



CHAPTER 8

Performance Manager

The primary purpose of Fabric Manager is to manage the network. A key management capability is network performance monitoring. This chapter includes the following topics:

[Performance Manager Architecture, page 8-1](#)

[Flow Statistics Configuration, page 8-3](#)

Performance Manager Architecture

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 Fabric Manager 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 Fabric Manager Server.

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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 76K. If errors and discards are also collected, the rrd file size becomes 110K. The default internal values are:

- 600 samples of 5 minutes (2 days and 2 hours)
- 700 samples of 30 minutes (12.5 days)
- 775 samples of 2 hours (50 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.

Flows, because of their variable counter requests, are more difficult to predict storage space requirements for. But as a rule of thumb, each extra flow adds another 76 kB.



Note

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

Using Performance Thresholds

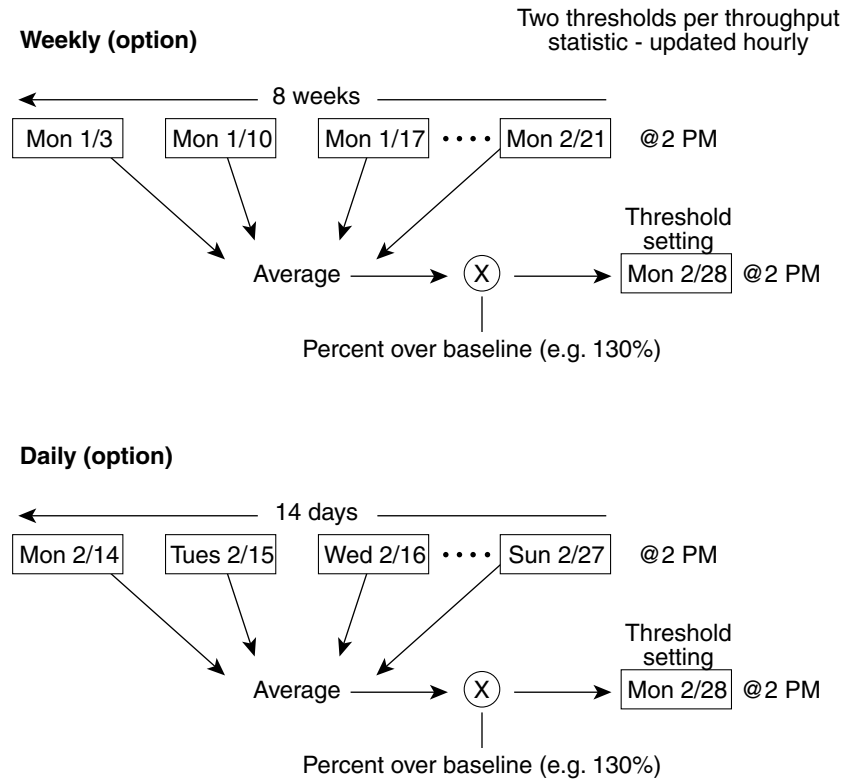
The Performance Manager Configuration Wizard allows you to set up two thresholds that will trigger events when the monitored traffic exceeds the percent utilization configured. These event triggers can be set as either Critical or Warning events that are reported on the Fabric Manager web client Events 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 Fabric Manager 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 8-1](#) shows an example of setting a baseline threshold for a weekly or daily option.

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Figure 8-1 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).

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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.

Flow Statistics Configuration

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.

This section includes the following topics:

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- [About Flow Statistics, page 8-4](#)
- [Counting Flow Statistics, page 8-4](#)

About Flow Statistics

If you enable flow counters, you can enable a maximum of 1K 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 8-1](#) explains the Flow Type radio button that defines the type of traffic monitored.

Table 8-1 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.

Counting Flow Statistics

To count the flow statistics for an active zone set using Fabric Manager, follow these steps:

- Step 1** Expand **End Devices** and then select **Flow Statistics** in the Physical Attributes pane. You see the Flow Statistics shown in [Figure 8-2](#).

