



## **Cisco SCA BB SNMP Real-Time Monitoring User Guide**

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# Preface

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## Introduction

This preface describes who should read this guide, how it is organized, and its document conventions. This guide is for experienced network administrators who use Cisco Service Control and the SCA BB application to monitor and control their network.

## Document Revision History

Table 1 records the changes to this document.

**Table 1**      *Document Revision History*

Revision	Cisco Service Control Release and Date	Change Summary
OL-30613-01	Supports all 4.1.x releases December 23, 2013	First version of this document.

## Organization

Table 2 lists the document organization of this guide.

**Table 2**      *Document Organization*

Section	Title	Description
1	<a href="#">Overview</a>	Provides an overview of MRTG and RRDTool, and how they are used to monitor a Cisco Service Control network.
2	<a href="#">Getting Started</a>	Explains the general procedure for real-time SNMP monitoring and also the general procedure for using the Cisco SCA BB real-time monitoring configuration utility.

**Table 2** Document Organization (continued)

Section	Title	Description
3	<a href="#">Real-Time Monitoring Configuration Utility</a>	Explains specific procedures for using the Cisco SCA BB real-time monitoring configuration utility, <code>rtmcmd</code> .
4	<a href="#">Troubleshooting</a>	Presents error messages and possible causes of the error.

## Related Publications

Use the Cisco SCA BB SNMP Real-Time Monitoring User Guide with the following Cisco documentation:

- [Cisco Service Control Application for Broadband User Guide](#)
- [Cisco Service Control Application for Broadband Reference Guide](#)
- [Cisco SCA BB Service Configuration API Programmer Guide](#)

## Conventions

This document uses the following conventions:

**Table 3** Document Conventions

Convention	Indication
<b>bold font</b>	Commands and keywords and user-entered text appear in <b>bold font</b> .
<i>italic font</i>	Document titles, new or emphasized terms, and arguments for which you supply values are in <i>italic font</i> .
[ ]	Elements in square brackets are optional.
{ x   y   z }	Required alternative keywords are grouped in braces and separated by vertical bars.
[ x   y   z ]	Optional alternative keywords are grouped in brackets and separated by vertical bars.
string	A nonquoted set of characters. Do not use quotation marks around the string or the string will include the quotation marks.
<code>courier font</code>	Terminal sessions and information the system displays appear in <code>courier font</code> .
< >	Nonprinting characters such as passwords are in angle brackets.
[ ]	Default responses to system prompts are in square brackets.
!, #	An exclamation point (!) or a pound sign (#) at the beginning of a line of code indicates a comment line.



**Note**

Means *reader take note*.



**Tip**

---

Means *the following information will help you solve a problem.*

---



**Caution**

---

Means *reader be careful.* In this situation, you might perform an action that could result in equipment damage or loss of data.

---



**Timesaver**

---

Means *the described action saves time.* You can save time by performing the action described in the paragraph.

---



**Warning**

---

**Means *reader be warned.* In this situation, you might perform an action that could result in bodily injury.**

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## Obtaining Documentation and Submitting a Service Request

For information on obtaining documentation, submitting a service request, and gathering additional information, see the monthly *What's New in Cisco Product Documentation*, which also lists all new and revised Cisco technical documentation, at:

<http://www.cisco.com/en/US/docs/general/whatsnew/whatsnew.html>

Subscribe to the *What's New in Cisco Product Documentation* as a Really Simple Syndication (RSS) feed and set content to be delivered directly to your desktop using a reader application. The RSS feeds are a free service and Cisco currently supports RSS version 2.0.







# Overview

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## Introduction

SNMP-based monitoring tools, such as Multi Router Traffic Grapher (MRTG), allow network administrators to monitor the activity and health of network devices in real time. Cisco SCA BB includes an SNMP-based real-time monitoring solution, which is implemented by using MRTG and a Round Robin Database (RRDTool).



**Note**

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Support for SNMP Real-Time Monitoring is available only for the SCE 1010 and SCE 2020, not the SCE 8000

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The SCA BB Real-Time Monitoring Configuration Utility (rtmcmd) is a command-line utility (CLU) for automating the production of the files required by the MRTG tool.

This chapter consists of these sections:

- [What Are MRTG and RRDTool?, page 1-1](#)
- [Components of SNMP RTM with MRTG and RRDTool, page 1-2](#)
- [SCA BB Real-Time Monitoring Reports, page 1-3](#)
- [SCA BB Real-Time Monitoring Environment, page 1-5](#)

## What Are MRTG and RRDTool?

The MRTG is a tool that monitors the traffic load on network links by monitoring specified SNMP counters. MRTG generates HTML pages containing images that provide real-time visual representation of this traffic, allowing the user to see traffic load on a network over time in graphical form. The Cisco Service Control Engine (SCE) platform running the Cisco SCA BB application provides numerous SNMP counters that can be used to produce reports.

The RRDTool stores and displays time-series data. The data is stored in a round-robin database so that the system storage footprint remains constant over time. This tool is used with MRTG to produce higher-quality graphics.

## References

See the following sites for MRTG and RRDTool documentation and download:

- MRTG web page
- RRDTool web page

## Components of SNMP RTM with MRTG and RRDTool

MRTG is a script that collects SNMP data from monitored devices. It monitors SNMP network devices and stores the retrieved data in a database. It is written in Perl and works on UNIX, Linux and Windows.

