

ECU to ECU2 In-Service Migration Procedure for NCS4000 System with CTC

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Introduction

This document describes how to successfully swap an in-service External Connection Unit (ECU) installed in an NCS4016 system and replace with the ECU 2. It also provides steps in order to remove/install ECU.

Prerequisites

NCS4016 system must be running 6.5.26. or later software before you begin this procedure.

Requirements

Cisco recommends that you have knowledge of these topics:

- Cisco Transport Controller (CTC) craft interface
- CLI Cisco IOS® for the Cisco NCS4000 series
- Cisco NCS4000 series including (NCS4016/NCS4009)

Components Used

The information in this document is based on these software and hardware versions:

- The procedure detailed in this article is not traffic affecting.
- This article assumes the NCS4000 chassis is a 4016 or 4009 shelf.

The information in this document was created from the devices in a specific lab environment. All of

the devices used in this document started with a cleared (default) configuration. If your network is live, ensure that you understand the potential impact of any command.

Note: If your network is live, ensure that you understand the potential impact of any command.

Use CTC

1. Establish a connection to the NCS4K and verify minimum software release of 6.5.26. Before you begin:

- Ensure that you have set up a computer that meets the hardware and software requirements to use the CTC.
- Ensure you have a complete image installed. If you have mini.iso image installed, then the ncs4k-mgbl.pkg must be installed on the NCS 4000 system.
- Complete configuring XML Agent.
- Complete configuring HTTP.
- Run the snmp-server ifindex persist command for Generalized Multi-Protocol Label Switching (GMPLS) in order to retain its links over a reload.

Step 1.a. From the computer connected to the NCS 4016 shelf, start Web Browser such as Windows Internet Explorer or Mozilla Firefox web browser or CTC Launcher.

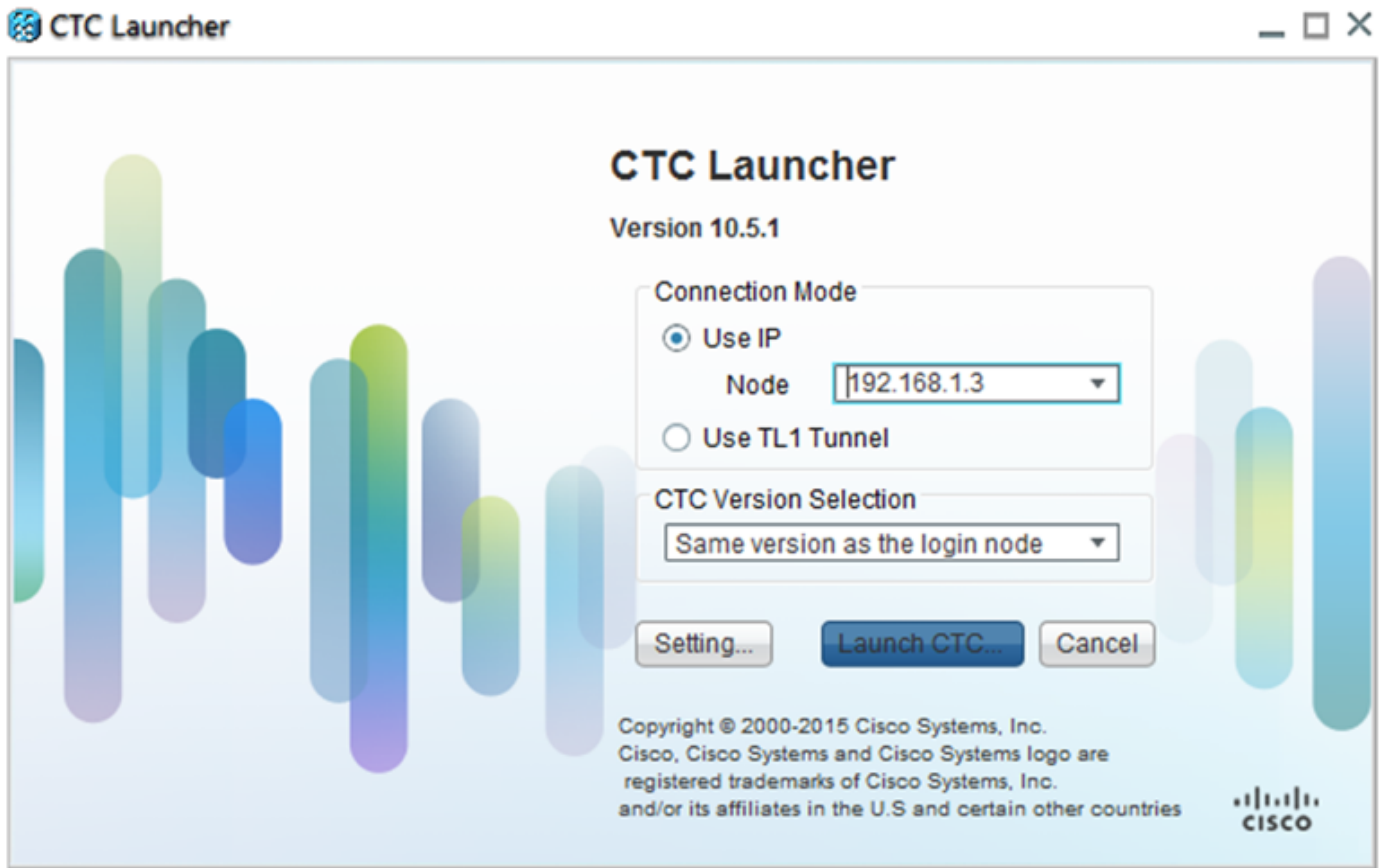
Step 1.b. In the browser URL field, enter the NCS 4016 IPv4 virtual IP address. For this example, it is 192.168.1.3.

Step 1.c. Hit **Enter**.

Step 1.d. If you use Internet Explorer, a Security Warning might appear that asks if you wish to open the web content. Click **Allow** if this Pop-Up appears.

