

升级思科路由器和PIM模块固件

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简介

本文档介绍升级思科蜂窝网兼容路由器和PIM模块P-5GS6-GL、P-5GS6-R16SA-GL及其调制解调器固件的过程。

先决条件

基本了解Cisco 5G产品组合和Cisco IOS® XE升级过程。

要求

思科建议您了解以下内容：

- Cisco路由器升级步骤和操作。
- 5G PIM模块的操作和配置。

使用的组件

- 思科C1101-4PLTEP(17.12.3)
- P-5GS6-R16SA-GL
- P-5GS6-GL

本文档中的信息都是基于特定实验室环境中的设备编写的。本文档中使用的所有设备最初均采用原始（默认）配置。如果您的网络处于活动状态，请确保您了解所有命令的潜在影响。

背景信息

5G Sub-6 GHz可插拔接口模块为思科路由器系列提供5G功能。可插拔模块的产品ID是P-5GS6-GL和P-5GS6-R16SA。P-5GS6-GL使用FN980 Telit调制解调器，P-5GS6-R16SA使用EM9293 Serra无线调制解调器。对于IR坚固型系列路由器，Cisco IOS XE版本17.7.1是第一个支持P-5GS6-GL的软件版本，因为Cisco IOS XE版本17.13.1是第一个支持P-5GS6-R16SA的软件版本。对于Cisco ISR 1000系列、8200和8300系列边缘平台，Cisco IOS XE版本17.9.2a是第一个支持P-5GS6-GL的软件版本，因为Cisco IOS XE版本17.12.1a是第一个支持P-5GS6-R16SA的软件版本。

升级

本文档介绍升级Cisco路由器、PIM模块调制解调器、CG522-E操作系统及其调制解调器的步骤。

思科路由器升级

Cisco路由器在捆绑包模式或安装模式下运行，捆绑包模式是指直接从软件.bin文件引导的路由器。安装模式表示已完全解压所有软件包文件，并且路由器会通过列表按顺序引导不同的软件包。

以安装模式升级路由器

- 1.确保将新映像传输到路由器存储器中，或者路由器可以到达外部存储器，其中通过TFTP、FTP、SFTP或SCP存储映像。
- 2.使用命令启动升级过程：

```
<#root>
```

```
install add file bootflash:
```

```
activate commit
```

示例：

```
<#root>
```

```
Router# install add file bootflash:c8000be-universalk9.BLD_V177_THROTTLE_LATEST_20211021_031123_V17_7_0
```

最后，显示如下所示的日志消息：

```
<#root>
```

SUCCESS: install_add_activate_commit Thu Oct 28 22:07:22 UTC 2021

这表示已成功执行添加、激活和提交过程。

3.然后路由器开始重新加载，使用新映像启动。

4.要验证新映像是否已成功卸载，可使用以下命令：

```
<#root>
```

```
ROUTER#
```

```
show version
```

```
Cisco IOS XE Software, Version
```

```
17.07.01
```

```
Cisco IOS Software [Bengaluru], c8000be Software (X86_64_LINUX_IOSD-UNIVERSALK9-M), Version 17.7.1, REL  
Technical Support: http://www.cisco.com/techsupport  
Copyright (c) 1986-2021 by Cisco Systems, Inc.  
Compiled Sat 21-Aug-21 03:27 by mcpre  
-----[further output has been omitted]-----
```

有关详细信息，请参阅配置指南[Cisco 1000系列软件配置指南](#)、[Cisco IOS XE 17 — 使用安装命令安装软件](#)[\[Cisco 1000系列集成多业务路由器\] - Cisco](#)

