



CHAPTER 1

Getting Started with Cisco Performance Management Reports

Cisco Prime Performance Manager is a highly scalable and easy to use performance management system. It allows Service Providers to proactively manage their next generation networks, including service assurance and capacity planning.

This guide describes how to extend the built-in reports that come “out of the box” with Prime Performance Manager by developing your own customized service reports.

This chapter contains:

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- [Key Components of the Report Writing Interface, page 1-2](#)
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XML-Based Service Reports

Prime Performance Manager reports are coded in XML. Out-of-the-box, Prime Performance Manager includes more than 400 reports that you can use as examples. You can copy an example report to your working directory, modify the XML, and then test and debug your report

The built-in reports display data reports on:

- Application traffic
- Availability of device interfaces, MPLS tunnels, pseudowires, and SNMP devices
- IP Quality of Service (QoS)
- IP Protocol performance
- IP Service-Level Agreement (SLA) statistics
- Resource Utilization, such as CPU and memory utilization
- Transport Statistics, such as ATM statistics, Ethernet Virtual Circuit (EVC) statistics, and so on

For details, see the *Cisco Prime Performance Manager 1.0 Data Sheet* on www.cisco.com. You should:

1. Go to <http://www.cisco.com/go/performance>.
2. Choose **Product Literature > Data Sheets**.

Key Components of the Report Writing Interface

The XML files, MIBs, and configuration files that you need to develop reports are located on the Prime Performance Manager Gateway server.

This guide tells you how to use:

- **Supported MIBs**—Prime Performance Manager provides support for over 400 Cisco and industry standard MIBs that you can use to develop reports
- **Capability Files**—Capability files let you define which MIBs are used in reports and which MIB variables are polled. There are two capability files:
 - **SystemCapability.xml**—Precoded system capability file. This file specifies the capabilities for the reports provided with the Prime Performance Manager system. Do not change this file.
 - **UserCapability.xml**—System capability file for user-developed reports. If you need to add or revise the reporting capabilities, specify your changes in this file.
- **Prepackaged XML Reports**—The Prime Performance Manager application provides over 130 XML report files that you can use as a model for your own reports.
- **Properties Files**—Each XML report file has a corresponding properties file that maps to the report XML file and defines variables used in the online reports and CSV reports.
- **Report Macros**—A collection of SNMP macros that you can call from your XML report code and UserCapability.xml file to perform processing tasks.

For example, an `IpAddress()` macro is provided to convert a specified object to an IP address.
- **BQL Files**—BQL Files enable cross-launching of your reports on Cisco Prime Network clients.
- **Online Help**—Includes system-generated help for your reports and a Reports Help page.

Directory Locations of Report Files and Related Files

Table 1-1 lists the locations of the reports and related files.

Table 1-1 Directory Locations for Prime Performance Manager Reports and Support Files

Files	Location
Performance reports (5-minute, 15-minute, hourly, daily, weekly, monthly) in CSV format	/opt/CSCOppm-gw/reports
Gateway log	opt/CSCOppm-gw/logs
Unit log	opt/CSCOppm-unit/logs
MIBs	/opt/CSCOppm-gw/etc/mibs
Capability Files	/opt/CSCOppm-gw/etc/ SystemCapability.xml /opt/CSCOppm-gw/etc/ UserCapability.xml

Table 1-1 Directory Locations for Prime Performance Manager Reports and Support Files

Files	Location
System XML reports/properties files	/opt/CSCOppm-gw/etc/pollers/system
User XML reports/properties files	/opt/CSCOppm-gw/etc/pollers/user
BQL Files	/opt/CSCOppm-gw/etc/bql/xl
Report Macros	Precompiled on the Prime Performance Manager gateway. See Chapter 5, “Reports Macro Reference” for reference information on the macros.
Event poller schema	The main XML schema for event polling is EventPoller.xsd. It is located in the /opt/CSCOppm-gw/etc/poller directory. You may view this file for reference, but do not edit it.