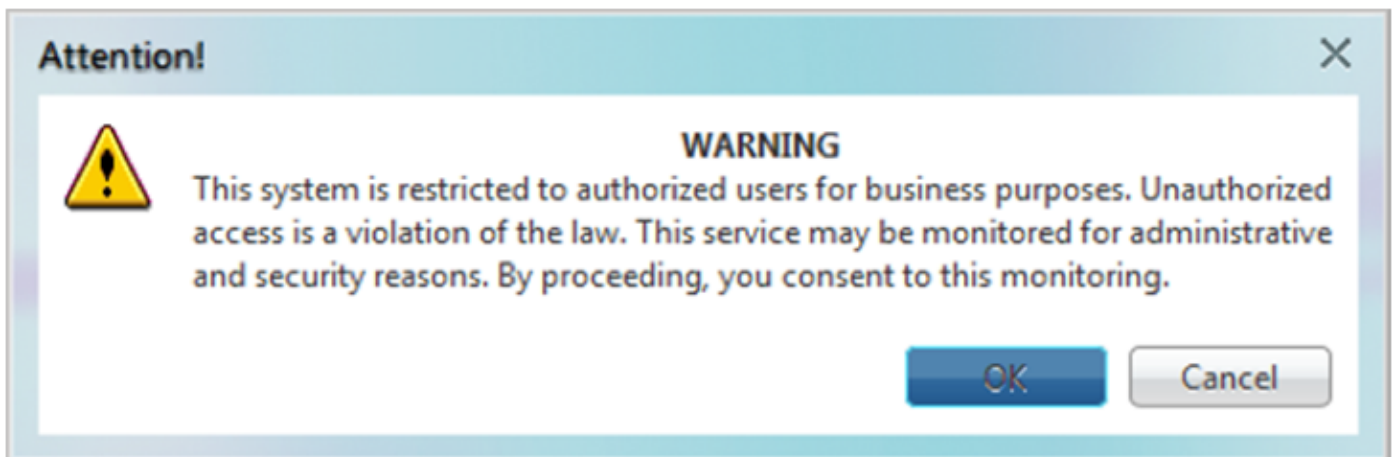
Step 1.e. If a Java Plug-in Security Warning dialogue box appears, hit the **Run** button and install the public-key security certificate if requested.

Step 1.f. A CTC Launcher Window will be displayed as indicated here. CTC is a Java applet that downloads to the laptop. In order to ensure that CTC version is not out of date, click on **Settings...** and in CTC Launcher Settings window, click on the **Delete Cache** option and the **OK** button.



Step 1.g. After you delete Cache, click **Launch CTC** on CTC Launcher Window.

Step 1.h. Since the application is not cached, there will be CTC download progress windows that appear and this process can take a few minutes. After the download, a warning message window appears as illustrated here. Click **OK**.



Step 1.i. In the CTC login window, type the user name and password. Click **Login** as shown in the image:



Cisco Transport Controller
Version 10.6.0

User Name

Password

Additional Nodes Disable Network Discovery
 Disable Circuit Management
 SSH2 Telnet

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1.1. Verify and Log All Existing Alarms

Alarms

Num	Ref	New	Date	Object	Eqpt Type	Slot	Unit	Port	Wavelength	Path Width	Sev	ST	SA	Cond	Descripti
NA	NA	NA	10/10/15 16:13:13	0	Chassis	NA	NA	0	NA	NA	MJ	R	NA	Power Shelf red...	Power Shelf redundancy k
NA	NA	NA	10/10/15 16:13:13	0/PT1-PM3	PEM	PT...	NA	0	NA	NA	MJ	R	NA	Power Module E...	Power Module Error (PM_)
NA	NA	NA	10/10/15 16:13:13	0/PT1-PM2	PEM	PT...	NA	0	NA	NA	MJ	R	NA	Power Module E...	Power Module Error (PM_)
NA	NA	NA	10/10/15 16:13:13	0/PT1-PM1	PEM	PT...	NA	0	NA	NA	MJ	R	NA	Power Module E...	Power Module Error (PM_)
NA	NA	NA	10/10/15 16:13:13	0/PT1-PM0	PEM	PT...	NA	0	NA	NA	MJ	R	NA	Power Module E...	Power Module Error (PM_)
NA	NA	NA	10/10/15 16:13:12	0/RP0/RP_S...	Route Pr...	RP...	NA	NA	NA	NA	MN	R	NA	SWITCH_LINK_E...	Switch Ethernet link fault

Synchronize Filter... Delete Cleared Alarms AutoDelete Cleared Alarms Help

1.2. Verify Software Release

Step 1.2.a. Navigate to **Maintenance > Software > Installation**.

Tab View

Alarms Conditions History Circuits Provisioning Inventory Maintenance

Database Audit SwitchOver Software Routing Table Fabric Plane Fabric Upgrade ECU Upgrade Timing

Installation FPD Upgrade

Installation Type: System FPD Auto-Upgrade (XR)

Inactive Packages
 Version: All Package: All
 ncs4k-6.1.42.CSCv36194-1.0.0
 ncs4k-6.1.42.CSCv52702-1.0.0
 ncs4k-6.1.42.CSCv63300-1.0.0
 Add Remove
 ISSU Upgrade ISSU Downgrade

Prepare Active and Commit Packages

- ncs4k-k9sec-6.5.26
- ncs4k-mgbl-6.5.26
- ncs4k-mpls-6.5.26
- ncs4k-sysadmin-6.5.26 version=6.5.26 [Boot image]
- ncs4k-xr-6.5.26 version=6.5.26 [Boot image]

Prepare >> << Clean Activate >> << Deactivate << Commit >> Activate

Step 1.2.b. The software must be minimum of 6.5.26 software in order to complete this procedure.

1.3. Verify Hard Drive Details

```
sysadmin-vm:0_RP0# sh media
```

```
Fri Jun 21 20:21:28.615 UTC
```

```
-----  
Partition              Size      Used  Percent  Avail  
-----  
rootfs:                2.4G     633M    29%     1.6G  
log:                   478M     308M    70%     135M  
config:                478M      32M     8%      410M  
disk0:                 949M      47M     6%      838M  
install:               3.7G     2.8G    81%     681M  
disk1:                 18G      3.0G    18%     14G  
-----
```

```
rootfs: = root file system (read-only)
```

```
log:    = system log files (read-only)
```

```
config: = configuration storage (read-only)
```

