



# Migrating 1T Multi-Chassis to 2T Multi-Chassis

This chapter describes how to migrate the Cisco NCS 6000 LCC and NCS 6000 FCC routers from a 1T Multi-Chassis system to a 2T Multi-Chassis system. These procedures must be completed for each fabric plane, one at a time.



**Note** You do not need to replace the fabric cards in the FCC and LCC at the same time. You can replace the fabric cards in the FCC and continue to use the S13 FC on the LCC (in 1T MC mode). However, you must migrate the fabric cards in the FCC to 2T before you migrate the fabric cards in the LCC.

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## Prerequisites

- Before you perform any procedures, review the safety guidelines in the [Cisco Network Convergence System 6000 Series Routers Hardware Installation Guide](#) to avoid injuring yourself or damaging the equipment.
- Before cabling the system, install each chassis in the planned location. Ensure that you have adequate floor space to cable the multi-chassis configuration and an environment that meets the recommended specifications. For more information, see the [Cisco Network Convergence System 6000 Series Routers Site Planning Guide](#).
- Perform the Router Health check on the router to ensure that any errors or exception are resolved prior to migrating to 2T multi-chassis mode. See [Commands for Router Health Check](#).
- Verify that the LCC and FCC are running Cisco IOS XR release 6.3.2 or later (with all applicable SMUs and packages).

- Install NC6-FANTRAY-2 Fan Trays in the LCC. See the [Replacing the Fan Tray](#) section in the *Cisco Network Convergence System 6000 Series Routers Hardware Installation Guide*.
- Verify that field-programmable device (FPD) upgrades are completed for all FPDs on both routers by using the **show hw-module fpd** command. For any FPD components that show status as NEED UPGD, use the **upgrade hw-module location location fpd** command. For any FPD components that show status as RLOAD REQ, use the **hw-module location location reload** command.
- Create a backup of the running configuration using the **copy running-config** command in both System Admin EXEC mode and XR EXEC mode.

## Required Tools and Equipment

To migrate from 1T multi-chassis to 2T multi-chassis, make sure you have the following:

- For each Cisco NCS 6000 fabric card chassis (FCC)
  - 2nd generation S2 Fabric Card (NCS-F-FC2)
- For each Cisco NCS 6000 line card chassis (LCC)
  - Version 2 fan trays (NC6-FANTRAY-2) in each LCC
  - Universal Fabric Cards (NC6-FC2-U)
  - 20-port 100Gbps Line Cards (NC6-20X100GE-L-C, NC6-20X100GE-M-C)—required for 2T operation
- For each LCC and FCC, you will need 2 optical module sets (NCS-FAB-OPT2) that includes 96 ONS-CXP2-SR25 modules each.

Additional required tool and equipment:

- ESD (Electrostatic Discharge) wrist strap (for inserting a CXP module)
- Number-2 Phillips screwdriver
- Cable Director (P/N 2123610-1), to provide support and strain relief for fabric cable connections (provided by Cisco approved vendor Tyco Electronics)
- Supply of Velcro tie wraps (to bundle cables)
- Ladder

## Shut Down the Fabric Plane

### Before you begin

Review and perform all tasks in the safety guidelines, prerequisites, and required equipment sections before performing this task.

**Step 1** From SysAdmin configuration mode, shut down the fabric plane.

**Example:**

```
sysadmin# config
sysadmin(config)# controller fabric plane 0 shutdown
sysadmin(config)# commit
sysadmin(config)# exit
sysadmin#
```

**Step 2** Use the **show controller fabric plane 0 detail** command to verify that the fabric plane Admin State and Plane State are down.

**Example:**

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

Plane Id	Admin State	Plane State	Plane Mode	up->dn counter	up->mcast counter	Total Bundles	Down Bundles	PPU State
0	DN	DN	SC	0	0	16	0	NA

**Step 3** Use the **show controller fabric plane all statistics** command to verify that traffic is flowing on other all fabric planes.

**Example:**

```
sysadmin# show controller fabric plane all statistics
```

Plane	In Cells	Out Cells	CE Cells	UCE Cells	PE Cells
0	0	0	0	0	0
1	7430639921442	7430639772529	0	0	0
2	14327261472715	14327261187106	0	0	0
3	14838472309926	14838472030539	0	0	0
4	14843483869980	14843483591078	0	0	0
5	5458575703053	5458575605025	0	0	0

## Replace 1T FC with 2T FC2 in the FCC

**Step 1** Use the **show running-config controller fabric plane 0** command to identify FCC fabric cards in this fabric plane.

**Note** In a multi-chassis configuration, there could be up to 4 cards (locations) spread over multiple FCC racks.

**Example:**

```
sysadmin-vm:1_RP0# show running-config controller fabric plane 0
Mon Oct 12 17:30:43.903 UTC-07:00
controller fabric plane 0
shutdown
```

```

instance 0
  location F0/FC0
!
instance 1
  location F0/FC1
!
instance 2
  location F0/FC2
!
instance 3
  location F0/FC3
!
!
sysadmin-vm:1_RP0#

```

**Step 2** For each fabric card identified in the previous step, do the following:

a) a. Shut down the fabric card.

