STORM Performance Management

What's new in SN08

In this document and in the other STORM documents, we use the term STORM Integrated Array (STORM-IA) to refer to the STORM installation that uses two STORM SAM-XTS shelves. We continue to use the term STORM SAM-XTS to refer to the hardware platform, and to identify the shelf type.

What's new in SN07

Performance metrics from STORM SAM-XTS units (used in STORM-IA) are available at the Integrated EMS. Refer to SNMP performance metrics on page 11 for the list of available statistics.

Performance management procedures

The following performance-related tasks apply to the STORage Management (STORM) unit:

Execute these tasks from the STORM System panel. Refer to the documentation on the STORM System panel for instructions.

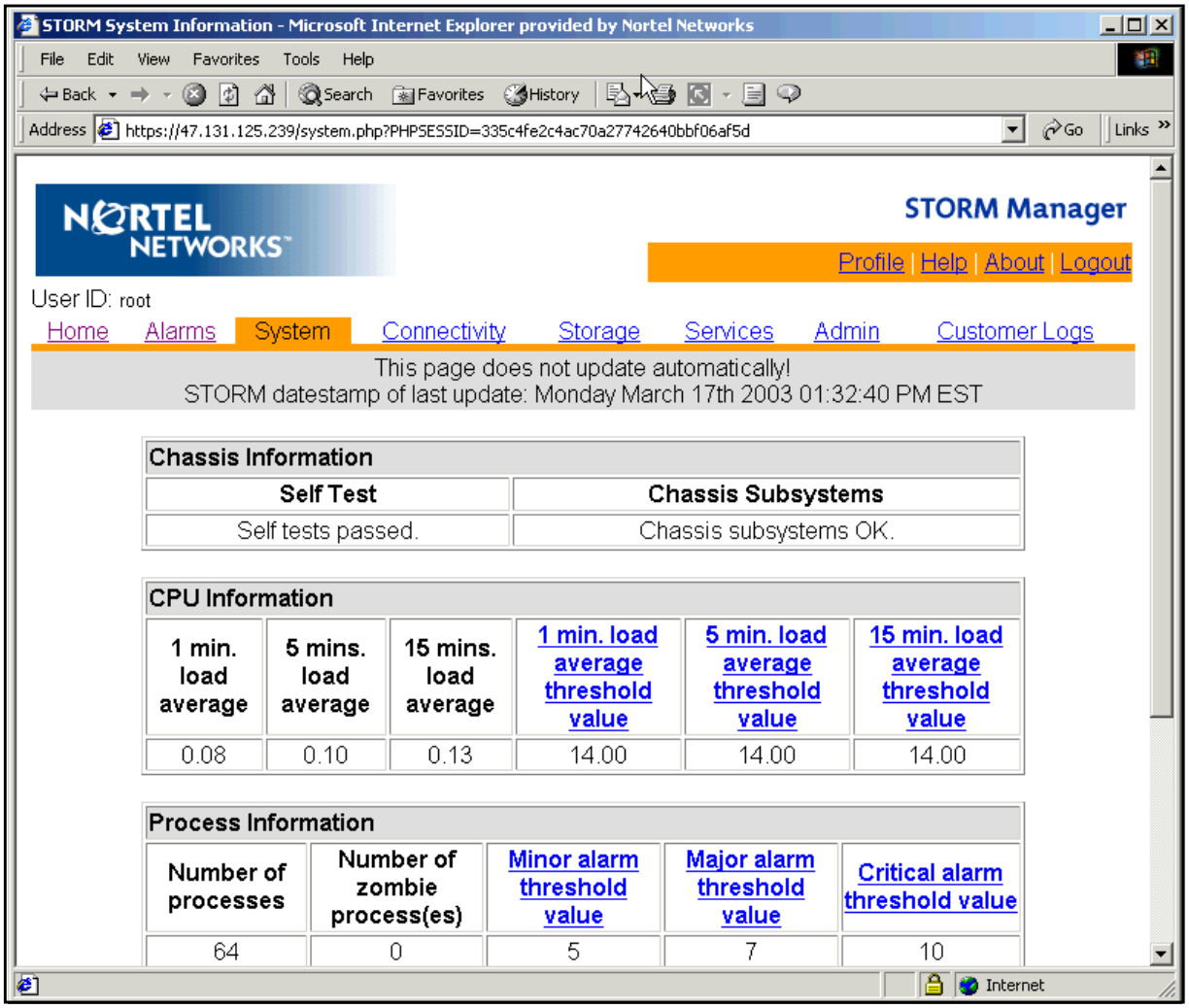
STORM System panel

The System panel enables an end user to execute the following tasks on system parameters associated with the STORM unit:

- view and modify alarm thresholds for central processing unit (CPU) usage
- view and modify alarm thresholds for the number of zombie processes on the STORM unit
- view and modify alarm thresholds for memory usage

Panel descriptions

The following figure shows an example of the STORM System panel.



CPU Information

The first group of alarm threshold information affects the following CPU usage measurements:

- 1 min. load average — indicates the system load average on the STORM unit for the past 1 minute
- 5 min. load average — indicates the system load average on the STORM unit for the past 5 minutes
- 15 min. load average — indicates the system load average on the STORM unit for the past 15 minutes
- 1 min. load average threshold value — enables the user to modify the alarm threshold for a 1-minute load average.
- 5 min. load average threshold value — enables the user to modify the alarm threshold for a 5-minute load average
- 15 min. load average threshold value — enables the user to modify the alarm threshold for a 15-minute load average

Refer to the procedure Modifying thresholds for the STORM CPU usage for instructions on modifying these values.

Process Information

The second group of threshold information affects the following alarm counts associated with zombie processes:

- Number of processes — indicates the total of processes currently running on the STORM unit
