to FC1/1 (FCC1)		FC3/7 to FC3/1 (FCC1)	
FC0/8 to FC1/2 (FCC0)		FC1/8 to FC3/2 (FCC0)		FC2/8 to FC1/2 (FCC1)		FC3/8 to FC3/2 (FCC1)	
FC0/9 to FC5/0 (FCC0)		FC1/9 to FC7/0 (FCC0)		FC2/9 to FC5/0 (FCC1)		FC3/9 to FC7/0 (FCC1)	
FC0/10 to FC5/1 (FCC0)		FC1/10 to FC7/1 (FCC0)		FC2/10 to FC5/1 (FCC1)		FC3/10 to FC7/1 (FCC1)	
FC0/11 to FC5/2 (FCC0)		FC1/11 to FC7/2 (FCC0)		FC2/11 to FC5/2 (FCC1)		FC3/11 to FC7/2 (FCC1)	

Table 13: Cabling Plan for LCC1 in a 4+2 Multi-Chassis Configuration

Plane 0		Plane 1		Plane 2		Plane 3	
LCC1 slot/port	FCC slot/port/ chassis	LCC1 slot/port	FCC slot/port/ chassis	LCC1 slot/port	FCC slot/port/ chassis	LCC1 slot/port	FCC slot/port/ chassis
FC0/0 to FC0/3 (FCC0)		FC1/0 to FC2/3 (FCC0)		FC2/0 to FC0/3 (FCC1)		FC3/0 to FC2/3 (FCC1)	
FC0/1 to FC0/4 (FCC0)		FC1/1 to FC2/4 (FCC0)		FC2/1 to FC0/4 (FCC1)		FC3/1 to FC2/4 (FCC1)	
FC0/2 to FC05 (FCC0)		FC1/2 to FC2/5 (FCC0)		FC2/2 to FC0/5 (FCC1)		FC3/2 to FC2/5 (FCC1)	
FC0/3 to FC4/3 (FCC0)		FC1/3 to FC6/3 (FCC0)		FC2/3 to FC4/3 (FCC1)		FC3/3 to FC6/3 (FCC1)	
FC0/4 to FC4/4 (FCC0)		FC1/4 to FC6/4 (FCC0)		FC2/4 to FC4/4 (FCC1)		FC3/4 to FC6/4 (FCC1)	
FC0/5 to FC4/5 (FCC0)		FC1/5 to FC6/5 (FCC0)		FC2/5 to FC4/5 (FCC1)		FC3/5 to FC6/5 (FCC1)	
FC0/6 to FC1/3 (FCC0)		FC1/6 to FC3/3 (FCC0)		FC2/6 to FC1/3 (FCC1)		FC3/6 to FC3/3 (FCC1)	
FC0/7 to FC1/4 (FCC0)		FC1/7 to FC3/4 (FCC0)		FC2/7 to FC1/4 (FCC1)		FC3/7 to FC3/4 (FCC1)	
FC0/8 to FC1/5 (FCC0)		FC1/8 to FC3/5 (FCC0)		FC2/8 to FC1/5 (FCC1)		FC3/8 to FC3/5 (FCC1)	

Plane 0		Plane 1		Plane 2		Plane 3	
LCC1 slot/port	FCC slot/port/ chassis	LCC1 slot/port	FCC slot/port/ chassis	LCC1 slot/port	FCC slot/port/ chassis	LCC1 slot/port	FCC slot/port/ chassis
FC0/9 to FC5/3 (FCC0)		FC1/9 to FC7/3 (FCC0)		FC2/9 to FC5/3 (FCC1)		FC3/9 to FC7/3 (FCC1)	
FC0/10 to FC5/4 (FCC0)		FC1/10 to FC7/4 (FCC0)		FC2/10 to FC5/4 (FCC1)		FC3/10 to FC7/4 (FCC1)	
FC0/11 to FC5/5 (FCC0)		FC1/11 to FC7/5 (FCC0)		FC2/11 to FC5/5 (FCC1)		FC3/11 to FC7/5 (FCC1)	

Table 14: Cabling Plan for LCC2 in a 4+2 Multi-Chassis Configuration

Plane 0		Plane 1		Plane 2		Plane 3	
LCC2 slot/port	FCC slot/port/ chassis	LCC2 slot/port	FCC slot/port/ chassis	LCC2 slot/port	FCC slot/port/ chassis	LCC2 slot/port	FCC slot/port/ chassis
FC0/0 to FC0/6 (FCC0)		FC1/0 to FC2/6 (FCC0)		FC2/0 to FC0/6 (FCC1)		FC3/0 to FC2/6 (FCC1)	
FC0/1 to FC0/7 (FCC0)		FC1/1 to FC2/7 (FCC0)		FC2/1 to FC0/7 (FCC1)		FC3/1 to FC2/7 (FCC1)	
FC0/2 to FC0/8 (FCC0)		FC1/2 to FC2/8 (FCC0)		FC2/2 to FC0/8 (FCC1)		FC3/2 to FC2/8 (FCC1)	
FC0/3 to FC4/6 (FCC0)		FC1/3 to FC6/6 (FCC0)		FC2/3 to FC4/6 (FCC1)		FC3/3 to FC6/6 (FCC1)	
FC0/4 to FC4/7 (FCC0)		FC1/4 to FC6/7 (FCC0)		FC2/4 to FC4/7 (FCC1)		FC3/4 to FC6/7 (FCC1)	
FC0/5 to FC4/8 (FCC0)		FC1/5 to FC6/8 (FCC0)		FC2/5 to FC4/8 (FCC1)		FC3/5 to FC6/8 (FCC1)	
FC0/6 to FC1/6 (FCC0)		FC1/6 to FC3/6 (FCC0)		FC2/6 to FC1/6 (FCC1)		FC3/6 to FC3/6 (FCC1)	
FC0/7 to FC1/7 (FCC0)		FC1/7 to FC3/7 (FCC0)		FC2/7 to FC1/7 (FCC1)		FC3/7 to FC3/7 (FCC1)	
FC0/8 to FC1/8 (FCC0)		FC1/8 to FC3/8 (FCC0)		FC2/8 to FC1/8 (FCC1)		FC3/8 to FC3/8 (FCC1)	
FC0/9 to FC5/6 (FCC0)		FC1/9 to FC7/6 (FCC0)		FC2/9 to FC5/6 (FCC1)		FC3/9 to FC7/6 (FCC1)	
FC0/10 to FC5/7 (FCC0)		FC1/10 to FC7/7 (FCC0)		FC2/10 to FC5/7 (FCC1)		FC3/10 to FC7/7 (FCC1)	
FC0/11 to FC5/8 (FCC0)		FC1/11 to FC7/8 (FCC0)		FC2/11 to FC5/8 (FCC1)		FC3/11 to FC7/8 (FCC1)	

Table 15: Cabling Plan for LCC3 in a 4+2 Multi-Chassis Configuration

Plane 0		Plane 1		Plane 2		Plane 3	
LCC3 slot/port	FCC slot/port/ chassis	LCC3 slot/port	FCC slot/port/ chassis	LCC3 slot/port	FCC slot/port/ chassis	LCC3 slot/port	FCC slot/port/ chassis
FC0/0 to FC0/9 (FCC0)		FC1/0 to FC2/9 (FCC0)		FC2/0 to FC0/9 (FCC1)		FC3/0 to FC2/9 (FCC1)	
FC0/1 to FC0/10 (FCC0)		FC1/1 to FC2/10 (FCC0)		FC2/1 to FC0/10 (FCC1)		FC3/1 to FC2/10 (FCC1)	
FC0/2 to FC0/11 (FCC0)		FC1/2 to FC2/11 (FCC0)		FC2/2 to FC0/11 (FCC1)		FC3/2 to FC2/11 (FCC1)	

Plane 0		Plane 1		Plane 2		Plane 3	
LCC3 slot/port	FCC slot/port/ chassis	LCC3 slot/port	FCC slot/port/ chassis	LCC3 slot/port	FCC slot/port/ chassis	LCC3 slot/port	FCC slot/port/ chassis
FC0/3 to FC4/9 (FCC0)		FC1/3 to FC6/9 (FCC0)		FC2/3 to FC4/9 (FCC1)		FC3/3 to FC6/9 (FCC1)	
FC0/4 to FC4/10 (FCC0)		FC1/4 to FC6/10 (FCC0)		FC2/4 to FC4/10 (FCC1)		FC3/4 to FC6/10 (FCC1)	
FC0/5 to FC4/11 (FCC0)		FC1/5 to FC6/11 (FCC0)		FC2/5 to FC4/11 (FCC1)		FC3/5 to FC6/11 (FCC1)	
FC0/6 to FC1/9 (FCC0)		FC1/6 to FC3/9 (FCC0)		FC2/6 to FC1/9 (FCC1)		FC3/6 to FC3/9 (FCC1)	
FC0/7 to FC1/10 (FCC0)		FC1/7 to FC3/10 (FCC0)		FC2/7 to FC1/10 (FCC1)		FC3/7 to FC3/10 (FCC1)	
FC0/8 to FC1/11 (FCC0)		FC1/8 to FC3/11 (FCC0)		FC2/8 to FC1/11 (FCC1)		FC3/8 to FC3/11 (FCC1)	
FC0/9 to FC5/9 (FCC0)		FC1/9 to FC7/9 (FCC0)		FC2/9 to FC5/9 (FCC1)		FC3/9 to FC7/9 (FCC1)	
FC0/10 to FC5/10 (FCC0)		FC1/10 to FC7/10 (FCC0)		FC2/10 to FC5/10 (FCC1)		FC3/10 to FC7/10 (FCC1)	
FC0/11 to FC5/11 (FCC0)		FC1/11 to FC7/11 (FCC0)		FC2/11 to FC5/11 (FCC1)		FC3/11 to FC7/11 (FCC1)	

Migrating a 2+2 Multi Chassis System to 4+2 Multi Chassis System

The following upgrade procedure is for migrating to a 4+2 MC system. The MC system comprises, four LCCs (LCC0, LCC1, LCC2, and LCC3) and two FCCs (FCC0, FCC1).



Note No plane by plane shutdown and un-shut is required for adding new LCC to MC system.

Before you begin

Complete the 2+2 Multi Chassis (MC) configuration.

Procedure

Step 1 Check that LCC2 and LCC3 are not powered-on.

Note The LCC2 and LCC3 should not have any Line Cards on the Chassis.

Step 2 Perform the Control Cable connection between LCC2/LCC3 and FCC0/FCC1 for a 4+2 configuration.

Step 3 Add the Chassis Serial Number in SysAdmin Config of LCC0.

Always use the appropriate Serial Numbers.

Step 4 Connect the datapath fabric connections for all the planes, as per the instance configuration of 2+2 MC system. Fabric Connection can be done together for all the planes for the new LCC.

Note For adding new LCC, there is no change required in fabric instance configuration.

Step 5 Switch on LCC2 and LCC3..

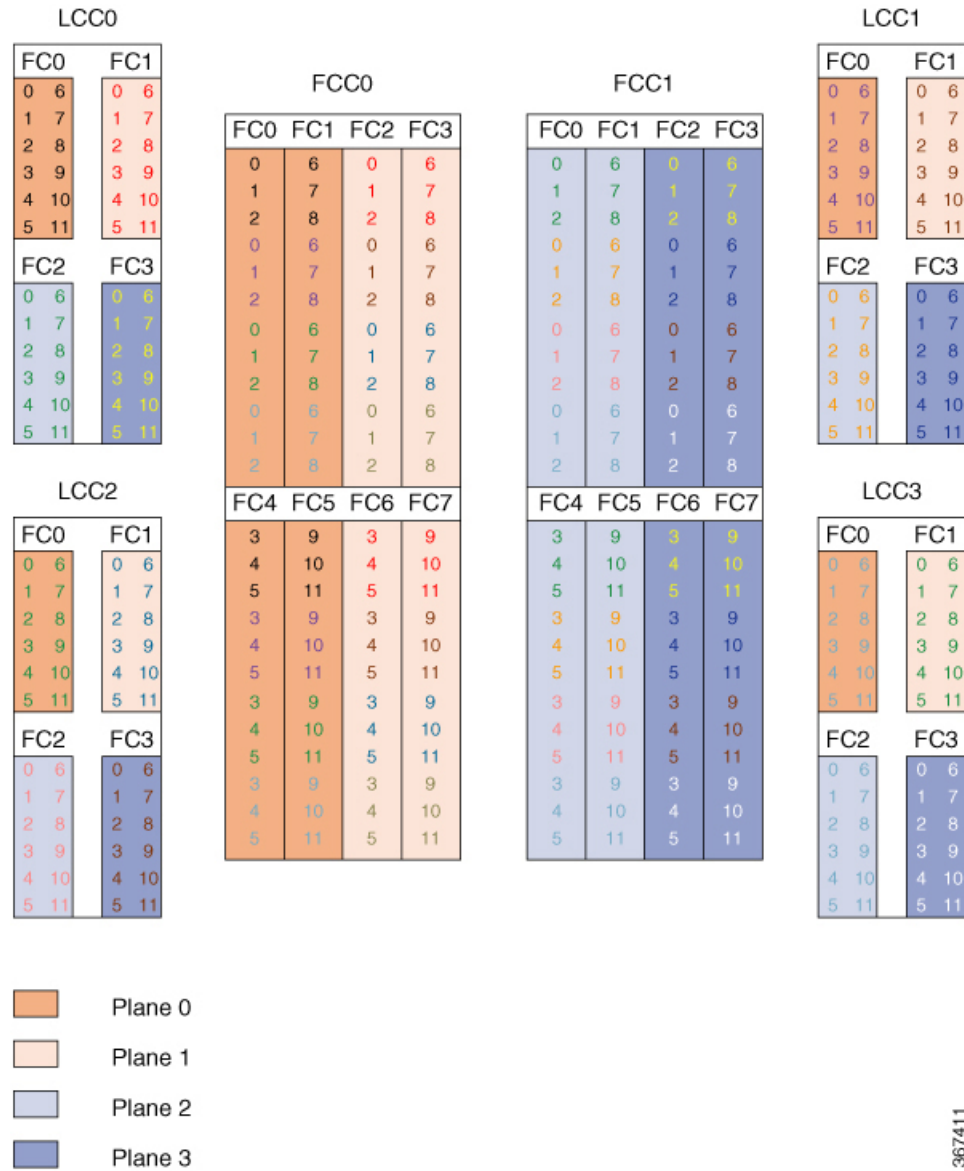
Step 6 Verify the 4+2 MC chassis state using the following commands:

- a) **show chassis**
- b) **show platform**
- c) **show controller fabric plane all detail**
- d) **show controller fabric bundle all detail**
- e) **show platform**

Example:

```
RP/0/RP0:hostname# admin
sysadmin-vm:0_RP0# show chassis
sysadmin-vm:0_RP0# show platform
sysadmin-vm:0_RP0# show controller fabric plane all detail
sysadmin-vm:0_RP0# show controller fabric bundle all detail
sysadmin-vm:0_RP0# exit
RP/0/RP0:hostname# show platform
```

Figure 5: Cisco NCS 4000 Multi-Chassis 4+2 Configuration



The following tables show the cabling plan for a 4+2 multi-chassis configuration. The FCC0 has the fabric instances 0 through 3 for planes 0, and 1. The FCC1 has the fabric instances 0 through 3 for planes 2 and 3.

Table 16: Cabling Plan for LCC0 in a 4+2 Multi-Chassis Configuration

Plane 0		Plane 1		Plane 2		Plane 3	
LCC0 slot/port	FCC slot/port/chassis	LCC0 slot/port	FCC slot/port/chassis	LCC0 slot/port	FCC slot/port/chassis	LCC0 slot/port	FCC slot/port/chassis
FC0/0 to FC0/0 (FCC0)		FC1/0 to FC2/0 (FCC0)		FC2/0 to FC0/0 (FCC1)		FC3/0 to FC2/0 (FCC1)	
FC0/1 to FC0/1 (FCC0)		FC1/1 to FC2/1 (FCC0)		FC2/1 to FC0/1 (FCC1)		FC3/1 to FC2/1 (FCC1)	

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Plane 0		Plane 1		Plane 2		Plane 3	
LCC0 slot/port	FCC slot/port/ chassis	LCC0 slot/port	FCC slot/port/ chassis	LCC0 slot/port	FCC slot/port/ chassis	LCC0 slot/port	FCC slot/port/ chassis
FC0/2 to FC0/2 (FCC0)		FC1/2 to FC2/2 (FCC0)		FC2/2 to FC0/2 (FCC1)		FC3/2 to FC2/2 (FCC1)	
FC0/3 to FC4/0 (FCC0)		FC1/3 to FC6/0 (FCC0)		FC2/3 to FC4/0 (FCC1)		FC3/3 to FC6/0 (FCC1)	
FC0/4 to FC4/1 (FCC0)		FC1/4 to FC6/1 (FCC0)		FC2/4 to FC4/1 (FCC1)		FC3/4 to FC6/1 (FCC1)	
FC0/5 to FC4/2 (FCC0)		FC1/5 to FC6/2 (FCC0)		FC2/5 to FC4/2 (FCC1)		FC3/5 to FC6/2 (FCC1)	
FC0/6 to FC1/0 (FCC0)		FC1/6 to FC3/0 (FCC0)		FC2/6 to FC1/0 (FCC1)		FC3/6 to FC3/0 (FCC1)	
FC0/7 to FC1/1 (FCC0)		FC1/7 to FC3/1 (FCC0)		FC2/7 to FC1/1 (FCC1)		FC3/7 to FC3/1 (FCC1)	
FC0/8 to FC1/2 (FCC0)		FC1/8 to FC3/2 (FCC0)		FC2/8 to FC1/2 (FCC1)		FC3/8 to FC3/2 (FCC1)	
FC0/9 to FC5/0 (FCC0)		FC1/9 to FC7/0 (FCC0)		FC2/9 to FC5/0 (FCC1)		FC3/9 to FC7/0 (FCC1)	
FC0/10 to FC5/1 (FCC0)		FC1/10 to FC7/1 (FCC0)		FC2/10 to FC5/1 (FCC1)		FC3/10 to FC7/1 (FCC1)	
FC0/11 to FC5/2 (FCC0)		FC1/11 to FC7/2 (FCC0)		FC2/11 to FC5/2 (FCC1)		FC3/11 to FC7/2 (FCC1)	

