



Defining Memory Threshold Notifications

Last Updated: October 10, 2011

The Memory Threshold Notifications feature allows you to reserve memory for critical notifications and to configure a router to issue notifications when available memory falls below a specified threshold.

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Finding Feature Information

Your software release may not support all the features documented in this module. For the latest feature information and caveats, see the release notes for your platform and software release. To find information about the features documented in this module, and to see a list of the releases in which each feature is supported, see the Feature Information Table at the end of this document.

Use Cisco Feature Navigator to find information about platform support and Cisco software image support. To access Cisco Feature Navigator, go to www.cisco.com/go/cfn. An account on Cisco.com is not required.

Information About Memory Threshold Notifications

The Memory Threshold Notifications feature provides two ways to mitigate low-memory conditions on a router: notifications can be sent to indicate that free memory has fallen below a configured threshold, and memory can be reserved to ensure that sufficient memory is available to issue critical notifications. To implement the Memory Threshold Notifications feature, you should understand the following concepts:

- [Memory Threshold Notifications, page 2](#)
- [Memory Reservation, page 2](#)



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Memory Threshold Notifications

Notifications are messages issued by the router. When you specify a memory threshold using the **memory free low-watermark** command, for example, the router issues a notification when available free memory falls below the specified threshold, and again once available free memory rises to 5 percent above the specified threshold. The following are examples of memory threshold notifications:

Available Free Memory Less Than the Specified Threshold

```
000029: *Aug 12 22:31:19.559: %SYS-4-FREEMEMLOW: Free Memory has dropped below 2000k
Pool: Processor Free: 66814056 freemem_lwm: 204800000
```

Available Free Memory Recovered to More Than the Specified Threshold

```
000032: *Aug 12 22:33:29.411: %SYS-5-FREEMEMRECOVER: Free Memory has recovered 2000k
Pool: Processor Free: 66813960 freemem_lwm: 0
```

Memory Reservation

Memory reservation for critical operations ensures that management processes, such as event logging, continue to function even when router memory is exhausted.

How to Define Memory Threshold Notifications

- [Setting a Low Free Memory Threshold, page 2](#)
- [Reserving Memory for Critical Notifications, page 3](#)

Setting a Low Free Memory Threshold

Perform this task to set a low free memory threshold.

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **memory free low-watermark [processor *threshold*]**

DETAILED STEPS

Command or Action	Purpose
Step 1 enable Example: Router> enable	Enables privileged EXEC mode. <ul style="list-style-type: none"> • Enter your password if prompted.

Command or Action	Purpose
Step 2 <code>configure terminal</code> Example: <pre>Router# configure terminal</pre>	Enters global configuration mode.
Step 3 <code>memory free low-watermark [processor <i>threshold</i>]</code> Example: <pre>Router(config)# memory free low-watermark processor 20000</pre>	Specifies a threshold in kilobytes of free processor memory. To view acceptable values for the memory threshold, enter the following command: <ul style="list-style-type: none"> • <code>memory free low-watermark processor ?</code>

Reserving Memory for Critical Notifications

When a router is overloaded by processes, the amount of available memory might fall to levels insufficient for it to issue critical notifications. Perform this task to reserve a region of memory to be used by the router for the issuing of critical notifications.

SUMMARY STEPS

1. `enable`
2. `configure terminal`
3. `memory reserve critical kilobytes`

DETAILED STEPS

Command or Action	Purpose
Step 1 <code>enable</code> Example: <pre>Router> enable</pre>	Enables privileged EXEC mode. <ul style="list-style-type: none"> • Enter your password if prompted.
Step 2 <code>configure terminal</code> Example: <pre>Router# configure terminal</pre>	Enters global configuration mode.

Command or Action	Purpose
Step 3 <code>memory reserve critical <i>kilobytes</i></code> Example: Router(config)# <code>memory reserve critical 1000</code>	Reserves the specified amount of memory in kilobytes so that the router can issue critical notifications. <ul style="list-style-type: none"> The amount of memory reserved for critical notifications cannot exceed 25 percent of total available memory.

Configuration Examples for Memory Threshold Notifications

- [Setting a Low Free Memory Threshold Examples, page 4](#)
- [Reserving Memory for Critical Notifications Example, page 4](#)

Setting a Low Free Memory Threshold Examples

Threshold for Free Processor Memory

The following example shows how to specify a threshold of 20000 KB of free processor memory before the router issues notifications:

```
Router(config)# memory free low-watermark processor 20000
```

If available free memory falls below the specified threshold, the router sends a notification message like this one:

```
000029: *Aug 12 22:31:19.559: %SYS-4-FREEMEMLOW: Free Memory has dropped below 20000k
Pool: Processor Free: 66814056 freemem_lwm: 204800000
```

Once available free memory rises to above 5 percent of the threshold, the router sends a notification message like this one:

```
000032: *Aug 12 22:33:29.411: %SYS-5-FREEMEMRECOVER: Free Memory has recovered 20000k
Pool: Processor Free: 66813960 freemem_lwm: 0
```

Reserving Memory for Critical Notifications Example

The following example shows how to reserve 1000 KB of memory for critical notifications:

```
Router# memory reserved critical 1000
```



Note

The amount of memory reserved for critical notifications cannot exceed 25 percent of total available memory.

Additional References

The following sections provide references related to the Memory Threshold Notifications feature.

Related Documents

Related Topic	Document Title
Cisco IOS XE commands	For information about Cisco IOS XE commands, use the Command Lookup Tool at http://tools.cisco.com/Support/CLILookup or the Cisco IOS Master Command List, All Releases, at http://www.cisco.com/en/US/docs/ios/mcl/allreleasemcl/all_book.html .

Standards

Standard	Title
No new or modified standards are supported by this feature and support for existing standards has not been modified by this feature.	--

MIBs

MIB	MIBs Link
<ul style="list-style-type: none"> No new or modified MIBs are supported by this feature and support for existing MIBs has not been modified by this feature. 	To locate and download MIBs for selected platforms, Cisco IOS XE releases, and feature sets, use Cisco MIB Locator found at the following URL: http://www.cisco.com/go/mibs

RFCs

RFC	Title
No new or modified RFCs are supported by this feature and support for existing RFCs has not been modified by this feature.	--

Technical Assistance

Description	Link
<p>The Cisco Support website provides extensive online resources, including documentation and tools for troubleshooting and resolving technical issues with Cisco products and technologies.</p> <p>To receive security and technical information about your products, you can subscribe to various services, such as the Product Alert Tool (accessed from Field Notices), the Cisco Technical Services Newsletter, and Really Simple Syndication (RSS) Feeds.</p> <p>Access to most tools on the Cisco Support website requires a Cisco.com user ID and password.</p>	http://www.cisco.com/techsupport

Feature Information for Memory Threshold Notifications

The following table provides release information about the feature or features described in this module. This table lists only the software release that introduced support for a given feature in a given software release train. Unless noted otherwise, subsequent releases of that software release train also support that feature.

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Table 1 *Feature Information for Memory Threshold Notifications*

Feature Name	Releases	Feature Information
Memory Threshold Notifications	Cisco IOS XE Release 2.1	This feature was introduced on Cisco ASR 1000 Series Aggregation Services Routers.

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