Cisco PIM模块调制解调器升级

调制解调器升级包括三个要素，一个.cwe文件，包含调制解调器本身的版本，两个.nvu文件OEM PRI和运营商PRI.OEM PRI（原始设备制造商主速率接口），负责内部通信并由调制解调器供应商定制；运营商PRI（运营商提供的主速率接口），由电信运营商或服务提供商直接提供给最终用户或企业，以便能够访问给定的蜂窝服务。对于FN980(P-5GS6-GL6 Modem(调制解调器)：固件映像包含在.bin文件中。对于EM9293(P-5GS6-R16SA-GL调制解调器)，固件映像包含在两种类型的文件中：.cwe(基于固件文件)和.nvu（运营商PRI文件和OEM PRI文件）。要升级EM9293上的所有3个版本，需要分别执行2次固件升级。EM9293升级一节中对此进行了详细说明。

1.使用命令确定调制解调器型号和运行固件：

```
<#root>
```

```
show cellular
```

```
hardware
```

示例：

<#root>

ISR2#

show cellular 0/2/0 hardware

Modem Firmware Version =

M0H.030202

Host Firmware Version = A0H.000302

Device Model ID =

FN980

International Mobile Subscriber Identity (IMSI) = 268011202523393

International Mobile Equipment Identity (IMEI) = 351533923179472

Integrated Circuit Card ID (ICCID) = 8935101812338223816

Mobile Subscriber Integrated Services

Digital Network-Number (MSISDN) =

Modem Status = Modem Online

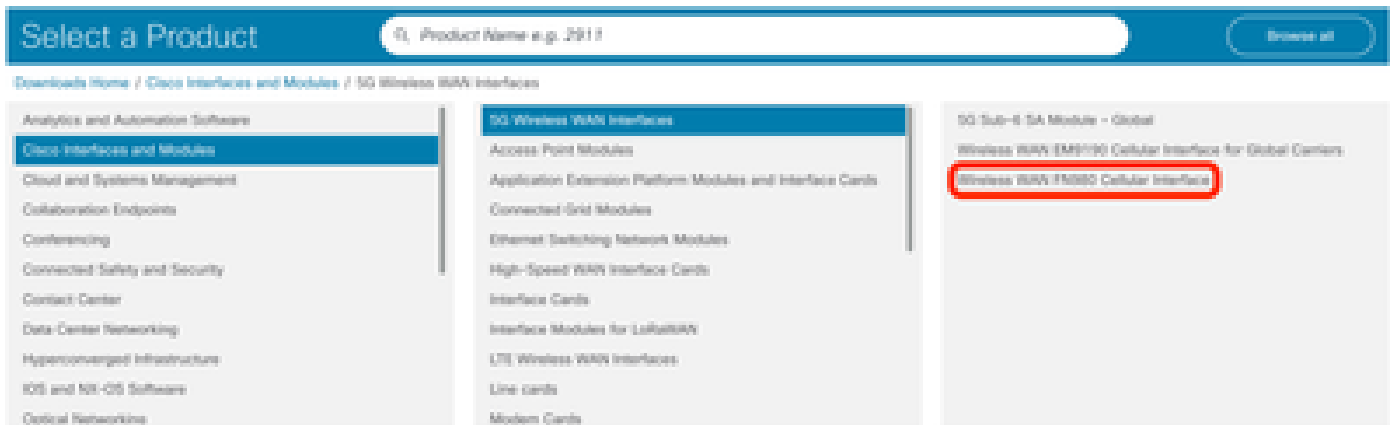
Current Modem Temperature = 46 deg C

PRI version = 1080-115, Carrier = Generic GCF

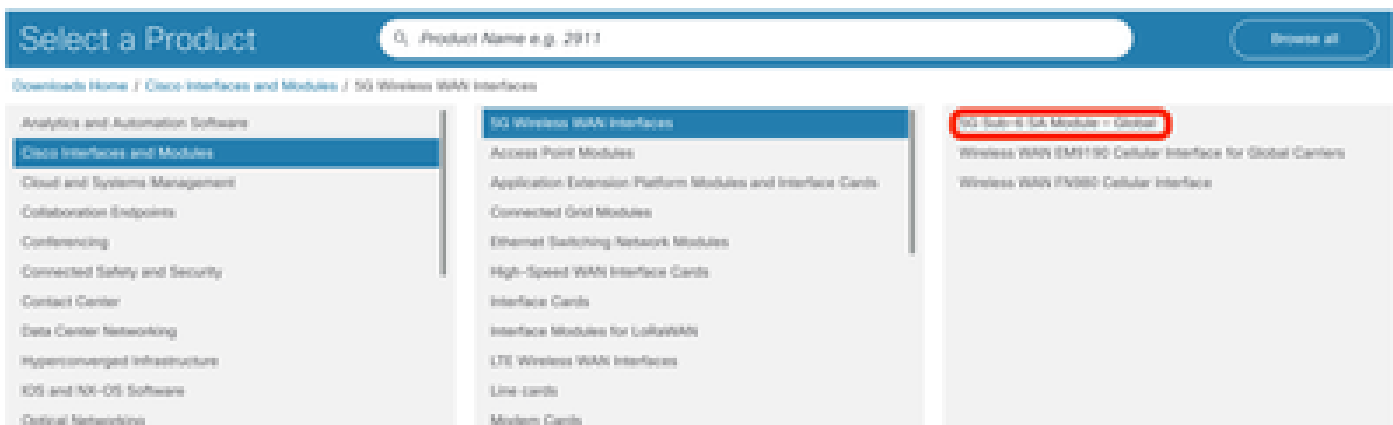
OEM PRI version = 1080-115

2.从software.cisco.com下载正确的文件。

对于此示例：



如果型号为EM9293，则必须从以下部分下载文件：



根据调制解调器型号，下一步的升级步骤在“FN980升级”或“EM9293升级”部分中执行。

FN980升级

1.使用不同于固件或fw的名称在闪存中创建文件夹：

```
<#root>
```

```
mk_dir firm_new
```

示例：

```
<#root>
```

```
ISR2#
```

```
mkdir firm_new
```

```
Create directory filename [firm_new]?
```

```
Created dir bootflash:/firm_new
```

2.将固件文件移动到上一步中创建的文件夹。

3.使用命令升级固件：

```
<#root>
```

```
microcode reload cellular
```

```
modem-provision
```