MRTG is a free software licensed under the GNU GPL. It requires the following:

- Perl
- RRDTool to persist data and to generate high-quality graphs

The MRTG CFG file lists the SNMP Object IDs (OIDs) of the SNMP counters that MRTG should poll.

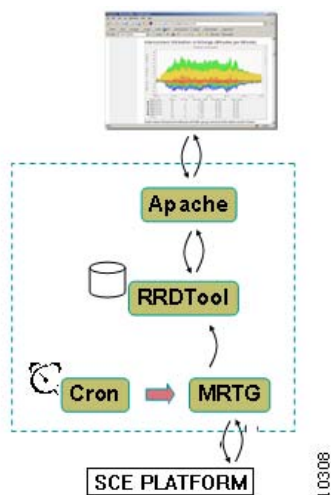
RRDTool stores data and generates charts. RRDTool uses Round Robin Database to store time-series data, and generates charts by using this data.

RRDTool is a free software licensed under the Gnu GPL. It requires a web server to delegate user-requests to the CGI interpreter of the RRDTool.

- RRDTool CGI files implement the report web pages. These files are executable scripts residing on the web server. When you request a report web page, RRDTool executes the script and dynamically creates the updated chart.
- Cron (or any other scheduling service) periodically invokes MRTG to poll SNMP counters from monitored devices.
- Apache (or any other web server) serves the charts to the user web browser.
- Cisco Service Control platforms support MIB counters that MRTG monitors.

Figure 1-1 illustrates the components of a real-time SNMP monitoring system in action.

**Figure 1-1** Components of a Real-Time SNMP Monitoring System



## References

See the following sites for RTM software components documentation and download:

- PyCron (for Windows setups)
- ActivePerl (for running MRTG)
- Apache web server

## SCA BB Real-Time Monitoring Reports

This section consists of these topics:

- [Predefined SCA BB Real-Time Monitoring Reports, page 1-3](#)
- [About Real-Time Monitoring Reports, page 1-4](#)

## Predefined SCA BB Real-Time Monitoring Reports

MRTG and RRDTool each require configuration files containing the information necessary for creating the reports, such as the OIDs of the relevant SNMP counters. To simplify the process of creating and maintaining MRTG configuration files and RRDTool CGI report files, Cisco SCA BB provides the following:

- A set of templates for creating MRTG CFG files and RRDTool CGI files that implement predefined reports based on SCE and SCA BB MIBs. These templates cannot be used as is, and must first be processed to reflect the specific service configuration to be monitored.
- A software tool, `rtmcmd`, that processes the templates into CFG and CGI files, according to the specified SCA BB service configuration and SCE platform hostname or IP address.

[Table 1-1](#) lists the available Cisco Service Control predefined SNMP-based reports.

**Table 1-1** *Predefined SCA BB Real-Time Monitoring Reports*

Number	Report Title
SCA BB Reports	
1	Link 1 Global Downstream BW per Service
2	Link 1 Global Upstream BW per Service
3	Link 2 Global Downstream BW per Service
4	Link 2 Global Upstream BW per Service
5	Total Global Downstream BW per Service
6	Total Global Upstream BW per Service
7	Global Active Subscribers per Service
8	Global Concurrent Sessions per Service
9	Global Concurrent Voice Calls
SCE Operational Reports	
10	Log Counters

**Table 1-1** *Predefined SCA BB Real-Time Monitoring Reports (continued)*

Number	Report Title
11	Active Flows per Traffic Processor
12	Traffic Processors Average Utilization
13	Flow Open Rate per Traffic Processor
14	Packets Rate per Traffic Processor
15	Subscriber Counters
16	RDR Counters
17	Downstream Bandwidth per TX Queue
18	Upstream Bandwidth per TX Queue

## About Real-Time Monitoring Reports

Note the following general information about charts:

- Each report is made of the following four charts:
  - Daily (5-minute average)
  - Weekly (30-minute average)
  - Monthly (2-hour average)
  - Yearly (1-day average)

Each chart represents different time scales. These charts are based on the round robin archives for each SNMP counter. MRTG creates these round robin archives.

- The legend items for each graph item (including the total item) include the following information for each item:
  - Average value
  - Maximum value
  - Current value
- The data in each chart is a series of average values. For example, a series of 5-minute-average values for the daily chart, 30-minute-average for the weekly chart, and so on.
- Maximum value items do not show the actual highest value of the monitored counter in each period, but the highest average value in the series, which is likely to be lower than the actual maximum value.
- The colors of the chart items are taken from a predefined, nonconfigurable set of colors.

