

# Check Memory Usage on Cisco ASR 1000 Series Aggregation Services Routers

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## Introduction

This document provides information on how to maintain and check system memory size on the Cisco ASR 1000 Series Aggregation Services Routers (ASR). This document applies to all Cisco IOS XE software releases that support the Cisco ASR 1000 Series Aggregation Services Routers.

## Prerequisites

### Requirements

There are no specific requirements for this document.

### Components Used

The information in this document is based on these software and hardware versions:

- All Cisco ASR 1000 Series Aggregation Services Routers, which includes 1002, 1004 and 1006 routers.
- All Cisco IOS XE software releases that support the Cisco ASR 1000 Series Aggregation Services Routers.

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

Refer to Cisco Technical Tips Conventions for more information on document conventions.

# Memory Usage Overview

The route processor (RP) of the Cisco ASR 1000 Series Aggregation Services Router has synchronous dynamic RAM (SDRAM), which provides storage for code, data and packets. The RP offers memory scalability up to 4 GB for ASR1000–RP1 and 16 GB for ASR1000–RP2.

Cisco ASR 1000 Series Aggregation Services Routers introduce the Cisco IOS XE Software as their software architecture. Based on Cisco IOS Software, Cisco IOS XE Software is a modular operating system built on a Linux kernel on route processor. IOS daemon (IOSd) runs as a standard user–level process under Linux and provides the Cisco IOS feature set, which includes routing protocols. Upon startup, IOSd is granted access to a fixed amount of physical memory on the RP typically 50 percent or 1 GB on 2 GB systems and 2 GB on 4 GB systems. Dual IOS operation with 2/4RU chassis with 4GB of Main Memory for software redundancy each consume 1 GB.

In order to display memory size, software, hardware, and web interface version information, use the **show version** command.

```
Router#show version
Cisco IOS Software, IOS-XE Software (PPC_LINUX_IOSD-ADVIPSERVICESK9-M),
Version 12.2(33)XNB, RELEASE SOFTWARE (fc1)
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 1986-2008 by Cisco Systems, Inc.
Compiled Fri 05-Sep-08 08:56 by mcpre
```

```
Cisco IOS-XE software, Copyright (c) 1986-2008 by Cisco Systems, Inc.
All rights reserved. Certain components of Cisco IOS-XE software are
licensed under the GNU General Public License ("GPL") Version 2.0. The
software code licensed under GPL Version 2.0 is free software that comes
with ABSOLUTELY NO WARRANTY. You can redistribute and/or modify such
GPL code under the terms of GPL Version 2.0. For more details, see the
documentation or "License Notice" file accompanying the IOS-XE software,
or the applicable URL provided on the flyer accompanying the IOS-XE
software.
```

```
ROM: IOS-XE ROMMON
```

```
ASR1006b uptime is 6 days, 21 hours, 49 minutes
Uptime for this control processor is 6 days, 21 hours, 51 minutes
System returned to ROM by reload at 15:35:57 JST Thu Feb 5 2009
System restarted at 15:40:15 JST Thu Feb 5 2009
System image file is "bootflash:packages.conf"
Last reload reason: Reload command
```

```
This product contains cryptographic features and is subject to United
States and local country laws governing import, export, transfer and
use. Delivery of Cisco cryptographic products does not imply
third-party authority to import, export, distribute or use encryption.
Importers, exporters, distributors and users are responsible for
compliance with U.S. and local country laws. By using this product you
agree to comply with applicable laws and regulations. If you are unable
to comply with U.S. and local laws, return this product immediately.
```

```
A summary of U.S. laws governing Cisco cryptographic products may be found at:
http://www.cisco.com/wwl/export/crypto/tool/stqrg.html
```

```
If you require further assistance please contact us by sending email to
export@cisco.com.
```

```
cisco ASR1006 (RP1) processor with 1779130K/6147K bytes of memory.
```

```
!--- total memory allocated to IOSd.
```

16 Gigabit Ethernet interfaces  
21 Gigabit Ethernet interfaces  
2 Ten Gigabit Ethernet interfaces  
32768K bytes of non-volatile configuration memory.  
**4194304K bytes** of physical memory.

*!--- IOS-XE total memory size.*

955063K bytes of eUSB flash at bootflash:.  
39004543K bytes of SATA hard disk at harddisk:.