**Example:**

```

sysadmin# config
sysadmin(config)# hw-module shutdown location F0/FC0
sysadmin(config)# commit
sysadmin(config)# exit
sysadmin # show platform location F0/FC0
Mon Oct 12 17:32:43.903 UTC-07:00
Location Card Type HW State SW State Config State
-----
F0/FC0 NCS-F-FC POWERED_OFF N/A NSHUT

```

- b) Remove the 1T (legacy) fabric card ([Removing an S2 Fabric Card](#))
- c) Install the 2T fabric card ([Installing an S2 Fabric Card](#))
- d) Insert CXP2 in 2T fabric card ([Guidelines for Handling CXP2 Optical Modules](#))
- e) Move the OM4 cables from the 1T FC to the same port position on the 2T FC.
- f) Repeat a through e for each fabric card in this fabric plane.

## Replace Legacy S13 Card with Universal Fabric Cards in the LCC

For each fabric card slot, do the following:

**Step 1** From SysAdmin VM configuration mode, shut down the fabric card.

**Example:**

```

sysadmin-vm:0_RP0# config
sysadmin-vm:0_RP0(config)# hw-module shutdown location 0/FC0
sysadmin-vm:0_RP0(config)# commit
sysadmin-vm:0_RP0(config)# exit

```

**Step 2** Use the show platform location command to verify that the fabric card is powered off.

**Example:**

```
sysadmin-vm:0_RP0# # show platform location 0/FC0
Mon Dec 5 23:54:02.366 UTC
Location  Card Type                HW State      SW State      Config State
-----
0/FC0     NC6-FC                          POWERED_OFF   N/A           NSHUT
```

**Step 3** Remove the legacy S13 fabric card on 0/FC0 ([Removing a Fabric Card](#))

**Step 4** Install the Universal Fabric Card (UFC) ([Installing a Fabric Card](#))

**Step 5** Insert CXP2 in UFC ([Guidelines for Handling CXP2 Optical Modules](#))

**Step 6** Move the OM4 cables from the legacy S13 fabric card to the same port position on the UFC.

**Step 7** Repeat 1 through 5 for each fabric card slot (FC0) in LCC racks 1, 2, 3, 4, and 5.

**Note** You can skip this step and continue to use the (legacy) S13 FC in any LCC rack that will not be using 2T line cards.

## Unshut the Fabric Cards

**Step 1** On the FCC, for each fabric card that was shutdown, do the following:

a) From SysAdmin configuration mode, unshut the fabric card.

**Example:**

```
sysadmin# config
sysadmin(config)# no hw-module shutdown location F0/FC0
sysadmin(config)# commit
sysadmin(config)# exit
```

b) Verify that front panel STATUS LEDs are green.

c) Use the **show platform location** command to verify that the fabric card is operational.

**Example:**

```
sysadmin-vm:0_RP0# show platform location F0/FC0
Mon Dec 5 23:54:02.366 UTC
Location  Card Type                HW State      SW State      Config State
-----
F0/FC0     NCS-F-FC2              OPERATIONAL   N/A           NSHUT
```

**Step 2** On the LCC, do the following:

a) From SysAdmin VM configuration mode, unshut the fabric card.

**Example:**

```
sysadmin-vm:0_RP0# config
```

```

sysadmin-vm:0_RP0(config)# no hw-module shutdown location 0/FC0
sysadmin-vm:0_RP0(config)# commit
sysadmin-vm:0_RP0(config)# exit

```

- b) Verify that front panel STATUS LEDs are green.
- c) Use the **show platform location** command to verify that the fabric card is operational.

**Example:**

```

sysadmin-vm:0_RP0# show platform location 0/FC0
Mon Dec 5 23:54:02.366 UTC

```

Location	Card Type	HW State	SW State	Config State
0/FC0	NC6-FC2-U	OPERATIONAL	N/A	NSHUT

## Verify the CXPs in the Fabric Cards

After all of the 2T fabric cards in the FCC and LCC are in Operational state, verify that all CXPs on the migrated 2T fabric cards have initialized.



**Note** To avoid traffic drops, perform this procedure before unshutting the fabric plane.



**Note** This process can take 3 to 5 minutes to complete.

- Step 1** On the FCC, enter the **show controller fabric cxp summary rack** *rack-number* command. Verify that all CXP modules are initialized properly.

