

What Causes a "%RSP-3-RESTART: cbus complex"?

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Introduction

This document explains the causes of the %RSP-3-RESTART: cbus complex error messages on the Cisco 7500 Series Routers.

Prerequisites

Requirements

There are no specific prerequisites for this document.

Components Used

The information in this document is based on these hardware platforms:

- Cisco 7500 Series Routers

The information presented in this document was created from devices in a specific lab environment. All of the devices used in this document started with a cleared (default) configuration. If you are working in a live network, ensure that you understand the potential impact of any command before using it.

Conventions

For more information on document conventions, refer to the Cisco Technical Tips Conventions.

MEMD Carving

At boot up, the packet memory (known as MEMD) is carved. This means that the total available memory is distributed among the different interface processors (classic xIP or Versatile Interface Processor (VIP) cards) that are present in the router. This distribution is optimized according to the characteristics of each interface, mainly speed and Maximum Transmission Unit (MTU).

What is a "Cbus Complex" Restart?

A cbus complex restart occurs when the router has encountered a condition which requires it to reload the interface processors and recarve the MEMD. When a cbus complex restart occurs, all the interface processors are reloaded. Each IP then downloads its microcode from the Route/Switch Processor (RSP). This causes a traffic interruption of approximately two minutes.

The interface microcodes are downloaded one after another, so the length of the interruption depends on the number of interfaces in the router. The recarve of the packet memory itself causes a short traffic interruption of a few seconds.

When a cbus complex restart occurs, this message is displayed:

```
%RSP-3-RESTART: cbus complex
```

When Does a "Cbus Complex" Restart Occur?

A cbus complex restart occurs when one of the parameters used by the carving algorithm is modified. Below are some events that may trigger a cbus complex restart.

- The **microcode reload** command.
- An MTU size change in the configuration.
- The crash of an interface (xIP).
- An `output frozen` condition detected on an interface.
- Some form of error condition (such as a parity error) present on the CyBus (the bus linking the RSP and the IPs), or in MEMD.

Note: Online Insertion and Removal (OIR) may change the number of interfaces, but this does not always result in a cbus complex restart. An OIR leads to a MEMD recarve without a cbus complex restart. For information on correctly performing an OIR, refer to Online Insertion and Removal (OIR) Support in Cisco Routers.

Troubleshooting

Below are some troubleshooting guidelines.

- If the cbus complex restart is caused by a **microcode reload** command or a change of MTU size in the configuration, there is no need to worry.
- The number of times MEMD has been recarved can be verified by issuing the **show controller cbus** command:

```
router#show controller cbus
MEMD at 40000000, 2097152 bytes (unused 3328, recarves 1, lost 0)
  RawQ 48000100, ReturnQ 48000108, EventQ 48000110
  BufhdrQ 48000138 (2889 items), LovltrQ 48000150 (22 items, 2016 bytes)
  IpcbufQ 48000160 (32 items, 4096 bytes)
  IpcbufQ_classic 48000158 (8 items, 4096 bytes)
...
```

- If other messages indicate that a VIP crash has occurred (such as %VIP2 R5K-1-MSG messages), refer to Troubleshooting Versatile Interface Processor (VIP) Crashes.
- If parity-related messages are present, refer to Processor Memory Parity Errors (PMPEs).
- When an `output frozen` is detected at an interface, refer to What Causes %RSP-3-RESTART: interface [xxx], output stuck/frozen/not transmitting Messages?.

How Can I Avoid a Cbus Complex Restart When a VIP Reloads?

A new feature called Single Line Card Reload (SLCR) has recently been introduced in Cisco IOS Software Release 12.0(13)S. This feature allows you to only reset the affected line card (as opposed to resetting all the line cards in the system), which results in a shorter recovery time and a much shorter traffic interruption.

When this feature is enabled:

- The affected card first downloads its microcode without blocking the traffic between other interface processors.
- The MEMD is then reloaded. As stated above, this process only takes a few seconds. During that time, all traffic is interrupted.

In summary, traffic interruption lasts around 20 seconds (microcode download and reloading) for the affected interface, and just a few seconds for all other interfaces (compared to two minutes for all the interfaces in a standard cbus complex restart).

Collecting Troubleshooting Information for the Cisco TAC

If you create a new Cisco TAC Service Request (registered customers only), attach the this information to your case for troubleshooting `%RSP-3-RESTART: cbus complex error` messages:

- Troubleshooting performed before opening the case.
- The **show tech-support** command output (in enable mode if possible).
- The **show log** command output, or console captures if available.

Attach the collected data to your case in nonzipped, plain text format (.txt). You can attach information to your case by uploading it using the TAC Service Request Tool (registered customers only) tool. If you cannot access the Case Query tool, you can attach the relevant information to your case by sending it to `attach@cisco.com` with your case number in the subject line of your message.

Do not manually reload or power-cycle the router before collecting the above information unless required to troubleshoot a `%RSP-3-RESTART: cbus complex error`, as this can cause important information to be lost that is needed for determining the root cause of the problem.

Related Information

- [Troubleshooting Versatile Interface Processor \(VIP\) Crashes](#)
- [Troubleshooting Router Crashes](#)
- [Single Line Card Reload Feature](#)
- [Technical Support – Cisco Systems](#)

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