Table 17: Cabling Plan for LCC1 in a 4+2 Multi-Chassis Configuration

Plane 0		Plane 1		Plane 2		Plane 3	
LCC1 slot/port	FCC slot/port/ chassis	LCC1 slot/port	FCC slot/port/ chassis	LCC1 slot/port	FCC slot/port/ chassis	LCC1 slot/port	FCC slot/port/ chassis
FC0/0 to FC0/3 (FCC0)		FC1/0 to FC2/3 (FCC0)		FC2/0 to FC0/3 (FCC1)		FC3/0 to FC2/3 (FCC1)	
FC0/1 to FC0/4 (FCC0)		FC1/1 to FC2/4 (FCC0)		FC2/1 to FC0/4 (FCC1)		FC3/1 to FC2/4 (FCC1)	
FC0/2 to FC05 (FCC0)		FC1/2 to FC2/5 (FCC0)		FC2/2 to FC0/5 (FCC1)		FC3/2 to FC2/5 (FCC1)	
FC0/3 to FC4/3 (FCC0)		FC1/3 to FC6/3 (FCC0)		FC2/3 to FC4/3 (FCC1)		FC3/3 to FC6/3 (FCC1)	
FC0/4 to FC4/4 (FCC0)		FC1/4 to FC6/4 (FCC0)		FC2/4 to FC4/4 (FCC1)		FC3/4 to FC6/4 (FCC1)	
FC0/5 to FC4/5 (FCC0)		FC1/5 to FC6/5 (FCC0)		FC2/5 to FC4/5 (FCC1)		FC3/5 to FC6/5 (FCC1)	
FC0/6 to FC1/3 (FCC0)		FC1/6 to FC3/3 (FCC0)		FC2/6 to FC1/3 (FCC1)		FC3/6 to FC3/3 (FCC1)	
FC0/7 to FC1/4 (FCC0)		FC1/7 to FC3/4 (FCC0)		FC2/7 to FC1/4 (FCC1)		FC3/7 to FC3/4 (FCC1)	
FC0/8 to FC1/5 (FCC0)		FC1/8 to FC3/5 (FCC0)		FC2/8 to FC1/5 (FCC1)		FC3/8 to FC3/5 (FCC1)	
FC0/9 to FC5/3 (FCC0)		FC1/9 to FC7/3 (FCC0)		FC2/9 to FC5/3 (FCC1)		FC3/9 to FC7/3 (FCC1)	
FC0/10 to FC5/4 (FCC0)		FC1/10 to FC7/4 (FCC0)		FC2/10 to FC5/4 (FCC1)		FC3/10 to FC7/4 (FCC1)	
FC0/11 to FC5/5 (FCC0)		FC1/11 to FC7/5 (FCC0)		FC2/11 to FC5/5 (FCC1)		FC3/11 to FC7/5 (FCC1)	

Table 18: Cabling Plan for LCC2 in a 4+2 Multi-Chassis Configuration

Plane 0		Plane 1		Plane 2		Plane 3	
LCC2 slot/port	FCC slot/port/ chassis	LCC2 slot/port	FCC slot/port/ chassis	LCC2 slot/port	FCC slot/port/ chassis	LCC2 slot/port	FCC slot/port/ chassis
FC0/0 to FC0/6 (FCC0)		FC1/0 to FC2/6 (FCC0)		FC2/0 to FC0/6 (FCC1)		FC3/0 to FC2/6 (FCC1)	
FC0/1 to FC0/7 (FCC0)		FC1/1 to FC2/7 (FCC0)		FC2/1 to FC0/7 (FCC1)		FC3/1 to FC2/7 (FCC1)	
FC0/2 to FC0/8 (FCC0)		FC1/2 to FC2/8 (FCC0)		FC2/2 to FC0/8 (FCC1)		FC3/2 to FC2/8 (FCC1)	
FC0/3 to FC4/6 (FCC0)		FC1/3 to FC6/6 (FCC0)		FC2/3 to FC4/6 (FCC1)		FC3/3 to FC6/6 (FCC1)	
FC0/4 to FC4/7 (FCC0)		FC1/4 to FC6/7 (FCC0)		FC2/4 to FC4/7 (FCC1)		FC3/4 to FC6/7 (FCC1)	
FC0/5 to FC4/8 (FCC0)		FC1/5 to FC6/8 (FCC0)		FC2/5 to FC4/8 (FCC1)		FC3/5 to FC6/8 (FCC1)	
FC0/6 to FC1/6 (FCC0)		FC1/6 to FC3/6 (FCC0)		FC2/6 to FC1/6 (FCC1)		FC3/6 to FC3/6 (FCC1)	
FC0/7 to FC1/7 (FCC0)		FC1/7 to FC3/7 (FCC0)		FC2/7 to FC1/7 (FCC1)		FC3/7 to FC3/7 (FCC1)	
FC0/8 to FC1/8 (FCC0)		FC1/8 to FC3/8 (FCC0)		FC2/8 to FC1/8 (FCC1)		FC3/8 to FC3/8 (FCC1)	
FC0/9 to FC5/6 (FCC0)		FC1/9 to FC7/6 (FCC0)		FC2/9 to FC5/6 (FCC1)		FC3/9 to FC7/6 (FCC1)	
FC0/10 to FC5/7 (FCC0)		FC1/10 to FC7/7 (FCC0)		FC2/10 to FC5/7 (FCC1)		FC3/10 to FC7/7 (FCC1)	
FC0/11 to FC5/8 (FCC0)		FC1/11 to FC7/8 (FCC0)		FC2/11 to FC5/8 (FCC1)		FC3/11 to FC7/8 (FCC1)	

Table 19: Cabling Plan for LCC3 in a 4+2 Multi-Chassis Configuration

Plane 0		Plane 1		Plane 2		Plane 3	
LCC3 slot/port	FCC slot/port/ chassis	LCC3 slot/port	FCC slot/port/ chassis	LCC3 slot/port	FCC slot/port/ chassis	LCC3 slot/port	FCC slot/port/ chassis
FC0/0 to FC0/9 (FCC0)		FC1/0 to FC2/9 (FCC0)		FC2/0 to FC0/9 (FCC1)		FC3/0 to FC2/9 (FCC1)	
FC0/1 to FC0/10 (FCC0)		FC1/1 to FC2/10 (FCC0)		FC2/1 to FC0/10 (FCC1)		FC3/1 to FC2/10 (FCC1)	
FC0/2 to FC0/11 (FCC0)		FC1/2 to FC2/11 (FCC0)		FC2/2 to FC0/11 (FCC1)		FC3/2 to FC2/11 (FCC1)	
FC0/3 to FC4/9 (FCC0)		FC1/3 to FC6/9 (FCC0)		FC2/3 to FC4/9 (FCC1)		FC3/3 to FC6/9 (FCC1)	
FC0/4 to FC4/10 (FCC0)		FC1/4 to FC6/10 (FCC0)		FC2/4 to FC4/10 (FCC1)		FC3/4 to FC6/10 (FCC1)	
FC0/5 to FC4/11 (FCC0)		FC1/5 to FC6/11 (FCC0)		FC2/5 to FC4/11 (FCC1)		FC3/5 to FC6/11 (FCC1)	
FC0/6 to FC1/9 (FCC0)		FC1/6 to FC3/9 (FCC0)		FC2/6 to FC1/9 (FCC1)		FC3/6 to FC3/9 (FCC1)	
FC0/7 to FC1/10 (FCC0)		FC1/7 to FC3/10 (FCC0)		FC2/7 to FC1/10 (FCC1)		FC3/7 to FC3/10 (FCC1)	
FC0/8 to FC1/11 (FCC0)		FC1/8 to FC3/11 (FCC0)		FC2/8 to FC1/11 (FCC1)		FC3/8 to FC3/11 (FCC1)	

Plane 0		Plane 1		Plane 2		Plane 3	
LCC3 slot/port	FCC slot/port/ chassis	LCC3 slot/port	FCC slot/port/ chassis	LCC3 slot/port	FCC slot/port/ chassis	LCC3 slot/port	FCC slot/port/ chassis
FC0/9 to FC5/9 (FCC0)		FC1/9 to FC7/9 (FCC0)		FC2/9 to FC5/9 (FCC1)		FC3/9 to FC7/9 (FCC1)	
FC0/10 to FC5/10 (FCC0)		FC1/10 to FC7/10 (FCC0)		FC2/10 to FC5/10 (FCC1)		FC3/10 to FC7/10 (FCC1)	
FC0/11 to FC5/11 (FCC0)		FC1/11 to FC7/11 (FCC0)		FC2/11 to FC5/11 (FCC1)		FC3/11 to FC7/11 (FCC1)	

Vertical Plane Configuration for 4+2

This section describes how to configure a multi-chassis 4+2 configuration. In this configuration, four line card chassis (LCC0, LCC1, LCC2, LCC3) are connected to two fabric card chassis (FCC0 and FCC1).

Chassis Serial Configurations for 4+2

Chassis Serial Configurations

LCC0, LCC1, LCC2, LCC3 are on rack0, rack1, rack 2, rack 3, respectively. FCC0 and FCC1 are on rack F0 and F1 respectively. Use the **chassis serial serial_number rack rack_id** command. For a detailed procedure, see [Assign Rack Number to Chassis](#), on page 2.

```
Chassis serial <serial number> rack 0
chassis serial <serial number> rack 1
Chassis serial <serial number> rack 2
chassis serial <serial number> rack 3
chassis serial <serial number> rack F1
chassis serial <serial number> rack F0
```

Fabric Instance Configuration for 4+2

The following configurations indicate the instances for fabric plane 0,1,2,3. For a detailed procedure, see [Associate a Fabric Card in a Fabric Card Chassis to a Fabric Plane](#), on page 3

- Fabric instance configuration for fabric plane 0.

```
config
controller fabric plane 0
instance 0
location F0/FC0

instance 1
location F0/FC1

instance 2
location F0/FC4

instance 3
location F0/FC5

commit
```



```
exit
```

- Fabric instance configuration for fabric plane 1.

```
config
controller fabric plane 1
instance 0
location F0/FC2

instance 1
location F0/FC6

instance 2
location F0/FC3

instance 3
location F0/FC7

commit
exit
```

- Fabric instance configuration for fabric plane 2.

```
config
controller fabric plane 2
instance 0
location F1/FC0

instance 1
location F1/FC4

instance 2
location F1/FC1

instance 3
location F1/FC5

commit
exit
```

- Fabric instance configuration for fabric plane 3.

```
config
controller fabric plane 3
instance 0
location F1/FC2

instance 1
location F1/FC6

instance 2
location F1/FC3

instance 3
location F1/FC7

commit
exit
```

Migrating a Single Chassis System to a Multi Chassis System (1+3)

The following upgrade procedure is for migrating a SC system to a 1+3 MC system. The MC system comprises, one LCC (LCC0) and three FCCs (FCC0 , FCC1, FCC2).

Before you begin

The following tasks need to be carried out for upgrading a single chassis system to a 1+3 multi chassis configuration.

- Login to Admin-VM using the root-system username and password.
- Verify the status of the LCC0. The commands to be run on the XR VM are: **show redundancy**, **show platform** , **show platform vm**. The commands to be run on the Admin VM are: **show platform**, **show chassis**, **show vm**.
- Verify the SMUs of the upcoming release. The commands to be used are: **show version**, **show install commit**, **show install active**, **show install inactive** .
- Verify the FPD. The commands to be used in the Admin VM are: **show hw-module fpd**.



Note If any FPD state indicates NEED UPGD or RLOAD REQ, then an FPD upgrade must be performed using the FPD upgrade commands.

Procedure

-
- Step 1** Check the FCC0, FCC1, FCC2 are not powered-on.
- Step 2** Connect the control ethernet cables between LCC0, FCC0, FCC1, FCC2.
- Step 3** Add the chassis serial number in system admin configuration mode of LCC0 using the **chassis serial serial-number rack rack-id** command.
- ```
chassis serial FLM18216XHV rack 0
chassis serial FLM184374H2 rack F0
chassis serial FLM184375G1 rack F1
chassis serial FLM184375G2 rack F2
```
- Step 4** Switch on FCC0, FCC1, FCC2 and let the device boot till SysAdmin and XR VMs are up.
- Step 5** Verify the 1+3 MC chassis state using the **show chassis** and **show platform** commands in admin mode and the **show platform** command in XR mode.
- Step 6** Perform plane by plane upgrade of the fabric planes. The upgrade for plane 0 is discussed here in detail. Follow the same steps for plane 1, plane 2, plane 3.
- a) Check the controller fabric state for the 1+3 MC system using the **show chassis** command.
  - b) Check if the LCC0 fabric is in single chassis mode using the **show controller fabric plane detail all** command.

- c) Shutdown plane 0 using the **controller fabric plane 0 shutdown** command.
- d) Check if the plane is in the DOWN state using the command **show controller fabric plane *plane\_id*** command. This may take a few minutes.
- e) Add the 1+3 fabric instance configuration as indicated here.

Plane 0 configuration:

```

config
controller fabric plane 0
instance 0
location F0/FC0
Instance 1
location F0/FC4
instance 2
location F0/FC1
Instance 3
location F0/FC5
instance 4
location F0/FC2
Instance 5
location F0/FC6
commit
exit

```

- f) Wait for the card to reload. This may take a few minutes. Verify if the card state is indicated as OPERATIONAL.
- g) Verify if the LCC fabric cards are in MC mode using the **show controller fabric plane *plane\_id*** command.
- h) Insert the CXP2 pluggables and wait for a few minutes. Check if the pluggables are initialized using the **show controller fabric cxp summary rack *rack\_id***

The states of the pluggables are indicated as follows:

```

sysadmin-vm:0_RP0:PE2# show controller fabric cxp summary rack 0
=====
Fabric side CXP Port Initialization Status Summary
=====
Active functional role of the Rack [R/S] : 0/RP0
. - CXP is not present
p - CXP is not powered
I - CXP is not Initialized
U - CXP is not Supported
T - One or more Tx channel is disabled on the CXP
R - One or more Rx channel is disabled on the CXP
G - CXP is Initialized properly

```

Verify that all the FCC fabric cards configured for this plane, the ports where the CXP2s are inserted (and connected with LCC fabric card ports) are initialized. If not, insert the CXP2s and wait for the CXP2s to initialize.

- i) Perform the data path cabling between LCC0, FCC0, FCC1, FCC2 plane 0 fabric cards.
- j) Unshut plane 0 if the CXP2s are in G state.  
G state indicates that the CXP2s are initialized properly.
- k) Unshut plane 0 by using the **controller fabric plane 0 no shutdown** command in system admin configuration mode.
- l) Verify the fabric state details using the following commands:

- **show controller fabric state all detail** in system admin mode.

- **show controller fabric bundle all detail** in system admin mode.
- **show platform** in system admin and XR mode.
- **show redundancy** in XR mode.
- **show platform vm** in XR mode.
- **show install commit** in XR mode.
- **show install active** in XR mode.
- **show install inactive** in XR mode.

Plane 1 configuration:

```
config
controller fabric plane 1
instance 0
location F0/FC3
instance 1
location F0/FC7
instance 2
location F1/FC0
instance 3
location F1/FC4
instance 4
location F1/FC1
instance 5
location F1/FC5
commit
exit
```

Plane 2 configuration:

```
config
controller fabric plane 2
instance 0
location F1/FC2
instance 1
location F1/FC6
instance 2
location F1/FC3
instance 3
location F1/FC7
instance 4
location F2/FC0
instance 5
location F2/FC4
commit
exit
```

Plane 3 configuration:

```
controller fabric plane 3
instance 0
location F2/FC1
Instance 1
location F2/FC5
instance 2
location F2/FC2
Instance 3
```

```

location F2/FC6
instance 4
location F2/FC3
Instance 5
location F2/FC7
commit
exit

```

## Migrating a 1+3 Multi Chassis System to 8+3 Multi Chassis System

The following upgrade procedure is for migrating a 1+3 MC system to a 8+3 MC system. The MC system comprises of eight LCCs (LCC0, LCC1, LCC2, LCC3, LCC4, LCC5, LCC6, LCC7) and three FCCs (FCC0, FCC1, FCC2).



**Note** No plane by plane shutdown and un-shut is required for adding new LCC to MC.

### Before you begin

Complete the 1+3 Multi Chassis (MC) configuration.

### Procedure

- Step 1** Check that LCC1, LCC2, LCC3, LCC4, LCC5, LCC6, LCC7 are in switched-off state.
- Note** The LCCs should not have any line cards on the chassis.
- During the addition of an LCCs, when the line cards are not yet inserted, the display outputs showing the plane status information is different for the show fabric health and show controller fabric commands. After the line cards are inserted into the newly added LCC, the display outputs showing the plane status is identical.
- Step 2** Perform the Control Cable connection between LCC1, LCC2, LCC3, LCC4, LCC5, LCC6, LCC7, FCC0, FCC1, and FCC2.
- Note** Make a note of all the chassis serial numbers of LCC1, LCC2, LCC3, LCC4, LCC5, LCC6, and LCC7. Add one LCC at a time.
- Step 3** Add the Chassis Serial Number in the Sysadmin config mode of LCC1.
- ```

chassis serial FLM184322M1 rack 1

```
- Step 4** Connect the datapath fabric connections for all the planes, as per the instance configuration of 1+3 MC system. Fabric Connection can be done together for all the planes for the new LCC.

In case of 8+3 MC system, each fabric chassis with 8 FCs, is not used by a single plane but includes one full plane and another partial plane. There are sufficient number of fabric links available. 8+3 configuration provides rack level and plane level redundancy.

Note For adding new LCC, there is no change required in fabric instance configuration.

Note The chassis addition is sequentially done with one rack at a time do avoid VM shutdown due to quorum error.

Step 5 Switch on LCC1.