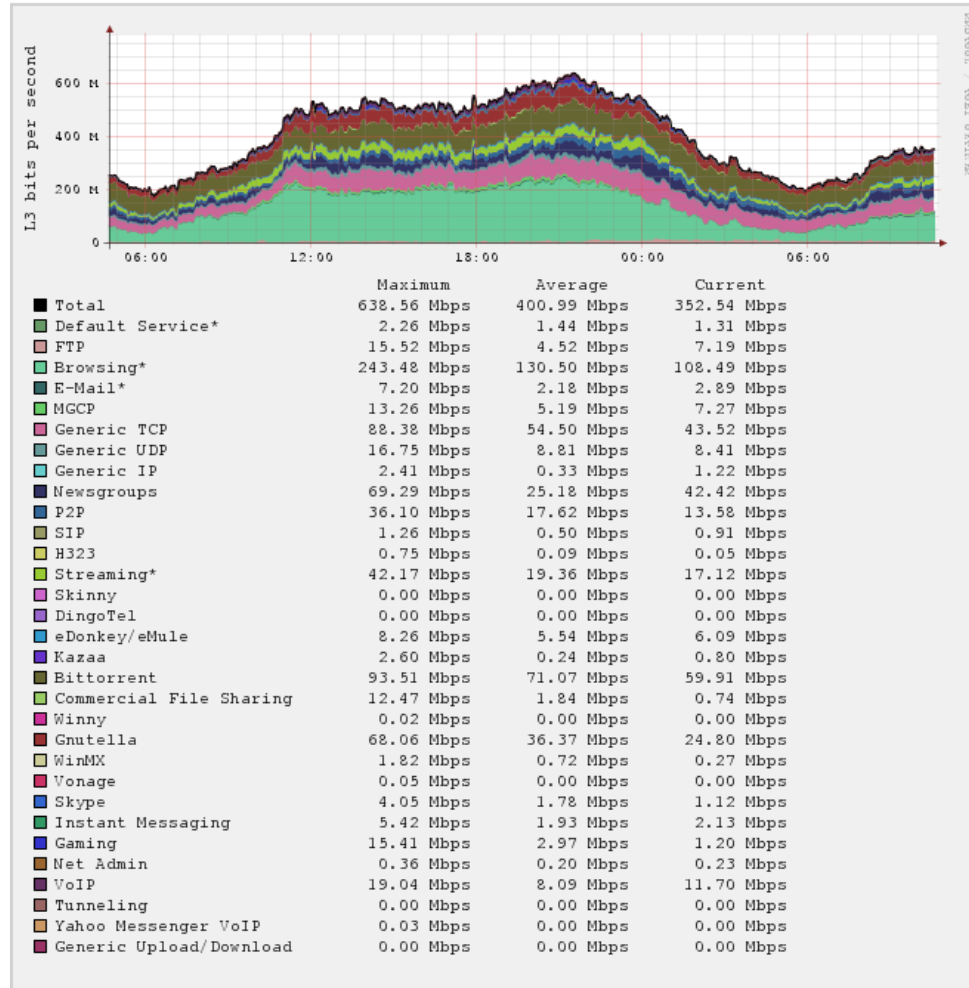
Figure 1-2 shows a report example.

Figure 1-2 Sample Graph

## SCE @ 10.10.10.10 - Total Global Downstream BW per Service

Created: Mon Nov 06 17:59:33 2006 ; Refreshed every 5 minutes.

### "Daily" Graph (5 Minute Average)



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## SCA BB Real-Time Monitoring Environment

This section consists of these topics:

- [SCA BB Real-Time Monitoring Setup, page 1-6](#)
- [RTM Directory, page 1-6](#)

## SCA BB Real-Time Monitoring Setup

An RTM setup requires the installation of the components described in [Chapter 3, “Real-Time Monitoring Configuration Utility,”](#) and can be set up on either Windows or UNIX/Linux servers.

[Chapter 2, “Getting Started”](#) provides a step-by-step description how to set up a SCA BB RTM system.

A SCA BB RTM system requires MRTG Version 2.14 and RRDTool Version 1.2. Consult the MRTG web site for the exact Perl version that is required.

Cisco has tested SCA BB RTM systems on the following setups:

- Windows 2000/XP using Apache v2.2 and PyCron v0.5
- Linux Red Hat 3 and Red Hat 4.



**Note**

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The SCA BB RTM functionality can support up to 90 SCE platforms.

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## RTM Directory

To view a report, RTM users browse to a URL mapped to a designated directory on their web server. This designated directory is referred to as the RTM directory. Users are required to create the RTM directory under the web server web documents directory tree. For example, when using an Apache web server on a Windows system, the RTM directory might be located at

C:/PROGRA~1/APACHE~1/Apache2.2/htdocs/rtm. Upon completion of an RTM setup installation (see [Chapter 2, “Getting Started”](#)), the SCA BB RTM directory contains the following subdirectories and files:

- An mrtg-cfg folder containing an MRTG CFG file for each monitored SCE platform. The CFG file names follow this pattern—<SCE IP/Host- name>\_scabb\_mrtg.cfg.
- A directory for each SCE named sce\_<SCE IP/Host-name >. These directories contain the Report CGI files and the RRDTool archives after the first invocation of MRTG.
- A static folder containing common, invariant files such as Cascading Style Sheets (CSS) and image files.
- An htaccess file (Apache web server only). This file is used to exclude files or folders from the automatic listings of the RTM directory.



# Getting Started

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## Introduction

This chapter provides details on using the MRTG tool, the RRD tool, and the SNMP Real-time monitoring configuration utility.

This chapter consists of these sections:

- [Using MRTG and RRDTool for Real-Time SNMP Monitoring, page 2-1](#)
- [Web Server Configuration, page 2-3](#)
- [Using the SCA BB Real-Time Monitoring Configuration Utility, page 2-4](#)
- [Installing the rtmcmd Utility and the RTM Report Templates, page 2-5](#)

## Using MRTG and RRDTool for Real-Time SNMP Monitoring

To produce graphics to monitor your network in real time using MRTG and RRDTool, follow these general steps.