How It Works

The Prime Performance Manager processes reports as follows:

1. Prime Performance Manager polls the devices in the network inventory based on:
 - The MIBs selected for polling in Prime Performance Manager reports.
 - Filtering specified in the SystemCapability.xml file and in the UserCapability.xml file.

The filtering process queries polled devices as to whether they actually support the MIB being used, and if the MIB is supported. It restricts polling to MIB objects that actually have table data and which meet other specified criteria. This ensures that Prime Performance Manager does not perform unnecessary polling.
2. Based on what MIB variables are polled by the system XML reports and by user-defined reports, Prime Performance Manager creates a virtual database table that contains the polled data.

This results in faster processing of polling data and allows reports to be displayed quickly.
3. Based on what you specify in your report XML, the system processes the data returned by the polling. You can use predefined reporting macros to manipulate the data.

For example, you can convert a value to a percentage.
4. Based on macro calls in the system reports and user-defined reports, Prime Performance Manager modifies the virtual tables. For example, two tables can be joined or data can be selected for inclusion in table rows.
5. Reports that contain data can be viewed when users select them from the Prime Performance Manager Reports tree. The appearance of the reports is customizable in the report XML.
6. At the end of each reporting period configured for the server, the system saves the virtual table data to the Prime Performance Manager database.

The ability to customize data polling and report display provides you with a flexible and powerful way to report data to users. In the tutorial chapter of this guide, [Chapter 2, “Writing a Report,”](#) we’ll walk you through the coding of a typical report, the cpu.xml report, and show you how you can modify a sample report to develop your own reports.

Online Reports Help

Prime Performance Manager provides an extensive help system to help you develop reports, including autogenerated help for your report, and a Reports Help page.

This section contains:

- [Auto-Generated Help for Your Report, page 1-4](#)
- [Reports Help Page, page 1-5](#)

Auto-Generated Help for Your Report

When you write and enable a report, Prime Performance Manager automatically creates online help for your project. It also allows you to write and publish a customized help file for it. Prime Performance Manager rebuilds the report help files once every night. You can also manually regenerate the report help by issuing the **ppm docreps** command from the gateway CLI.

The autogenerated help includes:

- **Links to the Report Definition File**— Click on the XML filename to view the XML definition. You can view the definition in the PPM Viewer (as straight ASCII text). You can also use the browser's frame source viewer, which provides a color-coded view that highlights XML keywords and coding elements.
- **Custom Help**—Click on the Custom Help link to display customized help for the report.
- **Links to the MIBs Used in the Report.** Click on a MIB filename to display the MIB.

[Example 1-1](#) shows the online help for the `cpu.xml` report.

Example 1-1 System Generated Help for the `cpu.xml` Report

```

=====
Definition File:
  cpu.xml (PPM Viewer)
  cpu.xml (Browser Viewer - Use View Frame Source Menu For Color Coded View)

Custom Help
=====

MIB Used: CISCO-PROCESS-MIB.my
          CISCO-PROCESS-MIB.my

MIB Used: ENTITY-MIB.my
          ENTITY-MIB.my

MIB Variables Polled:

    cpmCPUTotalTable = poll("cpmCPUTotalIndex,
                           cpmCPUTotalPhysicalIndex,
                           cpmCPUTotal15minRev,
                           cpmCPUTotal1minRev");

    cpmCPUThresholdTable = poll("cpmCPUTotalIndex,
                                cpmCPUThresholdClass,
                                cpmCPUTRisingThresholdValue,
                                cpmCPUTFallingThresholdValue");