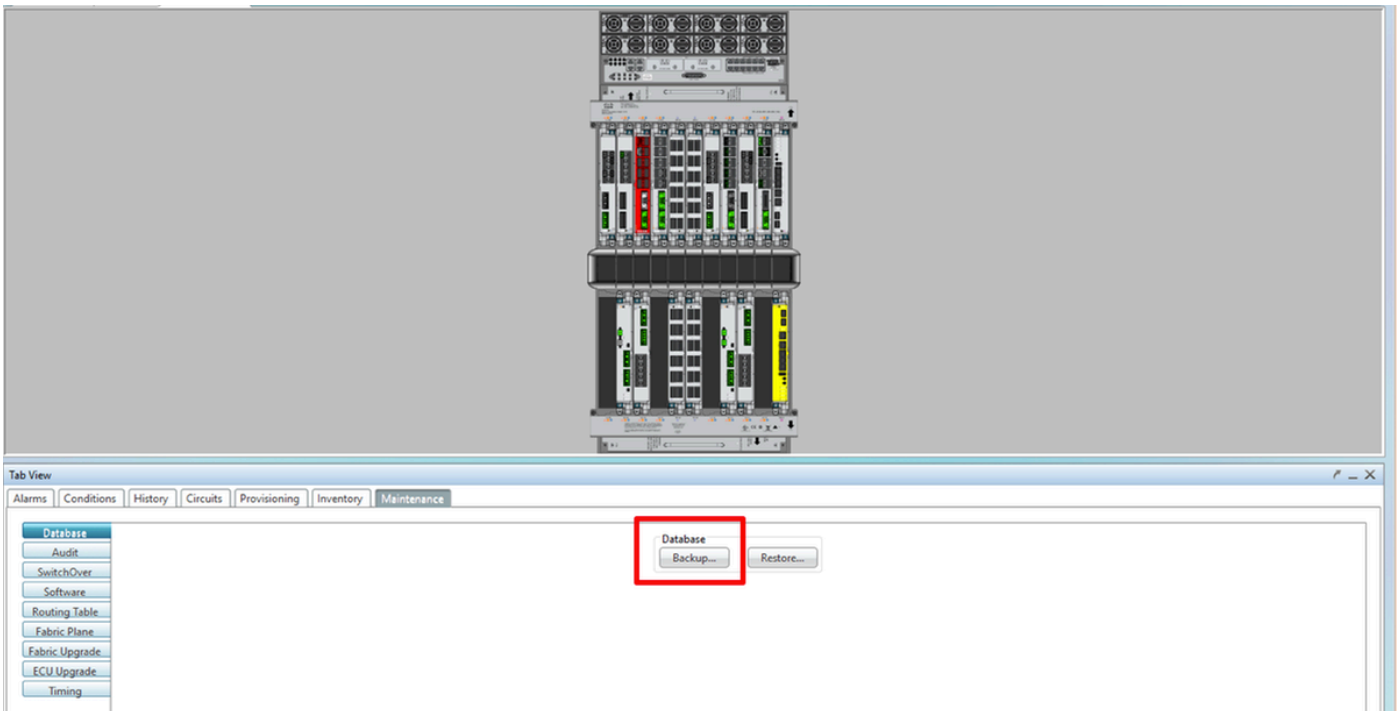
```
install: = install repository (read-only)
```

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

1.4. Create Database Backup

Step 1.4.a. Create a database backup.

Step 1.4.b. Navigate to **Maintenance > Database** and select **Database Backup**.



Step 1.4.c. Select/Enter the full path with the file name in order to save the backup on the node.

Step 1.4.d. Click **OK** in order to save the file.

Step 1.4.e. Note the backup file location.

1.5. BITS Timing

If BITS Timing is used by the NCS4K, record the output for these two commands. If no Timing is used, skip to the next section.

Step 1.5.a. Launch CLI using putty or any other terminal program.

Step 1.5.b. Record the output for the command **show controller timing controller clock**.

```
RP/0/RP0:Node_Name| #show controller timing controller clock
Wed Nov 13 14:53:18.781 CST
```

SYNCEC Clock-Setting: Rack 0

	BITS0-IN	BITS0-OUT	BITS1-IN	BITS1-OUT
Config	: Yes	No	Yes	No
PORT Mode	: T1	-	T1	-
Framing	: ESF	-	ESF	-
Linecoding	: B8ZS	-	B8ZS	-
Submode	: -	-	-	-
Shutdown	: No	No	No	No
Direction	: RX	TX	RX	TX
QL Option	: O2 G1	O2 G1	O2 G1	O2 G1
RX_ssm	: PRS	-	PRS	-
TX_ssm	: -	-	-	-
If_state	: UP	ADMIN_DOWN	UP	ADMIN_DOWN

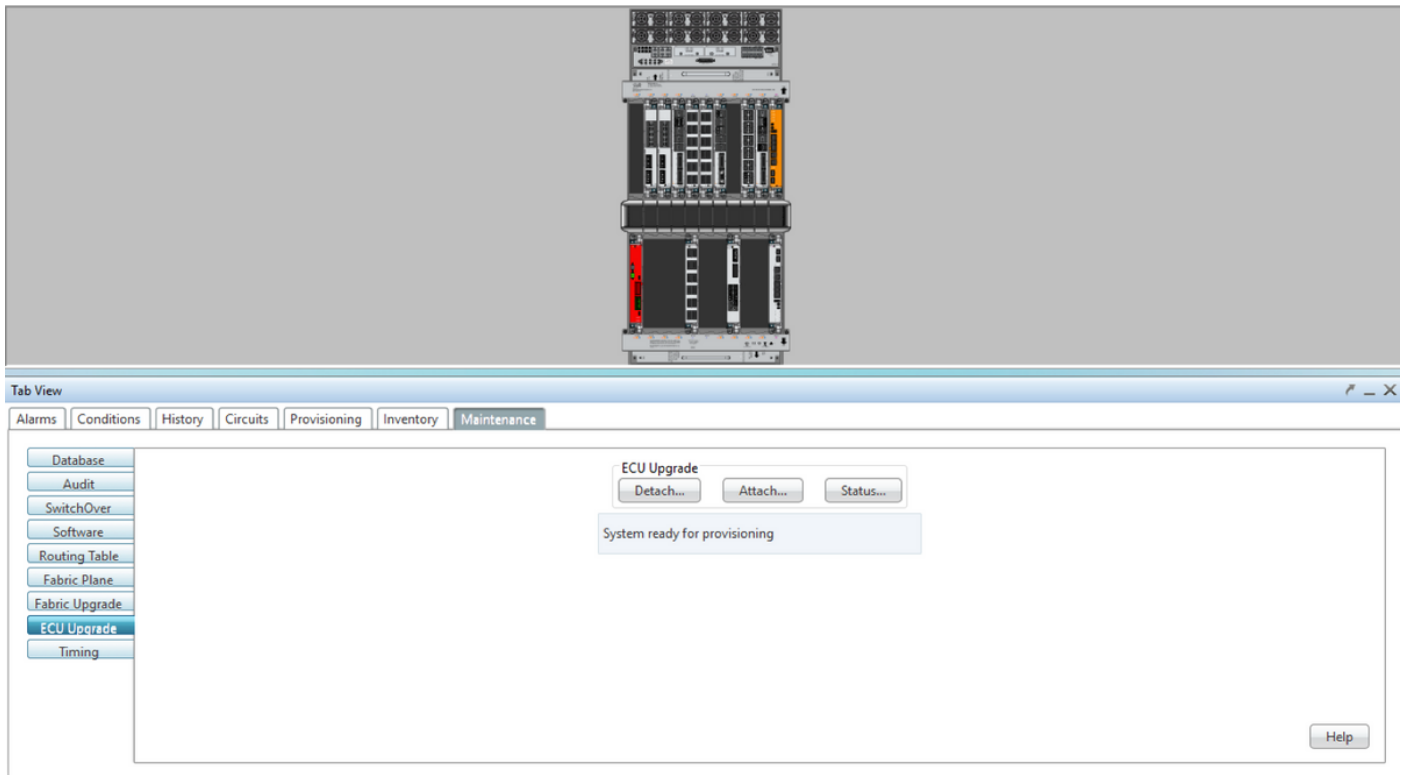
	TE0-E	TE1-E	TE0-W	TE1-W
Config	: NA	NA	NA	NA
PORT Mode	: ICS	ICS	ICS	ICS
Framing	: -	-	-	-
Linecoding	: -	-	-	-
Submode	: -	-	-	-
Shutdown	: No	No	No	No
Direction	: -	-	-	-
QL Option	: O1	O1	O1	O1
RX_ssm	: -	-	-	-
TX_ssm	: -	-	-	-
If_state	: DOWN	DOWN	DOWN	DOWN