### SUMMARY STEPS

1. Install MRTG (requires Perl installation) and RRDTool
2. Install cron or any other scheduling service
3. Install a web server.
4. Configure the web server to allow CGI script execution and automatic listings of directories. See [“How to Install the CFG and CGI Files for Use by MRTG and RRDTool”](#) section on page 3-5.
5. Create the RTM directory under the web server web documents directory tree. See [Chapter 1, “Overview”](#).
6. For each SCE device that you want to monitor, create the necessary CFG and CGI files. The CFG and CGI files reflect the service configuration applied to the monitored SCE devices. Cisco Service Control provides a utility to create the files, necessary to produce a range of predefined reports, automatically. See [Chapter 3, “Real-Time Monitoring Configuration Utility”](#) and the [“Real-Time Monitoring Configuration Overview”](#) section on page 3-1.
7. Install the MRTG CFG and Report CGI files on the RTM setup.

8. Configure the cron job to invoke MRTG periodically on the MRTG CFG files created for each SCE device.
9. Monitor the reports by using a web browser.

### DETAILED STEPS

---

- Step 1** Install MRTG (requires Perl installation) and RRDTool.
- Step 2** Install cron or any other scheduling service.
- Step 3** Install a web server.
- Step 4** Configure the web server to allow CGI script execution and automatic listings of directories. See [“How to Install the CFG and CGI Files for Use by MRTG and RRDTool”](#) section on page 3-5.
- Step 5** Create the RTM directory under the web server web documents directory tree. See [Chapter 1, “Overview”](#).
- Step 6** For each SCE device that you want to monitor, create the necessary CFG and CGI files. The CFG and CGI files reflect the service configuration applied to the monitored SCE devices. Cisco Service Control provides a utility to create the files, necessary to produce a range of predefined reports, automatically. See [Chapter 3, “Real-Time Monitoring Configuration Utility”](#) and the [“Real-Time Monitoring Configuration Overview”](#) section on page 3-1.
- Step 7** Install the MRTG CFG and Report CGI files on the RTM setup.
- Step 8** Configure the cron job to invoke MRTG periodically on the MRTG CFG files created for each SCE device.
- Step 9** Monitor the reports by using a web browser.
  - a. Browse to the root of the RTM directory and select an SCE device.
  - b. Select a report from the available reports listed on the left. [Figure 2-1](#) is a screen shot taken after selecting an SCE device.



Figure 2-1 Report Selection

SCE @ 10.10.10.10

- [Link 1 Global Downstream BW per Service](#)
- [Link 1 Global Upstream BW per Service](#)
- [Link 2 Global Downstream BW per Service](#)
- [Link 2 Global Upstream BW per Service](#)
- [Total Global Downstream BW per Service](#)
- [Total Global Upstream BW per Service](#)
- [Global Active Subscribers per Service](#)
- [Global Concurrent Sessions per Service](#)
- [Global Concurrent Voice Calls](#)
- [Log Counters](#)
- [Active Flows per Traffic Processor](#)
- [Traffic Processors Average Utilization](#)
- [Flow Open Rate per Traffic Processor](#)
- [Packets Rate per Traffic Processor](#)
- [Subscriber Counters](#)
- [RDR Counters](#)
- [Downstream Bandwidth per TX Queue](#)
- [Upstream Bandwidth per TX Queue](#)

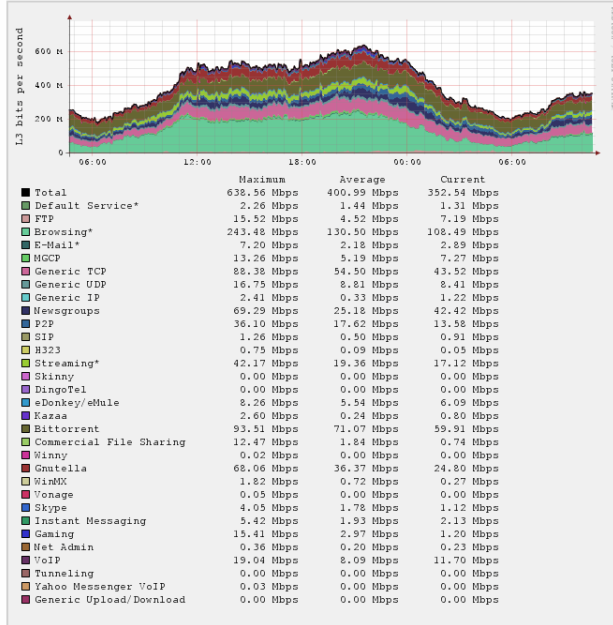


- [Daily](#)
- [Weekly](#)
- [Monthly](#)
- [Yearly](#)

SCE @ 10.10.10.10 - Total Global Downstream BW per Service

Created: Mon Nov 06 17:59:33 2006 ; Refreshed every 5 minutes.

"Daily" Graph (5 Minute Average)



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This guide focuses on Step 6, creating the CFG and CGI files for MRTG and RRDTool. The SCA BB Real-Time Monitoring Configuration utility creates the necessary files from the specified PQB file or service configuration.