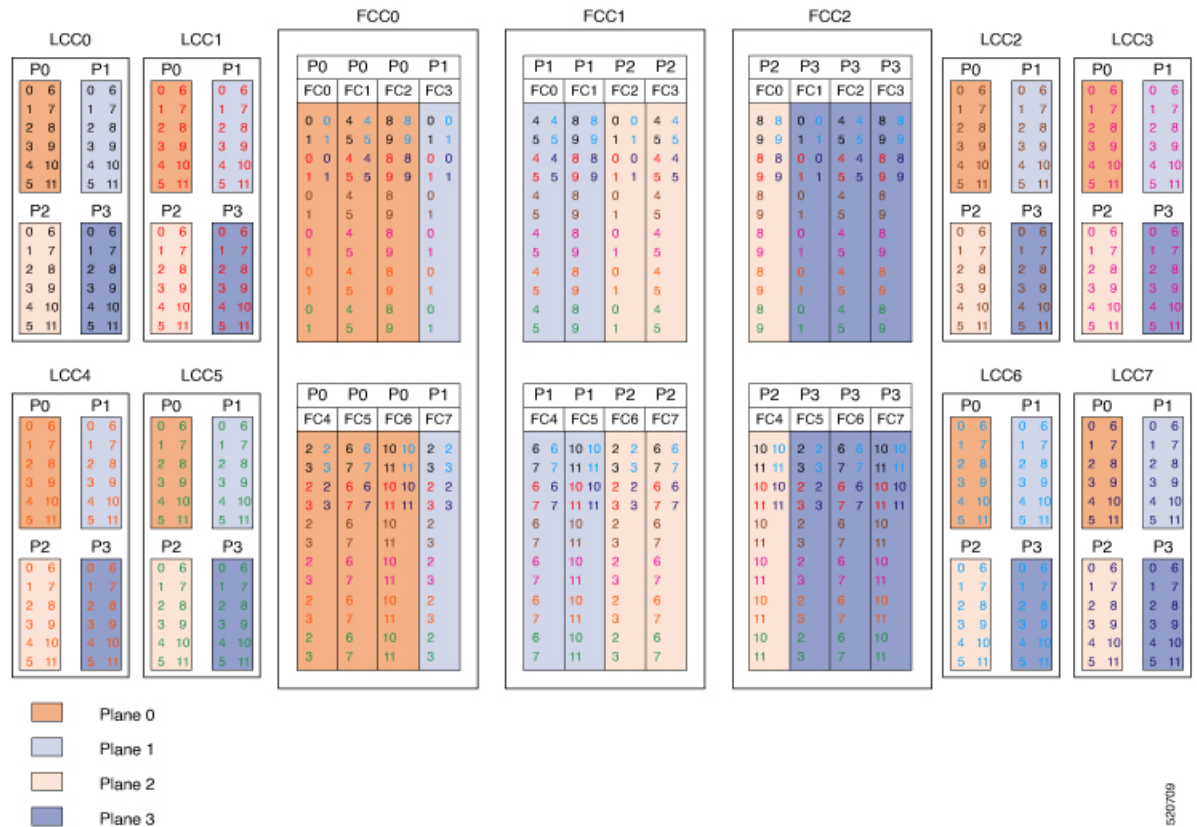
Step 6 Repeat Step 3 through Step 5 for LCC2 to LCC7.

Step 7 Verify the 8+3 MC chassis state using the following commands:

- show chassis
- show platform
- show controller fabric plane all detail
- show controller fabric bundle all detail

The following image shows the cable connections for the 8+3 MC configuration.

Figure 6: Cisco NCS 4000 Multi Chassis 8+3 Configuration



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Cabling Plan for the 8+3 MC Configuration

The following tables show the cabling plan for a 8+3 multi-chassis configuration.

Table 20: Cabling Plan for LCC0 in a 8+3 Multi-Chassis Configuration

Plane 0		Plane 1		Plane 2		Plane 3	
LCC slot/port	FCC slot/port/ chassis	LCC slot/port	FCC slot/port/ chassis	LCC slot/port	FCC slot/port/ chassis	LCC slot/port	FCC slot/port/ chassis
0/FC0/0	F0/FC0/0	0/FC1/0	F0/FC3/0	0/FC2/0	F1/FC2/0	0/FC3/0	F2/FC1/0
0/FC0/1	F0/FC0/1	0/FC1/1	F0/FC3/1	0/FC2/1	F1/FC2/1	0/FC3/1	F2/FC1/1
0/FC0/2	F0/FC4/0	0/FC1/2	F0/FC7/0	0/FC2/2	F1/FC6/0	0/FC3/2	F2/FC5/0
0/FC0/3	F0/FC4/1	0/FC1/3	F0/FC7/1	0/FC2/3	F1/FC6/1	0/FC3/3	F2/FC5/1
0/FC0/4	F0/FC1/0	0/FC1/4	F1/FC0/0	0/FC2/4	F1/FC3/0	0/FC3/4	F2/FC2/0
0/FC0/5	F0/FC1/1	0/FC1/5	F1/FC0/1	0/FC2/5	F1/FC3/1	0/FC3/5	F2/FC2/1
0/FC0/6	F0/FC5/0	0/FC1/6	F1/FC4/0	0/FC2/6	F1/FC7/0	0/FC3/6	F2/FC6/0
0/FC0/7	F0/FC5/1	0/FC1/7	F1/FC4/1	0/FC2/7	F1/FC7/1	0/FC3/7	F2/FC6/1
0/FC0/8	F0/FC2/0	0/FC1/8	F1/FC1/0	0/FC2/8	F2/FC0/0	0/FC3/8	F2/FC3/0
0/FC0/9	F0/FC2/1	0/FC1/9	F1/FC1/1	0/FC2/9	F2/FC0/1	0/FC3/9	F2/FC3/1
0/FC0/10	F0/FC6/0	0/FC1/10	F1/FC5/0	0/FC2/10	F2/FC4/0	0/FC3/10	F2/FC7/0
0/FC0/11	F0/FC6/1	0/FC1/11	F1/FC5/1	0/FC2/11	F2/FC4/1	0/FC3/11	F2/FC7/1

Table 21: Cabling Plan for LCC1 in a 8+3 Multi-Chassis Configuration

Plane 0		Plane 1		Plane 2		Plane 3	
LCC slot/port	FCC slot/port/ chassis	LCC slot/port	FCC slot/port/ chassis	LCC slot/port	FCC slot/port/ chassis	LCC slot/port	FCC slot/port/ chassis
1/FC0/0	F0/FC0/2	1/FC1/0	F0/FC3/2	1/FC2/0	F1/FC2/2	1/FC3/0	F2/FC1/2
1/FC0/1	F0/FC0/3	1/FC1/1	F0/FC3/3	1/FC2/1	F1/FC2/3	1/FC3/1	F2/FC1/3
1/FC0/2	F0/FC4/2	1/FC1/2	F0/FC7/2	1/FC2/2	F1/FC6/2	1/FC3/2	F2/FC5/2
1/FC0/3	F0/FC4/3	1/FC1/3	F0/FC7/3	1/FC2/3	F1/FC6/3	1/FC3/3	F2/FC5/3
1/FC0/4	F0/FC1/2	1/FC1/4	F1/FC0/2	1/FC2/4	F1/FC3/2	1/FC3/4	F2/FC2/2
1/FC0/5	F0/FC1/3	1/FC1/5	F1/FC0/3	1/FC2/5	F1/FC3/3	1/FC3/5	F2/FC2/3
1/FC0/6	F0/FC5/2	1/FC1/6	F1/FC4/2	1/FC2/6	F1/FC7/2	1/FC3/6	F2/FC6/2
1/FC0/7	F0/FC5/3	1/FC1/7	F1/FC4/3	1/FC2/7	F1/FC7/3	1/FC3/7	F2/FC6/3
1/FC0/8	F0/FC2/2	1/FC1/8	F1/FC1/2	1/FC2/8	F2/FC0/2	1/FC3/8	F2/FC3/2
1/FC0/9	F0/FC2/3	1/FC1/9	F1/FC1/3	1/FC2/9	F2/FC0/3	1/FC3/9	F2/FC3/3

Plane 0		Plane 1		Plane 2		Plane 3	
LCC slot/port	FCC slot/port/ chassis	LCC slot/port	FCC slot/port/ chassis	LCC slot/port	FCC slot/port/ chassis	LCC slot/port	FCC slot/port/ chassis
1/FC0/10	F0/FC6/2	1/FC1/10	F1/FC5/2	1/FC2/10	F2/FC4/2	1/FC3/10	F2/FC7/2
1/FC0/11	F0/FC6/3	1/FC1/11	F1/FC5/3	1/FC2/11	F2/FC4/3	1/FC3/11	F2/FC7/3

Table 22: Cabling Plan for LCC2 in a 8+3 Multi-Chassis Configuration

Plane 0		Plane 1		Plane 2		Plane 3	
LCC slot/port	FCC slot/port/ chassis	LCC slot/port	FCC slot/port/ chassis	LCC slot/port	FCC slot/port/ chassis	LCC slot/port	FCC slot/port/ chassis
2/FC0/0	F0/FC0/4	2/FC1/0	F0/FC3/4	2/FC2/0	F1/FC2/4	2/FC3/0	F2/FC1/4
2/FC0/1	F0/FC0/5	2/FC1/1	F0/FC3/5	2/FC2/1	F1/FC2/5	2/FC3/1	F2/FC1/5
2/FC0/2	F0/FC4/4	2/FC1/2	F0/FC7/4	2/FC2/2	F1/FC6/4	2/FC3/2	F2/FC5/4
2/FC0/3	F0/FC4/5	2/FC1/3	F0/FC7/5	2/FC2/3	F1/FC6/5	2/FC3/3	F2/FC5/5
2/FC0/4	F0/FC1/4	2/FC1/4	F1/FC0/4	2/FC2/4	F1/FC3/4	2/FC3/4	F2/FC2/4
2/FC0/5	F0/FC1/5	2/FC1/5	F1/FC0/5	2/FC2/5	F1/FC3/5	2/FC3/5	F2/FC2/5
2/FC0/6	F0/FC5/4	2/FC1/6	F1/FC4/4	2/FC2/6	F1/FC7/4	2/FC3/6	F2/FC6/4
2/FC0/7	F0/FC5/5	2/FC1/7	F1/FC4/5	2/FC2/7	F1/FC7/5	2/FC3/7	F2/FC6/5
2/FC0/8	F0/FC2/4	2/FC1/8	F1/FC1/4	2/FC2/8	F2/FC0/4	2/FC3/8	F2/FC3/4
2/FC0/9	F0/FC2/5	2/FC1/9	F1/FC1/5	2/FC2/9	F2/FC0/5	2/FC3/9	F2/FC3/5
2/FC0/10	F0/FC6/4	2/FC1/10	F1/FC5/4	2/FC2/10	F2/FC4/4	2/FC3/10	F2/FC7/4
2/FC0/11	F0/FC6/5	2/FC1/11	F1/FC5/5	2/FC2/11	F2/FC4/5	2/FC3/11	F2/FC7/5

Table 23: Cabling Plan for LCC3 in a 8+3 Multi-Chassis Configuration

Plane 0		Plane 1		Plane 2		Plane 3	
LCC slot/port	FCC slot/port/ chassis	LCC slot/port	FCC slot/port/ chassis	LCC slot/port	FCC slot/port/ chassis	LCC slot/port	FCC slot/port/ chassis
3/FC0/0	F0/FC0/6	3/FC1/0	F0/FC3/6	3/FC2/0	F1/FC2/6	3/FC3/0	F2/FC1/6
3/FC0/1	F0/FC0/7	3/FC1/1	F0/FC3/7	3/FC2/1	F1/FC2/7	3/FC3/1	F2/FC1/7
3/FC0/2	F0/FC4/6	3/FC1/2	F0/FC7/6	3/FC2/2	F1/FC6/6	3/FC3/2	F2/FC5/6
3/FC0/3	F0/FC4/7	3/FC1/3	F0/FC7/7	3/FC2/3	F1/FC6/7	3/FC3/3	F2/FC5/7
3/FC0/4	F0/FC1/6	3/FC1/4	F1/FC0/6	3/FC2/4	F1/FC3/6	3/FC3/4	F2/FC2/6
3/FC0/5	F0/FC1/7	3/FC1/5	F1/FC0/7	3/FC2/5	F1/FC3/7	3/FC3/5	F2/FC2/7

Plane 0		Plane 1		Plane 2		Plane 3	
LCC slot/port	FCC slot/port/ chassis	LCC slot/port	FCC slot/port/ chassis	LCC slot/port	FCC slot/port/ chassis	LCC slot/port	FCC slot/port/ chassis
3/FC0/6	F0/FC5/6	3/FC1/6	F1/FC4/6	3/FC2/6	F1/FC7/6	3/FC3/6	F2/FC6/6
3/FC0/7	F0/FC5/7	3/FC1/7	F1/FC4/7	3/FC2/7	F1/FC7/7	3/FC3/7	F2/FC6/7
3/FC0/8	F0/FC2/6	3/FC1/8	F1/FC1/6	3/FC2/8	F2/FC0/6	3/FC3/8	F2/FC3/6
3/FC0/9	F0/FC2/7	3/FC1/9	F1/FC1/7	3/FC2/9	F2/FC0/7	3/FC3/9	F2/FC3/7
3/FC0/10	F0/FC6/6	3/FC1/10	F1/FC5/6	3/FC2/10	F2/FC4/6	3/FC3/10	F2/FC7/6
3/FC0/11	F0/FC6/7	3/FC1/11	F1/FC5/7	3/FC2/11	F2/FC4/7	3/FC3/11	F2/FC7/7

Table 24: Cabling Plan for LCC4 in a 8+3 Multi-Chassis Configuration

Plane 0		Plane 1		Plane 2		Plane 3	
LCC slot/port	FCC slot/port/ chassis	LCC slot/port	FCC slot/port/ chassis	LCC slot/port	FCC slot/port/ chassis	LCC slot/port	FCC slot/port/ chassis
4/FC0/0	F0/FC0/8	4/FC1/0	F0/FC3/8	4/FC2/0	F1/FC2/8	4/FC3/0	F2/FC1/8
4/FC0/1	F0/FC0/9	4/FC1/1	F0/FC3/9	4/FC2/1	F1/FC2/9	4/FC3/1	F2/FC1/9
4/FC0/2	F0/FC4/8	4/FC1/2	F0/FC7/8	4/FC2/2	F1/FC6/8	4/FC3/2	F2/FC5/8
4/FC0/3	F0/FC4/9	4/FC1/3	F0/FC7/9	4/FC2/3	F1/FC6/9	4/FC3/3	F2/FC5/9
4/FC0/4	F0/FC1/8	4/FC1/4	F1/FC0/8	4/FC2/4	F1/FC3/8	4/FC3/4	F2/FC2/8
4/FC0/5	F0/FC1/9	4/FC1/5	F1/FC0/9	4/FC2/5	F1/FC3/9	4/FC3/5	F2/FC2/9
4/FC0/6	F0/FC5/8	4/FC1/6	F1/FC4/8	4/FC2/6	F1/FC7/8	4/FC3/6	F2/FC6/8
4/FC0/7	F0/FC5/9	4/FC1/7	F1/FC4/9	4/FC2/7	F1/FC7/9	4/FC3/7	F2/FC6/9
4/FC0/8	F0/FC2/8	4/FC1/8	F1/FC1/8	4/FC2/8	F2/FC0/8	4/FC3/8	F2/FC3/8
4/FC0/9	F0/FC2/9	4/FC1/9	F1/FC1/9	4/FC2/9	F2/FC0/9	4/FC3/9	F2/FC3/9
4/FC0/10	F0/FC6/8	4/FC1/10	F1/FC5/8	4/FC2/10	F2/FC4/8	4/FC3/10	F2/FC7/8
4/FC0/11	F0/FC6/9	4/FC1/11	F1/FC5/9	4/FC2/11	F2/FC4/9	4/FC3/11	F2/FC7/9

Table 25: Cabling Plan for LCC5 in a 8+3 Multi-Chassis Configuration

Plane 0		Plane 1		Plane 2		Plane 3	
LCC slot/port	FCC slot/port/ chassis	LCC slot/port	FCC slot/port/ chassis	LCC slot/port	FCC slot/port/ chassis	LCC slot/port	FCC slot/port/ chassis
5/FC0/0	F0/FC0/10	5/FC1/0	F0/FC3/10	5/FC2/0	F1/FC2/10	5/FC3/0	F2/FC1/10
5/FC0/1	F0/FC0/11	5/FC1/1	F0/FC3/11	5/FC2/1	F1/FC2/11	5/FC3/1	F2/FC1/11

Plane 0		Plane 1		Plane 2		Plane 3	
LCC slot/port	FCC slot/port/ chassis	LCC slot/port	FCC slot/port/ chassis	LCC slot/port	FCC slot/port/ chassis	LCC slot/port	FCC slot/port/ chassis
5/FC0/2	F0/FC4/10	5/FC1/2	F0/FC7/10	5/FC2/2	F1/FC6/10	5/FC3/2	F2/FC5/10
5/FC0/3	F0/FC4/11	5/FC1/3	F0/FC7/11	5/FC2/3	F1/FC6/11	5/FC3/3	F2/FC5/11
5/FC0/4	F0/FC1/10	5/FC1/4	F1/FC0/10	5/FC2/4	F1/FC3/10	5/FC3/4	F2/FC2/10
5/FC0/5	F0/FC1/11	5/FC1/5	F1/FC0/11	5/FC2/5	F1/FC3/11	5/FC3/5	F2/FC2/11
5/FC0/6	F0/FC5/10	5/FC1/6	F1/FC4/10	5/FC2/6	F1/FC7/10	5/FC3/6	F2/FC6/10
5/FC0/7	F0/FC5/11	5/FC1/7	F1/FC4/11	5/FC2/7	F1/FC7/11	5/FC3/7	F2/FC6/11
5/FC0/8	F0/FC2/10	5/FC1/8	F1/FC1/10	5/FC2/8	F2/FC0/10	5/FC3/8	F2/FC3/10
5/FC0/9	F0/FC2/11	5/FC1/9	F1/FC1/11	5/FC2/9	F2/FC0/11	5/FC3/9	F2/FC3/11
5/FC0/10	F0/FC6/10	5/FC1/10	F1/FC5/10	5/FC2/10	F2/FC4/10	5/FC3/10	F2/FC7/10
5/FC0/11	F0/FC6/11	5/FC1/11	F1/FC5/11	5/FC2/11	F2/FC4/11	5/FC3/11	F2/FC7/11

