Configuring Performance Manager

This chapter describes how DCNM-SAN is used to monitor and manage a network. This chapter includes the following topics:

Information About Performance Manager

This section includes the following topics:

Performance Manager gathers network device statistics historically and provides this information graphically using a web browser. It presents recent statistics in detail and older statistics in summary. Performance Manager also integrates with external tools such as Cisco Traffic Analyzer.

The Performance Manager has three operational stages:

- Definition—The Flow Wizard sets up flows in the switches.
- Collection—The Web Server Performance Collection screen collects information on desired fabrics.
- Presentation—Generates web pages to present the collected data through DCNM-SAN Web Server.

Performance Manager can collect statistics for ISLs, hosts, storage elements, and configured flows. Flows are defined based on a host-to-storage (or storage-to-host) link. Performance Manager gathers statistics from across the fabric based on collection configuration files. These files determine which SAN elements and SAN links Performance Manager gathers statistics for. Based on this configuration, Performance Manager communicates with the appropriate devices (switches, hosts, or storage elements) and collects the appropriate information at fixed five-minute intervals.

Performance Manager uses a round-robin database to hold the statistical data collected from the fabric. This data is stored based on the configured parameters in the collection configuration file. At each polling interval, Performance Manager gathers the relevant statistics and stores them in the round-robin database. This database is a fixed size and will not grow beyond its preset limits.

Performance Manager creates a series of archived data to hold summarized information present in the real-time round-robin database. This archived data is used to generate daily, weekly, monthly, and yearly consolidated reports. In this way, Performance Manager maintains significant historical data without the cost of an ever-increasing database size.

Note   You must restart Performance Manager if you change the user credentials on DCNM-SAN Server.

Data Interpolation

One of the unique features of Performance Manager is its ability to interpolate data when statistical polling results are missing or delayed. Other performance tools may store the missing data point as zero, but this can distort historical trending. Performance Manager interpolates the missing data point by comparing the data point that preceded the missing data and the data point stored in the polling interval after the missing data. This maintains the continuity of the performance information.

Data Collection

One year's worth of data for two variables (Rx and Tx bytes) requires a round-robin database (rrd) file size of 76 K. If errors and discards are also collected, the rrd file size becomes 110 K. The default internal values are as follows:

- 600 samples of 5 minutes (2 days and 2 hours)
- 700 samples of 30 minutes (14 days)
- 775 samples of 2 hours (64 days)
- 300 samples of 1 day

A 1000-port SAN requires 110 MB for a year's worth of historical data that includes errors and discards. If there were 20 switches in this SAN with equal distribution of fabric ports, about two to three SNMP packets per switch would be sent every 5 minutes for a total of about 100 request or response SNMP packets required to monitor the data.

Because of their variable counter requests, flows are more difficult to predict storage space requirements for. But in general you can expect that, each extra flow adds another 76 KB.

Note   Performance Manager does not collect statistics on nonmanageable and non-MDS switches. Loop devices (FL/NL) are not collected.

To setup a shared RRD path to collect PM data, perform these steps:

Step 1   Locate the server.properties file.

For Windows setup, location is: *C:\Program Files\Cisco Systems\dcm\fm\conf*

For Linux setup, location is: */usr/local/cisco/dcm/fm/conf.*

Step 2   Add **pm.rrdpath** property file information to the server.properties file.

For example:

Add server location accessible from the DCNM server in the format:

```
pm.rrdpath=\\server_ip\\public\\cisco\\data
```

Step 3   Save *server.properties* file.

Step 4   Restart the Cisco DCNM server.

✎
Note   After the Performance Manager server is ready, the new updated location will be used to save the RRD files. Performance Manager creates a new directory **pm\db** under the specified location. Ensure that RRD files are not altered, as the Performance Manager server is actively writing into the rrd files.

Using Performance Thresholds

The Performance Manager Configuration Wizard allows you to set up two thresholds that will trigger events when the monitored traffic exceeds the percent utilization configured. These event triggers can be set as either Critical or Warning events that are reported on the DCNM-SAN web client Events browser page.

Absolute value thresholds apply directly to the statistics gathered. These statistics, as a percent of the total link capacity, are compared to the percent utilization configured for the threshold type. If the statistics exceed either configured threshold, an event is shown on the DCNM-SAN web client Events tab.

Baseline thresholds create a threshold that adapts to the typical traffic pattern for each link for the same time window each day, week, or every two weeks. Baseline thresholds are set as a percent of the average (110% to 500%), where 100% equals the calculated weighted average. Figure 11-1 shows an example of setting a baseline threshold for a weekly or daily option.