The other steps in this process are explained in detail in the relevant MRTG and RRDTool documentation (see Chapter 1, "Overview").

# Web Server Configuration

The web server configuration should be such that it enables the following two common web server features:

- Executing CGI scripts—Reports are created on demand by browsing to a CGI script file that dynamically creates the report HTML page.
- Enabling automatic listings of directories when there is no directory index (for example, index.html). This feature, when configured, enables the listing of the SCE platforms for which MRTG CFG file and report CGI files have been prepared.

These features can be selectively enabled only for the RTM directory.

## Apache Web Server Configuration

The following configuration steps for the Apache Web Server reflect the general guidelines provided in the [“Web Server Configuration”](#) section on page 2-3.

- 
- Step 1** Add a directory section for the RTM directory to the Apache configuration file, httpd.conf. Use the following example as a template for the newly created section:

```
Directory "<Apache installation directory>/htdocs/<rtm directory>">
Options Indexes FollowSymLinks ExecCGIAllowOverride Indexes
Order allow,deny
</Directory>
```

- Step 2** Restart the Apache Web Server.
- 

## Using the SCA BB Real-Time Monitoring Configuration Utility

To use rtmcmd to produce the files for MRTG and RRDTool, follow this procedure:

### SUMMARY STEPS

1. If using rtmcmd for the first time, do the following:
  - a. Prepare a destination directory where the utility will save the CFG and CGI files. We recommend that you use a different directory than the RTM folder where the CFG and CGI files are installed.
  - b. Edit the user configuration file according to your setup (see the [“User Configuration File”](#) section on page 3-4). A sample configuration file (rtmcmf.cfg) is located in the bin directory in the utility installation directory.
2. Run rtmcmd, using the appropriate options and point it to the directories and configuration file you have prepared. See the [“rtmcmd Utility—Overview”](#) section on page 3-2).
3. Install CFG and CGI files into your RTM setup. See the [“How to Install the CFG and CGI Files for Use by MRTG and RRDTool”](#) section on page 3-5.

### DETAILED STEPS

---

- Step 1** If using rtmcmd for the first time, do the following:

- a. Install rtmcmd.
- b. Extract the templates distribution to a directory.

See the [“Installing the rtmcmd Utility and the RTM Report Templates”](#) section on page 2-5.

- Step 2** Prepare a destination directory where the utility will save the CFG and CGI files. We recommend that you use a different directory than the RTM folder where the CFG and CGI files are installed.

- Step 3** Edit the user configuration file according to your setup (see the [“User Configuration File”](#) section on page 3-4). A sample configuration file (rtmcmf.cfg) is located in the bin directory in the utility installation directory.

This step may not be required each time you run the utility if the directory locations have not been changed.

**Step 4** Run rtmcmd, using the appropriate options and point it to the directories and configuration file you have prepared (see the “[rtmcmd Utility](#)” section on page 3-2).

rtmcmd writes the files to the specified destination directory. The destination directory contains:

- A subdirectory for each SCE platform containing CGI report files, the index HTML file, and the reports index HTML file.
- A subdirectory for MRTG CFG files containing an MRTG CFG file for each SCE device.
- Sample files for the configuration of the cron application. There is one sample file for Windows and one sample file for UNIX/Linux.
- A static directory containing CSS and image files.
- An htaccess file—When using the Apache web server, this file is used to exclude files or folders from the automatic listings of a directory.

The resulting CFG files are compatible with the SCA BB and SCE MIBs of releases 3.0.5 and later.

If rtmcmd fails, an error log is available at the following locations:

- Linux—“<USERPROFILE>/p-cube/servconf.log”
- Windows—“<user folder>\p-cube\servconf.log”

**Step 5** Install CFG and CGI files into your RTM setup. See the “[How to Install the CFG and CGI Files for Use by MRTG and RRDTool](#)” section on page 3-5.

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## Installing the rtmcmd Utility and the RTM Report Templates

To install the SCA BB rtmcmd utility and RTM report templates, install the Java Runtime Environment. See the “[Installing the Java Runtime Environment](#)” section on page 2-5.

### Installing the Java Runtime Environment

To verify that the JRE is installed, run **java -version** at the command prompt; the Java version should start with 1.4 or 1.5.

The JRE can be downloaded from the Sun™ web site, at:  
<http://www.oracle.com/technetwork/java/javase/download-138376.html>

If a different version of JRE is also installed on the workstation, set the JAVA\_HOME environment variable in servconf to point to the JRE 1.4 installation directory. For example:

```
JAVA_HOME=C:\Program Files\Java\j2re1.4.2_08
```

**Step 1** Locate the file sca\_bb\_util.tgz file (located in the SCA BB distribution zip file), and copy it to a Windows or Linux workstation.

**Step 2** Unpack the file to a new folder.

The SCA BB Real-Time Monitoring Configuration Utility, rtmcmd, is located under the bin folder.

**Step 3** Locate the scabb\_rtm\_templates\_v3.0.5A\_b05.zip file.

The file is located on the Software Download of Cisco Service Control Application Suite for Broadband page at <http://www.cisco.com/cgi-bin/tablebuild.pl/scasbb>.