Table 26: Cabling Plan for LCC6 in a 8+3 Multi-Chassis Configuration

Plane 0		Plane 1		Plane 2		Plane 3	
LCC slot/port	FCC slot/port/ chassis	LCC slot/port	FCC slot/port/ chassis	LCC slot/port	FCC slot/port/ chassis	LCC slot/port	FCC slot/port/ chassis
6/FC0/0	F0/FC0/12	6/FC1/0	F0/FC3/12	6/FC2/0	F1/FC2/12	6/FC3/0	F2/FC1/12
6/FC0/1	F0/FC0/13	6/FC1/1	F0/FC3/13	6/FC2/1	F1/FC2/13	6/FC3/1	F2/FC1/13
6/FC0/2	F0/FC4/12	6/FC1/2	F0/FC7/12	6/FC2/2	F1/FC6/12	6/FC3/2	F2/FC5/12
6/FC0/3	F0/FC4/13	6/FC1/3	F0/FC7/13	6/FC2/3	F1/FC6/13	6/FC3/3	F2/FC5/13
6/FC0/4	F0/FC1/12	6/FC1/4	F1/FC0/12	6/FC2/4	F1/FC3/12	6/FC3/4	F2/FC2/12
6/FC0/5	F0/FC1/13	6/FC1/5	F1/FC0/13	6/FC2/5	F1/FC3/13	6/FC3/5	F2/FC2/13
6/FC0/6	F0/FC5/12	6/FC1/6	F1/FC4/12	6/FC2/6	F1/FC7/12	6/FC3/6	F2/FC6/12
6/FC0/7	F0/FC5/13	6/FC1/7	F1/FC4/13	6/FC2/7	F1/FC7/13	6/FC3/7	F2/FC6/13
6/FC0/8	F0/FC2/12	6/FC1/8	F1/FC1/12	6/FC2/8	F2/FC0/12	6/FC3/8	F2/FC3/12
6/FC0/9	F0/FC2/13	6/FC1/9	F1/FC1/13	6/FC2/9	F2/FC0/13	6/FC3/9	F2/FC3/13
6/FC0/10	F0/FC6/12	6/FC1/10	F1/FC5/12	6/FC2/10	F2/FC4/12	6/FC3/10	F2/FC7/12
6/FC0/11	F0/FC6/13	6/FC1/11	F1/FC5/13	6/FC2/11	F2/FC4/13	6/FC3/11	F2/FC7/13

Table 27: Cabling Plan for LCC7 in a 8+3 Multi-Chassis Configuration

Plane 0		Plane 1		Plane 2		Plane 3	
LCC slot/port	FCC slot/port/chassis	LCC slot/port	FCC slot/port/chassis	LCC slot/port	FCC slot/port/chassis	LCC slot/port	FCC slot/port/chassis
7/FC0/0	F0/FC0/14	7/FC1/0	F0/FC3/14	7/FC2/0	F1/FC2/14	7/FC3/0	F2/FC1/14
7/FC0/1	F0/FC0/15	7/FC1/1	F0/FC3/15	7/FC2/1	F1/FC2/15	7/FC3/1	F2/FC1/15
7/FC0/2	F0/FC4/14	7/FC1/2	F0/FC7/14	7/FC2/2	F1/FC6/14	7/FC3/2	F2/FC5/14
7/FC0/3	F0/FC4/15	7/FC1/3	F0/FC7/15	7/FC2/3	F1/FC6/15	7/FC3/3	F2/FC5/15
7/FC0/4	F0/FC1/14	7/FC1/4	F1/FC0/14	7/FC2/4	F1/FC3/14	7/FC3/4	F2/FC2/14
7/FC0/5	F0/FC1/15	7/FC1/5	F1/FC0/15	7/FC2/5	F1/FC3/15	7/FC3/5	F2/FC2/15
7/FC0/6	F0/FC5/14	7/FC1/6	F1/FC4/14	7/FC2/6	F1/FC7/14	7/FC3/6	F2/FC6/14
7/FC0/7	F0/FC5/15	7/FC1/7	F1/FC4/15	7/FC2/7	F1/FC7/15	7/FC3/7	F2/FC6/15
7/FC0/8	F0/FC2/14	7/FC1/8	F1/FC1/14	7/FC2/8	F2/FC0/14	7/FC3/8	F2/FC3/14
7/FC0/9	F0/FC2/15	7/FC1/9	F1/FC1/15	7/FC2/9	F2/FC0/15	7/FC3/9	F2/FC3/15
7/FC0/10	F0/FC6/14	7/FC1/10	F1/FC5/14	7/FC2/10	F2/FC4/14	7/FC3/10	F2/FC7/14
7/FC0/11	F0/FC6/15	7/FC1/11	F1/FC5/15	7/FC2/11	F2/FC4/15	7/FC3/11	F2/FC7/15



Note The cable plan for the 8+3 configuration is not flexible.

Chassis Serial Configurations for 8+3

Chassis Serial Configurations

LCC0, LCC1, LCC2, LCC3, LCC4, LCC5, LCC6, and LCC7 are on rack 0, rack 1, rack 2, rack 3, rack 4, rack 5, rack 6, and rack 7 respectively. FCC0, FCC1, and FCC2 are on rack F0, rack F1, and rack F2 respectively. Use the **chassis serial serial_number rack rack_id** command. For a detailed procedure, see [Assign Rack Number to Chassis](#), on page 2.

```
chassis serial <serial number> rack 0
chassis serial <serial number> rack 1
chassis serial <serial number> rack 2
chassis serial <serial number> rack 3
chassis serial <serial number> rack 4
chassis serial <serial number> rack 5
chassis serial <serial number> rack 6
chassis serial <serial number> rack 7
chassis serial <serial number> rack F0
chassis serial <serial number> rack F1
chassis serial <serial number> rack F2
```

Fabric Instance Configuration for 8+3

The following configurations are for a 8+3 MC system with six FCC fabric cards per plane with FCC rack level redundancy. For a detailed procedure, see [Associate a Fabric Card in a Fabric Card Chassis to a Fabric Plane](#), on page 3

- Fabric instance configuration for fabric plane 0:

```
config
controller fabric plane 0
instance 0
location F0/FC0
instance 1
location F0/FC4
instance 2
location F0/FC1
instance 3
location F0/FC5
instance 4
location F0/FC2
instance 5
location F0/FC6
```

- Fabric instance configuration for fabric plane 1:

```
config
controller fabric plane 1
instance 0
location F0/FC3
instance 1
location F0/FC7
instance 2
location F1/FC0
instance 3
location F1/FC4
instance 4
location F1/FC1
instance 5
location F1/FC5
```

- Fabric instance configuration for plane 2:

```
config
controller fabric plane 2
instance 0
location F1/FC2
instance 1
location F1/FC6
instance 2
location F1/FC3
instance 3
location F1/FC7
instance 4
location F2/FC0
instance 5
location F2/FC4
```

- Fabric instance configuration for plane 3:

```
config
```

```
controller fabric plane 3
instance 0
location F2/FC1
Instance 1
location F2/FC5
instance 2
location F2/FC2
Instance 3
location F2/FC6
instance 4
location F2/FC3
Instance 5
location F2/FC7
```



Note Removing a fabric plane instance configuration might impact traffic. Shutdown the relevant plane before removing or modifying a fabric instance configuration.

In the event of a plane configuration mismatch, the CXP2 LEDs for the relevant plane is shown red. This is because the bundles are down, although the plane status is shown Up. The user needs to correct the configuration error before proceeding.

Migrating a 1+3 Multi Chassis System to 12+3 Multi Chassis System

The following upgrade procedure is for migrating a 1+3 MC system to a 12+3 MC system. The MC system comprises of 12 LCCs (LCC0, LCC1, LCC2, LCC3, LCC4, LCC5, LCC6, LCC7, LCC8, LCC9, LCC10, LCC11) and three FCCs (FCC0, FCC1, FCC2).



Note No plane by plane shutdown and unshut is required for adding new LCC to MC.

Before you begin

Complete the 1+3 Multi Chassis (MC) configuration.

Procedure

Step 1 Check that LCC1, LCC2, LCC3, LCC4, LCC5, LCC6, LCC7, LCC8, LCC9, LCC10, LCC11 are in switched-off state.

Note The LCCs must not have any line cards on the chassis.

During the addition of LCCs, when the line cards are not yet inserted, the display outputs showing the plane status information is different for the **show fabric health** and **show controller fabric** commands. After the line cards are inserted into the newly added LCC, the display outputs showing the plane status is identical.

Step 2 Perform the Control Cable connection between LCC1, LCC2, LCC3, LCC4, LCC5, LCC6, LCC7, LCC8, LCC9, LCC10, LCC11, FCC0, FCC1, and FCC2.

Note Make a note of all the chassis serial numbers of LCC1, LCC2, LCC3, LCC4, LCC5, LCC6, LCC7, LCC8, LCC9, LCC10, and LCC11. Add one LCC at a time.

Step 3 Add the Chassis Serial Number in the **Sysadmin** config mode of LCC1.

```
chassis serial FLM184322M1 rack 1
```

Step 4 Connect the data path fabric connections for all the planes, as per the instance configuration of 1+3 MC system. Fabric Connection can be done together for all the planes for the new LCC.

If there is 12+3 MC system, each fabric chassis with 12 FCs, is not used by a single plane but includes one full plane and another partial plane. There is sufficient number of fabric links available. 12+3 configuration provides rack level and plane level redundancy.

Note For adding new LCC, there is no change that is required in fabric instance configuration.

Note The chassis addition is sequentially done with one rack at a time to avoid VM shutdown due to the quorum error.

Step 5 Switch on LCC1.

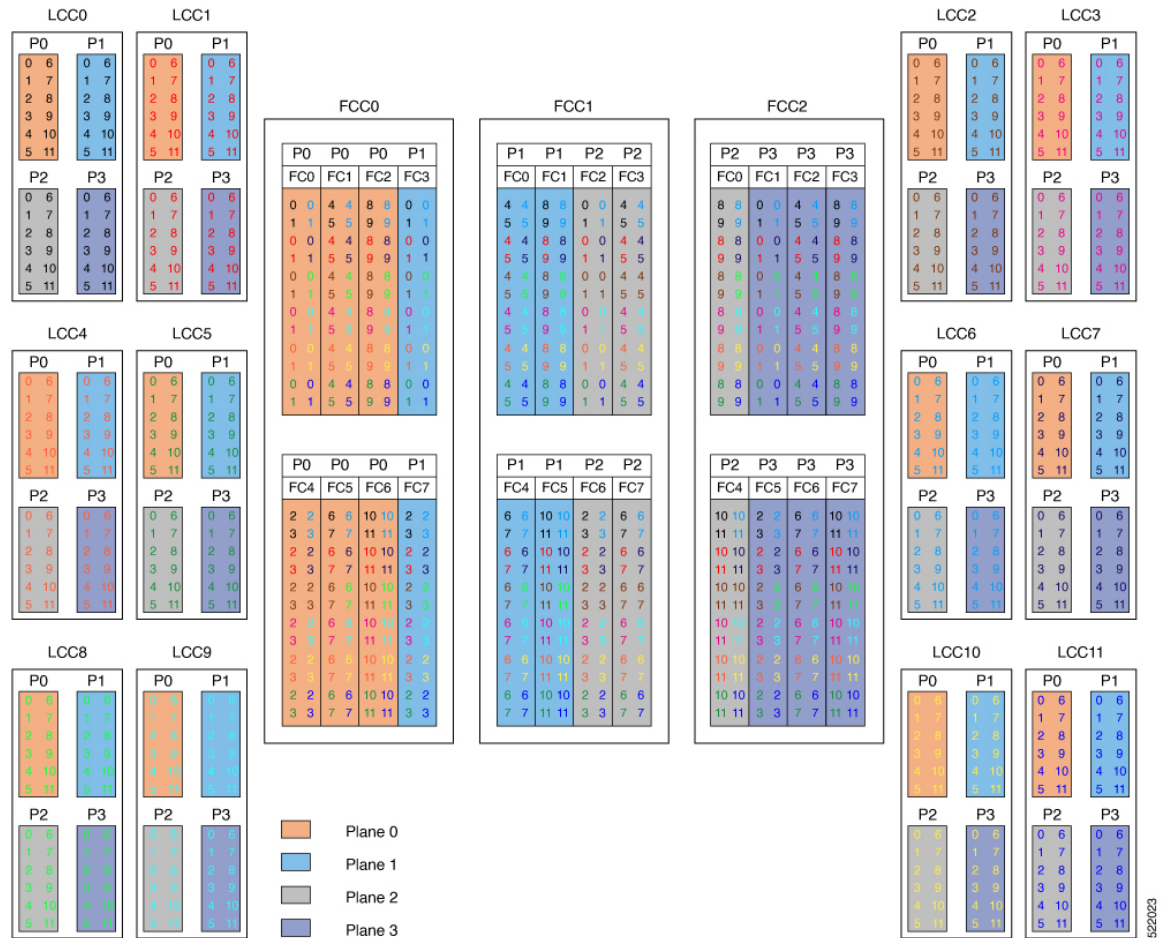
Step 6 Repeat Step 3 through Step 5 for LCC2 to LCC11.

Step 7 Verify the 12+3 MC chassis state using the following commands:

- **show chassis**
- **show platform**
- **show controller fabric plane all detail**
- **show controller fabric bundle all detail**

The following image shows the cable connections for the 12+3 MC configuration.

Figure 7: Cisco NCS 4000 Multi Chassis 12+3 Configuration



Cabling Plan for the 12+3 MC Configuration

The following tables show the cabling plan for a 12+3 multichassis configuration.

Table 28: Cabling Plan for LCC0 in a 12+3 Multi-Chassis Configuration

Plane 0		Plane 1		Plane 2		Plane 3	
LCC slot/port	FCC slot/port/chassis	LCC slot/port	FCC slot/port/chassis	LCC slot/port	FCC slot/port/chassis	LCC slot/port	FCC slot/port/chassis
0/FC0/0	F0/FC0/0	0/FC1/0	F0/FC3/0	0/FC2/0	F1/FC2/0	0/FC3/0	F2/FC1/0
0/FC0/1	F0/FC0/1	0/FC1/1	F0/FC3/1	0/FC2/1	F1/FC2/1	0/FC3/1	F2/FC1/1
0/FC0/2	F0/FC4/0	0/FC1/2	F0/FC7/0	0/FC2/2	F1/FC6/0	0/FC3/2	F2/FC5/0
0/FC0/3	F0/FC4/1	0/FC1/3	F0/FC7/1	0/FC2/3	F1/FC6/1	0/FC3/3	F2/FC5/1

Plane 0		Plane 1		Plane 2		Plane 3	
LCC slot/port	FCC slot/port/ chassis	LCC slot/port	FCC slot/port/ chassis	LCC slot/port	FCC slot/port/ chassis	LCC slot/port	FCC slot/port/ chassis
0/FC0/4	F0/FC1/0	0/FC1/4	F1/FC0/0	0/FC2/4	F1/FC3/0	0/FC3/4	F2/FC2/0
0/FC0/5	F0/FC1/1	0/FC1/5	F1/FC0/1	0/FC2/5	F1/FC3/1	0/FC3/5	F2/FC2/1
0/FC0/6	F0/FC5/0	0/FC1/6	F1/FC4/0	0/FC2/6	F1/FC7/0	0/FC3/6	F2/FC6/0
0/FC0/7	F0/FC5/1	0/FC1/7	F1/FC4/1	0/FC2/7	F1/FC7/1	0/FC3/7	F2/FC6/1
0/FC0/8	F0/FC2/0	0/FC1/8	F1/FC1/0	0/FC2/8	F2/FC0/0	0/FC3/8	F2/FC3/0
0/FC0/9	F0/FC2/1	0/FC1/9	F1/FC1/1	0/FC2/9	F2/FC0/1	0/FC3/9	F2/FC3/1
0/FC0/10	F0/FC6/0	0/FC1/10	F1/FC5/0	0/FC2/10	F2/FC4/0	0/FC3/10	F2/FC7/0
0/FC0/11	F0/FC6/1	0/FC1/11	F1/FC5/1	0/FC2/11	F2/FC4/1	0/FC3/11	F2/FC7/1

Table 29: Cabling Plan for LCC1 in a 12+3 Multi-Chassis Configuration

Plane 0		Plane 1		Plane 2		Plane 3	
LCC slot/port	FCC slot/port/ chassis	LCC slot/port	FCC slot/port/ chassis	LCC slot/port	FCC slot/port/ chassis	LCC slot/port	FCC slot/port/ chassis
1/FC0/0	F0/FC0/2	1/FC1/0	F0/FC3/2	1/FC2/0	F1/FC2/2	1/FC3/0	F2/FC1/2
1/FC0/1	F0/FC0/3	1/FC1/1	F0/FC3/3	1/FC2/1	F1/FC2/3	1/FC3/1	F2/FC1/3
1/FC0/2	F0/FC4/2	1/FC1/2	F0/FC7/2	1/FC2/2	F1/FC6/2	1/FC3/2	F2/FC5/2
1/FC0/3	F0/FC4/3	1/FC1/3	F0/FC7/3	1/FC2/3	F1/FC6/3	1/FC3/3	F2/FC5/3
1/FC0/4	F0/FC1/2	1/FC1/4	F1/FC0/2	1/FC2/4	F1/FC3/2	1/FC3/4	F2/FC2/2
1/FC0/5	F0/FC1/3	1/FC1/5	F1/FC0/3	1/FC2/5	F1/FC3/3	1/FC3/5	F2/FC2/3
1/FC0/6	F0/FC5/2	1/FC1/6	F1/FC4/2	1/FC2/6	F1/FC7/2	1/FC3/6	F2/FC6/2
1/FC0/7	F0/FC5/3	1/FC1/7	F1/FC4/3	1/FC2/7	F1/FC7/3	1/FC3/7	F2/FC6/3
1/FC0/8	F0/FC2/2	1/FC1/8	F1/FC1/2	1/FC2/8	F2/FC0/2	1/FC3/8	F2/FC3/2
1/FC0/9	F0/FC2/3	1/FC1/9	F1/FC1/3	1/FC2/9	F2/FC0/3	1/FC3/9	F2/FC3/3
1/FC0/10	F0/FC6/2	1/FC1/10	F1/FC5/2	1/FC2/10	F2/FC4/2	1/FC3/10	F2/FC7/2
1/FC0/11	F0/FC6/3	1/FC1/11	F1/FC5/3	1/FC2/11	F2/FC4/3	1/FC3/11	F2/FC7/3

Table 30: Cabling Plan for LCC2 in a 12+3 Multi-Chassis Configuration

Plane 0		Plane 1		Plane 2		Plane 3	
LCC slot/port	FCC slot/port/chassis	LCC slot/port	FCC slot/port/chassis	LCC slot/port	FCC slot/port/chassis	LCC slot/port	FCC slot/port/chassis
2/FC0/0	F0/FC0/4	2/FC1/0	F0/FC3/4	2/FC2/0	F1/FC2/4	2/FC3/0	F2/FC1/4
2/FC0/1	F0/FC0/5	2/FC1/1	F0/FC3/5	2/FC2/1	F1/FC2/5	2/FC3/1	F2/FC1/5
2/FC0/2	F0/FC4/4	2/FC1/2	F0/FC7/4	2/FC2/2	F1/FC6/4	2/FC3/2	F2/FC5/4
2/FC0/3	F0/FC4/5	2/FC1/3	F0/FC7/5	2/FC2/3	F1/FC6/5	2/FC3/3	F2/FC5/5
2/FC0/4	F0/FC1/4	2/FC1/4	F1/FC0/4	2/FC2/4	F1/FC3/4	2/FC3/4	F2/FC2/4
2/FC0/5	F0/FC1/5	2/FC1/5	F1/FC0/5	2/FC2/5	F1/FC3/5	2/FC3/5	F2/FC2/5
2/FC0/6	F0/FC5/4	2/FC1/6	F1/FC4/4	2/FC2/6	F1/FC7/4	2/FC3/6	F2/FC6/4
2/FC0/7	F0/FC5/5	2/FC1/7	F1/FC4/5	2/FC2/7	F1/FC7/5	2/FC3/7	F2/FC6/5
2/FC0/8	F0/FC2/4	2/FC1/8	F1/FC1/4	2/FC2/8	F2/FC0/4	2/FC3/8	F2/FC3/4
2/FC0/9	F0/FC2/5	2/FC1/9	F1/FC1/5	2/FC2/9	F2/FC0/5	2/FC3/9	F2/FC3/5
2/FC0/10	F0/FC6/4	2/FC1/10	F1/FC5/4	2/FC2/10	F2/FC4/4	2/FC3/10	F2/FC7/4
2/FC0/11	F0/FC6/5	2/FC1/11	F1/FC5/5	2/FC2/11	F2/FC4/5	2/FC3/11	F2/FC7/5