Configuration register is 0x2102

## Check Memory Usage

### Check Memory Usage within IOSd

The **show processes** command displays information about the active processes. Issue **show processes memory** to show the amount of memory used within IOSd.

Router#**show processes memory**

Processor Pool Total: 1821391588 Used: 218319000 Free: 1603072588  
lsmpi\_io Pool Total: 6295088 Used: 6294116 Free: 972

PID	TTY	Allocated	Freed	Holding	Getbufs	Retbufs	Process
0	0	174405308	8586260	134742552	811	137870	*Init*
0	0	65688	393404	152	0	0	*Sched*
0	0	21603272	48285960	274932	3	1	*Dead*
0	0	0	0	406304	0	0	*MallocLite*
1	0	431576	0	448716	0	0	Chunk Manager
2	0	236	236	11140	0	0	Load Meter
3	0	2785880	2782996	32092	0	0	Exec
4	0	0	0	17140	0	0	Retransmission o
5	0	34360	0	17140	0	0	IPC ISSU Dispatc
6	0	3336	236	20240	0	0	Check heaps
7	0	32780	32780	17140	45	0	Pool Manager
8	0	236	236	17140	0	0	Timers
9	0	206550924	206496084	71980	9326586	9326586	ARP Input
10	0	24356	24356	17140	111	111	ARP Background
11	0	236	236	17140	0	0	ATM Idle Timer
12	0	0	0	17140	0	0	ATM ASYNC PROC
13	0	0	0	17140	0	0	AAA_SERVER_DEADT
14	0	0	0	29140	0	0	Policy Manager
15	0	59092	692	74972	172	172	Entity MIB API

### Check Memory Usage on IOS XE

In order to see current system memory usage on Cisco IOS XE, use the **show platform software status control-processor brief** command.

Router#**show platform software status control-processor brief**

Load Average

Slot	Status	1-Min	5-Min	15-Min
RP0	Healthy	0.20	0.23	0.19
RP1	Healthy	0.19	0.19	0.12
ESP0	Healthy	0.65	0.54	0.47
SIP1	Healthy	0.17	0.07	0.01
SIP2	Healthy	0.02	0.06	0.01

Memory (kB)

Slot	Status	Total	Used (Pct)	Free (Pct)	Committed (Pct)
RP0	Healthy	3919872	2710788 (65%)	1209084 (29%)	2327484 (56%)

```

RP1 Healthy 3919872 2377136 (57%) 1542736 (37%) 2320964 (56%)
ESP0 Healthy 2030444 1112344 (53%) 918100 (43%) 3409068 (162%)
SIP1 Healthy 484452 293408 (55%) 191044 (36%) 244180 (46%)
SIP2 Healthy 484452 293408 (55%) 191044 (36%) 244020 (46%)

```

#### CPU Utilization

```

Slot CPU User System Nice Idle IRQ SIRQ Iowait
RP0 0 10.91 1.88 0.00 86.67 0.38 0.13 0.00
RP1 0 8.06 1.22 0.00 90.11 0.00 0.03 0.55
ESP0 0 5.78 3.61 0.00 90.51 0.02 0.05 0.00
SIP1 0 4.32 0.45 0.00 95.20 0.00 0.01 0.00
SIP2 0 3.95 0.44 0.00 95.57 0.00 0.01 0.00

```

In order to display memory usage for each process running on Cisco IOS XE, use **monitor platform software process {fp|rp} {active|standby}**. After the screen appears, you can type **shift + M** in order to sort displayed processes with memory usage.

*RES* indicates the non-swapped physical memory a process uses and *SHR* indicates the amount of shared memory used by a process. *RES + SHR* is the total amount of a process, and *%MEM* indicates the currently used share of available physical memory for the processes.

```

Router#monitor platform software process rp active
top - 05:18:46 up 14 days, 17:33, 0 users, load average: 0.00, 0.01, 0.00
Tasks: 119 total, 1 running, 118 sleeping, 0 stopped, 0 zombie
Cpu(s): 0.4% us, 0.4% sy, 0.0% ni, 99.1% id, 0.0% wa, 0.0% hi, 0.0% si
Mem: 3714760k total, 1454344k used, 2260416k free, 97952k buffers
Swap: 0k total, 0k used, 0k free, 875376k cached