- Step 4** Download and copy the scabb\_rtm\_templates\_v3.0.5A\_b05.zip file to a Windows or Linux workstation.
- Step 5** Unpack the file to a new folder.
-



# Real-Time Monitoring Configuration Utility

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## Introduction

This chapter provides an overview of the Real-time monitoring configuration, `rtmcmd` utility, and user configuration files.

This chapter consists of these sections:

- [Real-Time Monitoring Configuration Overview, page 3-1](#)
- [rtmcmd Utility, page 3-2](#)
- [Information About the User Configuration File, page 3-3](#)
- [User Configuration File Format, page 3-4](#)
- [Files and Directories, page 3-5](#)
- [How to Install the CFG and CGI Files for Use by MRTG and RRDTool, page 3-5](#)

## Real-Time Monitoring Configuration Overview

The Real-Time Monitoring Configuration Utility (`rtmcmd`) is a Cisco Service Control software tool for processing the SCA BB report templates into the appropriate CFG and CGI files.

`rtmcmd` is:

- A Java command-line utility.
- Based on the SCA BB Service Configuration Java API.
- Can be used on both Windows and Linux platforms (provided with appropriate shell scripts).
- Compatible with SCA BB Release 3.0.5 and later. The resulting CFG files are compatible with the SCA BB and SCE MIBs of Releases 3.0.5 and later.

The utility expects the following arguments:

- The current service configuration from either of these sources:
  - A specified PQB file
  - A specified SCE platform from which to retrieve the service configuration. Using this option requires you to specify a username and password.

- The IP address or host name of the SCE platform from which SNMP data is collected.
- The directory location of the report templates.
- The target directory where the resulting CFG and CGI files should be saved. This directory is a temporary target location.
- The location of the user configuration file containing the information required for processing the report templates.

The utility compiles the templates and the PQB file into the actual CFG and CGI files required by MRTG and RRDTool, and stores the results in the specified target directory.

## rtmcmd Utility

This section consists of these topics:

- [rtmcmd Utility—Overview, page 3-2](#)
- [rtmcmd Utility—Examples, page 3-3](#)

### rtmcmd Utility—Overview

The command-line syntax of the SCA BB Real-Time Monitoring Configuration Utility is:

```
rtmcmd --sce <SCE IP addresses>{--file <PQB filename>| (--pqb-sce address <SCE
address>--username <username>--password <password>)} --source-dir <dir>--dest-dir
<dir>--config-file <file>
```

Table 3-1 lists the rtmcmd options.

**Table 3-1** rtmcmd Options

Option	Abbreviation (if applicable)	Description
--sce <SCE IP address>	-S	(Required) IP addresses of one or more SCE platforms from which SNMP data is collected.  Each IP address must be a valid SCE platform IP address or SCE hostname.  Enclose multiple addresses in quotation marks, separated by a semicolon.  For example: --sce "10.1.2.3;10.1.2.4;10.1.2.5"
--file <PQB filename>	-f	(Required if an SCE to retrieve from is not specified) PQB file to use.
--pqb-sce <SCE address>	-q	(Required if a PQB file is not specified) Hostname or IP addresses of the SCE platform from which the service configuration should be retrieved.
--username <username>	-U	(Required if an SCE to retrieve from is specified) Username for connecting to the SCE platform to retrieve the service configuration.

**Table 3-1** *rtmcmd Options (continued)*

Option	Abbreviation (if applicable)	Description
--password <password>	-P	(Required if username is specified) Password for connecting to the SCE platform to retrieve the Service Configuration.
--source-dir <dir>	-s	(Required) Template files location.
--dest-dir <dir>	-d	(Required) Target directory where the processed templates should be stored.
--config-file <file>	-c	(Required) (See the “User Configuration File” section on page 3-4).

Additional operations can be invoked to display information about the Real-Time Monitoring Configuration Utility by using the following syntax:

```
rtmcmd <operation>
```

Table 3-2 lists these additional rtmcmd operations.

**Table 3-2** *rtmcmd Operations*

Operation	Description
--version	Display rtmcmd version.
--help	Display rtmcmd help.

## rtmcmd Utility—Examples

Create report and configuration files for the specified SCE platforms. Load the service configuration file from a local file:

```
rtmcmd --sce="63.111.106.7;63.111.106.12" --file=servicecfg.pqb
--source-dir=/rtm-templates --dest-dir=/rtm-output
-c ./rtmcmd.cfg
```

Create report and configuration files for the specified SCE platforms. Retrieve a Service Configuration file from the specified SCE:

```
rtmcmd -S "63.111.106.7;63.111.106.12" -U user123 -P ****
--pqb-sce=63.111.106.7 --source-dir=/rtm-templates
--dest-dir=/rtm-output -c ./rtmcmd.cfg
```

## Information About the User Configuration File

This section consists of these topics:

- [User Configuration File, page 3-4](#)
- [rtmcmd User Configuration File Example, page 3-4](#)

## User Configuration File

The user configuration file contains user-specific information required by the `rtmcmd` utility. The SCA BB utilities distribution package contains a sample configuration file, named `rtmcmd.cfg`. Edit this file according to the details of your setup.

[Table 3-3](#) the configuration parameters that should be present in the user configuration file.