Figure 11-1   ***Baseline Threshold Example***
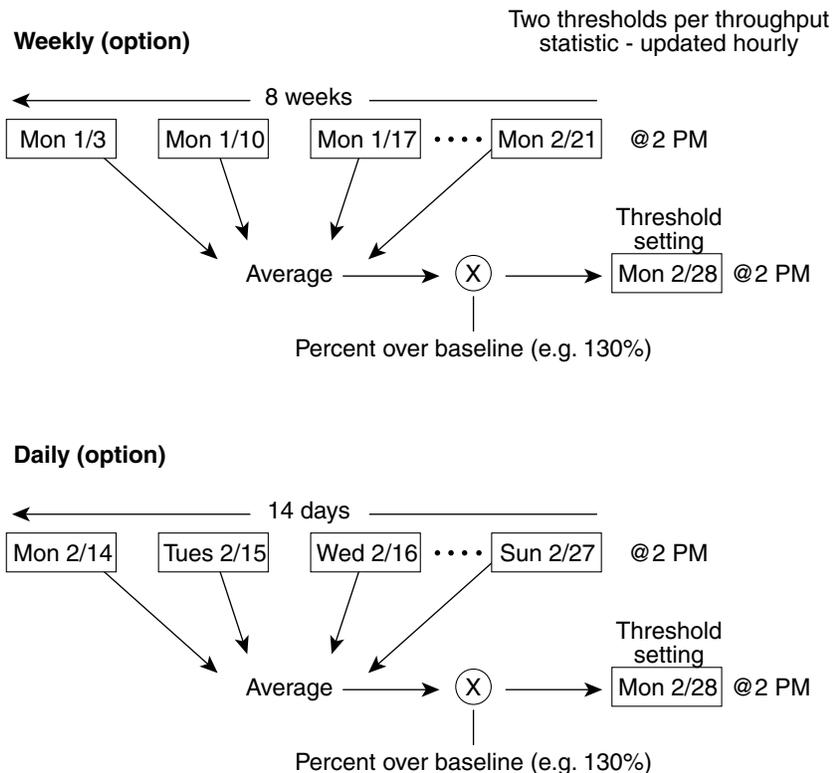
The threshold is set for Monday at 2 p.m. The baseline threshold is set at 130% of the average for that statistic. The average is calculated from the statistics value that occurred at 2 p.m. on Monday, for every prior Monday (for the weekly option) or the statistics value that occurred at 2 p.m. on each day, for every prior day (for the daily option).

Flow Statistics

Flow statistics count the ingress traffic in the aggregated statistics table. You can collect two kinds of statistics:

- Aggregated flow statistics to count the traffic for a VSAN.

- Flow statistics to count the traffic for a source and destination ID pair in a VSAN.

If you enable flow counters, you can enable a maximum of 1 K entries for aggregate flow and flow statistics. Be sure to assign an unused flow index to a module for each new flow. Flow indexes can be repeated across modules. The number space for flow index is shared between the aggregate flow statistics and the flow statistics.

Generation 1 modules allow a maximum of 1024 flow statements per module. Generation 2 modules allow a maximum of 2048-128 flow statements per module.

Table 11-1 explains the Flow Type radio button that defines the type of traffic monitored.

Table 11-1   Performance Manager Flow Types

Flow type	Description
Host->Storage	Unidirectional flow, monitoring data from the host to the storage element
Storage->Host	Unidirectional flow, monitoring data from the storage element to the host
Both	Bidirectional flow, monitoring data to and from the host and storage elements

Flow Setup Wizards

The Performance Manager Flow and Performance Manager Setup wizards greatly simplify configuration. All you need to do is select the categories of statistics to capture and the wizards provide a list of flows and links to monitor. You can remove entries if desired, or just accept the provided list and start data collection. Statistics for host and storage links are not associated with a specific port on a switch, so you do not lose long term statistics if a connection is moved to a different port.

## Creating a Flow Using Performance Manager Flow Wizard

DETAILED STEPS

Step 1   Choose **Performance > Create Flows**.

Specify how you want to determine and add new flows as shown in Figure 11-2. For this, you have to define traffic counters between source and destination devices, via one of these options:

- In a VSAN - For this option, click **VSAN**.

- Based on high traffic devices - For this option, click **Device Traffic**. Note that PM collections must already be turned on in order to use this option. If PM collection is not turned on for the selected fabric, then an error message will appear and you cannot continue.