```

```

PID USER PR NI VIRT RES SHR S %CPU %MEM TIME+ COMMAND
17385 root 20 0 1874m 338m 75m S 0.2 9.3 65:59.18 ppc_linux_iosd-
18098 root 20 0 71880 59m 6324 S 0.2 1.6 10:48.84 smand
16521 root 20 0 87868 51m 47m S 0.0 1.4 0:02.80 fman_rp
16903 root 20 0 27788 16m 14m S 0.0 0.5 15:41.61 imand
15957 root 20 0 24776 9696 6880 S 0.2 0.3 12:49.67 cmand
17697 root 20 0 19504 6160 4544 S 0.0 0.2 0:00.95 psd
16316 root 20 0 18232 5972 3736 S 0.0 0.2 12:43.32 emd
16732 root 20 0 16184 5556 3900 S 0.4 0.1 21:22.61 hman
17237 root 20 0 15892 5456 3088 S 0.0 0.1 0:00.99 plogd
15166 root 20 0 4056 2396 1248 S 0.0 0.1 0:00.72 pvp.sh
16937 root 9 -11 3992 2308 1232 S 0.0 0.1 0:00.13 pman.sh
15559 root 9 -11 3992 2304 1228 S 0.0 0.1 0:00.13 pman.sh
17978 root 9 -11 3992 2304 1228 S 0.0 0.1 0:00.13 pman.sh

```

In case this message appears when you issue the **monitor platform software process** command on the console, you need to set a terminal type with the **terminal terminal-type** command in order to appropriate one, such as VT100.

```

Router#monitor platform software process rp active
Terminal type 'network' unsupported for command
Change the terminal type with the 'terminal terminal-type' command.

```

```

Router#terminal terminal-type VT100

```

## Check Memory Usage on QFP

In order to display information about memory usage of QFP, use the **show platform hardware qfp active infrastructure exmem statistics** command. **Exmem** contains IRAM, DRAM, SRAM and BQS related memory.

```

Router#show platform hardware qfp active infrastructure exmem statistics

```

QFP exmem statistics

```
Type: Name: IRAM, CPP: 0
  Total: 134217728
  InUse: 5372928
  Free: 127926272
  Free protected: 918528
  Free unprotected: 0
  Lowest free water mark: 128844800
  Largest free block: 99505152
Type: Name: DRAM, CPP: 0
  Total: 402653184
  InUse: 124705792
  Free: 275775488
  Free protected: 1041408
  Free unprotected: 1130496
  Lowest free water mark: 275587072
  Largest free block: 273415168
```

<snip>

In order to display memory usage for each user, add user options, as shown.

```
Router#show platform hardware qfp active infrastructure exmem statistics user
Type: Name: IRAM, CPP: 0
```

Allocations	Bytes-Alloc	Bytes-Total	User-Name
1	115200	115712	CPP_FIA

```
Type: Name: DRAM, CPP: 0
```

Allocations	Bytes-Alloc	Bytes-Total	User-Name
4	1248	4096	P/I
22	11567884	11585536	SBC
9	270600	276480	CEF
1	1138256	1138688	QM RM
3	528	3072	CFM
4	262144	262144	Qm 16
34	8405116	8436736	ING_EGR_UIDB
1	655360	655360	ING EGR INPUT CHUNK_Config_0

<snip>

In order to display TCAM usage of QFP, use the **show platform hardware qfp active tcam resource-manager usage** command.

```
Router#show platform hardware qfp active tcam resource-manager usage
QFP TCAM Usage Information
```

80 Bit Region Information

```
-----
Name                                     : Leaf Region #0
Number of cells per entry                : 1
Current 80 bit entries used              : 0
Current used cell entries                 : 0
Current free cell entries                 : 0
:
```

Total TCAM Cell Usage Information

```
-----
Name                                     : TCAM #0 on CPP #0
Total number of regions                  : 3
```

Total tcam used cell entries : 0  
Total tcam free cell entries : 131072  
Threshold status : below critical limit

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## Related Information

- [Troubleshoot Cisco ASR 1000 Series Aggregation Services Routers Crashes](#)
  - [Cisco ASR 1000 Series Aggregation Services Routers Support Page](#)
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