**Table 3-3** User Configuration File Parameters

Parameter	Description	Default Value	Required/Optional
<code>rrdtool_bin_dir</code>	Absolute path to the directory where <code>rrdtool</code> and <code>rrdcgi</code> binary files are installed.	—	Required
<code>rtm_dir</code>	Absolute path to the directory where RRD archives and CGI files are stored. This directory is under the web server web directory.	—	Required
<code>mrtg_bin_dir</code>	Absolute path to the directory where MRTG binary files are installed. This location is used to create MRTG invocation commands in the crontab sample file.	—	Required
<code>snmpCommunityString</code>	SNMP community string to use when accessing the SCE platforms.	Public	Required

## rtmcmd User Configuration File Example

The following is an example `rtmcmd` user configuration file:

```
#The absolute path to the RRD tool's execution files folder
#Use '\\' or '/' as path separator
rrdtool_bin_dir=C:/rrdtool-1.2.15/rrdtool/Release
#The absolute path where RTM files will be placed.
#This path will be used by MRTG to create and update the RRD files
#Note: path must not contain white spaces!
rtm_dir=C:/PROGRA~1/APACHE~1/Apache2.2/htdocs
#The absolute path to the MRTG bin folder.
#This path will be used to create file crontab.txt
mrtg_bin_dir=C:/mrtg-2.14.5/bin
#The SCE's community string
snmpCommunityString=public
```

## User Configuration File Format

The configuration text file is a list of key-value pairs, where the key is one of the parameters listed in the following format:

- Each key-value pair is on a separate line.
- A key-value pair may be extended across several adjacent lines by adding a backslash character at the end of each line.
- To use an actual backslash in the value (as in directory names on Windows), the backslash should be escaped with another backslash (“\\”) or a slash “/” can be used instead.



- To comment a line, add “#” or “!” at the beginning of the line.

For example:

```
# This is a comment line.
# Directory names should use escape backslashes:
rtm_dir=D:\\PROGRA~1\\APACHE~1\\Apache2.2\\htdocs
```

See the “[User Configuration File](#)” section on page 3-4 for details.

## Files and Directories

The real-time monitoring process requires that you specify a number of files and directories. Following is a brief summary of all relevant files and directories and where you must specify them:

- User configuration file:
  - rrdtool\_bin\_dir—Directory where MRTG and the web server will find the RRDTool binary files
  - rtm\_dir—The RTM directory is where MRTG will create and update the RRDTool archive files. We recommend that the target directory provided to the rtmcmd be different from the RTM directory (see the “[RTM Directory](#)” section on page 1-6). After rtmcmd completes processing the templates, copy the CFG and CGI files to the RTM directory. See the “[How to Install the CFG and CGI Files for Use by MRTG and RRDTool](#)” section on page 3-5 and the “[SCA BB Real-Time Monitoring Environment](#)” section on page 1-5.
  - mrtg\_bin\_dir—The location where MRTG binary files are installed. This location is used to create the MRTG invocation commands written to the crontab sample file.
- rtmcmd:
  - source directory—Location where rtmcmd will find the report templates.
  - destination directory—Location where rtmcmd will save the CFG and CGI files that it creates. After you run rtmcmd, you must move the generated files from this location to the appropriate MRTG and RRDTool directories.
- config-file—Location and filename of the user configuration file.
- Service Configuration—Location and name of the PQB file. The Service Configuration may alternatively be retrieved from a specified SCE platform.

## How to Install the CFG and CGI Files for Use by MRTG and RRDTool

After the rtmcmd utility creates the CFG and CGI files, install them into your RTM setup.

This section consists of these topics:

- [First Installation, page 3-5](#)
- [Files Update, page 3-6](#)

### First Installation

If this is a fresh installation of an RTM setup, complete the following steps.

**SUMMARY STEPS**

1. Copy the entire contents of the target directory created by rtmcmd, including all subdirectories, to the RTM directory. The rtm\_dir property, in the rtmcmd user configuration file, specifies the RTM directory. Do not copy the two crontab.txt sample files.
2. Add a Cron task that invokes MRTG periodically (every 5 minutes) on these CFG files, by adding a task line to the crontab file.

**DETAILED STEPS**

- 
- Step 1** Copy the entire contents of the target directory created by rtmcmd, including all subdirectories, to the RTM directory. The rtm\_dir property, in the rtmcmd user configuration file, specifies the RTM directory. Do not copy the two crontab.txt sample files.
- Step 2** Add a Cron task that invokes MRTG periodically (every 5 minutes) on these CFG files, by adding a task line to the crontab file. On Windows workstations, the line should resemble this:

```
*/5 * * * * <Full path to the Perl bin directory>\wperl.exe <Full path to the MRTG bin
directory>\mrtg <RTM directory>\mrtg-cfg\<SCE address>_scabb_mrtg.cfg
```

rtmcmd creates two crontab.txt sample files for Windows and for UNIX/Linux setups in the destination directory. Use these files to configure Cron.

For UNIX/Linux systems, after the periodic MRTG invocation command, add an update permission command (**chmod**) for RRD files providing read permissions to the web server. For the command details, see the crontab sample file created by the rtmcmd utility.

**Note**

When using Security Enhanced Linux (which is a standard feature of Redhat Enterprise 4), several extra steps might be required to ensure correct operation of the Apache server. A full discussion of this issue is beyond the scope of this document. Note the following command, which would be useful in case SELinux is activated and the system log indicates that Hyper Text Transfer Protocol Daemon (HTTPD) encounters permission problems: **chcon -R -h -t httpd\_sys\_content\_t <RTM directory>**.