Step 2   If you have clicked **VSAN**, then:

Figure 11-2   Create Flows Dialog Box
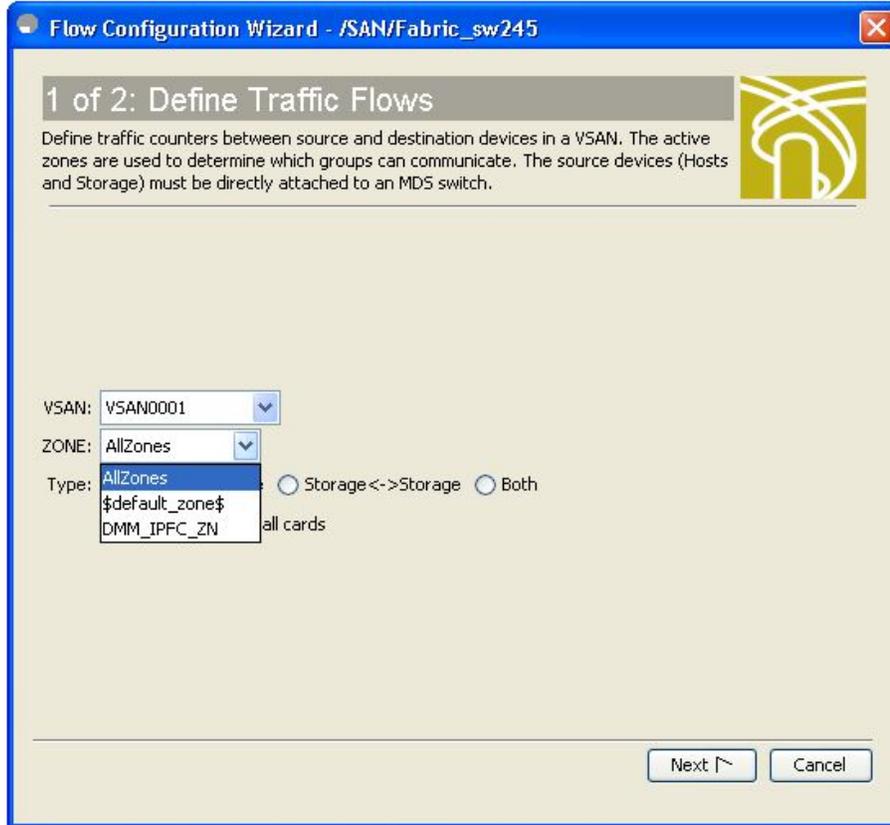
a. Click the drop-down menu in the VSAN field.

b. Choose the list of VSANs provided by the flow configuration wizard.

c. Click the drop-down menu in the Zone field.

d. Choose the list of zones provided by the flow configuration wizard.

e. Click **Next** to continue to the next windowas shown in Figure 11-3).

Figure 11-3   Review Traffic Flows Dialog Box

f. Choose items in the Possible Flow Pairs area.

g. The Review Traffic Flows window displays all VSAN flow pairs in the Exisitng Flows for Vsan area.

h. Click **Add** to create the selected flow.

i. Choose items in the Existing Flows for Vsan area.

j. Click **Remove** to remove the selected flow.

Step 3   If you have clicked **Device Traffic**, then:

a. Click **Next**.

You see the Define Traffic Flows page.

b. Specify a traffic utilization percentage threshold vlaue in the Show device ports with traffic > text box.

c. Specify whether you want to look at the peak or average traffic values, over the last day or last week, for the traffic types:

 – Host<->Storage

 – Storage<->Storage

 – Both

d. Click **Next**.

If new flow pairs are found, you will see the Review Traffic Flows page, where possible flow pairs are shown in a table, along with the traffic parameters used to identify them.

e. To see only rows having a specific source or destination device, specify the name of the device in the **Filter** text box.

  f. To create a flow, click the corresponding row in the Possible Flow Pairs table, and then click **Add**.

  To remove an existing flow, click the corresponding row in the Existing Flow Pairs table, and then click **Remove**.

Step 4 Click **Finish** to restart the Performance Manager collection.

You see the Confirmation dialog box as shown in Figure 11-4.

Figure 11-4 *Confirmation Dialog Box*
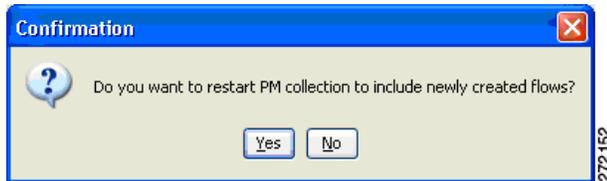
To verify the newly created flow, choose **Physical Attributes > End Devices > Flow Statistics.** The newly created flows are displayed.

✎

Note Performance Manager Collection can be enabled for LAN devices and traffice counters are collected periodically.