Step 1.5.c. Record the output for the command **show frequency synchronization clock-interfaces brief**.

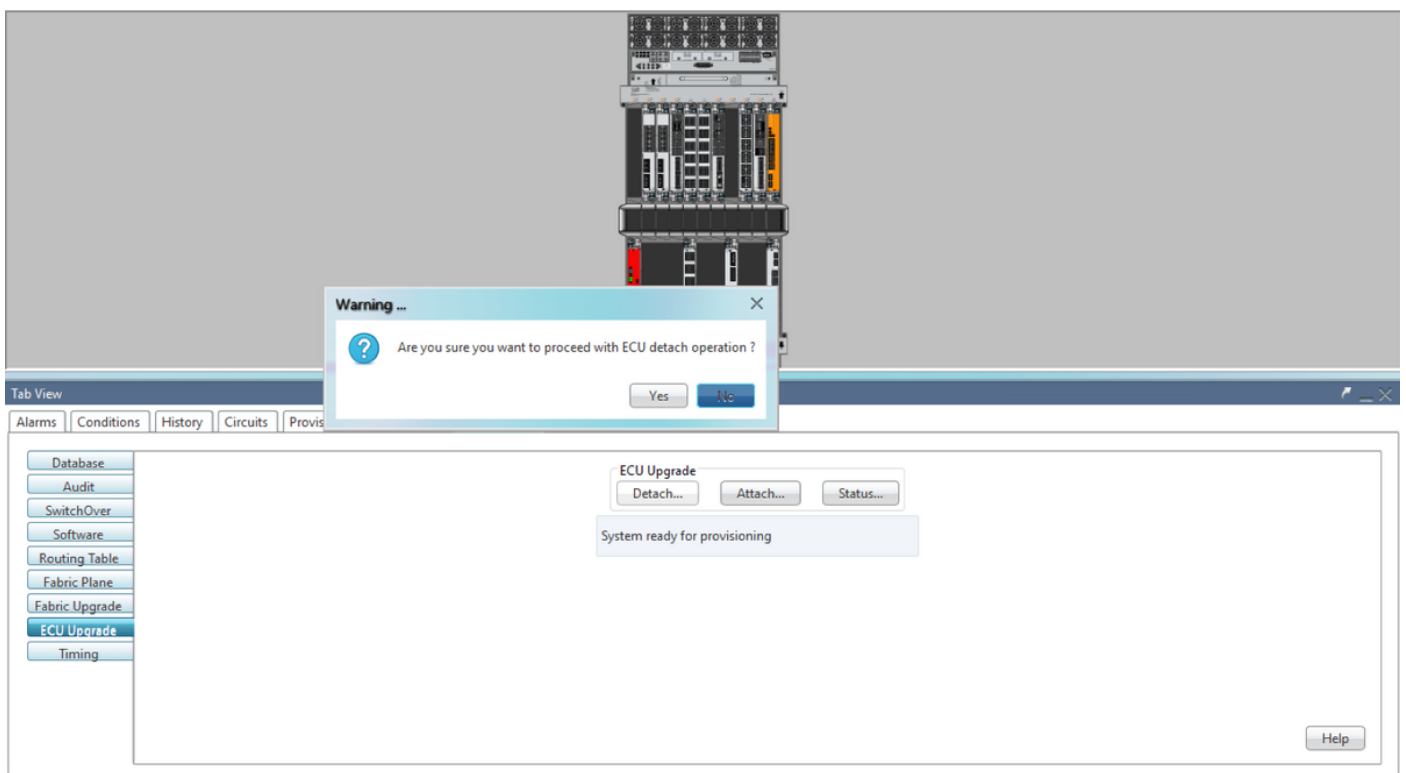
```
RP/0/RP0: Node_Name #show frequency synchronization clock-interfaces brief
Tue Nov 5 16:38:03.711 CST
Flags: > - Up           D - Down           S - Assigned for selection
       d - SSM Disabled  s - Output squelched L - Looped back
Node 0/RP0:
=====
Fl  Clock Interface      QLrcv  QLuse  Pri  QLsnd  Output driven by
=====
>S  Rack0-Bits0-In        PRS    PRS    50  n/a    n/a
D   Rack0-Bits0-Out      n/a    n/a    n/a  PRS    Rack0-Bits0-In
>S  Rack0-Bits1-In        PRS    PRS    50  n/a    n/a
D   Rack0-Bits1-Out      n/a    n/a    n/a  PRS    Rack0-Bits0-In
D   0/TE0-E              n/a    n/a    n/a  n/a    n/a
D   0/TE1-E              n/a    n/a    n/a  n/a    n/a
D   0/TE0-W              n/a    n/a    n/a  n/a    n/a
D   0/TE1-W              n/a    n/a    n/a  n/a    n/a
>S  Internal0            n/a    ST3    255  n/a    n/a
```

1.6. Prepare for ECU Removal

Step 1.6.a. Launch CTC, navigate to **Node View > Maintenance Tab**, click on the **ECU Upgrade Pane** on the left bottom. Click on the **Detach** Button.



Step 1.6.b. Select **Yes** if you want to proceed with the Detach Operation.



Step 1.6.c. In alarms, 'The detach provision for disk started' and 'disk provision in progress' minor alarm will appear.

Num	Ref	New	Date	Object	Eqpt Type	Slot	Unit	Port	Wavelength	Path Width	Sev	ST	SA	Cond	Description	Direction	Location
NA	NA	NA	06/01/18 16:57:05	0/RP0	Route Pr...	RP0	NA	NA	NA	NA	MN	R	NA	ECU_CAL_PROV...	The detach provision for disk started	NA	NEAR
NA	NA	NA	06/01/18 16:57:05	0/RP0	Route Pr...	RP0	NA	NA	NA	NA	MN	R	NA	ECU_CAL_DISK...	disk provision is in progress	NA	NEAR

Step 1.6.d. Before ECU Module is removed physically, please ensure the alarm 'The Detach Operation for disk started' is cleared on the system.