Table 31: Cabling Plan for LCC3 in a 12+3 Multi-Chassis Configuration

Plane 0		Plane 1		Plane 2		Plane 3	
LCC slot/port	FCC slot/port/chassis	LCC slot/port	FCC slot/port/chassis	LCC slot/port	FCC slot/port/chassis	LCC slot/port	FCC slot/port/chassis
3/FC0/0	F0/FC0/6	3/FC1/0	F0/FC3/6	3/FC2/0	F1/FC2/6	3/FC3/0	F2/FC1/6
3/FC0/1	F0/FC0/7	3/FC1/1	F0/FC3/7	3/FC2/1	F1/FC2/7	3/FC3/1	F2/FC1/7
3/FC0/2	F0/FC4/6	3/FC1/2	F0/FC7/6	3/FC2/2	F1/FC6/6	3/FC3/2	F2/FC5/6
3/FC0/3	F0/FC4/7	3/FC1/3	F0/FC7/7	3/FC2/3	F1/FC6/7	3/FC3/3	F2/FC5/7
3/FC0/4	F0/FC1/6	3/FC1/4	F1/FC0/6	3/FC2/4	F1/FC3/6	3/FC3/4	F2/FC2/6
3/FC0/5	F0/FC1/7	3/FC1/5	F1/FC0/7	3/FC2/5	F1/FC3/7	3/FC3/5	F2/FC2/7
3/FC0/6	F0/FC5/6	3/FC1/6	F1/FC4/6	3/FC2/6	F1/FC7/6	3/FC3/6	F2/FC6/6
3/FC0/7	F0/FC5/7	3/FC1/7	F1/FC4/7	3/FC2/7	F1/FC7/7	3/FC3/7	F2/FC6/7
3/FC0/8	F0/FC2/6	3/FC1/8	F1/FC1/6	3/FC2/8	F2/FC0/6	3/FC3/8	F2/FC3/6
3/FC0/9	F0/FC2/7	3/FC1/9	F1/FC1/7	3/FC2/9	F2/FC0/7	3/FC3/9	F2/FC3/7
3/FC0/10	F0/FC6/6	3/FC1/10	F1/FC5/6	3/FC2/10	F2/FC4/6	3/FC3/10	F2/FC7/6
3/FC0/11	F0/FC6/7	3/FC1/11	F1/FC5/7	3/FC2/11	F2/FC4/7	3/FC3/11	F2/FC7/7

Table 32: Cabling Plan for LCC4 in a 12+3 Multi-Chassis Configuration

Plane 0		Plane 1		Plane 2		Plane 3	
LCC slot/port	FCC slot/port/ chassis	LCC slot/port	FCC slot/port/ chassis	LCC slot/port	FCC slot/port/ chassis	LCC slot/port	FCC slot/port/ chassis
4/FC0/0	F0/FC0/8	4/FC1/0	F0/FC3/8	4/FC2/0	F1/FC2/8	4/FC3/0	F2/FC1/8
4/FC0/1	F0/FC0/9	4/FC1/1	F0/FC3/9	4/FC2/1	F1/FC2/9	4/FC3/1	F2/FC1/9
4/FC0/2	F0/FC4/8	4/FC1/2	F0/FC7/8	4/FC2/2	F1/FC6/8	4/FC3/2	F2/FC5/8
4/FC0/3	F0/FC4/9	4/FC1/3	F0/FC7/9	4/FC2/3	F1/FC6/9	4/FC3/3	F2/FC5/9
4/FC0/4	F0/FC1/8	4/FC1/4	F1/FC0/8	4/FC2/4	F1/FC3/8	4/FC3/4	F2/FC2/8
4/FC0/5	F0/FC1/9	4/FC1/5	F1/FC0/9	4/FC2/5	F1/FC3/9	4/FC3/5	F2/FC2/9
4/FC0/6	F0/FC5/8	4/FC1/6	F1/FC4/8	4/FC2/6	F1/FC7/8	4/FC3/6	F2/FC6/8
4/FC0/7	F0/FC5/9	4/FC1/7	F1/FC4/9	4/FC2/7	F1/FC7/9	4/FC3/7	F2/FC6/9
4/FC0/8	F0/FC2/8	4/FC1/8	F1/FC1/8	4/FC2/8	F2/FC0/8	4/FC3/8	F2/FC3/8
4/FC0/9	F0/FC2/9	4/FC1/9	F1/FC1/9	4/FC2/9	F2/FC0/9	4/FC3/9	F2/FC3/9
4/FC0/10	F0/FC6/8	4/FC1/10	F1/FC5/8	4/FC2/10	F2/FC4/8	4/FC3/10	F2/FC7/8
4/FC0/11	F0/FC6/9	4/FC1/11	F1/FC5/9	4/FC2/11	F2/FC4/9	4/FC3/11	F2/FC7/9

Table 33: Cabling Plan for LCC5 in a 12+3 Multi-Chassis Configuration

Plane 0		Plane 1		Plane 2		Plane 3	
LCC slot/port	FCC slot/port/ chassis	LCC slot/port	FCC slot/port/ chassis	LCC slot/port	FCC slot/port/ chassis	LCC slot/port	FCC slot/port/ chassis
5/FC0/0	F0/FC0/10	5/FC1/0	F0/FC3/10	5/FC2/0	F1/FC2/10	5/FC3/0	F2/FC1/10
5/FC0/1	F0/FC0/11	5/FC1/1	F0/FC3/11	5/FC2/1	F1/FC2/11	5/FC3/1	F2/FC1/11
5/FC0/2	F0/FC4/10	5/FC1/2	F0/FC7/10	5/FC2/2	F1/FC6/10	5/FC3/2	F2/FC5/10
5/FC0/3	F0/FC4/11	5/FC1/3	F0/FC7/11	5/FC2/3	F1/FC6/11	5/FC3/3	F2/FC5/11
5/FC0/4	F0/FC1/10	5/FC1/4	F1/FC0/10	5/FC2/4	F1/FC3/10	5/FC3/4	F2/FC2/10
5/FC0/5	F0/FC1/11	5/FC1/5	F1/FC0/11	5/FC2/5	F1/FC3/11	5/FC3/5	F2/FC2/11
5/FC0/6	F0/FC5/10	5/FC1/6	F1/FC4/10	5/FC2/6	F1/FC7/10	5/FC3/6	F2/FC6/10
5/FC0/7	F0/FC5/11	5/FC1/7	F1/FC4/11	5/FC2/7	F1/FC7/11	5/FC3/7	F2/FC6/11
5/FC0/8	F0/FC2/10	5/FC1/8	F1/FC1/10	5/FC2/8	F2/FC0/10	5/FC3/8	F2/FC3/10
5/FC0/9	F0/FC2/11	5/FC1/9	F1/FC1/11	5/FC2/9	F2/FC0/11	5/FC3/9	F2/FC3/11
5/FC0/10	F0/FC6/10	5/FC1/10	F1/FC5/10	5/FC2/10	F2/FC4/10	5/FC3/10	F2/FC7/10
5/FC0/11	F0/FC6/11	5/FC1/11	F1/FC5/11	5/FC2/11	F2/FC4/11	5/FC3/11	F2/FC7/11

Table 34: Cabling Plan for LCC6 in a 12+3 Multi-Chassis Configuration

Plane 0		Plane 1		Plane 2		Plane 3	
LCC slot/port	FCC slot/port/chassis	LCC slot/port	FCC slot/port/chassis	LCC slot/port	FCC slot/port/chassis	LCC slot/port	FCC slot/port/chassis
6/FC0/0	F0/FC0/12	6/FC1/0	F0/FC3/12	6/FC2/0	F1/FC2/12	6/FC3/0	F2/FC1/12
6/FC0/1	F0/FC0/13	6/FC1/1	F0/FC3/13	6/FC2/1	F1/FC2/13	6/FC3/1	F2/FC1/13
6/FC0/2	F0/FC4/12	6/FC1/2	F0/FC7/12	6/FC2/2	F1/FC6/12	6/FC3/2	F2/FC5/12
6/FC0/3	F0/FC4/13	6/FC1/3	F0/FC7/13	6/FC2/3	F1/FC6/13	6/FC3/3	F2/FC5/13
6/FC0/4	F0/FC1/12	6/FC1/4	F1/FC0/12	6/FC2/4	F1/FC3/12	6/FC3/4	F2/FC2/12
6/FC0/5	F0/FC1/13	6/FC1/5	F1/FC0/13	6/FC2/5	F1/FC3/13	6/FC3/5	F2/FC2/13
6/FC0/6	F0/FC5/12	6/FC1/6	F1/FC4/12	6/FC2/6	F1/FC7/12	6/FC3/6	F2/FC6/12
6/FC0/7	F0/FC5/13	6/FC1/7	F1/FC4/13	6/FC2/7	F1/FC7/13	6/FC3/7	F2/FC6/13
6/FC0/8	F0/FC2/12	6/FC1/8	F1/FC1/12	6/FC2/8	F2/FC0/12	6/FC3/8	F2/FC3/12
6/FC0/9	F0/FC2/13	6/FC1/9	F1/FC1/13	6/FC2/9	F2/FC0/13	6/FC3/9	F2/FC3/13
6/FC0/10	F0/FC6/12	6/FC1/10	F1/FC5/12	6/FC2/10	F2/FC4/12	6/FC3/10	F2/FC7/12
6/FC0/11	F0/FC6/13	6/FC1/11	F1/FC5/13	6/FC2/11	F2/FC4/13	6/FC3/11	F2/FC7/13

Table 35: Cabling Plan for LCC7 in a 12+3 Multi-Chassis Configuration

Plane 0		Plane 1		Plane 2		Plane 3	
LCC slot/port	FCC slot/port/chassis	LCC slot/port	FCC slot/port/chassis	LCC slot/port	FCC slot/port/chassis	LCC slot/port	FCC slot/port/chassis
7/FC0/0	F0/FC0/14	7/FC1/0	F0/FC3/14	7/FC2/0	F1/FC2/14	7/FC3/0	F2/FC1/14
7/FC0/1	F0/FC0/15	7/FC1/1	F0/FC3/15	7/FC2/1	F1/FC2/15	7/FC3/1	F2/FC1/15
7/FC0/2	F0/FC4/14	7/FC1/2	F0/FC7/14	7/FC2/2	F1/FC6/14	7/FC3/2	F2/FC5/14
7/FC0/3	F0/FC4/15	7/FC1/3	F0/FC7/15	7/FC2/3	F1/FC6/15	7/FC3/3	F2/FC5/15
7/FC0/4	F0/FC1/14	7/FC1/4	F1/FC0/14	7/FC2/4	F1/FC3/14	7/FC3/4	F2/FC2/14
7/FC0/5	F0/FC1/15	7/FC1/5	F1/FC0/15	7/FC2/5	F1/FC3/15	7/FC3/5	F2/FC2/15
7/FC0/6	F0/FC5/14	7/FC1/6	F1/FC4/14	7/FC2/6	F1/FC7/14	7/FC3/6	F2/FC6/14
7/FC0/7	F0/FC5/15	7/FC1/7	F1/FC4/15	7/FC2/7	F1/FC7/15	7/FC3/7	F2/FC6/15
7/FC0/8	F0/FC2/14	7/FC1/8	F1/FC1/14	7/FC2/8	F2/FC0/14	7/FC3/8	F2/FC3/14
7/FC0/9	F0/FC2/15	7/FC1/9	F1/FC1/15	7/FC2/9	F2/FC0/15	7/FC3/9	F2/FC3/15
7/FC0/10	F0/FC6/14	7/FC1/10	F1/FC5/14	7/FC2/10	F2/FC4/14	7/FC3/10	F2/FC7/14
7/FC0/11	F0/FC6/15	7/FC1/11	F1/FC5/15	7/FC2/11	F2/FC4/15	7/FC3/11	F2/FC7/15

Table 36: Cabling Plan for LCC8 in a 12+3 Multi-Chassis Configuration

Plane 0		Plane 1		Plane 2		Plane 3	
LCC slot/port	FCC slot/port/ chassis	LCC slot/port	FCC slot/port/ chassis	LCC slot/port	FCC slot/port/ chassis	LCC slot/port	FCC slot/port/ chassis
8/FC0/0	F0/FC0/16	8/FC1/0	F0/FC3/16	8/FC2/0	F1/FC2/16	8/FC3/0	F2/FC1/16
8/FC0/1	F0/FC0/17	8/FC1/1	F0/FC3/17	8/FC2/1	F1/FC2/17	8/FC3/1	F2/FC1/17
8/FC0/2	F0/FC4/16	8/FC1/2	F0/FC7/16	8/FC2/2	F1/FC6/16	8/FC3/2	F2/FC5/16
8/FC0/3	F0/FC4/17	8/FC1/3	F0/FC7/17	8/FC2/3	F1/FC6/17	8/FC3/3	F2/FC5/17
8/FC0/4	F0/FC1/16	8/FC1/4	F1/FC0/16	8/FC2/4	F1/FC3/16	8/FC3/4	F2/FC2/16
8/FC0/5	F0/FC1/17	8/FC1/5	F1/FC0/17	8/FC2/5	F1/FC3/17	8/FC3/5	F2/FC2/17
8/FC0/6	F0/FC5/16	8/FC1/6	F1/FC4/16	8/FC2/6	F1/FC7/16	8/FC3/6	F2/FC6/16
8/FC0/7	F0/FC5/17	8/FC1/7	F1/FC4/17	8/FC2/7	F1/FC7/17	8/FC3/7	F2/FC6/17
8/FC0/8	F0/FC2/16	8/FC1/8	F1/FC1/16	8/FC2/8	F2/FC0/16	8/FC3/8	F2/FC3/16
8/FC0/9	F0/FC2/17	8/FC1/9	F1/FC1/17	8/FC2/9	F2/FC0/17	8/FC3/9	F2/FC3/17
8/FC0/10	F0/FC6/16	8/FC1/10	F1/FC5/16	8/FC2/10	F2/FC4/16	8/FC3/10	F2/FC7/16
8/FC0/11	F0/FC6/17	8/FC1/11	F1/FC5/17	8/FC2/11	F2/FC4/17	8/FC3/11	F2/FC7/17

Table 37: Cabling Plan for LCC9 in a 12+3 Multi-Chassis Configuration

Plane 0		Plane 1		Plane 2		Plane 3	
LCC slot/port	FCC slot/port/ chassis	LCC slot/port	FCC slot/port/ chassis	LCC slot/port	FCC slot/port/ chassis	LCC slot/port	FCC slot/port/ chassis
9/FC0/0	F0/FC0/18	9/FC1/0	F0/FC3/18	9/FC2/0	F1/FC2/18	9/FC3/0	F2/FC1/18
9/FC0/1	F0/FC0/19	9/FC1/1	F0/FC3/19	9/FC2/1	F1/FC2/19	9/FC3/1	F2/FC1/19
9/FC0/2	F0/FC4/18	9/FC1/2	F0/FC7/18	9/FC2/2	F1/FC6/18	9/FC3/2	F2/FC5/18
9/FC0/3	F0/FC4/19	9/FC1/3	F0/FC7/19	9/FC2/3	F1/FC6/19	9/FC3/3	F2/FC5/19
9/FC0/4	F0/FC1/18	9/FC1/4	F1/FC0/18	9/FC2/4	F1/FC3/18	9/FC3/4	F2/FC2/18
9/FC0/5	F0/FC1/19	9/FC1/5	F1/FC0/19	9/FC2/5	F1/FC3/19	9/FC3/5	F2/FC2/19
9/FC0/6	F0/FC5/18	9/FC1/6	F1/FC4/18	9/FC2/6	F1/FC7/18	9/FC3/6	F2/FC6/18
9/FC0/7	F0/FC5/19	9/FC1/7	F1/FC4/19	9/FC2/7	F1/FC7/19	9/FC3/7	F2/FC6/19
9/FC0/8	F0/FC2/18	9/FC1/8	F1/FC1/18	9/FC2/8	F2/FC0/18	9/FC3/8	F2/FC3/18
9/FC0/9	F0/FC2/19	9/FC1/9	F1/FC1/19	9/FC2/9	F2/FC0/19	9/FC3/9	F2/FC3/19
9/FC0/10	F0/FC6/18	9/FC1/10	F1/FC5/18	9/FC2/10	F2/FC4/18	9/FC3/10	F2/FC7/18
9/FC0/11	F0/FC6/19	9/FC1/11	F1/FC5/19	9/FC2/11	F2/FC4/19	9/FC3/11	F2/FC7/19