**Example:**

```

sysadmin-vm:0_RP0# show controller fabric cxp summary rack F0
Mon Aug 13 13:07:17.635 UTC-05:30

```

```

=====
Fabric side CXP Port Initialization Status Summary
=====

```

```

Active functional role of the Rack [R/S] : F0/SC0

```

```

. - CXP is not present
p - CXP is not powered
I - CXP is not Initialized
U - CXP is not Supported
V - CXP in recovery
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 [0-31] per slot

```

```

+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
| Slot | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |10 |11 |12 |13 |14 |15 |
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
| F0/FC0 | G | G | G | G | G | G | G | G | G | G | G | G | G | G | G |
+-----+-----+-----+-----+-----+-----+-----+-----+-----+
| F0/FC1 | G | G | G | 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 | G | G | G |
+-----+-----+-----+-----+-----+-----+-----+-----+-----+
| F0/FC3 | G | G | G | G | G | G | G | G | G | G | G | G | G | G | G |
+-----+-----+-----+-----+-----+-----+-----+-----+-----+
| F0/FC4 | G | G | G | G | G | G | G | G | G | G | G | G | G | G | G |
+-----+-----+-----+-----+-----+-----+-----+-----+-----+
| Slot |16 |17 |18 |19 |20 |21 |22 |23 |24 |25 |26 |27 |28 |29 |30 |31 |
+-----+-----+-----+-----+-----+-----+-----+-----+-----+
| F0/FC0 | G | G | G | G | G | G | G | G | G | G | G | G | G | G | G |
+-----+-----+-----+-----+-----+-----+-----+-----+-----+
| F0/FC1 | G | G | G | 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 | G | G | G |
+-----+-----+-----+-----+-----+-----+-----+-----+-----+
| F0/FC3 | G | G | G | G | G | G | G | G | G | G | G | G | G | G | G |
+-----+-----+-----+-----+-----+-----+-----+-----+-----+
| F0/FC4 | G | G | G | G | G | G | G | G | G | G | G | G | G | G | G |
+-----+-----+-----+-----+-----+-----+-----+-----+-----+
sysadmin-vm:1_RP1#
    
```

**Step 2** On the LCC, enter the **show controller fabric cxp summary rack** *rack-number* command. Verify that all CXP modules are initialized properly.

**Example:**

```

sysadmin-vm:0_RP0# show controller fabric cxp summary rack 0
Mon Aug 13 13:08:17.140 UTC-05:30
=====
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
V - CXP in recovery
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 [0-15] per slot
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
| Slot | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |10 |11 |12 |13 |14 |15 |
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
| 0/FC0 | G | G | G | G | G | G | G | G | G | G | G | G | G | G | G |
+-----+-----+-----+-----+-----+-----+-----+-----+-----+
| 0/FC1 | G | G | G | G | G | G | G | G | G | G | G | G | G | G | G |
+-----+-----+-----+-----+-----+-----+-----+-----+-----+
| 0/FC2 | G | G | G | G | G | G | G | G | G | G | G | G | G | G | G |
+-----+-----+-----+-----+-----+-----+-----+-----+-----+
| 0/FC3 | G | G | G | G | G | G | G | G | G | G | G | G | G | G | G |
+-----+-----+-----+-----+-----+-----+-----+-----+-----+
| 0/FC4 | G | G | G | G | G | G | G | G | G | G | G | G | G | G | G |
+-----+-----+-----+-----+-----+-----+-----+-----+-----+
    
```

```
sysadmin-vm:1_RP1#
```

## Unshut the Fabric Plane

**Step 1** From SysAdmin configuration mode, unshut the fabric plane.

**Example:**

```
sysadmin# config
sysadmin(config)# no controller fabric plane 0 shutdown
sysadmin(config)# commit
sysadmin(config)# exit
sysadmin#
```

**Step 2** Use the `show controller fabric plane all statistics` command to verify that traffic is flowing on the fabric plane.

**Example:**

```
sysadmin# show controller fabric plane all statistics
```

Plane	In Cells	Out Cells	CE Cells	UCE Cells	PE Cells
0	3992144	3977252	0	0	0
1	7430639921442	7430639772529	0	0	0
2	14327261472715	14327261187106	0	0	0
3	14838472309926	14838472030539	0	0	0
4	14843483869980	14843483591078	0	0	0
5	5458575703053	5458575605025	0	0	0

**Step 3** Use the `show controller fabric plane 0 detail` command to verify that the fabric plane Admin State and Plane State are operationally UP.

**Example:**

```
sysadmin# show controller fabric plane 0 detail
```

Plane Id	Admin State	Plane State	Plane Mode	up->dn counter	up->mcast counter	Total Bundles	Down Bundles	PPU State
0	UP	UP	MC	0	3	80	0	NA
1	UP	UP	MC	0	1	80	0	NA
2	UP	UP	MC	0	1	80	0	NA
3	UP	UP	MC	10	29	80	0	NA
4	UP	UP	MC	10	25	80	0	NA
5	UP	UP	MC	11	30	80	0	NA

**Step 4** Perform the Router Health Check. See [Commands for Router Health Check](#).



**What to do next**

1. Repeat these steps for each remaining fabric plane (FC1, FC2, FC3, FC4, and FC5) until all six fabric planes have been migrated.
2. After all fabric planes have been migrated, you can install the 2T line card. Do the following:
  - a. [Verify Power Requirements](#)
  - b. [Remove Line Card Slice Configurations](#)
  - c. [Remove 1T Line Cards](#)
  - d. [Install 2T Line Cards](#)