Warning

Please wait till the alarm "The detach provision for disk started" to be cleared before ECU is physically removed

System ready for provisioning

Attach... Status...

Database
Audit
SwitchOver
Software
Routing Table
Fabric Plane
Fabric Upgrade
ECU Upgrade
Timing

NET CKT RSA-SSL Memory: 93 of 742 MB

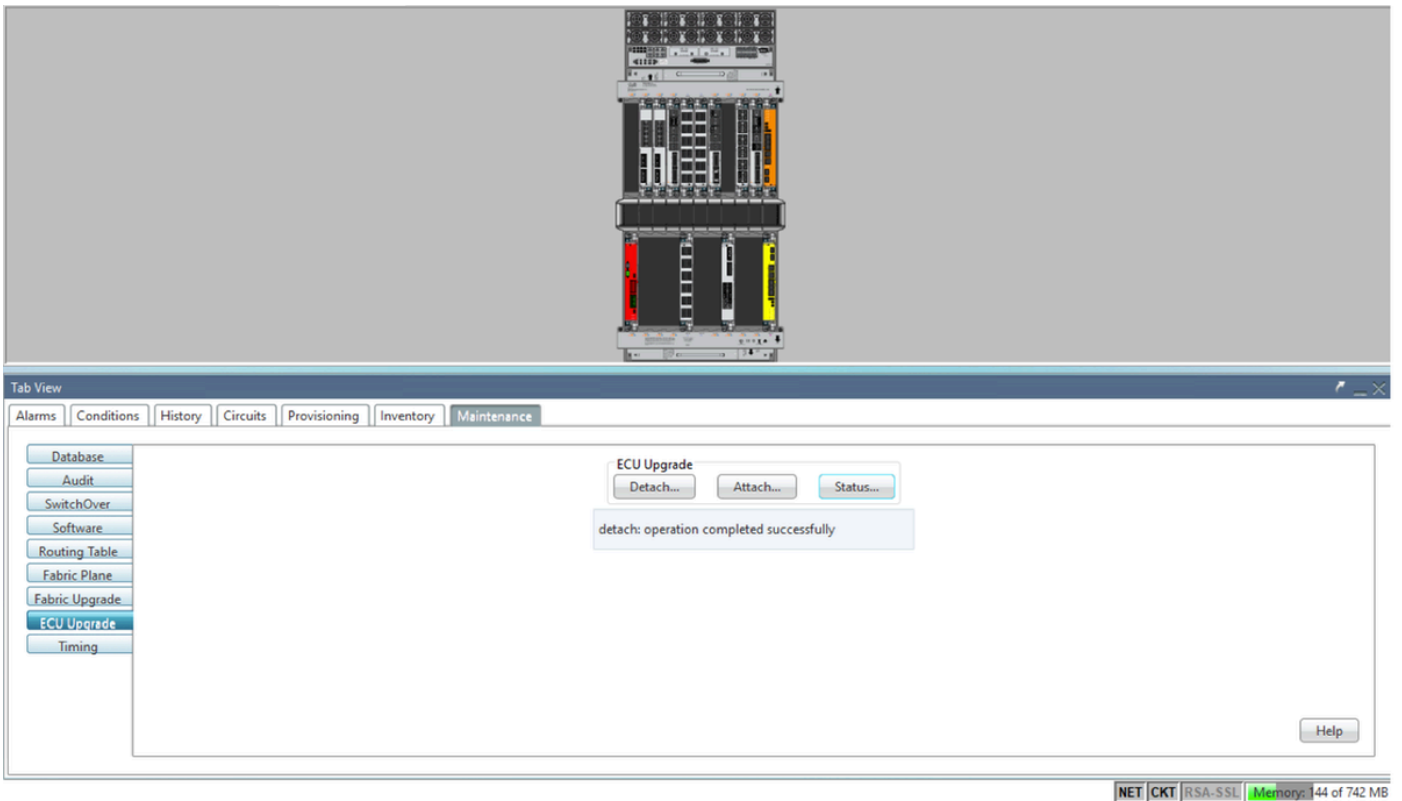
ECU Upgrade

Detach... Attach... Status...

detach: operation ongoing

Database
Audit
SwitchOver
Software
Routing Table
Fabric Plane
Fabric Upgrade
ECU Upgrade
Timing

NET CKT RSA-SSL Memory: 58 of 742 MB



Once the alarm is cleared, the ECU Module can be physically removed.

Disk provision alarm and the DISK1-DISK-SPACE (disk space alert for location **Sysadmin:/misc/disk1**) alarms will persist on the system until ECU Migration is completed.

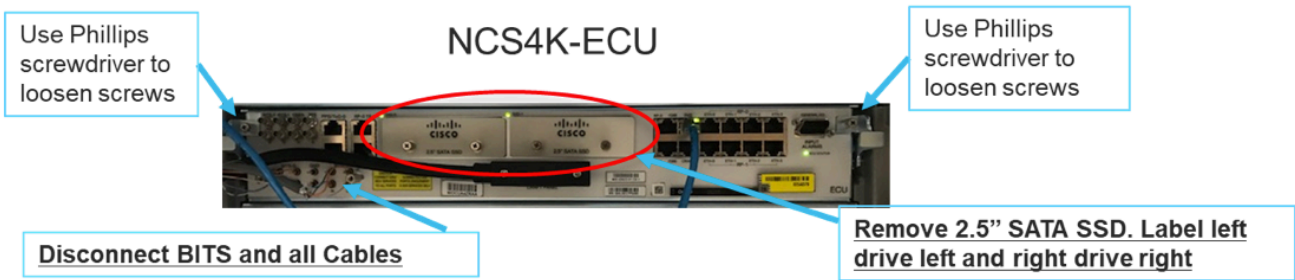
Num	Ref	New	Date	Object	Eqpt Type	Slot	Unit	Port	Wavelength	Path Width	Sev	ST	SA	Cond	Description	Direction	Location
NA	NA	✓	06/21/19 14:24:34	0/RP0	Route Pr...	RP0	NA	NA	NA	NA	CR	R	NA	DISK1-DISK-SPACE	Disk space alert for location "Sysadmin:/misc/disk1"	NA	NEAR
NA	NA	✓	06/21/19 14:22:32	0/RP0	Route Pr...	RP0	NA	NA	NA	NA	MN	C	NA	ECU_CAL_PROVISION_FOR_DETACH_STARTED	The detach provision for disk started	NA	NEAR
NA	NA	✓	06/21/19 14:22:45	0/RP0	Route Pr...	RP0	NA	NA	NA	NA	MN	R	NA	ECU_CAL_PROVISION_FOR_DETACH_STARTED	The detach provision for disk started	NA	NEAR
NA	NA	✓	06/21/19 14:22:31	0/RP1	Route Pr...	RP1	NA	NA	NA	NA	CR	R	NA	DISK1-DISK-SPACE	Disk space alert for location "Sysadmin:/misc/disk1"	NA	NEAR
NA	NA	NA	06/21/19 14:21:07	0/RP1	Route Pr...	RP1	NA	NA	NA	NA	MN	R	NA	ECU_CAL_DISK_PROVISION_IN_PROGRESS_0	disk provision is in progress	NA	NEAR