```

```

cpmCPUThresholdTable =
    cpmCPUThresholdTable.filter(cpmCPUThresholdClass == 1);

cpmCPUTotalTable =
    cpmCPUTotalTable.leftJoin(cpmCPUThresholdTable,
(cpmCPUTotalTable.cpmCPUTotalIndex == cpmCPUThresholdTable.cpmCPUTotalIndex));
=====
CSV File Format
Report ID: CPU                               MIB Used: CISCO_PROCESS_MIB
=====

CSV Filename Prefix: CPU
-----
 1 TimeStamp                               TimeStamp
 2 Node                                    fqdnid
 3 Slot                                    CPUSlot
 4 Number                                   CPUNum
 5 Description                             CPUDescr
 6 CPUUtilMax5min                          Max(cpmCPUTotal5minRev / 100)
 7 CPUUtilAvg5min                          Avg(cpmCPUTotal5minRev / 100)
 8 CPUUtilMax1min                          Max(cpmCPUTotal1minRev / 100)
 9 CPUUtilAvg1min                          Avg(cpmCPUTotal1minRev / 100)
10 CPURisingThreshold                      cpmCPURisingThresholdValue / 100
11 CPUFallingThreshold                     cpmCPUFallingThresholdValue / 100
=====

Web Reports
Report ID: CPU                               MIB Used: CISCO_PROCESS_MIB
=====

1 CPU Utilization
-----
Average Utilization                         Avg(cpmCPUTotal5minRev / 100)
Peak Utilization                           Max(cpmCPUTotal5minRev / 100)
Node                                        fqdnid
Slot                                        CPUSlot
CPU                                         CPUNum
CPU Description                             CPUDescr
Avg                                          Avg(cpmCPUTotal1minRev / 100)
Peak                                        Max(cpmCPUTotal1minRev / 100)
Rising                                     cpmCPURisingThresholdValue / 100
Falling                                    cpmCPUFallingThresholdValue / 100

```

Reports Help Page

To display the online reports help, select **Home > Reports Documentation** from the main menu. The online Reports Documentation includes:

- System Reports README: system MIBs, Poll Definitions, and CSV Formats. Online Help link: displays a list of polled MIB objects, poll definitions, and the algorithms used to derive the display parameters.
- User Reports: README: user MIBs, Poll Definitions, CSV Formats. Custom Help link: displays the same information as the System Reports README online help, if defined.
- Report XML Definitions
- IETF RFCs

- SNMP MIBs
- System Capability Definitions
- User Capability Definitions

What You Can Specify

Aside from the MIBs that are polled and MIB variables reported, you can specify report views, report time intervals, sort order for data.

Report Views: Graphs, Tables, and CSV Files

The XML interface lets you provide code reports to provide users with:

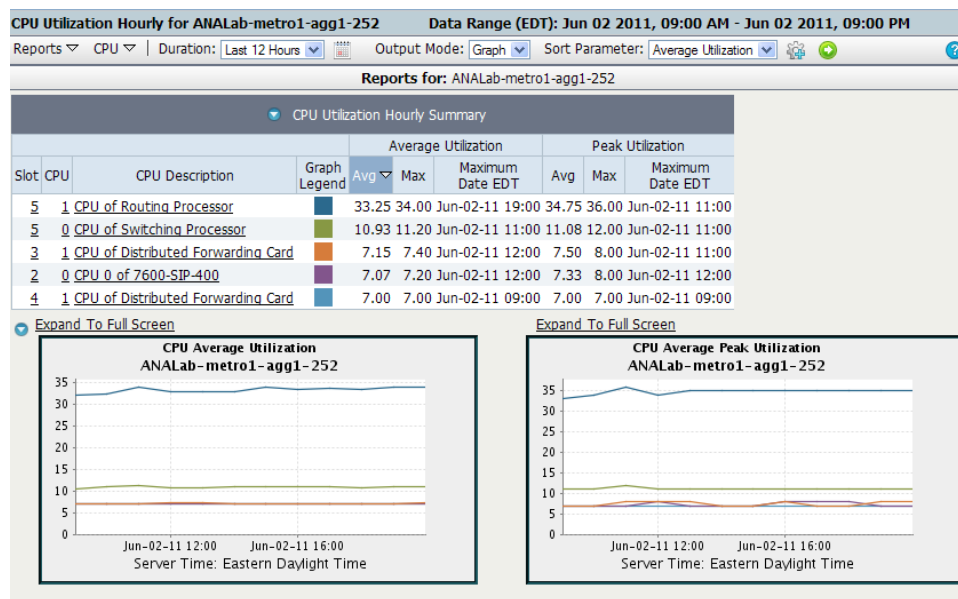
- **Graph Views**—Display a graph of performance over specified time intervals.
- **Table Views**—Display performance in a tabular view.
- **CSV File View**—Lets users save the report in a comma-separated value (CSV) file that they can view using a spreadsheet or a text editor.