Figure 8-2 Flow Statistics in Fabric Manager

Switch	Module, Index	Type	VsanId	DestId	SrcId	Mask	Frames	Bytes	CreationTime
sw172-22-46-225	1, 1	vsanId destId srcId	4001	df0007	d8001f	ffffff	0	0	2007/03/29-14:00:04
sw172-22-46-223	1, 2	vsanId destId srcId	4001	ef0003	ec0007	ffffff	0	0	2007/03/29-14:04:06
sw172-22-46-233	1, 1	vsanId destId srcId	1	ee0006	ed0004	ffffff	8.523K	505.100K	2007/04/02-11:42:57
sw172-22-46-221	4, 1	vsanId destId srcId	1	ee0006	6401e4	ffffff	631	37.440K	2007/04/04-12:44:05
sw172-22-46-220	1, 72	vsanId destId srcId	4001	ea019b	ef0003	ffffff	0	0	2007/03/31-18:50:14
sw172-22-46-224	1, 1	vsanId destId srcId	4001	ef0003	ea019f	ffffff	712	104.612K	2007/02/21-08:03:55
sw172-22-46-174	10, 1	vsanId destId srcId	1	ee0006	ee00ef	ffffff	755	47.880K	2007/04/04-12:44:10
sw172-22-46-233	1, 2	vsanId destId srcId	1	ef000f	ed0004	ffffff	1.031K	59.060K	2007/04/02-11:42:57
sw172-22-46-223	1, 3	vsanId destId srcId	1	ee0006	650101	ffffff	16.231K	682.832K	2007/04/02-11:43:05
sw172-22-46-221	4, 2	vsanId destId srcId	1	ef000f	6401e4	ffffff	998.944M	2067.213G	2007/04/04-12:44:05
sw172-22-46-220	1, 77	vsanId destId srcId	4001	ea019f	ef0003	ffffff	0	0	2007/03/31-18:50:14
sw172-22-46-224	1, 2	vsanId destId srcId	4001	ef0003	ea01a7	ffffff	810	110.220K	2007/02/21-08:03:55
sw172-22-46-223	1, 4	vsanId destId srcId	1	ef000f	650101	ffffff	7.065K	296.600K	2007/04/02-11:43:05
sw172-22-46-174	10, 2	vsanId destId srcId	1	ef000f	ee00ef	ffffff	443	28.116K	2007/04/04-12:44:10
sw172-22-46-221	4, 3	vsanId destId srcId	1	ee0006	6401da	ffffff	631	37.440K	2007/04/04-12:44:05

- Step 2** Click the **Create** icon to create a flow.

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Note If you are managing your fabrics with Performance Manager, you need to set up an initial set of flows and collections on the fabric.

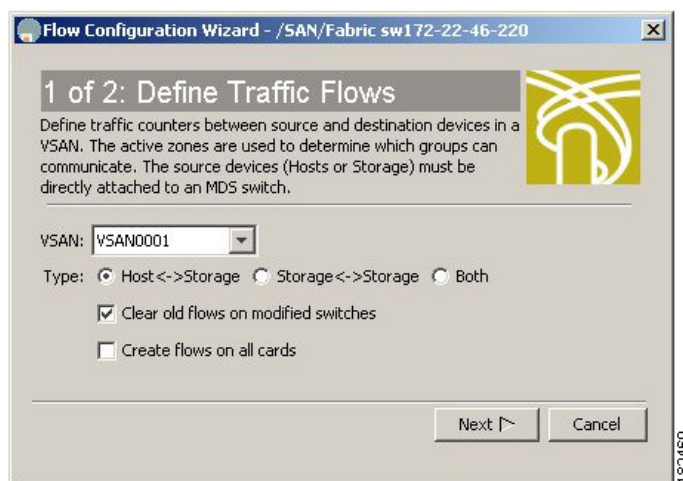
See the “[Historical Performance Monitoring](#)” section on page 60-4 for a full description on Performance Manager features.



Note When creating flows, make sure the device type is set correctly.

You see the dialog box shown in [Figure 8-3](#).

Figure 8-3 Define Traffic Flows Dialog Box

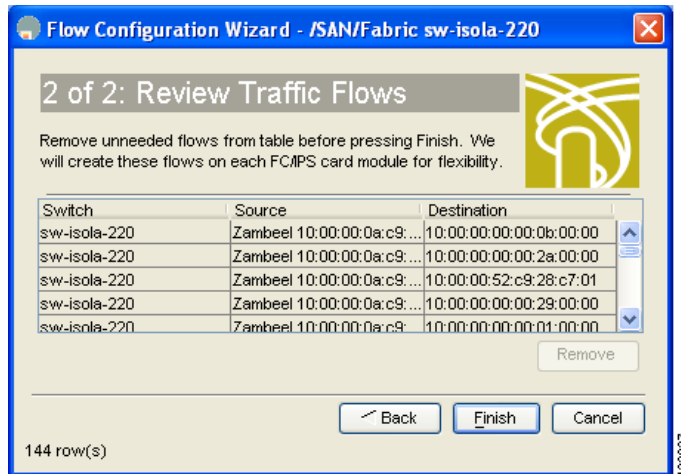


- Step 3** Choose the VSAN from which to create flows. Flows are defined per active zone set.
- Step 4** Choose the **Type** radio button for the flow type you want to define.
- Step 5** Optionally, check the **Clear old flows on modified switches** check box if you want to remove old flow data.
- Step 6** Optionally, check the **Create flows on all cards** check box if you want to create flows on all cards for flexibility.
- Step 7** Click **Next** to review the available flows for the chosen VSAN.

You see the dialog box shown in [Figure 8-4](#).

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Figure 8-4 Review Traffic Flows Dialog Box



Step 8 Remove any flows you are not interested in.

Step 9 Click **Finish** to create the flow.