1.7. Remove ECU1

1.7.1. Remove ECU Module from the NCS4K Chassis:

- a. Ensure the user is wearing ESD wrist strap.
- b. Remove all cables connected to NCS4K-ECU Module.
- c. When you remove the EMS cable, it will drop all remote management to the shelf. It will not be restored until the EMS cable is reconnected in section 1.7.2. Remote access can still be attained with the use of the console port.
- d. Remove all individual timing cables connected to the unit.
- e. Use Philips screwdriver to loosen screws on ECU unit.
- f. Use the latch on both sides to plug out NCS4K-ECU unit.
- g. Remove both 2.5" SATA drives (SSD) from the original NCS4K-ECU. Note the exact position, left or right, in the ECU.

h. Insert the 2.5" SATA drives removed from NCS4K-ECU into the new NCS4K-ECU2 module, ensure they are installed in the same position as the original ECU.



1.7.2. Install the ECU2 module and reconnect cables:

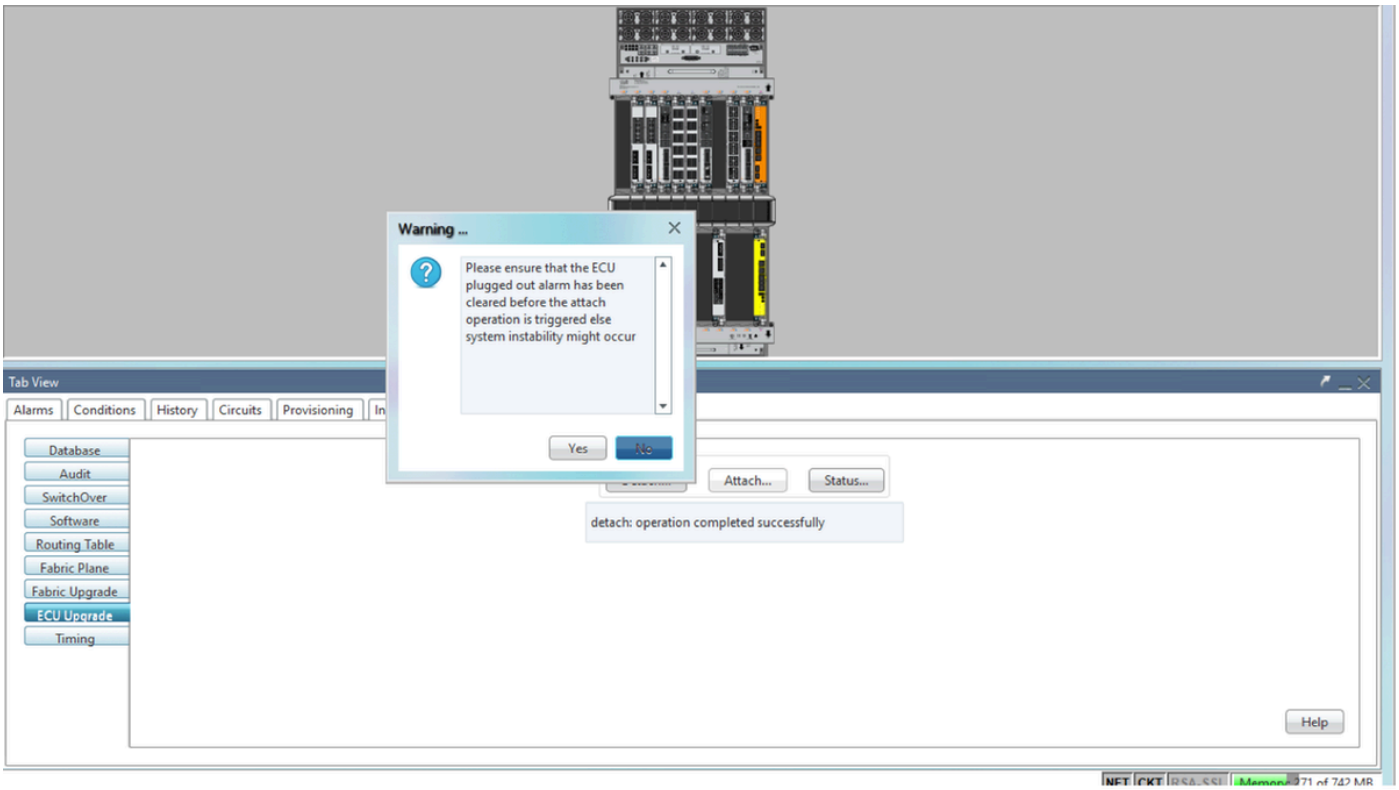
- a. Place the new NCS4K-ECU2 module with both 2.5" SATA drives into the original ECU slot.
- b. Reconnect all cables removed in section 1.7.1 to the new ECU2 Module.
- c. Tighten the screws after latches are in the correct position.
- d. Ensure remote management connectivity to the NE is available again.
- e. Ensure the NE's front-panel LCD is operational.