示例：

```
<#root>
```

```
ISR2#
```

```
microcode reload cellular 0 2 modem-provision bootflash:/firm_new/
```

EM9293升级

对于EM9293调制解调器，有3个可用于固件升级的文件：

1. CWE (基于固件文件)
2. NVU (运营商PRI文件)
3. NVU (OEM优先级文件)

示例：

Software Download

Downloads Home / Cisco Interfaces and Modules / 5G Wireless WAN Interfaces / 5G Sub-6 SA Module - Global

Select a Software Type

Cellular Modem Firmware

Cellular OEM PRI Firmware

Software Download

Downloads Home / Cisco Interfaces and Modules / 5G Wireless WAN Interfaces / 5G Sub-6 SA Module - Global / Cellular Modem Firmware - 02.13.08.00

Q Search...

Expand All Collapse All

Latest Release

02.13.08.00

All Releases

02.13.08.00

5G Sub-6 SA Module - Global

Release 02.13.08.00

Related Links and Documentation

My Notifications

Firmware Upgrade Guide

File Information	Release Date	Size	
02.13.08.00 modem firmware for EM9293 modem. EM9293_02.13.08.00 new Adviseories	19-Dec-2023	123.23 MB	Download Compare Details
Generic carrier PRI, based on 02.13.08.00 modem firmware, for EM9293 modem. EM9293_02.13.08.00_GENERIC_000.047_000 new Adviseories	19-Dec-2023	0.05 MB	Download Compare Details

NVU (OEM优先级文件)

示例：

Software Download

Downloads Home / Cisco Interfaces and Modules / 5G Wireless WAN Interfaces / 5G Sub-6 SA Module - Global

Select a Software Type

Cellular Modem Firmware

Cellular OEM PRI Firmware

Software Download

Downloads Home / Cisco Interfaces and Modules / 5G Wireless WAN Interfaces / 5G Sub-6 SA Module - Global / Cellular OEM PRI Firmware- EM9293_001.002

0, Search...