Table 38: Cabling Plan for LCC10 in a 12+3 Multi-Chassis Configuration

Plane 0		Plane 1		Plane 2		Plane 3	
LCC slot/port	FCC slot/port/chassis	LCC slot/port	FCC slot/port/chassis	LCC slot/port	FCC slot/port/chassis	LCC slot/port	FCC slot/port/chassis
10/FC0/0	F0/FC0/20	10/FC1/0	F0/FC3/20	10/FC2/0	F1/FC2/20	10/FC3/0	F2/FC1/20
10/FC0/1	F0/FC0/21	10/FC1/1	F0/FC3/21	10/FC2/1	F1/FC2/21	10/FC3/1	F2/FC1/21
10/FC0/2	F0/FC4/20	10/FC1/2	F0/FC7/20	10/FC2/2	F1/FC6/20	10/FC3/2	F2/FC5/20
10/FC0/3	F0/FC4/21	10/FC1/3	F0/FC7/21	10/FC2/3	F1/FC6/21	10/FC3/3	F2/FC5/21
10/FC0/4	F0/FC1/20	10/FC1/4	F1/FC0/20	10/FC2/4	F1/FC3/20	10/FC3/4	F2/FC2/20
10/FC0/5	F0/FC1/21	10/FC1/5	F1/FC0/21	10/FC2/5	F1/FC3/21	10/FC3/5	F2/FC2/21
10/FC0/6	F0/FC5/20	10/FC1/6	F1/FC4/20	10/FC2/6	F1/FC7/20	10/FC3/6	F2/FC6/20
10/FC0/7	F0/FC5/21	10/FC1/7	F1/FC4/21	10/FC2/7	F1/FC7/21	10/FC3/7	F2/FC6/21
10/FC0/8	F0/FC2/20	10/FC1/8	F1/FC1/20	10/FC2/8	F2/FC0/20	10/FC3/8	F2/FC3/20
10/FC0/9	F0/FC2/21	10/FC1/9	F1/FC1/21	10/FC2/9	F2/FC0/21	10/FC3/9	F2/FC3/21
10/FC0/10	F0/FC6/20	10/FC1/10	F1/FC5/20	10/FC2/10	F2/FC4/20	10/FC3/10	F2/FC7/20
10/FC0/11	F0/FC6/21	10/FC1/11	F1/FC5/21	10/FC2/11	F2/FC4/21	10/FC3/11	F2/FC7/21

Table 39: Cabling Plan for LCC11 in a 12+3 Multi-Chassis Configuration

Plane 0		Plane 1		Plane 2		Plane 3	
LCC slot/port	FCC slot/port/chassis	LCC slot/port	FCC slot/port/chassis	LCC slot/port	FCC slot/port/chassis	LCC slot/port	FCC slot/port/chassis
11/FC0/0	F0/FC0/22	11/FC1/0	F0/FC3/22	11/FC2/0	F1/FC2/22	11/FC3/0	F2/FC1/22
11/FC0/1	F0/FC0/23	11/FC1/1	F0/FC3/23	11/FC2/1	F1/FC2/23	11/FC3/1	F2/FC1/23
11/FC0/2	F0/FC4/22	11/FC1/2	F0/FC7/22	11/FC2/2	F1/FC6/22	11/FC3/2	F2/FC5/22
11/FC0/3	F0/FC4/23	11/FC1/3	F0/FC7/23	11/FC2/3	F1/FC6/23	11/FC3/3	F2/FC5/23
11/FC0/4	F0/FC1/22	11/FC1/4	F1/FC0/22	11/FC2/4	F1/FC3/22	11/FC3/4	F2/FC2/22
11/FC0/5	F0/FC1/23	11/FC1/5	F1/FC0/23	11/FC2/5	F1/FC3/23	11/FC3/5	F2/FC2/23
11/FC0/6	F0/FC5/22	11/FC1/6	F1/FC4/22	11/FC2/6	F1/FC7/22	11/FC3/6	F2/FC6/22
11/FC0/7	F0/FC5/23	11/FC1/7	F1/FC4/23	11/FC2/7	F1/FC7/23	11/FC3/7	F2/FC6/23
11/FC0/8	F0/FC2/22	11/FC1/8	F1/FC1/22	11/FC2/8	F2/FC0/22	11/FC3/8	F2/FC3/22
11/FC0/9	F0/FC2/23	11/FC1/9	F1/FC1/23	11/FC2/9	F2/FC0/23	11/FC3/9	F2/FC3/23
11/FC0/10	F0/FC6/22	11/FC1/10	F1/FC5/22	11/FC2/10	F2/FC4/22	11/FC3/10	F2/FC7/22
11/FC0/11	F0/FC6/23	11/FC1/11	F1/FC5/23	11/FC2/11	F2/FC4/23	11/FC3/11	F2/FC7/23



Note The cable plan for the 12+3 configuration is not flexible.

Chassis Serial Configurations for 12+3

Chassis Serial Configurations

LCC0, LCC1, LCC2, LCC3, LCC4, LCC5, LCC6, LCC7, LCC8, LCC9, LCC10, and LCC11 are on rack 0, rack 1, rack 2, rack 3, rack 4, rack 5, rack 6, rack 7, rack 8, rack 9, rack 10, and rack 11 respectively. FCC0, FCC1, and FCC2 are on rack F0, rack F1, and rack F2 respectively. Use the **chassis serial** *serial_number* **rack** *rack_id* command. For a detailed procedure, see [Assign Rack Number to Chassis](#), on page 2.

```
chassis serial <serial number> rack 0
chassis serial <serial number> rack 1
chassis serial <serial number> rack 2
chassis serial <serial number> rack 3
chassis serial <serial number> rack 4
chassis serial <serial number> rack 5
chassis serial <serial number> rack 6
chassis serial <serial number> rack 7
chassis serial <serial number> rack 8
chassis serial <serial number> rack 9
chassis serial <serial number> rack 10
chassis serial <serial number> rack 11
chassis serial <serial number> rack F0
chassis serial <serial number> rack F1
chassis serial <serial number> rack F2
```

Fabric Instance Configuration for 12+3

The following configurations are for a 12+3 MC system with six FCC fabric cards per plane with FCC rack level redundancy. For a detailed procedure, see [Associate a Fabric Card in a Fabric Card Chassis to a Fabric Plane](#), on page 3.

- Fabric instance configuration for fabric plane 0:

```
config
controller fabric plane 0
instance 0
location F0/FC0
instance 1
location F0/FC4
instance 2
location F0/FC1
instance 3
location F0/FC5
instance 4
location F0/FC2
instance 5
location F0/FC6
```

- Fabric instance configuration for fabric plane 1:

```
config
controller fabric plane 1
```

```

instance 0
location F0/FC3
instance 1
location F0/FC7
instance 2
location F1/FC0
instance 3
location F1/FC4
instance 4
location F1/FC1
instance 5
location F1/FC5

```

- Fabric instance configuration for plane 2:

```

config
controller fabric plane 2
instance 0
location F1/FC2
instance 1
location F1/FC6
instance 2
location F1/FC3
instance 3
location F1/FC7
instance 4
location F2/FC0
instance 5
location F2/FC4

```

- Fabric instance configuration for plane 3:

```

config
controller fabric plane 3
instance 0
location F2/FC1
Instance 1
location F2/FC5
instance 2
location F2/FC2
Instance 3
location F2/FC6
instance 4
location F2/FC3
Instance 5
location F2/FC7

```



Note Removing a fabric plane instance configuration might impact traffic. Shut down the relevant plane before removing or modifying a fabric instance configuration.

If there is a plane configuration mismatch, the CXP2 LEDs for the relevant plane are shown red. This is because the bundles are down, although the plane status is shown Up. You must correct the configuration error before proceeding.

Verify CE Links

The following commands are used to verify the control ethernet (CE) links. These commands are common for all MC systems.

Procedure

Step 1 show controller switch reachable

Checks reachability for all LC, RP, and SC.

Example:

```

sysadmin-vm:F0_SC0# show controller switch reachable
Wed Jun 24 22:43:13.302 UTC.
Rack Card Switch
-----
0      RP0   RP-SW
0      RP1   RP-SW
0      LC0   LC-SW
0      LC1   LC-SW
0      LC2   LC-SW
0      LC3   LC-SW
0      LC4   LC-SW
0      LC5   LC-SW
0      LC6   LC-SW
0      LC7   LC-SW
1      RP0   RP-SW
1      RP1   RP-SW
1      LC0   LC-SW
1      LC1   LC-SW
1      LC2   LC-SW
1      LC3   LC-SW
1      LC4   LC-SW
1      LC5   LC-SW
1      LC6   LC-SW
1      LC7   LC-SW
2      RP0   RP-SW
2      RP1   RP-SW
F0     SC0   SC-SW
F0     SC0   F-SW0
F0     SC1   SC-SW
F1     SC0   SC-SW
F1     SC1   SC-SW
F1     SC1   F-SW0

```

Step 2 show controller switch mlap reachable

Checks reachability for switch mlap.

Example:

```

sysadmin-vm:F0_SC0# show controller switch mlap reachable
Wed Jun 24 22:54:33.351 UTC
Rack Card Switch
-----
0      RP0   RP-SW
0      RP1   RP-SW

```



```

1      RP0  RP-SW
1      RP1  RP-SW
2      RP0  RP-SW
2      RP1  RP-SW
F0     SC0  SC-SW
F0     SC0  F-SW0
F0     SC1  SC-SW
F1     SC0  SC-SW
F1     SC1  SC-SW
F1     SC1  F-SW0

```

Step 3 show controller switch mlap location

Checks CE connectivity.

Note Port information information is internal port info. i.e. port 58 is RP port 0 and 59 is RP port 1.

```

sysadmin-vm:F1_SC0# show controller switch mlap location ?
Description: Location information for MLAP switch summary data
Possible completions:
  0/RP0/RP-SW
  0/RP1/RP-SW
  1/RP0/RP-SW
  1/RP1/RP-SW
  F0/SC0/SC-SW
  F0/SC1/F-SW0
  F0/SC1/SC-SW
  F1/SC0/F-SW0
  F1/SC0/SC-SW
  F1/SC1/SC-SW

show controller switch mlap location 0/RP0/RP-SW | i External
show controller switch mlap location 0/RP1/RP-SW | i External
show controller switch mlap location 1/RP0/RP-SW | i External
show controller switch mlap location 1/RP1/RP-SW | i External

show controller switch mlap location F0/SC0/SC-SW | i External
show controller switch mlap location F0/SC1/SC-SW | i External
show controller switch mlap location F0/SC1/F-SW0 | i Active (If this fails, capture below
command with F0/SC0-SW0 location)
show controller switch mlap location F0/SC0/F-SW0 | i Active
show controller switch mlap location F0/SC1/F-SW0 | i Standby(If this fails, capture below
command with F0/SC0-SW0 location)
show controller switch mlap location F0/SC0/F-SW0 | i Standby

show controller switch mlap location F1/SC0/SC-SW | i External
show controller switch mlap location F1/SC1/SC-SW | i External
show controller switch mlap location F1/SC1/F-SW0 | i Active(If this fails, capture below
command with F1/SC0-SW0 location)
show controller switch mlap location F1/SC0/F-SW0 | i Active
show controller switch mlap location F1/SC1/F-SW0 | i Standby(If this fails, capture below
command with F1/SC0-SW0 location)
show controller switch mlap location F1/SC0/F-SW0 | i Standby

```

Example:

2+2 MC system.

```

sysadmin-vm:F1_SC0# show controller switch mlap location 0/RP0/RP-SW | i External

```

```

Wed Aug 5 13:51:08.598 UTC
58 Up Up Active Forwarding External Exp Eth0: F0/SC1/F-SW0 17
59 Up Up Standby Blocking External Exp Eth1: F1/SC0/F-SW0 17
sysadmin-vm:F1_SC0# show controller switch mlap location 0/RP1/RP-SW | i External
Wed Aug 5 13:51:16.227 UTC
58 Up Up Active Forwarding External Exp Eth0: F0/SC1/F-SW0 16
59 Up Up Standby Blocking External Exp Eth1: F1/SC0/F-SW0 16
sysadmin-vm:F1_SC0# show controller switch mlap location 1/RP0/RP-SW | i External
Wed Aug 5 13:51:24.746 UTC
58 Up Up Active Forwarding External Exp Eth0: F0/SC1/F-SW0 20
59 Up Up Standby Blocking External Exp Eth1: F1/SC0/F-SW0 21
sysadmin-vm:F1_SC0# show controller switch mlap location 1/RP1/RP-SW | i External
Wed Aug 5 13:51:31.577 UTC
58 Up Up Active Forwarding External Exp Eth0: F0/SC1/F-SW0 21
59 Up Up Standby Blocking External Exp Eth1: F1/SC0/F-SW0 20
sysadmin-vm:F1_SC0#

sysadmin-vm:F1_SC0# show controller switch mlap location F0/SC0/SC-SW | i External
Wed Aug 5 13:54:45.342 UTC
22 Up Up Standby Blocking External Exp Eth1: F1/SC0/F-SW0 1
24 Up Up Active Forwarding External Exp Eth0: F0/SC1/F-SW0 1
sysadmin-vm:F1_SC0# show controller switch mlap location F0/SC1/F-SW0 | i Active
Wed Aug 5 13:54:52.803 UTC
0 Up Up Active Forwarding External Exp Eth1: F1/SC0/SC-SW 24
1 Up Up Active Forwarding External Exp Eth0: F0/SC0/SC-SW 24
4 Up Up Active Forwarding External Exp Eth3: F1/SC1/SC-SW 24
5 Up Up Active Forwarding External Exp Eth2: F0/SC1/SC-SW 24
16 Up Up Active Forwarding External Exp Eth5: 0/RP1/RP-SW 58
17 Up Up Active Forwarding External Exp Eth4: 0/RP0/RP-SW 58
20 Up Up Active Forwarding External Exp Eth7: 1/RP0/RP-SW 58
21 Up Up Active Forwarding External Exp Eth6: 1/RP1/RP-SW 58
112 Up Up Active Forwarding External HS 0: F1/SC0/F-SW0 112
116 Up Up Active Forwarding External HS 1: F1/SC0/F-SW0 116
sysadmin-vm:F1_SC0# show controller switch mlap location F0/SC1/F-SW0 | i Standby
Wed Aug 5 13:55:07.597 UTC
sysadmin-vm:F1_SC0# show controller switch mlap location F0/SC1/SC-SW | i External
Wed Aug 5 13:55:17.642 UTC
22 Up Up Standby Blocking External Exp Eth1: F1/SC0/F-SW0 5
24 Up Up Active Forwarding External Exp Eth0: F0/SC1/F-SW0 5
sysadmin-vm:F1_SC0#

sysadmin-vm:F1_SC0# show controller switch mlap location F1/SC0/SC-SW | i External
Wed Aug 5 13:57:57.519 UTC
22 Up Up Standby Blocking External Exp Eth1: F1/SC0/F-SW0 0
24 Up Up Active Forwarding External Exp Eth0: F0/SC1/F-SW
sysadmin-vm:F1_SC0# show controller switch mlap location F1/SC0/F-SW0 | i Active
Wed Aug 5 13:58:25.308 UTC
112 Up Up Active Forwarding External HS 0: F0/SC1/F-SW0 112
116 Up Up Active Forwarding External HS 1: F0/SC1/F-SW0 116
sysadmin-vm:F1_SC0# show controller switch mlap location F1/SC0/F-SW0 | i Standby
Wed Aug 5 13:58:43.633 UTC
0 Up Up Standby Blocking External Exp Eth1: F1/SC0/SC-SW 22
1 Up Up Standby Blocking External Exp Eth0: F0/SC0/SC-SW 22
4 Up Up Standby Blocking External Exp Eth3: F1/SC1/SC-SW 22
5 Up Up Standby Blocking External Exp Eth2: F0/SC1/SC-SW 22
16 Up Up Standby Blocking External Exp Eth5: 0/RP1/RP-SW 59
17 Up Up Standby Blocking External Exp Eth4: 0/RP0/RP-SW 59
20 Up Up Standby Blocking External Exp Eth7: 1/RP1/RP-SW 59
21 Up Up Standby Blocking External Exp Eth6: 1/RP0/RP-SW 59
sysadmin-vm:F1_SC0# show controller switch mlap location F1/SC1/SC-SW | i External
Wed Aug 5 14:00:18.450 UTC
22 Up Up Standby Blocking External Exp Eth1: F1/SC0/F-SW0 4

```

```
24 Up Up Active Forwarding External Exp Eth0: F0/SC1/F-SW0 4
sysadmin-vm:F1_SC0#
```

Step 4 show controller fabric link port s2 rx state down

Verifies fabric links.

Note No links should be down.

Example:

```
sysadmin-vm:F0_SC0# sh controller fabric link port s2 rx state down
Wed Jun 17 21:01:31.361 UTC
```

```
Description:
Ch - Channel,      Sx - Slice/bus #,      Px - Port # within slice/bus
DN - Down,        LI - Lane into CDR,    LO - Lane out of CDR
SFE port          Admin Near-end      Near Far Far-end      Other End
R/S/A/P           /Oper CDR             -end -end CDR          R/S/A/P
state            LO-Sx-Px-LI CXP/Ch CXP/Ch LO-Sx-Px-LI
-----
F0/FC5/2/15      UP/DN 03-S1-P2-03 07/09 07/09              1/FC1/0/70
```

```
Description:
Ch - Channel,      Sx - Slice/bus #,      Px - Port # within slice/bus
DN - Down,        LI - Lane into CDR,    LO - Lane out of CDR
SFE port          Admin Near-end      Near Far Far-end      Other End
R/S/A/P           /Oper CDR             -end -end CDR          R/S/A/P
state            LO-Sx-Px-LI CXP/Ch CXP/Ch LO-Sx-Px-LI
-----
F1/FC5/1/14      UP/DN 01-S1-P0-01 07/04 07/04 04-S1-P0-04 1/FC4/0/68
```

Shows F0/FC5/7 connected to 1/FC1/7 and F1/FC5/7 connected to 1/FC4/7 should be cleaned



CHAPTER 4

Troubleshooting the Fabric Cable Connections

This chapter has troubleshooting details for incorrect fabric cable connections.

- [Troubleshooting the Fabric Cable Connections](#) , on page 67

Troubleshooting the Fabric Cable Connections

As there are a large number of fabric cable connections that are required for configuring the MC connections, there are possibilities of incorrect connections. Check the following:

1. To check the plane and link bundle state details, use the following commands:
 - **show controller fabric plane all detail**
 - **show controller fabric bundle all detail**
2. After the issues with the links have been identified, check the CXP2 connections using the **show controller fabric exp summary rack F0** command.
3. Manually check that the MPO cables connections between the ports.
4. Check the cables in between ports. Check for lane Rx and Tx power, signal strength, and whether a signal is detected both at the Rx and TX ports. Use the following commands:
 - **show controller fabric exp dom location F0/FC0 port 0**
 - **show controller fabric exp dom location F0/FC0 port 0**
5. Verify the ASIC status on the S2 fabric cards using the commands:
 - **show controller fabric sfe s2 F0/FC0/0**
 - **show controller fabric sfe s2 F0/FC0/1**
6. If the above commands display the required outputs, check cabling error. To identify the bundles that are down, use the **show controller fabric bundle all detail | I DN** command.
7. To check if the 12 lanes in a link are down, use the **show controller fabric link port s2 rx all | i "DN|SFE|R/S/A/P|state" | i "F0/FC0|SFE|R/S/A/P|state"** command. If all the 12 lanes are down, it indicates that the CXP/ link is connected incorrectly. If less than 12 lanes are down, there could be other reasons for the link failure.