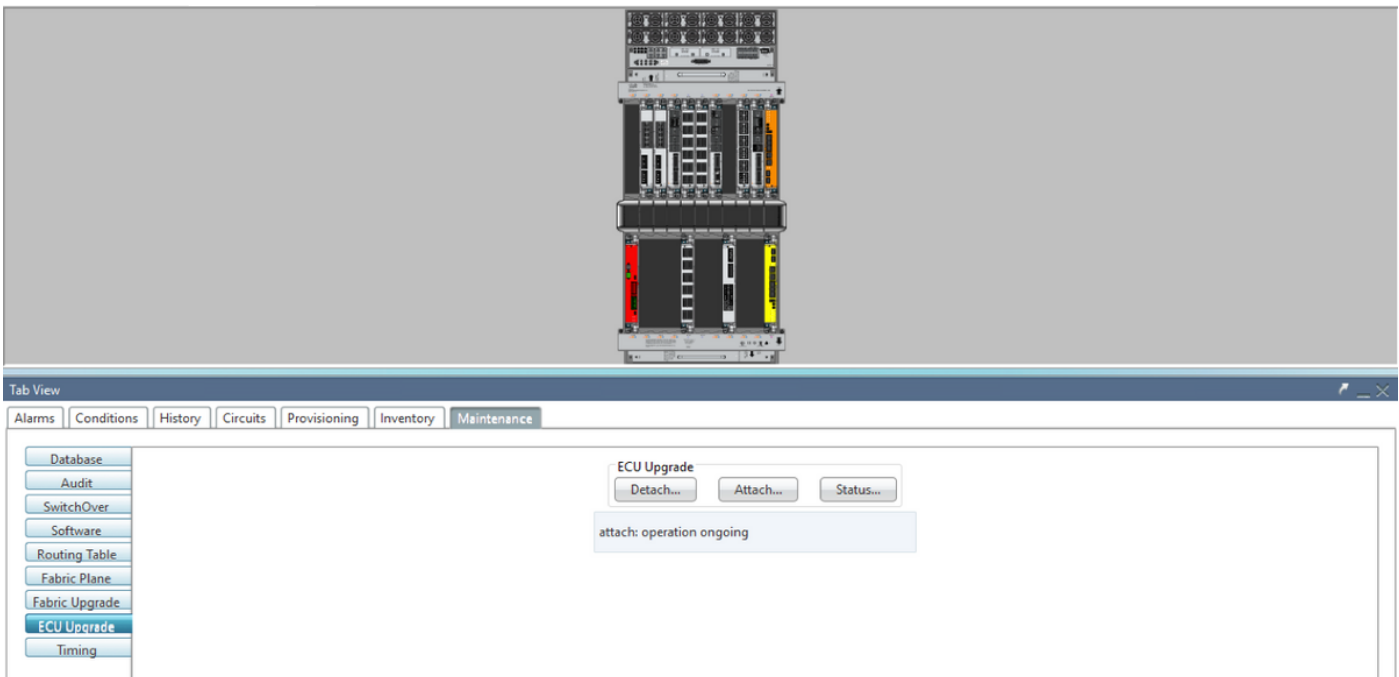
1.7.3. Initialize new ECU2 in NCS4K Chassis:

Wait for 2 to 3 minutes for NCS4K-ECU2 module to initialize.

Ensure ECU 'plugged out alarm' is cleared before attach operation is triggered else it could lead the system to an inconsistent state.



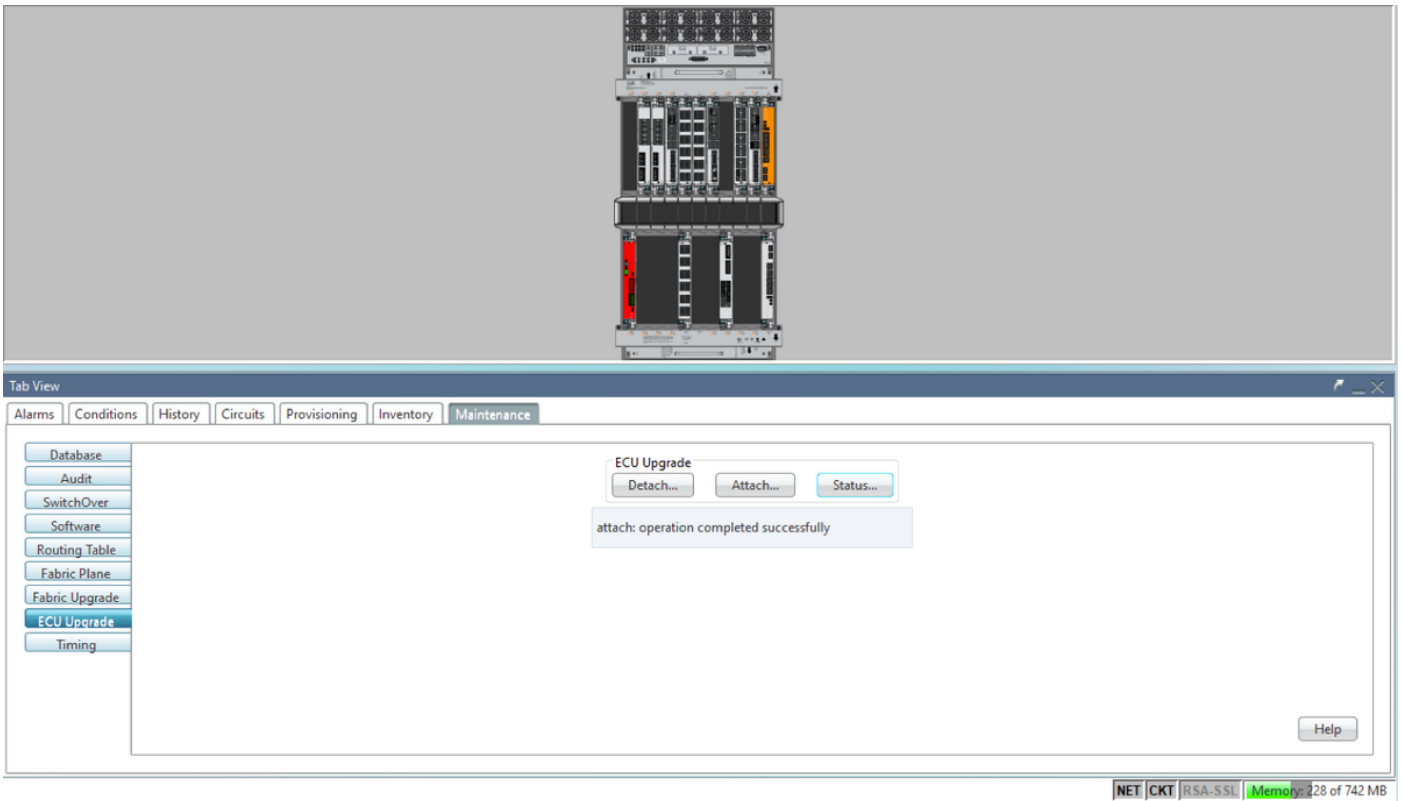
Click on the **Attach...** button to proceed as shown in the image.



Alarm 'The attach provision for disk started' will be raised once the attach procedure is triggered.

Num	Ref	New	Date	Object	Eqpt Type	Slot	Unit	Port	Wavelength	Path Width	Sev	ST	SA	Cond	Description	Direction	Location
NA	NA	✓	06/21/19 14:37:23	0/RP1	Route Pr...	RP1	NA	NA	NA	NA	MN	R	NA	ECU_CAL_PROV...	The attach provision for disk started	NA	NEAR
NA	NA	NA	06/21/19 14:24:34	0/RP0	Route Pr...	RP0	NA	NA	NA	NA	CR	R	NA	DISK1-DISK-SPA...	Disk space alert for location "/>		

Once these alarms are cleared from the system, ECU migration from NCS4K-ECU to NCS4K-ECU2 is completed successfully.