The polling done by MRTG creates a CPU load on both the workstation, where MRTG is running, and on the SCE platform. Therefore, the following configuration is recommended:

- Polling period of once every 5 minutes
  - Maximum number of SCE platforms polled by a single workstation (assuming a Win2K machine, with Pentium 4, 3.2 GHz CPU, and 1 GB memory) is 10 SCE platforms
- 

## Files Update

The rtmcmd utility is used to create an updated set of MRTG configuration files and report CGI files when:

- Adding a new SCE device to the RTM setup.
- A change in the Service Configuration applied to some SCE devices should be reflected in the reports.

**SUMMARY STEPS**

1. Copy the newly created MRTG CFG files from the mrtg-cfg directory in the rtmcmd target directory to the mrtg-cfg directory in the RTM directory.
2. Add a cron task that invokes MRTG periodically on these CFG files.
3. Update the report CGI files—Copy the updated CGI files from the SCE folder to the appropriate directory in the RTM directory.

**DETAILED STEPS**

- 
- Step 1** Copy the newly created MRTG CFG files from the mrtg-cfg directory in the rtmcmd target directory to the mrtg-cfg directory within the RTM directory. The RTM directory is the same location as specified by the rtm\_dir property in the user configuration file.
- Step 2** Add a cron task that invokes MRTG periodically (every 5 minutes) on these CFG files, by adding a task line to the crontab file. This operation is described in detail in Step 2 of the [“First Installation” section on page 3-5](#).
- Step 3** Update the report CGI files—Copy the updated CGI files from the SCE folder created in the rtmcmd target directory to the appropriate directory in the RTM directory. You can copy the entire SCE folder if this SCE device has not been monitored before.
-





# Troubleshooting

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## Introduction

This chapter provides details for troubleshooting SNMP Real-time monitoring using Cisco SCE.

- [Error Message When Viewing a Report, page 4-1](#)
- [Reports Missing Data, page 4-3](#)

## Error Message When Viewing a Report

### Problem

Apparent Error Message: viewing a report returns with an error message.

```
Error opening <RRD archive name>.rrd: No such file or directory
```

### Cause and Solution

MRTG did not create RRD DB files. Verify that your <RTM Folder>/sce\_<SCE IP> does not contain \*.rrd files.

There are two possible reasons that MRTG did not create the RRD DB files:

1. MRTG execution failed and you should check that the following settings are correct:
  - a. Verify the SCE is accessible, for example ping.
  - b. Verify that the SCE SNMP agent is enabled.
  - c. Verify that the SCE community string is configured correctly in the RTM user configuration file.
  - d. Verify that the RTM directory is configured correctly in the user configuration file. The path cannot contain white space.



---

**Note** Use slash or '\W' as the path delimiter.

---

- e. Verify the RRDTool bin directory is configured correctly in the user configuration file.




---

**Note** Use slash or '\\' as the path delimiter.

---

- f. Run MRTG from a command prompt and verify that it completes with no errors:

```
perl <MRTG bin folder>/mrtg<RTM folder>/mrtg-cfg/<SCE address>_scabb_mrtg.cfg
```

2. Cron did not invoke MRTG.
  - a. Verify cron is configured correctly—Check that the MRTG invocation command for the specific SCE platform is correct.
  - b. If using PyCron, try running MRTG from PyCron GUI and verify that it completes with return code 0

## Problem

Apparent Error Message: viewing a report returns with an error message The server encountered an internal error or misconfiguration and was unable to complete your request.

## Cause

This error message appears on Unix/Linux systems if the web server user does not have execution permissions on the report CGI files of the SCE platform.

## Solution

Add execute permissions for all users to all .cgi files.

## Problem

Apparent Error Message: viewing a report returns with an error message.

```
ERROR: Opening <report image filename>.png' for write: Permission denied.
```

## Cause

This error message appears on UNIX/Linux systems if the web server user does not have *write* permissions on the SCE platform directory in the RTM directory.

## Solution

Add write permissions for all users to all SCE directories in the RTM directory.

## Problem

Apparent Error Message: viewing a report returns with an error message.

```
ERROR: opening <RRD archive name>.rrd': Permission denied.
```

## Cause

This error message appears on UNIX/Linux systems if the web server user does not have read permissions on RRD archive files in the SCE platform directory.

## Solution

Add read permissions for all users to all RRD archive files. The example crontab.txt file created by the rtmcmd for Unix/Linux systems contains a permissions change command for each monitored SCE. The permissions change command follows the MRTG invocation.

## Reports Missing Data

- [Problem, page 4-3](#)
- [Cause and Solution, page 4-3](#)

## Problem

Reports missing data. There is a sheer drop in reported traffic.

## Cause and Solution

Cron has stopped invoking MRTG.

1. Verify that the \*.rrd files in the sce\_<SCE IP> folder was not modified during the past five minutes.
2. Verify Cron is configured as a service and that the service active.
3. Run MRTG from a command line and verify that it completes with no errors.

```
perl <MRTG bin folder>/mrtg<RTM folder>/mrtg-cfg/<SCE address>_scabb_mrtg.cfg
```
4. Check that Cron settings are correct.