Expand All Collapse All

Latest Release

EM9293_001.002

All Releases

EM9293_001.002

5G Sub-6 SA Module - Global

Release EM9293_001.002

Related Links and Documentation

My Notifications

Firmware Upgrade Guide

File Information

Release Date

Size

This OEM PRI file is only for EM9293 modems. It is compatible with modem firmware 02.13.08.00 and above.

02-Jun-2024

0.03 MB

EM9293_1105111_02.13.08.00_Cisco_001.000

0.03 MB

0.03 MB

要更新所有3个版本（基于固件、运营商PRI和OEM PRI），需要分别执行2次固件升级过程：

- 第一次使用.CWE（基于固件文件）和.NVU（运营商PRI文件）在一个文件夹中。
- 第2次，使用.NVU（OEM PRI文件）放在1个文件夹中。

- 将路由器升级到最新的Cisco IOS XE版本。
- 下载.cwe和.nvu文件
- 在路由器bootflash中为每个固件升级过程创建2个文件夹：

<#root>

Router#

mkdir bootflash:fw_vzw_em7455

Create directory filename [fw_vzw_em7455]?

Created dir bootflash:/fw_vzw_em7455

Router#

mkdir bootflash:oem_pri_em7455

Create directory filename [oem_pri_em7455]?

Created dir bootflash:/oem_pri_em7455

- 将下载的文件复制到新创建的文件夹：

<#root>

```
copy usb0:/7455_fw/74xx_02.33.03.00.cwe bootflash:/fw_vzw_em7455/
```

Copy in

[illegible]

Router#

```
copy usb0:/7455_fw/7455_02.33.03.00_VERIZON_002.079_001.nvu bootflash:/fw_vzw_em7455/
```

```
Copy in progress...C 17447 bytes copied in 0.024 secs (726958 bytes/sec)
```

Router#

```
copy usb0:/7455 oem_pri/EM7455 1102526 02.33.03.00 00 Cisco 000.016 000.nvu bootflash:/oem_pri_em7455/
```

Copy in progress...C

```
18051 bytes copied in 0.028 secs (644679 bytes/sec)
```

Router#

5.验证文件是否正确复制到新创建的文件夹：

<#root>

Router#

```
dir bootflash:fw vzw em7455
```

Directory of bootflash:/fw_vzw_em7455/

```
146884 -rw- 17447 Oct 27 2021 04:48:09 +00:00 7455_02.33.03.00_VERIZON_002.079_001.nvu
106090 -rw- 64426341 Oct 27 2021 04:46:21 +00:00 74xx_02.33.03.00.cwe
```

```
2908606464 bytes total (201584640 bytes free)
```

Router#

```
dir bootflash:oem pri em7455
```

Directory of bootflash:/oem_pri_em7455/

```
155047 -rw- 18051 Oct 27 2021 04:52:38 +00:00 EM7455_1102526_02.33.03.00_00_Cisco_000.016_000.nvu
```

2908606464 bytes total (201584640 bytes free)
Router#

6.验证当前固件、运营商PRI和OEM PRI版本：

<#root>

Router#

show cellular 0/2/0 hardware

Modem Firmware Version =

SWI9X30C_02.30.01.01

Device Model ID = EM7455 International Mobile Subscriber Identity (IMSI) = 311480371731931
International Mobile Equipment Identity (IMEI) = 356129073232008
Integrated Circuit Card ID (ICCID) = 89148000003650136091
Mobile Subscriber Integrated Services
Digital Network-Number (MSISDN) = 4086098674
Factory Serial Number (FSN) = LF103794050210
Modem Status = Modem Online
Current Modem Temperature = 36 deg C
PRI SKU ID = 1102526, PRI version = 002.052_003, Carrier = VERIZON
OEM PRI version = 000.012