1.8. Post Checks

1.8.1. Verify Alarms

Verify alarms and ensure that there are no new or unexpected alarms on the shelf.

Note: The Disk space alert for location alarm might take a little longer to idle for both RP0 and RP1 but you can verify that the disk is operational with the SH media command.

The screenshot shows the 'Alarms' tab in the network management interface. It displays a table with the following columns: Num, Ref, New, Date, Object, Eqpt Type, Slot, Unit, Port, Wavelength, Path Width, Sev, ST, SA, Cond, Description, Direction, and Location. The table contains three rows of data:

Num	Ref	New	Date	Object	Eqpt Type	Slot	Unit	Port	Wavelength	Path Width	Sev	ST	SA	Cond	Description	Direction	Location
NA	NA	✓	06/21/19 14:40:34	0/RP0	Route Pr...	RP0		NA	NA	NA	CR	C	NA	DISK1-DISK-SPA...	Disk space alert for location "Sysadmin/mis...	NA	NEAR
NA	NA	✓	06/21/19 14:40:01	0/RP0	Route Pr...	RP0		NA	NA	NA	MN	C	NA	ECU_CAL_DISK_...	disk provision is in progress	NA	NEAR
NA	NA	✓	06/21/19 14:40:00	0/RP0	Route Pr...	RP0		NA	NA	NA	MN	C	NA	ECU_CAL_PROV...	The attach provision for disk started	NA	NEAR

The screenshot shows the 'Alarms' tab in the network management interface, displaying a table of active alarms. The table has the same columns as the previous screenshot. The table contains six rows of data, with some rows highlighted in yellow and others in red:

Num	Ref	New	Date	Object	Eqpt Type	Slot	Unit	Port	Wavelength	Path Width	Sev	ST	SA	Cond	Description	Direction	Location
NA	NA	✓	06/21/19 14:40:34	0/RP0	Route Pr...	RP0		NA	NA	NA	CR	C	NA	DISK1-DISK-SPA...	Disk space alert for location "Sysadmin/mis...	NA	NEAR
NA	NA	✓	06/21/19 14:40:01	0/RP0	Route Pr...	RP0		NA	NA	NA	MN	C	NA	ECU_CAL_DISK_...	disk provision is in progress	NA	NEAR
NA	NA	✓	06/21/19 14:40:00	0/RP0	Route Pr...	RP0		NA	NA	NA	MN	C	NA	ECU_CAL_PROV...	The attach provision for disk started	NA	NEAR
NA	NA	✓	06/21/19 14:38:41	0/RP0	Route Pr...	RP0		NA	NA	NA	MN	R	NA	ECU_CAL_PROV...	The attach provision for disk started	NA	NEAR
NA	NA	NA	06/21/19 14:22:31	0/RP1	Route Pr...	RP1		NA	NA	NA	CR	R	NA	DISK1-DISK-SPA...	Disk space alert for location "Sysadmin/mis...	NA	NEAR
NA	NA	NA	06/21/19 14:21:07	0/RP1	Route Pr...	RP1		NA	NA	NA	MN	R	NA	ECU_CAL_DISK_...	disk provision is in progress	NA	NEAR

1.8.2. Verify Media

Verify that both solid-state disk drives are slotted correctly and reachable.

```
sysadmin-vm:0_RP0# sh media
```

```
Fri Jun 21 20:21:28.615 UTC
```

Partition	Size	Used	Percent	Avail
rootfs:	2.4G	633M	29%	1.6G
log:	478M	308M	70%	135M
config:	478M	32M	8%	410M
disk0:	949M	47M	6%	838M
install:	3.7G	2.8G	81%	681M
disk1:	18G	3.0G	18%	14G

```
rootfs: = root file system (read-only)
```

```
log: = system log files (read-only)
```

```
config: = configuration storage (read-only)
```

```
install: = install repository (read-only)
```

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

1.8.3. BITS Timing Re-Check

If BITS Timing was equipped and section 1.5 was completed. Run the commands again after you re-attach the BITS Timing to ECU2 and compare with previous results.

RP/0/RP0:node_name#show controller timing controller clock

Wed Nov 13 14:53:18.781 CST

SYNCEC Clock-Setting: Rack 0

	BITS0-IN	BITS0-OUT	BITS1-IN	BITS1-OUT
Config	: Yes	No	Yes	No
PORT Mode	: T1	-	T1	-
Framing	: ESF	-	ESF	-
Linecoding	: B8ZS	-	B8ZS	-
Submode	: -	-	-	-
Shutdown	: No	No	No	No
Direction	: RX	TX	RX	TX
QL Option	: O2 G1	O2 G1	O2 G1	O2 G1
RX_ssm	: PRS	-	PRS	-
TX_ssm	: -	-	-	-
If_state	: UP	ADMIN_DOWN	UP	ADMIN_DOWN

	TE0-E	TE1-E	TE0-W	TE1-W
Config	: NA	NA	NA	NA
PORT Mode	: ICS	ICS	ICS	ICS
Framing	: -	-	-	-
Linecoding	: -	-	-	-
Submode	: -	-	-	-
Shutdown	: No	No	No	No
Direction	: -	-	-	-
QL Option	: O1	O1	O1	O1
RX_ssm	: -	-	-	-
TX_ssm	: -	-	-	-
If_state	: DOWN	DOWN	DOWN	DOWN

RP/0/RP0: Node_Name #show frequency synchronization clock-interfaces brief

Tue Nov 5 16:38:03.711 CST

Flags: > - Up D - Down S - Assigned for selection
 d - SSM Disabled s - Output squelched L - Looped back

Node 0/RP0:

```
=====
Fl  Clock Interface      QLrcv  QLuse  Pri  QLsnd  Output driven by
=====
>S  Rack0-Bits0-In       PRS    PRS    50  n/a    n/a
D   Rack0-Bits0-Out     n/a    n/a    n/a  PRS    Rack0-Bits0-In
>S  Rack0-Bits1-In       PRS    PRS    50  n/a    n/a
D   Rack0-Bits1-Out     n/a    n/a    n/a  PRS    Rack0-Bits0-In
D   0/TE0-E             n/a    n/a    n/a  n/a    n/a
D   0/TE1-E             n/a    n/a    n/a  n/a    n/a
D   0/TE0-W             n/a    n/a    n/a  n/a    n/a
D   0/TE1-W             n/a    n/a    n/a  n/a    n/a
>S  Internal0           n/a    ST3    255  n/a    n/a
=====
```