Zeroization

Zeroization erases all potentially sensitive information in the router memory. This includes the erasure of the main memory, cache memories, and other memories containing packet data, NVRAM, and Flash memory. The Zeroization button on the faceplate is used to invoke zeroization. The parameters for zeroization can be configured, but zeroization cannot be invoked through the command-line interface (CLI).

Zeroization is disabled by default.

Feature History for zeroisation

Release	Modification
12.3(8)YD	This feature was introduced.
12.4(2)T	This feature was integrated into Cisco IOS Release 12.4(2)T.

Finding Support Information for Platforms and Cisco IOS Software Images

Use Cisco Feature Navigator to find information about platform support and Cisco IOS software image support. Access Cisco Feature Navigator at http://www.cisco.com/go/fn. You must have an account on Cisco.com. If you do not have an account or have forgotten your username or password, click **Cancel** at the login dialog box and follow the instructions that appear.

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Restrictions for Zeroization

- Zeroization is supported on the Cisco 3200 series routers only.
- When zeroization is enabled, the auxiliary (AUX) port should not be used for any function other than an actuator, such as a push button. There is no way to reliably ascertain whether a device connected to the AUX port might trigger zeroization. We recommend that if zeroization is enabled, no devices, with the exception of the zeroization actuator, be attached to the AUX port. There are some AUX port configuration restrictions that apply when zeroization is enabled.
- Zeroization can only be invoked and executed locally. It cannot be invoked and executed remotely through a Telnet session.
- Zeroization shuts down all network interfaces and causes zeroization of the Cisco IOS configuration and object code files, including all IP addresses on the router that are contained in volatile memory.

Information About Zeroization

To invoke zeroization, you should understand the following concept:

- Scrubbing the Router Memory, page 2

Scrubbing the Router Memory

Scrubbing is defined as performing several passes through the memory areas, overwriting the memory using a separate data pattern for each pass. The data patterns used for scrubbing consist of separate passes; each pass fills the memory with the following data patterns:

- All ones (that is, 0xffff ffff)
- Alternating ones and zeroes (that is, 0xa5a5 a5a5)
- Alternating zeroes and ones (that is, 0x5a5a 5a5a)
- All zeroes (that is, 0x0000 0000)

The data patterns ensure that

- Each bit in the memory is cleared to zero and set to one at least once.
- The final state of the memory is such that all prior information is erased.

The following items in the router memory are scrubbed:

- Dual-port RAM in the CPM
- Main memory

All the main memory is scrubbed except the memory area containing a small program loop that does the actual scrubbing.

The following items in the router memory cannot be scrubbed:

- Console and AUX port UART FIFO queues. A series of characters is forced through the FIFO queues to ensure that all sensitive information in the FIFO queues is flushed.
- NVRAM, which is erased entirely.
- Flash memory file system, which is erased entirely.

- Caches, which are flushed and invalidated, eliminating all of the information. The process of scrubbing the main memory causes all cache lines to receive the scrubbing data patterns.

Note Some items cannot be completely scrubbed. For example, some devices provide a *reset* or *invalidate* of their memory, rather than providing a full data path through which the scrubbing patterns can be written upon memory.

Command Reference

This section documents modified commands only.

- **service declassify**
- **show declassify**

show declassify

To display the state of the declassify function (enabled, in progress, and so forth) and the sequence of declassification steps that will be performed, use the **show declassify** command in global configuration mode.

show declassify

Syntax Description

This command has no arguments or keywords.

Note The **show declassify** command is supported on the Cisco 3200 series routers only.

Command Modes

Global configuration

Command History

Release	Modification
12.3(8)YD	This command was introduced.
12.4(2)T	This command was integrated into Cisco IOS Release 12.4(2)T.

Examples

The following example is sample output for the **show declassify** command:

```
Router# show declassify

Declassify facility: Enabled=Yes  In Progress=No
    Erase flash=Yes  Erase nvram=Yes
    Obtain memory size
    Shutdown Interfaces
    Declassify Console and Aux Ports
    Erase flash
    Declassify NVRAM
    Declassify Communications Processor Module
    Declassify RAM, D-Cache, and I-Cache
```

Table 1 describes the significant fields shown in the display.

Table 1 show declassify Field Descriptions

Field	Description
Enabled	A “Yes” value indicates that zeroization is enabled. A “No” value indicates that zeroization is disabled.
In Progress	A “Yes” value indicates that zeroization is currently in progress. A “No” value indicates that zeroization is currently not in progress.

Table 1 show declassify Field Descriptions (continued)

Field	Description
Erase flash	A “Yes” value indicates that erasure of Flash memory is enabled. A “No” value indicates that the erasure of Flash memory is disabled.
Erase nvram	A “Yes” value indicates that the erasure of NVRAM is enabled. A “No” value indicates that the erasure of NVRAM is disabled.
Obtain memory size	Obtain the main memory size in order to understand how much of the memory is to be scrubbed.
Shutdown Interfaces	Shut down any and all network interfaces.
Declassify Console and AUX Ports	Remove potentially sensitive information from console and AUX port FIFOs.
Erase flash	Erase Flash memory.
Declassify NVRAM	Erase NVRAM.
Declassify Communications Processor Module	Erase the memory in the Communications Processor Module (CPM).
Declassify RAM, D-Cache, and I-Cache	Scrub the main memory, erase the Data Cache (D-Cache), and erase the Instruction Cache (I-Cache).

Related Commands

Command	Description
service declassify	Invokes declassification.