

升級思科路由器和PIM模組韌體

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簡介

本文檔介紹升級思科蜂窩相容路由器和PIM模組P-5GS6-GL、P-5GS6-R16SA-GL及其數據機韌體的過程。

必要條件

基本瞭解Cisco 5G產品組合和Cisco IOS® XE升級流程。

需求

思科建議您瞭解：

- 思科路由器升級步驟和操作。
- 5G PIM模組的操作和配置。

採用元件

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

本文中的資訊是根據特定實驗室環境內的裝置所建立。文中使用到的所有裝置皆從已清除（預設）的組態來啟動。如果您的網路運作中，請確保您瞭解任何指令可能造成的影響。

背景資訊

5G Sub-6 GHz可插拔介面模組為思科路由器系列提供5G功能。可插拔模組的產品ID是P-5GS6-GL和P-5GS6-R16SA。P-5GS6-GL使用FN980 Telit數據機，P-5GS6-R16SA使用EM9293串列無線數據機。對於IR強固型系列路由器，Cisco IOS XE版本17.7.1是第一個支援P-5GS6-GL的軟體版本，因為Cisco IOS XE版本17.13.1是第一個支援P-5GS6-R16SA的軟體版本。對於Cisco ISR 1000系列、8200和8300系列邊緣平台，Cisco IOS XE版本17.9.2a是第一個提供對P-5GS6-GL支援的軟體版本，因為Cisco IOS XE版本17.12.1a是第一個提供對P-5GS6-R16SA支援的軟體版本。

升級

本檔案介紹升級Cisco路由器、PIM模組資料機、CG522-E作業系統及其資料機的步驟。

思科路由器升級

思科路由器在套件組合模式或安裝模式下運作，套件組合模式是指直接從軟體.bin檔案啟動的路由器。安裝模式表示已完全解壓所有程式包檔案，並且路由器會通過清單按順序引導不同的程式包。

在安裝模式下升級路由器

1.確保將新映像傳輸到路由器儲存中，或者路由器可以通過TFTP、FTP、SFTP或SCP到達儲存映像的外部儲存中。

2.使用命令啟動升級過程：

```
<#root>
```

```
install add file bootflash:
```

```
activate commit
```

範例：

```
<#root>
```

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

最後，將顯示類似以下的日誌消息：

```
<#root>
```

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

這表示新增、啟用和提交過程已成功執行。

3.然後啟動路由器重新載入，啟動時啟動新映像。

4.要驗證新映像是否已成功解除安裝，可以使用以下命令：

```
<#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]-----
```

有關詳細資訊，請參閱配置指南[Cisco 1000系列軟體配置指南](#)、[Cisco IOS XE 17 — 使用安裝命令安裝軟體](#)[\[Cisco 1000系列整合服務路由器\] - Cisco](#)

Cisco PIM模組資料機升級

數據機升級由三個元素組成：一個.cwe文件，其中包含數據機本身的版本；兩個.nvu文件OEM PRI和運營商PRI。OEM PRI（原始裝置製造商主要速率介面），負責內部通訊並由數據機供應商定製；運營商PRI（運營商提供的主要速率介面），由電信運營商或服務提供商直接提供給終端使用者或企業，以便能夠訪問給定的蜂窩服務。對於FN980(P-5GS6 GL-PRI Modem(數據機)韌體映像包含在.bin檔案中。對於EM9293(P-5GS6-R16SA-GL數據機)，韌體映像包含在兩種型別的檔案中：.cwe(基於韌體檔案)和.nvu(運營商PRI檔案和OEM PRI檔案)。要升級EM9293上的所有3個版本，需要分別執行2次韌體升級。EM9293升級一節中對此進行了更詳細說明。