Router#

Router#

Router#show cellular 0/2/0 firmware

Idx Carrier FwVersion PriVersion Status

1 ATT 02.32.08.00 002.067_001 Inactive

2 BELL 02.24.05.06 001.005_000 Inactive

3 GENERIC 02.30.01.01 002.045_001 Inactive

4 ROGERS 02.30.01.01 001.023_000 Inactive

5 SPRINT 02.30.01.01 002.045_000 Inactive

6 TELUS 02.30.01.01 001.023_000 Inactive

7 US-Cellular 02.30.01.01 000.020_000 Inactive

8

VERIZON 02.30.01.01 002.052_003 Active

9 VODAFONE 02.24.03.00 001.001_000 Inactive

Firmware Activation mode = AUTO

Router#

7.使用microcode reload命令启动调制解调器固件升级：

<#root>

microcode reload cellular 0 2 modem-provision bootflash:

升级固件和运营商PRI:

<#root>

Router#

microcode reload cellular 0 2 modem-provision bootflash:fw_vzw_em7455

Reload microcode? [confirm]

Log status of firmware download in router flash?[confirm]

Firmware download status will be logged in bootflash:fwlogfile

Microcode Reload Process launched for cwan slot/bay =0/2; hw type=0x102download option = 0

Router#

The interface will be Shut Down for Firmware Upgrade

This will terminate any active data connections.

*****Success !! send FW Upgrade command to card *****

Modem will be upgraded!

Upgrade process will take up to 15 minutes. During this time the modem will be unusable.

Please do not remove power or reload the router during the upgrade process.

*Oct 27 05:01:56.150: %LINK-5-CHANGED: Interface Cellular0/2/0, changed state to administratively down

*Oct 27 05:01:56.155: %LINK-5-CHANGED: Interface Cellular0/2/1, changed state to administratively down

FIRMWARE INFO BEFORE UPGRADE:

Modem Device ID: EM7455 MODEM F/W Boot Version: SWI9X30C_02.30.01.01

Modem F/W App Version: SWI9X30C_02.30.01.01 Modem SKU ID: 1102526

Modem Package Identifier:

Modem PRI Ver: 000.012 Modem Carrier Name: VERIZON

Modem Carrier Revision: 002.052_003

FW_UPGRADE: Modem needs CWE, PRI

*Oct 27 05:02:20.571: %IOSXE-3-PLATFORM: R0/0: ngiolite: WWAN modem Action:[unbind] State[1]

*Oct 27 05:02:21.577: %IOSXE-3-PLATFORM: R0/0: ngiolite: WWAN modem Action:[remove] State[0]

FW_UPGRADE: Upgrade begin at Wed Oct 27 05:02:24 2021

FW_UPGRADE: Upgrade end at Wed Oct 27 05:03:35 2021

FW_UPGRADE: Firmware upgrade success.....

FW_UPGRADE: Waiting for modem to become online

*Oct 27 05:03:35.331: %IOSXE-3-PLATFORM: R0/0: kernel: GobiSerial driver ttyUSB0: usb_serial_generic_su

*Oct 27 05:03:35.331: %IOSXE-3-PLATFORM: R0/0: kernel: GobiSerial driver ttyUSB0: usb_serial_generic_su

*Oct 27 05:03:45.785: %IOSXE-3-PLATFORM: R0/0: ngiolite: WWAN modem Action:[add] State[1]

*Oct 27 05:03:45.927: %IOSXE-3-PLATFORM: R0/0: ngiolite: WWAN modem Action:[bind] State[1]

FIRMWARE INFO AFTER UPGRADE:

Modem Device ID: EM7455 MODEM F/W Boot Version: SWI9X30C_02.33.03.00

Modem F/W App Version: SWI9X30C_02.33.03.00 Modem SKU ID: 1102526

Modem Package Identifier:

Modem PRI Ver: 000.012 Modem Carrier Name: VERIZON

Modem Carrier Revision: 002.079_001

F/W Upgrade: Firmware Upgrade has Completed Successfully

*Oct 27 05:05:56.936: %CELLWAN-2-MODEM_UP: Modem in slot 0/2 is now UP

*Oct 27 05:05:57.141: %CELLWAN-2-MODEM_RADIO: Cellular0/2/0 Modem radio has been turned on

*Oct 27 05:05:57.152: %CELLWAN-5-FIRMWARE_SWITCH: Firmware switchover initiated for modem in slot 0/2

*Oct 27 05:06:03.152: %CELLWAN-4-MODEM_RESTART_IND: Cellular0/2/0 Modem restart reason: Request Modem R

*Oct 27 05:06:23.214: %IOSXE-3-PLATFORM: R0/0: ngiolite: WWAN modem Action:[unbind] State[1]

*Oct 27 05:06:24.230: %CELLWAN-2-MODEM_DOWN: Modem in slot 0/2 is DOWN

```
*Oct 27 05:06:24.223: %IOSXE-3-PLATFORM: R0/0: ngio1ite: WWAN modem Action:[remove] State[2]
*Oct 27 05:06:30.672: %IOSXE-3-PLATFORM: R0/0: ngio1ite: WWAN modem Action:[add] State[1]
*Oct 27 05:06:30.846: %IOSXE-3-PLATFORM: R0/0: ngio1ite: WWAN modem Action:[bind] State[1]
*Oct 27 05:08:41.959: %CELLWAN-2-MODEM_UP: Modem in slot 0/2 is now UP
*Oct 27 05:08:42.162: %CELLWAN-2-MODEM_RADIO: Cellular0/2/0 Modem radio has been turned on
*Oct 27 05:08:44.159: %LINK-3-UPDOWN: Interface Cellular0/2/0, changed state to down
*Oct 27 05:08:44.163: %LINK-3-UPDOWN: Interface Cellular0/2/1, changed state to down
*Oct 27 05:09:09.216: %LINK-3-UPDOWN: Interface Cellular0/2/0, changed state to up
*Oct 27 05:09:10.216: %LINEPROTO-5-UPDOWN: Line protocol on Interface Cellular0/2/0, changed state to up
Router#
```

升级OEM PRI:

<#root>

Router#

microcode reload cellular 0 2 modem-provision bootflash:oem_pri_em7455

```
Reload microcode? [confirm]
Log status of firmware download in router flash?[confirm]
Firmware download status will be logged in bootflash:fwlogfile
Microcode Reload Process launched for cwan slot/bay =0/2; hw type=0x102download option = 0
```

Router#

```
*****
The interface will be Shut Down for Firmware Upgrade
This will terminate any active data connections.
*****Success !! send FW Upgrade command to card
```

```
*Oct 27 05:10:29.468: %LINK-3-UPDOWN: Interface Cellular0/2/0, changed state to down
*Oct 27 05:10:30.468: %LINEPROTO-5-UPDOWN: Line protocol on Interface Cellular0/2/0, changed state to down
*****
```

```
Modem will be upgraded!
Upgrade process will take up to 15 minutes. During this time the modem will be unusable.
Please do not remove power or reload the router during the upgrade process.
*****
```

```
*Oct 27 05:10:34.476: %LINK-5-CHANGED: Interface Cellular0/2/0, changed state to administratively down
*Oct 27 05:10:36.480: %LINK-5-CHANGED: Interface Cellular0/2/1, changed state to administratively down
-----
```

```
FIRMWARE INFO BEFORE UPGRADE:
Modem Device ID: EM7455 MODEM F/W Boot Version: SWI9X30C_02.33.03.00
Modem F/W App Version: SWI9X30C_02.33.03.00 Modem SKU ID: 1102526
Modem Package Identifier:
Modem PRI Ver: 000.012 Modem Carrier Name: VERIZON
Modem Carrier Revision: 002.079_001
-----
```