Note Also, verify the lanes in the S3 cards using the above command.

```
sysadmin-vm:1_RP0# show controller fabric link port s2 rx | in DN

1/FC3/2/84 ER/DN 11/00 05/00 F1/FC7/0/67
1/FC3/2/85 ER/DN 11/11 05/11 08-S0-P9-08 F1/FC7/1/97
1/FC3/2/86 ER/DN 11/10 05/10 07-S0-P9-07 F1/FC7/1/100
1/FC3/2/89 ER/DN 11/07 05/07 09-S0-P9-09 F1/FC7/1/96
1/FC3/2/91 ER/DN 11/05 05/05 F1/FC7/0/68
1/FC3/2/92 UP/DN 11/04 05/04 02-S0-P9-02 F1/FC7/1/99
1/FC3/2/95 ER/DN 11/01 05/01 F1/FC7/0/60
```

You can shut/no shut each port and recheck.

```
sysadmin-vm:1_RP0# config t
sysadmin-vm:1_RP0(config)# controller fabric link port 1/FC3/2/84
sysadmin-vm:1_RP0(config-port-1/FC3/2/84)# shut
```

8. To detect incorrect topology, use the following commands:

- **show controller sfe link-info rx 0 143 topo instance 0 location F0/FC0 | i T**
- **show controller sfe link-info rx 0 143 topo instance 1 location F0/FC0 | i T**

Repeat the commands if you have more instances.

9. To identify the incorrect cable connections, compare the links with “Invalid Topology (T)” from the Step 8 output with the links in the Step 7 output.

Sample outputs for the commands discussed in this section:

```
sysadmin-vm:0_RP0# show controller fabric plane all detail

Plane Admin Plane  Plane  up->dn  up->mcast  Total   Down   PPU
Id      State State  Mode   counter  counter  Bundles Bundles State
-----
0       UP    UP      MC      0         0         1      24     2   NA
1       UP    UP      MC      0         0         1      24     1   NA
2       UP    UP      MC      0         0         1      24     0   NA
3       UP    UP      MC      0         0         1      24     1   NA

sysadmin-vm:0_RP0#
sysadmin-vm:0_RP0#
sysadmin-vm:0_RP0# show controller fabric bundle all detail
Wed May  2  23:37:48.248 UTC

Bundle   Oper  Plane  Total  Down  Bundle   Bundle
R/S/P    State Id   Links Links Port1    Port2
-----
F0/FC0/0  DN    0      12 12   F0/FC0/0  0/FC0/0
F0/FC0/1  DN    0      12 12   F0/FC0/1  0/FC0/1
F0/FC0/2  UP    0      12 0    F0/FC0/2  0/FC0/2
F0/FC0/3  UP    0      12 0    F0/FC0/3  0/FC0/3
F0/FC0/4  UP    0      12 0    F0/FC0/4  0/FC0/4
F0/FC0/5  UP    0      12 0    F0/FC0/5  0/FC0/5
F0/FC0/6  UP    0      12 0    F0/FC0/6  1/FC0/0
F0/FC0/7  UP    0      12 0    F0/FC0/7  1/FC0/1
F0/FC0/8  UP    0      12 0    F0/FC0/8  1/FC0/2
F0/FC0/9  UP    0      12 0    F0/FC0/9  1/FC0/3
F0/FC0/10 UP    0      12 0    F0/FC0/10 1/FC0/4
F0/FC0/11 UP    0      12 0    F0/FC0/11 1/FC0/5
F0/FC1/0  UP    1      12 0    F0/FC1/0  0/FC1/0
F0/FC1/1  UP    1      12 0    F0/FC1/1  0/FC1/1
```

F0/FC1/2	UP	1	12 0	F0/FC1/2	0/FC1/2
F0/FC1/3	UP	1	12 0	F0/FC1/3	0/FC1/3
F0/FC1/4	UP	1	12 0	F0/FC1/4	0/FC1/4
F0/FC1/5	UP	1	12 0	F0/FC1/5	0/FC1/5
F0/FC1/6	UP	1	12 0	F0/FC1/6	1/FC1/0
F0/FC1/7	UP	1	12 0	F0/FC1/7	1/FC1/1
F0/FC1/8	UP	1	12 0	F0/FC1/8	1/FC1/2
F0/FC1/9	UP	1	12 0	F0/FC1/9	1/FC1/3
F0/FC1/10	UP	1	12 0	F0/FC1/10	1/FC1/4
F0/FC1/11	UP	1	12 0	F0/FC1/11	1/FC1/5
F0/FC2/0	UP	2	12 0	F0/FC2/0	0/FC2/0
F0/FC2/1	UP	2	12 0	F0/FC2/1	0/FC2/1
F0/FC2/2	UP	2	12 0	F0/FC2/2	0/FC2/2
F0/FC2/3	UP	2	12 0	F0/FC2/3	0/FC2/3
F0/FC2/4	UP	2	12 0	F0/FC2/4	0/FC2/4
F0/FC2/5	UP	2	12 0	F0/FC2/5	0/FC2/5
F0/FC2/6	UP	2	12 0	F0/FC2/6	1/FC2/0
F0/FC2/7	UP	2	12 0	F0/FC2/7	1/FC2/1
F0/FC2/8	UP	2	12 0	F0/FC2/8	1/FC2/2
F0/FC2/9	UP	2	12 0	F0/FC2/9	1/FC2/3
F0/FC2/10	UP	2	12 0	F0/FC2/10	1/FC2/4
F0/FC2/11	UP	2	12 0	F0/FC2/11	1/FC2/5
F0/FC3/0	UP	3	12 0	F0/FC3/0	0/FC3/0
F0/FC3/1	UP	3	12 0	F0/FC3/1	0/FC3/1
F0/FC3/2	UP	3	12 0	F0/FC3/2	0/FC3/2
F0/FC3/3	UP	3	12 0	F0/FC3/3	0/FC3/3
F0/FC3/4	UP	3	12 0	F0/FC3/4	0/FC3/4
F0/FC3/5	UP	3	12 0	F0/FC3/5	0/FC3/5
F0/FC3/6	UP	3	12 0	F0/FC3/6	1/FC3/0
F0/FC3/7	UP	3	12 0	F0/FC3/7	1/FC3/1
F0/FC3/8	UP	3	12 0	F0/FC3/8	1/FC3/2
F0/FC3/9	UP	3	12 0	F0/FC3/9	1/FC3/3
F0/FC3/10	UP	3	12 0	F0/FC3/10	1/FC3/4
F0/FC3/11	UP	3	12 10	F0/FC3/11	1/FC3/5
F0/FC4/0	UP	0	12 0	F0/FC4/0	0/FC0/6
F0/FC4/1	UP	0	12 0	F0/FC4/1	0/FC0/7
F0/FC4/2	UP	0	12 0	F0/FC4/2	0/FC0/8
F0/FC4/3	UP	0	12 0	F0/FC4/3	0/FC0/9
F0/FC4/4	UP	0	12 0	F0/FC4/4	0/FC0/10
F0/FC4/5	UP	0	12 0	F0/FC4/5	0/FC0/11
F0/FC4/6	UP	0	12 0	F0/FC4/6	1/FC0/6
F0/FC4/7	UP	0	12 0	F0/FC4/7	1/FC0/7
F0/FC4/8	UP	0	12 0	F0/FC4/8	1/FC0/8
F0/FC4/9	UP	0	12 0	F0/FC4/9	1/FC0/9
F0/FC4/10	UP	0	12 0	F0/FC4/10	1/FC0/10
F0/FC4/11	UP	0	12 0	F0/FC4/11	1/FC0/11
F0/FC5/0	UP	1	12 0	F0/FC5/0	0/FC1/6
F0/FC5/1	UP	1	12 0	F0/FC5/1	0/FC1/7
F0/FC5/2	UP	1	12 0	F0/FC5/2	0/FC1/8
F0/FC5/3	UP	1	12 0	F0/FC5/3	0/FC1/9
F0/FC5/4	UP	1	12 0	F0/FC5/4	0/FC1/10
F0/FC5/5	UP	1	12 0	F0/FC5/5	0/FC1/11
F0/FC5/6	UP	1	12 0	F0/FC5/6	1/FC1/6
F0/FC5/7	UP	1	12 0	F0/FC5/7	1/FC1/7
F0/FC5/8	UP	1	12 0	F0/FC5/8	1/FC1/8
F0/FC5/9	UP	1	12 0	F0/FC5/9	1/FC1/9
F0/FC5/10	DN	1	12 12	F0/FC5/10	1/FC1/10
F0/FC5/11	UP	1	12 0	F0/FC5/11	1/FC1/11
F0/FC6/0	UP	2	12 0	F0/FC6/0	0/FC2/6
F0/FC6/1	UP	2	12 0	F0/FC6/1	0/FC2/7
F0/FC6/2	UP	2	12 0	F0/FC6/2	0/FC2/8
F0/FC6/3	UP	2	12 0	F0/FC6/3	0/FC2/9
F0/FC6/4	UP	2	12 0	F0/FC6/4	0/FC2/10
F0/FC6/5	UP	2	12 0	F0/FC6/5	0/FC2/11

```

F0/FC6/6    UP    2      12 0    F0/FC6/6    1/FC2/6
F0/FC6/7    UP    2      12 0    F0/FC6/7    1/FC2/7
F0/FC6/8    UP    2      12 0    F0/FC6/8    1/FC2/8
F0/FC6/9    UP    2      12 0    F0/FC6/9    1/FC2/9
F0/FC6/10   UP    2      12 0    F0/FC6/10   1/FC2/10
F0/FC6/11   UP    2      12 0    F0/FC6/11   1/FC2/11
F0/FC7/0    UP    3      12 0    F0/FC7/0    0/FC3/6
F0/FC7/1    UP    3      12 0    F0/FC7/1    0/FC3/7
F0/FC7/2    UP    3      12 0    F0/FC7/2    0/FC3/8
F0/FC7/3    UP    3      12 0    F0/FC7/3    0/FC3/9
F0/FC7/4    UP    3      12 0    F0/FC7/4    0/FC3/10
F0/FC7/5    UP    3      12 0    F0/FC7/5    0/FC3/11
F0/FC7/6    UP    3      12 0    F0/FC7/6    1/FC3/6
F0/FC7/7    UP    3      12 0    F0/FC7/7    1/FC3/7
F0/FC7/8    UP    3      12 0    F0/FC7/8    1/FC3/8
F0/FC7/9    UP    3      12 0    F0/FC7/9    1/FC3/9
F0/FC7/10   UP    3      12 0    F0/FC7/10   1/FC3/10
F0/FC7/11   UP    3      12 0    F0/FC7/11   1/FC3/11
    
```

```
sysadmin-vm:0_RP1# sh controller fabric bundle all detail | ex "12 0"
```

Bundle R/S/P	Oper State	Plane Id	Total Links	Down Links	Bundle Port1	Bundle Port2
F0/FC4/6	UP	0	12	1	F0/FC4/6	3/FC0/2
F1/FC1/6	DN	1	12	12	F1/FC1/6	3/FC1/8
F1/FC5/6	UP	1	12	1	F1/FC5/6	3/FC1/10
F1/FC6/0	UP	2	12	7	F1/FC6/0	0/FC2/2
F1/FC6/1	UP	2	12	7	F1/FC6/1	0/FC2/3
F1/FC6/2	UP	2	12	7	F1/FC6/2	1/FC2/2
F1/FC6/3	UP	2	12	7	F1/FC6/3	1/FC2/3
F1/FC6/4	UP	2	12	7	F1/FC6/4	2/FC2/2
F1/FC6/5	UP	2	12	7	F1/FC6/5	2/FC2/3
F1/FC6/6	UP	2	12	7	F1/FC6/6	3/FC2/2
F1/FC6/7	UP	2	12	7	F1/FC6/7	3/FC2/3
F2/FC5/0	UP	3	12	7	F2/FC5/0	0/FC3/2
F2/FC5/1	UP	3	12	7	F2/FC5/1	0/FC3/3
F2/FC5/2	UP	3	12	7	F2/FC5/2	1/FC3/2
F2/FC5/3	UP	3	12	7	F2/FC5/3	1/FC3/3
F2/FC5/4	UP	3	12	7	F2/FC5/4	2/FC3/2
F2/FC5/5	UP	3	12	7	F2/FC5/5	2/FC3/3
F2/FC5/6	UP	3	12	7	F2/FC5/6	3/FC3/2
F2/FC5/7	UP	3	12	7	F2/FC5/7	3/FC3/3
F2/FC6/7	UP	3	12	1	F2/FC6/7	3/FC3/7

```
sysadmin-vm:0_RP1#
```

```
sysadmin-vm:0_RP0# show controller fabric cxp summary rack F0
```

```

=====
Fabric side CXP Port Initialization Status Summary
=====
Active functional role of the Rack [R/S] : F0/SC1
. - CXP is not present
p - CXP is not powered
I - CXP is not Initialized
U - CXP is not Supported
T - One or more Tx channel is disabled on the CXP
R - One or more Rx channel is disabled on the CXP
G - CXP is Initialized properly

Maximum CXP port number [0-23] per slot
+-----+-----+-----+-----+-----+-----+-----+-----+-----+
| Slot  | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |10 |11 |
+-----+-----+-----+-----+-----+-----+-----+-----+-----+
    
```


<<

```

| F0/FC0 | G | G | G | G | G | G | G | G | G | G | G | G |
Ones in Bold (port 0 and 1) are initialized properly
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
| F0/FC1 | G | G | G | G | G | G | G | G | G | G | G | G |
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
| F0/FC2 | G | G | G | G | G | G | G | G | G | G | G | G |
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
| F0/FC3 | G | G | G | G | G | G | G | G | G | G | G | T |
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
| F0/FC4 | G | G | G | G | G | G | G | G | G | G | G | G |
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
| F0/FC5 | G | G | G | G | G | G | G | G | G | G | T | G |
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
| F0/FC6 | G | G | G | G | G | G | G | G | G | G | G | G |
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
| F0/FC7 | G | G | G | G | G | G | G | G | G | G | G | G |
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
| Slot   |12 |13 |14 |15 |16 |17 |18 |19 |20 |21 |22 |23 |
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
| F0/FC0 | . | . | . | . | . | . | . | . | . | . | . | . |
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
| F0/FC1 | . | . | . | . | . | . | . | . | . | . | . | . |
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
| F0/FC2 | . | . | . | . | . | . | . | . | . | . | . | . |
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
| F0/FC3 | . | . | . | . | . | . | . | . | . | . | . | . |
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
| F0/FC4 | . | . | . | . | . | . | . | . | . | . | . | . |
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
| F0/FC5 | . | . | . | . | . | . | . | . | . | . | . | . |
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
| F0/FC6 | . | . | . | . | . | . | . | . | . | . | . | . |
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
| F0/FC7 | . | . | . | . | . | . | . | . | . | . | . | . |
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+

```

sysadmin-vm:0_RP0# show controller fabric cxp dom location F0/FC0 port 0

```

=====
                        CXP Digital Optical Monitor Information
=====
Location: F0/FC0,          CXP port number: 0
-----
Connector description      : CXP Optical Transceiver with Optical Connector
Vendor Name                : CISCO-AVAGO
Cisco Part Number         : 10-3250-01
Cisco Serial Number       : AGF2132K00N
Cisco VID                  : V00
Cisco PID                  : ONS-CXP2-SR25
Cisco CLEI Code           : WOTRD92BAA
Vendor Part Number        : SFBR-86PDAZ-CS1
Vendor Serial Number      : AGF2132K00N
Vendor Date Code          : 20170813
Vendor Lot Code           :
Vendor OUI IEEE COMPANY ID : 0x176A
Eeprom Revision           : 0xAC17
Firmware Revision         : 0x7A
Vendor Revision Number    : 2
-----
Tx Temperature Reading    :45.00 Celsius   Tx Temperature Alarm :Not Set
Tx Voltage Reading        :3230.90mV       Tx Voltage Alarm     :Not Set
-----
| Channel | Channel | FAULT | Signal | Optical Power |

```

Number.	Status	Status	Strength	Alarm
Tx Ch 0:	Enabled	no fault	Signal Detected	off
Tx Ch 1:	Enabled	no fault	Signal Detected	off
Tx Ch 2:	Enabled	no fault	Signal Detected	off
Tx Ch 3:	Enabled	no fault	Signal Detected	off
Tx Ch 4:	Enabled	no fault	Signal Detected	off
Tx Ch 5:	Enabled	no fault	Signal Detected	off
Tx Ch 6:	Enabled	no fault	Signal Detected	off
Tx Ch 7:	Enabled	no fault	Signal Detected	off
Tx Ch 8:	Enabled	no fault	Signal Detected	off
Tx Ch 9:	Enabled	no fault	Signal Detected	off
Tx Ch 10:	Enabled	no fault	Signal Detected	off
Tx Ch 11:	Enabled	no fault	Signal Detected	off

Channel Number.	Optical Light Output	Bias Current	Optical Bias Alarm
Tx Ch 0:	1.11mW 0.4336dBm	7.000 mA	off
Tx Ch 1:	1.15mW 0.6070dBm	7.000 mA	off
Tx Ch 2:	1.12mW 0.4805dBm	7.000 mA	off
Tx Ch 3:	1.29mW 1.0924dBm	7.000 mA	off
Tx Ch 4:	1.23mW 0.8849dBm	7.000 mA	off
Tx Ch 5:	1.35mW 1.3033dBm	7.000 mA	off
Tx Ch 6:	1.34mW 1.2743dBm	7.000 mA	off
Tx Ch 7:	1.32mW 1.2090dBm	7.000 mA	off
Tx Ch 8:	1.10mW 0.4179dBm	7.000 mA	off
Tx Ch 9:	1.21mW 0.8135dBm	7.000 mA	off
Tx Ch 10:	1.27mW 1.0483dBm	7.000 mA	off
Tx Ch 11:	1.10mW 0.3981dBm	7.000 mA	off

Rx Temperature Reading :45.00 Celsius Rx Temperature Alarm :Not Set
 Rx Voltage Reading :3246.90 mV Rx Voltage Alarm :Not Set