1.使用以下命令確定數據機型號和運行韌體：

```
<#root>
```

```
show cellular
```

```
hardware
```

範例：

<#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

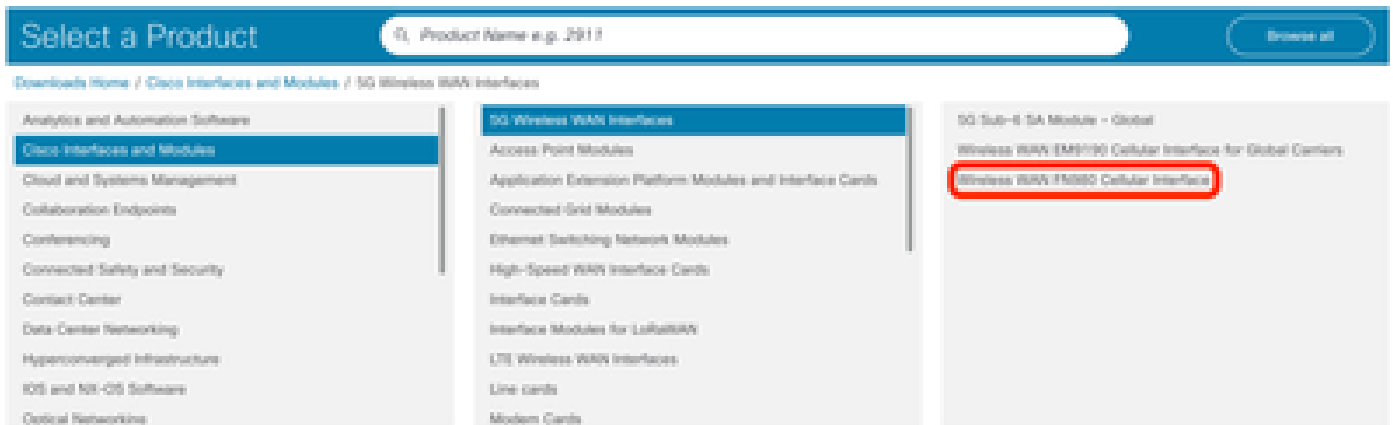
Current Modem Temperature = 46 deg C

PRI version = 1080-115, Carrier = Generic GCF

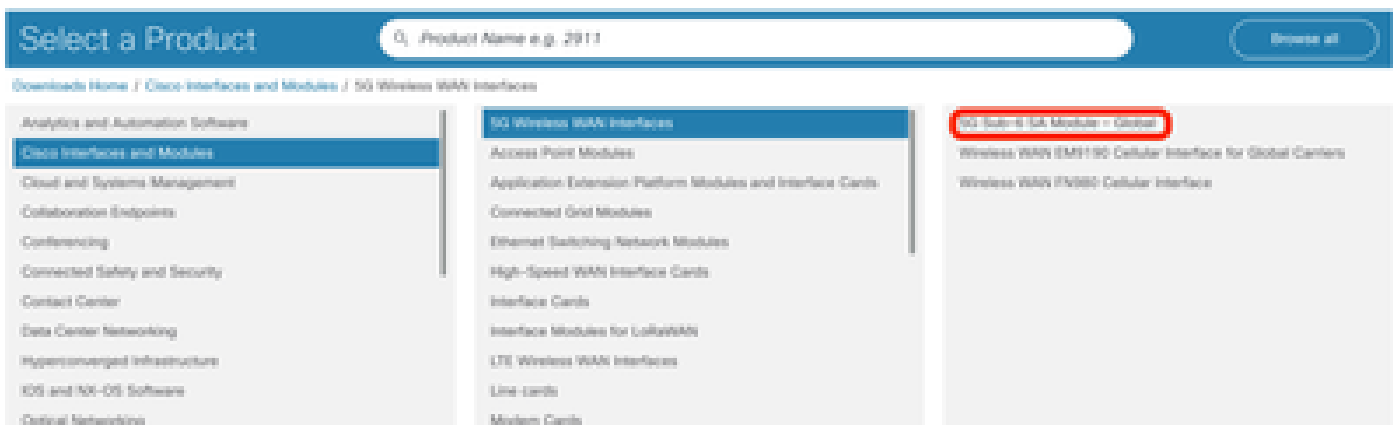
OEM PRI version = 1080-115

2.從software.cisco.com下載正確的檔案。

在本例中：



如果型號為EM9293，則必須從以下部分下載檔案：



根據數據機型號，接下來的升級步驟將在「FN980升級」或「EM9293升級」部分中完成。

FN980升級

1.使用與firmware或fw不同的名稱在快閃記憶體中建立資料夾：

```
<#root>
```

```
mk_dir firm_new
```

範例：

```
<#root>
```

```
ISR2#
```

```
mkdir firm_new
```

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

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

2.將韌體檔案移到上一步中建立的資料夾中。

3.使用以下命令升級韌體：

```
<#root>
```

```
microcode reload cellular
```

```
modem-provision
```

範例：

```
<#root>
```

```
ISR2#
```

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

EM9293升級

對於EM9293數據機，有3個可用於韌體升級的檔案：

1. CWE (基於韌體檔案)
2. NVU (運營商PRI檔案)
3. NVU (OEM PRI檔案)

範例：

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

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02.13.08.00

All Releases

02.13.08.00

5G Sub-6 SA Module - Global

Release 02.13.08.00

My Notifications

Related Links and Documentation

Firmware Upgrade Guide

File Information	Release Date	Size	
02.13.08.00 modem firmware for EM9293 modem. EM9293_02.13.08.00 PDF Advisories [2]	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 PDF Advisories [2]	19-Dec-2023	0.05 MB	Download Compare Details

NVU (OEM PRI檔案)

範例：

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

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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.

EM9293_1105111_02.13.08.00_Cisco_001.000

02-Jun-2024

0.03 MB

Download

要更新所有3個版本（基於韌體、運營商PRI和OEM PRI），需要分別執行2次韌體升級過程：

- 第一次使用.CWE（基於韌體檔案）和.NVU（運營商PRI檔案）在一個資料夾中。
- 第二次使用.NVU（OEM PRI檔案），位於1個資料夾中。

- 1.將路由器升級為最新Cisco IOS XE版本。
- 2.下載.cwe和.nvu檔案
- 3.在路由器bootflash中為每個韌體升級過程建立2個資料夾：

<#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

- 4.將下載的檔案複製到新建立的資料夾：

<#root>


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

[illegible]

Router#

Router#

Router#

```
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.驗證當前韌體、運營商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命令啟動數據機韌體升級：

<#root>

microcode reload cellular 0 2 modem-provision bootflash:

升級韌體和運營商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#
```

正在升級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.驗證數據機格式化程式、運營商PRI和OEM PRI是否已成功升級：

```
<#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#
```

結論

建議始終運行適用於Cisco路由器的最新軟體版本，以及最新的數據機韌體，因為它包含蜂窩運營商支援所需的最新PRI檔案。

關於此翻譯

思科已使用電腦和人工技術翻譯本文件，讓全世界的使用者能夠以自己的語言理解支援內容。請注意，即使是最佳機器翻譯，也不如專業譯者翻譯的內容準確。Cisco Systems, Inc. 對這些翻譯的準確度概不負責，並建議一律查看原始英文文件（提供連結）。