

How RME Handles Shared Memory on Cisco IOS Devices

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Introduction

This technical tip addresses shared (I/O) memory handling on Cisco IOS® devices by Resource Manager Essentials (RME) applications.

Prerequisites

Requirements

There are no specific requirements for this document.

Components Used

This document is not restricted to specific software and hardware versions.

The information in this document was created from the devices in a specific lab environment. All of the devices used in this document started with a cleared (default) configuration. If your network is live, make sure that you understand the potential impact of any command.

Conventions

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

Management Information Base (MIB) Support on Devices

RME reads the memory information on Cisco IOS devices when the devices are imported into inventory. The Inventory application uses memory size for reporting purposes. The Software Image Manager (SWIM) uses the same information to verify that the device meets the memory requirements as mandated by a specific image during the software upgrade process.

Cisco IOS devices include several types of memory; for instance, processor memory, shared memory, protocol control information (PCI) memory, and so on. Shared memory, also called I/O memory, is common on Cisco 1600, 2500, and 4500 Series devices.

Cisco IOS® software supports the CISCO-MEMORY-POOL-MIB for Simple Network Management Protocol (SNMP) managers to read the memory information on the device. This MIB has a ciscoMemoryPoolTable. Each entry in the table corresponds to a different memory pool installed on the device. Each entry contains the ciscoMemoryPoolUsed and ciscoMemoryPoolFree MIB variables. If you add these two variables together, they equal the total size of that memory pool. If you add the sizes of all of these memory pools, they equal the total memory available on the device. This MIB is supported only on Cisco IOS 11.1 and later software releases.

Earlier versions of Cisco IOS software only return the size of processor memory using the processorRam MIB variable in OLD-CISCO-CHASSIS-MIB. Even though these earlier versions support shared memory, PCI memory, and so on, SNMP managers cannot read the size of such memory pools due to the lack of MIB support.

RME Application Handling

Because of the discrepancies in the available MIB instrumentation on Cisco IOS devices and the fact that different applications in RME use different sources to read memory information details, it is possible for users to be confused about how RME applications handle this information.

The Inventory application polls both the OLD-CISCO-CHASSIS-MIB and the CISCO-MEMORY-POOL-MIB to read the memory information on the device. On devices running software releases prior to Cisco IOS 11.1, RME applications can recognize only processor RAM (other types of memory such as shared memory, PCI memory, and so on, are not recognized). Processor RAM size is reported as the total memory on such devices.

The Inventory application uses the processorRam MIB variable to determine the processor RAM size on the device. This value appears in the *Chassis Information* section of the **Detailed Device Report** and the **Hardware Report**. The RAM size displayed by the Inventory application in these two reports does not include shared memory, PCI memory, and so on. The **Inventory Detailed Report** has a *Memory Pool* section that displays details about all the memory pools that are present on the device. You can use this section to read the sizes of shared memory and PCI memory present on the device.

SWIM's **Add Image to Library from CCO** and **Distribute Images** (Recommend Image Upgrade screen) functions use the information from the CISCO-MEMORY-POOL-MIB (if it is implemented on the device) to calculate the total size of memory available. SWIM sums up the ciscoMemoryPoolUsed and the ciscoMemoryPoolFree variable values in each entry to find the total size of memory on the device. If the CISCO-MEMORY-POOL-MIB is not available on the device, SWIM uses the processorRAM MIB variable value as the total size of memory.

In summary, to determine the total size of memory, the user should examine the *Memory Pool* section of the **Inventory Detailed Device Report**. If the software version running on the device is earlier than Cisco IOS 11.1, then the user should check the **show version** command output on the device to determine the amount of total memory.

How RME Applications Handle Memory Size

This is sample output of the **show version** command on one Cisco IOS device running Cisco IOS 11.0 and another running Cisco IOS 11.1. The last line in the command line interface (CLI) output indicates the device has a 16MB processor RAM and 2MB of shared memory.

Cisco IOS 11.0 output:

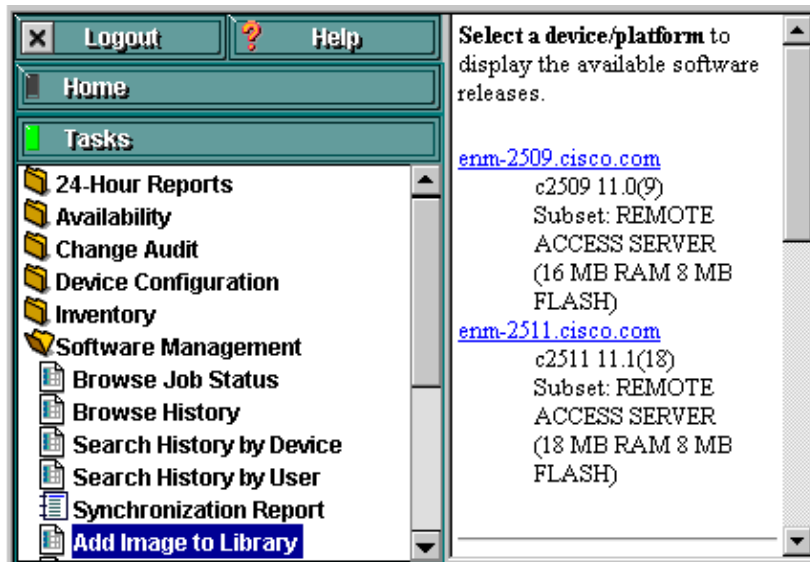
```
enm-2509> show version
```

```
Cisco Internetwork Operating System Software IOS (tm) 3000 Software (IGS-C-L),
Version 11.0(9), RELEASE SOFTWARE (fc1)
...
...
System image file is "igs-c-l.110-9", booted via flash
cisco 2509 (68030) processor (revision C) with 16384K/2048K bytes of memory.
enm-2509>
```

Cisco IOS 11.1 output:

```
enm-2511>show version
Cisco Internetwork Operating System Software IOS (tm) 3000 Software (IGS-C-L),
Version 11.1(18), RELEASE SOFTWARE (fc1)
...
...
System image file is "igs-c-l.111-18.bin", booted via flash
cisco 2511 (68030) processor (revision C) with 16384K/2048K bytes of memory.
enm-2511>
```

SWIM's Add Image to Library from CCO and Distribute Images windows display memory sizes for the above devices as 16MB and 18MB respectively. Shared memory is recognized only on the **enm-2511** device. This graphic illustrates this example:



Since SWIM does not always recognize shared memory, memory requirement checking results may be reported as failures for some devices. SWIM does this checking while it imports an image from CCO to the Software Library (for a specific device) and also while downloads the image to the device. If the software release on the device is earlier than Cisco IOS 11.1, the user should manually verify that the device has enough memory to run the image and continue with SWIM operation.

Related Information

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