The tutorial chapter of this guide (“[Writing a Report](#)”) walks you through coding of the `cpu.xml` report, which shows CPU utilization for the network as a whole or for devices that a user selects.

Graph View

[Figure 1-1](#) is an example of a Graph View for CPU Utilization.

Figure 1-1 Graph View for CPU Utilization Report



When you code your own report, you can control the time intervals that users can select.

Table View

Figure 1-2 shows a table view example for the CPU Utilization report.

Figure 1-2 Table View

Node	Slot	CPU	CPU Description	Timestamp EDT	5 Min Util		1 Min Util		Threshold	
					Avg	Peak	Avg	Peak	Rising	Falling
t1-dev-crsl-1-sdr-1	0	1	host	Jun-06-11 13:00	76.0	77.0	73.4	76.0	0.0	0.0
t1-dev-crsl-1-sdr-1	0	1	host	Jun-06-11 19:00	75.4	77.0	78.2	79.0	0.0	0.0
t1-dev-crsl-1-sdr-1	0	1	host	Jun-06-11 20:00	75.0	76.0	77.4	81.0	0.0	0.0
t1-dev-crsl-1-sdr-1	0	1	host	Jun-06-11 18:00	75.0	76.0	75.0	77.0	0.0	0.0
t1-dev-crsl-1-sdr-1	0	1	host	Jun-06-11 12:00	75.0	77.0	75.7	80.0	0.0	0.0
t1-dev-crsl-1-sdr-1	0	1	host	Jun-06-11 11:00	74.6	76.0	75.4	80.0	0.0	0.0
t1-dev-crsl-1-sdr-1	0	1	host	Jun-06-11 14:00	73.4	76.0	75.2	79.0	0.0	0.0
t1-dev-crsl-1-sdr-1	0	1	host	Jun-06-11 10:00	73.0	73.0	71.0	71.0	0.0	0.0
t1-dev-crsl-1-sdr-1	0	1	host	Jun-06-11 09:00	73.0	73.0	71.0	71.0	0.0	0.0
t1-dev-crsl-1-sdr-1	0	1	host	Jun-06-11 17:00	71.3	74.0	72.7	73.0	0.0	0.0
t1-dev-crsl-1-sdr-1	0	1	host	Jun-06-11 16:00	66.0	66.0	72.0	72.0	0.0	0.0
t1-dev-crsl-1-sdr-1	0	1	host	Jun-06-11 15:00	66.0	66.0	72.0	72.0	0.0	0.0
csr-o-2941a	0	0	CPU of main processor	Jun-06-11 15:00	37.8	41.0	39.8	53.0	0.0	0.0

CSV File View

If users select the CSV file view, they are prompted to save the report as a CSV file. The CSV file can be viewed in a spreadsheet such as Microsoft Excel or using a text editor.

Reporting Intervals

The XML schema for the Cisco Prime reports allows you to specify several reporting intervals for your reports.

Sort Order

You can specify the order in which data is sorted on your reports.

Basic Report Categories

There three basic report categories—Network Level reports, Device Level reports, and reports on specific variables. When you first view your report, it shows statistics for the entire discovered network. You can then select specific devices to view reports for a single device.

Report Management Interface

- **Reports Status Table**—In the Prime Performance Manager user interface, select **Reports** and click the Reports Status tab to display the Reports Status table. This allows you to enable or disable reports.
- **Reports Settings Page**—Choose **Reports** and click the Settings tab to enable various report intervals and control report aging.

For details on the user interface, see the *Cisco Prime Performance Manager 1.1 User Guide*.