Channel Number.	Channel Status	Signal Strength	Optical Power Alarm	Optical Light Input
Rx Ch 0:	Enabled	Signal Detected	off	1.03mW 0.1494dBm
Rx Ch 1:	Enabled	Signal Detected	off	1.15mW 0.6145dBm
Rx Ch 2:	Enabled	Signal Detected	off	1.20mW 0.7882dBm
Rx Ch 3:	Enabled	Signal Detected	off	1.09mW 0.3743dBm
Rx Ch 4:	Enabled	Signal Detected	off	1.37mW 1.3799dBm
Rx Ch 5:	Enabled	Signal Detected	off	1.25mW 0.9795dBm
Rx Ch 6:	Enabled	Signal Detected	off	1.31mW 1.1826dBm
Rx Ch 7:	Enabled	Signal Detected	off	1.33mW 1.2320dBm
Rx Ch 8:	Enabled	Signal Detected	off	1.23mW 0.8955dBm
Rx Ch 9:	Enabled	Signal Detected	off	1.47mW 1.6702dBm
Rx Ch 10:	Enabled	Signal Detected	off	1.11mW 0.4454dBm
Rx Ch 11:	Enabled	Signal Detected	off	1.34mW 1.2743dBm

sysadmin-vm:0_RP0# show controller fabric sfe s2 F0/FC0/0

Sfe R/S/A	Admin State	Oper State
F0/FC0/0	UP	UP

sysadmin-vm:0_RP0# show controller fabric sfe s2 F0/FC0/1

Sfe	Admin	Oper

```

R/S/A      State      State
-----
F0/FC0/1  UP          UP
    
```

sysadmin-vm:0_RP0# Show controller fabric bundle all detail | i DN

```

F0/FC0/0  DN    0      12 12  F0/FC0/0  0/FC0/0
F0/FC0/1  DN    0      12 12  F0/FC0/1  0/FC0/1
    
```

sysadmin-vm:0_RP0# show controller fabric link port s2 rx all | i "DN|SFE|R/S/A/P|state" | i "F0/FC0|SFE|R/S/A/P|state"

SFE port R/S/A/P	Admin /Oper state	Near-end CDR LO-Sx-Px-LI	Near -end CXP/Ch	Far -end CXP/Ch	Far-end CDR LO-Sx-Px-LI	Other End R/S/A/P
F0/FC0/0/13	UP/DN		01/03	01/03		0/FC0/0/81
F0/FC0/0/15	UP/DN		01/01	01/01		0/FC0/0/83
F0/FC0/0/16	UP/DN		01/00	01/00		0/FC0/0/72
F0/FC0/0/18	UP/DN		01/02	01/02		0/FC0/0/82
F0/FC0/0/20	UP/DN		01/04	01/04		0/FC0/0/80
F0/FC0/0/22	UP/DN		01/05	01/05		0/FC0/0/79
F0/FC0/0/24	UP/DN		00/04	00/04		0/FC0/0/128
F0/FC0/0/26	UP/DN		00/05	00/05		0/FC0/0/127
F0/FC0/0/29	UP/DN		00/02	00/02		0/FC0/0/131
F0/FC0/0/31	UP/DN		00/00	00/00		0/FC0/0/120
F0/FC0/0/32	UP/DN		00/01	00/01		0/FC0/0/130
F0/FC0/0/34	UP/DN		00/03	00/03		0/FC0/0/129
F0/FC0/1/126	UP/DN	05-S0-P5-05	01/06	01/06		0/FC0/0/78
F0/FC0/1/127	UP/DN	03-S0-P5-03	01/09	01/09		0/FC0/0/75
F0/FC0/1/128	UP/DN	06-S0-P5-06	01/08	01/08		0/FC0/0/76
F0/FC0/1/129	UP/DN	04-S0-P5-04	01/07	01/07		0/FC0/0/77
F0/FC0/1/130	UP/DN	12-S0-P5-12	01/10	01/10		0/FC0/0/74
F0/FC0/1/131	UP/DN	11-S0-P5-11	01/11	01/11		0/FC0/0/73
F0/FC0/1/138	UP/DN	06-S0-P4-06	00/08	00/08		0/FC0/0/124
F0/FC0/1/139	UP/DN	12-S0-P4-12	00/10	00/10		0/FC0/0/122
F0/FC0/1/140	UP/DN	04-S0-P4-04	00/07	00/07		0/FC0/0/125
F0/FC0/1/141	UP/DN	03-S0-P4-03	00/09	00/09		0/FC0/0/123
F0/FC0/1/142	UP/DN	11-S0-P4-11	00/11	00/11		0/FC0/0/121
F0/FC0/1/143	UP/DN	05-S0-P4-05	00/06	00/06		0/FC0/0/126

sysadmin-vm:0_RP0# show controller sfe link-info rx 0 143 topo instance 0 location F0/FC0 | i T

R - No Reach Cells	S - Size error	T - Invalid Topo	U - Perm Shut
F0/FC0/0/13	23.00 S2 0/0 UP/DN	.....T.....	0/FC0/0/81 0/FC0/0/129
F0/FC0/0/15	23.00 S2 0/0 UP/DN	.....T.....	0/FC0/0/83 0/FC0/0/130
F0/FC0/0/16	23.00 S2 0/0 UP/DN	.....T.....	0/FC0/0/72 0/FC0/0/120
F0/FC0/0/18	23.00 S2 0/0 UP/DN	.....T.....	0/FC0/0/82 0/FC0/0/131
F0/FC0/0/20	23.00 S2 0/0 UP/DN	.....T.....	0/FC0/0/80 0/FC0/0/128
F0/FC0/0/22	23.00 S2 0/0 UP/DN	.....T.....	0/FC0/0/79 0/FC0/0/127
F0/FC0/0/24	23.00 S2 0/0 UP/DN	.....T.....	0/FC0/0/128 0/FC0/0/80
F0/FC0/0/26	23.00 S2 0/0 UP/DN	.....T.....	0/FC0/0/127 0/FC0/0/79
F0/FC0/0/29	23.00 S2 0/0 UP/DN	.....T.....	0/FC0/0/131 0/FC0/0/82
F0/FC0/0/31	23.00 S2 0/0 UP/DN	.....T.....	0/FC0/0/120 0/FC0/0/72
F0/FC0/0/32	23.00 S2 0/0 UP/DN	.....T.....	0/FC0/0/130 0/FC0/0/83
F0/FC0/0/34	23.00 S2 0/0 UP/DN	.....T.....	0/FC0/0/129 0/FC0/0/81

sysadmin-vm:0_RP0# show controller sfe link-info rx 0 143 topo instance 1 location F0/FC0 | i T

R - No Reach Cells S - Size error T - Invalid Topo U - Perm Shut

```

F0/FC0/1/126 23.00 S2 0/0 UP/DN .....T..... 0/FC0/0/78 0/FC0/0/126
F0/FC0/1/127 23.00 S2 0/0 UP/DN .....T..... 0/FC0/0/75 0/FC0/0/123
F0/FC0/1/128 23.00 S2 0/0 UP/DN .....T..... 0/FC0/0/76 0/FC0/0/124
F0/FC0/1/129 23.00 S2 0/0 UP/DN .....T..... 0/FC0/0/77 0/FC0/0/125
F0/FC0/1/130 23.00 S2 0/0 UP/DN .....T..... 0/FC0/0/74 0/FC0/0/122
F0/FC0/1/131 23.00 S2 0/0 UP/DN .....T..... 0/FC0/0/73 0/FC0/0/121
F0/FC0/1/138 23.00 S2 0/0 UP/DN .....T..... 0/FC0/0/124 0/FC0/0/76
F0/FC0/1/139 23.00 S2 0/0 UP/DN .....T..... 0/FC0/0/122 0/FC0/0/74
F0/FC0/1/140 23.00 S2 0/0 UP/DN .....T..... 0/FC0/0/125 0/FC0/0/77
F0/FC0/1/141 23.00 S2 0/0 UP/DN .....T..... 0/FC0/0/123 0/FC0/0/75
F0/FC0/1/142 23.00 S2 0/0 UP/DN .....T..... 0/FC0/0/121 0/FC0/0/73
F0/FC0/1/143 23.00 S2 0/0 UP/DN .....T..... 0/FC0/0/126 0/FC0/0/78
    
```



CHAPTER 5

Replacing the NCS 4000 Rack

- [Rolling Back a Multi Chassis System \(1+1\) to a Single Chassis System, on page 75](#)
- [Replacing the NCS 4000 Rack, on page 77](#)

Rolling Back a Multi Chassis System (1+1) to a Single Chassis System

This procedure describes the steps for rolling back a 1+1 MC system to an SC system.

Procedure

Step 1 Take note of the important configuration values of fabric planes on calvados in system admin mode.

```
sysadmin-vm:2_RP1:R3# show controller fabric plane all detail
Wed Jan  8 13:59:51.628 UTC-05:30

Plane Admin Plane  Plane  up->dn  up->mcast  Total   Down   PPU
Id      State State  Mode    counter  counter Bundles Bundles State
-----
0       UP    UP      MC       0         1        24     0     NA
1       UP    UP      MC       0         1        24     0     NA
2       UP    UP      MC       0         2        24     0     NA
3       UP    UP      MC       0         1        24     0     NA

sysadmin-vm:2_RP1:R3# show controller fabric link port s3 rx | in UP/UP | count
Wed Jan  8 14:00:12.240 UTC-05:30
Count: 1151 lines

sysadmin-vm:2_RP1:R3# show running-config controller
Wed Jan  8 14:00:45.634 UTC-05:30
controller fabric plane 0
instance 0
location F0/FC0
!
instance 1
location F0/FC4
!
!
controller fabric plane 1
instance 0
location F0/FC1
!
instance 1
```

```

location F0/FC5
!
!
controller fabric plane 2
instance 0
location F1/FC0
!
instance 1
location F1/FC4
!
!
controller fabric plane 3
instance 0
location F1/FC1
!
instance 1
location F1/FC5
!
!

sysadmin-vm:2_RP1:R3# show running-config chassis
Wed Jan  8 14:01:53.275 UTC-05:30
chassis serial FLM213200B9
rack F0
!
chassis serial FLM213200BN
rack F1
!
chassis serial SAL18370JXS
rack 2
!
chassis serial SAL1925H76U
rack 0
!

```

Step 2 Shutdown fabric plane 0 using the following commands.

```

sysadmin-vm:2_RP1:R3(config)# controller fabric plane 0
sysadmin-vm:2_RP1:R3(config-plane-0)# shut
sysadmin-vm:2_RP1:R3(config-plane-0)# commit
Wed Jan  8 14:03:13.639 UTC-05:30
Commit complete.

```

Step 3 Remove the instance fabric configuration for plane 0 using the following command.

```

sysadmin-vm:2_RP1:R3(config)# no instance 0
sysadmin-vm:2_RP1:R3(config)# no instance 1
sysadmin-vm:2_RP1:R3(config-plane-0)# commit

```

Note Verify the NCS4016-FC2-M or NCS4009-FC2-M card for fabric plane 0 and wait for the card to reload automatically. The mode changes to SC.

```

0/RP0/ADMIN0:Jan  8 14:16:15.852 IST: shelf_mgr[3118]: %INFRA-SHELF_MGR-4-CARD_RELOAD :
Reloading card 0/FC0
0/RP0/ADMIN0:Jan  8 14:16:15.852 IST: shelf_mgr[3118]: %PKT_INFRA-FM-4-FAULT_MINOR :
ALARM_MINOR :AUTORESET :DECLARE :0/FC0: Automatic System Reset
2/RP0/ADMIN0:Jan  8 14:16:16.045 IST: shelf_mgr[3177]: %INFRA-SHELF_MGR-4-CARD_RELOAD :
Reloading card 2/FC0
2/RP0/ADMIN0:Jan  8 14:16:16.048 IST: shelf_mgr[3177]: %PKT_INFRA-FM-4-FAULT_MINOR :
ALARM_MINOR :AUTORESET :DECLARE :2/FC0: Automatic System Reset

```

Step 4 After 7 minutes, when the fabric cards become operational, un-shut the fabric plane 0. After un-shut, Admin State changes to UP and Fabric State changes to DOWN; and the traffic is not affected on the LCC0 and the plane 0 fabric cards in SC Mode.

Step 5 Follow the above steps for the other fabric planes 1, 2, 3 and check the fabric status.

```
sysadmin-vm:0_RP0:R3# show controller fabric plane all detail
Wed Jan 8 18:31:01.271 UTC-05:30
```

Plane Id	Admin State	Plane State	Plane Mode	up->dn counter	up->mcast counter	Total Bundles	Down Bundles	PPU State
0	UP	DN	SC	3	0	0	0	NA
1	UP	DN	SC	3	1	0	0	NA
2	UP	DN	SC	3	0	0	0	NA
3	UP	DN	SC	2	1	0	0	NA

Step 6 Remove the chassis configuration for fabric plane 0, fabric plane 1, and LCC2 to shutdown the respective fabric and other LCC1, LCC2, LCC3 chassis. Only LCC0 remains live.

```
sysadmin-vm:0_RP0:R3(config)# no chassis serial FLM213200B9
Wed Jan 8 18:37:12.290 UTC-05:30
sysadmin-vm:0_RP0:R3(config)# no chassis serial FLM213200BN
Wed Jan 8 18:37:20.647 UTC-05:30
sysadmin-vm:0_RP0:R3(config)# no chassis serial SAL18370JXS
Wed Jan 8 18:37:27.800 UTC-05:30
sysadmin-vm:0_RP0:R3(config)# commit
Wed Jan 8 18:37:31.194 UTC-05:30
```

Step 7 Check the fabric plane details in the system admin mode.

Note The fabric plane changes to UP state and does not impact traffic on LCC0.

```
sysadmin-vm:0_RP0:R3# show controller fabric plane all detail
Wed Jan 8 18:39:49.109 UTC-05:30
```

Plane Id	Admin State	Plane State	Plane Mode	up->dn counter	up->mcast counter	Total Bundles	Down Bundles	PPU State
0	UP	UP	SC	3	0	0	0	NA
1	UP	UP	SC	3	1	0	0	NA
2	UP	UP	SC	3	0	0	0	NA
3	UP	UP	SC	2	1	0	0	NA

Step 8 Remove the control plane cables and other fabric plane cables.

Replacing the NCS 4000 Rack

This procedure describes the steps for replacing the NCS 4000 rack.

Procedure

Step 1 Check the running configuration of the NCS 4000 chassis.

```
sysadmin-vm:2_RP1:R3# show running-config chassis
Wed Jan 8 14:01:53.275 UTC-05:30
chassis serial FLM213200B9
rack F0
!
chassis serial FLM213200BN
rack F1
!
```

```
chassis serial SAL18370JXS
rack 2
!
chassis serial SAL1925H76U
rack 0
!
```

Step 2 Verify the rack to be replaced is the source of mac-pool using **show macpool** command.

- If the rack to be replaced is the source of mac-pool, the rack is marked as **true**.

In the below example, rack1 is the source of mac addresses. It is marked as **true**.

```
sysadmin-vm:1_RP1# show macpool
Sat Oct 30 13:25:07.475 UTC+00:00
Rack Serial Rack Num Mac Base Mac Count Selected Allocated
-----
FLM213101UR F0 00:00:00:00:00:00 0 false 0
FLM213200BC F1 00:00:00:00:00:00 0 false 0
FLM213300GV F2 00:00:00:00:00:00 0 false 0
SAL1806LW7T 6 74:ab:62:44:eb:20 2015 false 0
SAL1824UHYD 3 b0:4a:d4:00:00:20 2015 false 0
SAL1824UJ1F 4 aa:00:ea:00:00:20 2015 false 0
SAL1834Z18B 5 f0:7f:06:e7:26:c0 2015 false 0
SAL184121V3 0 f0:7f:06:e7:8c:80 2015 false 0
SAL1917DZBZ 1 78:ba:f9:9b:72:40 2015 true 100
SAL1940Q2A4 2 00:af:1f:d6:00:20 2015 false 0
SAL2016PB3V 7 04:2a:e2:b3:b0:20 2015 false 0
```

- If the rack to be replaced is the not source of mac-pool, the rack is marked as **false**.

In the procedure, the rack to be replaced, rack2, is not the source of mac addresses.

Step 3 Enter the serial number of the chassis to remove the old rack using **no chassis serial serialNumber** command.

```
sysadmin-vm:0_RP0:R3(config)# no chassis serial SAL18370JXS
Wed Jan 8 18:37:27.800 UTC-05:30
sysadmin-vm:0_RP0:R3(config)# commit
Wed Jan 8 18:37:31.194 UTC-05:30
```

Step 4 After deleting the chassis configuration, check if the chassis is shut down. If not, power off the rack.

Step 5 If the deleted rack is the source of the mac-pool:

- Reload the complete system using the **hw-module location all reload** command.
- If not, skip this step.

Step 6 Check if other racks are operational using **show chassis**.

```
sysadmin-vm:0_RP0# show chassis
Wed Oct 16 09:41:31.116 UTC-05:00
Serial Num Rack Num Rack Type Rack State Data Plane Ctrl Plane
-----
FLM213200BN F1 FCC OPERATIONAL CONN CONN
FLM213200B9 F0 FCC OPERATIONAL CONN CONN
SAL1925H76U 0 LCC OPERATIONAL CONN CONN
```

Step 7 Remove the control plane connection SFP+ pluggables and cables from the RP0 and RP1 for the rack under removal.

Step 8 Remove the CXP2 pluggables and related fiber for all the fabric cards FC0, FC1, FC2, and FC3.

Step 9 Insert the required cards and pluggables for the line card.

Step 10 Insert the required fabric card without CXP2 pluggables and insert RPs without SFP+ pluggables.

Step 11 Power on the new rack and connect the Console Con0 and Con1 on RP0 and RP1.

Step 12 Check the rack id of the new rack using **show chassis** command in admin mode.

Note By default, the new rack displays rack id as 0.

Step 13 Add new chassis in system admin configuration mode.

```
sysadmin-vm:0_RP0:R3(config)# chassis serial SAL18370JXT rack 2
Wed Jan 8 18:37:27.800 UTC-05:30
sysadmin-vm:0_RP0:R3(config)# commit
Wed Jan 8 18:37:31.194 UTC-05:30
```

Step 14 Power up the new rack and check the rack id is changed according to requirement using **show chassis** command.

Step 15 When the rack is proper with rack id, switch off the rack.

Step 16 Reconnect the CXP2 pluggable and related fiber on all the fabric cards FC0, FC1, FC2, and FC3.

Step 17 Reconnect the SFP+ pluggable and related fiber on RP0 and RP1.

Step 18 Note down the new rack serial number written on the rack or displayed in [Step 13](#) output.

Step 19 Provision the new rack serial number in existing MC system.

```
sysadmin-vm:0_RP0:R3(config)# chassis serial SAL18370JXT rack 2
Wed Jan 8 18:37:27.800 UTC-05:30
sysadmin-vm:0_RP0:R3(config)# commit
Wed Jan 8 18:37:31.194 UTC-05:30
```

Step 20 Power on the new rack. In this example, it is rack 2.

Step 21 Validate all the control plane and fabric connectivity.