OEM PRI for SKU :1102526.

```
*Oct 27 05:10:55.092: %IOSXE-3-PLATFORM: R0/0: ngio1ite: WWAN modem Action:[unbind] State[1]
*Oct 27 05:10:56.094: %IOSXE-3-PLATFORM: R0/0: ngio1ite: WWAN modem Action:[remove] State[0]
FW_UPGRADE: Upgrade begin at Wed Oct 27 05:10:58 2021
FW_UPGRADE: Upgrade end at Wed Oct 27 05:11:00 2021
FW_UPGRADE: Firmware upgrade success.....
FW_UPGRADE: Waiting for modem to become online
*Oct 27 05:11:00.225: %IOSXE-3-PLATFORM: R0/0: kernel: GobiSerial driver ttyUSB0: usb_serial_generic_s
*Oct 27 05:11:00.225: %IOSXE-3-PLATFORM: R0/0: kernel: GobiSerial driver ttyUSB0: usb_serial_generic_s
*Oct 27 05:11:07.693: %IOSXE-3-PLATFORM: R0/0: ngio1ite: WWAN modem Action:[add] State[1]
*Oct 27 05:11:07.841: %IOSXE-3-PLATFORM: R0/0: ngio1ite: WWAN modem Action:[bind] State[1]
```

```

-----
FIRMWARE INFO AFTER UPGRADE:
Modem Device ID: EM7455 MODEM F/W Boot Version: SWI9X30C_02.33.03.00
Modem F/W App Version: SWI9X30C_02.33.03.00 Modem SKU ID: 1102526
Modem Package Identifier:
Modem PRI Ver: 000.016 Modem Carrier Name: VERIZON
Modem Carrier Revision: 002.079_001
-----
F/W Upgrade: Firmware Upgrade has Completed Successfully
*Oct 27 05:13:18.936: %CELLWAN-2-MODEM_UP: Modem in slot 0/2 is now UP
*Oct 27 05:13:19.141: %CELLWAN-2-MODEM_RADIO: Cellular0/2/0 Modem radio has been turned on
*Oct 27 05:13:21.140: %LINK-3-UPDOWN: Interface Cellular0/2/0, changed state to down
*Oct 27 05:13:21.143: %LINK-3-UPDOWN: Interface Cellular0/2/1, changed state to down
Router#

```

8.验证调制解调器格式化软件、运营商PRI和OEM PRI已成功升级：

```

<#root>

Router#

show cellular 0/2/0 hardware

Modem Firmware Version =

SWI9X30C_02.33.03.00

Device Model ID = EM7455
International Mobile Subscriber Identity (IMSI) = 311480371731931
International Mobile Equipment Identity (IMEI) = 356129073232008
Integrated Circuit Card ID (ICCID) = 89148000003650136091
Mobile Subscriber Integrated Services
Digital Network-Number (MSISDN) = 4086098674
Factory Serial Number (FSN) = LF103794050210
Modem Status = Modem Online
Current Modem Temperature = 37 deg C
PRI SKU ID = 1102526, PRI version = 002.079_001, Carrier = VERIZON
OEM PRI version = 000.016
Router#
Router#
Router#show cellular 0/2/0 firmware
Idx Carrier FwVersion PriVersion Status
1 ATT 02.32.08.00 002.067_001 Inactive
2 GENERIC 02.30.01.01 002.045_001 Inactive
3 SPRINT 02.30.01.01 002.045_000 Inactive
4 VERIZON 02.33.03.00 002.079_001 Active
5 VODAFONE 02.24.03.00 001.001_000 Inactive

Firmware Activation mode = AUTO
Router#

```

结论

建议始终运行适用于Cisco路由器的最新软件版本和最新的调制解调器固件，因为它包含蜂窝运营商支持所需的最新PRI文件。

关于此翻译

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