- Number of zombie process(es) — indicates the total of zombie processes currently running on the STORM unit. A zombie is a process started by a parent process that has not been terminated by its parent process.
- Minor alarm threshold value — enables the user to modify the minor alarm threshold for zombie processes
- Major alarm threshold value — enables the user to modify the major alarm threshold for zombie processes
- Critical alarm threshold value — enables the user to modify the critical alarm threshold for zombie processes

Refer to the procedure Modifying thresholds for the STORM zombie processes for instructions on modifying these values.

Memory Information

The third group of threshold values affects the following memory usage for the alarms:

- Total memory (MB) — indicates the number of megabytes for system memory
- Total memory used (MB) — indicates the number of megabytes currently in use by system memory
- Total memory used (%) — indicates the percentage of system memory in use
- Total memory available (MB) — indicates the number of megabytes available in system memory
- Total memory available (%) — indicates the percentage of available system memory
- Minor alarm threshold value (%) — enables the user to modify the minor alarm threshold for system memory
- Major alarm threshold value (%) — enables the user to modify the major alarm threshold for system memory
- Critical alarm threshold (%) — enables the user to modify the critical alarm threshold for system memory

Refer to the procedure Modifying thresholds for the STORM memory usage for instructions on modifying these values.

Limitations and restrictions

System information for the STORM unit includes the following limitation:

- The System panel does not refresh automatically. To update the display, reload the browser.

Panel messages

The following system and error messages can appear during use of the System panel.

`STORM Error: Load average must be a numeric value.`

The user incorrectly entered non-numeric data in one of the load average alarm threshold fields.

`STORM Error: Load average must be between 0.01 and 20.`

The user tried to change one of the load average alarm thresholds by entering invalid data. Re-enter using data within the specified numeric range.

`STORM Error: Zombie alarm threshold must be a numeric value.`

The user incorrectly entered non-numeric data in one of the zombie alarm threshold fields.

`STORM Error: Zombie alarm threshold must be between 1 and 20.`

The user tried to change one of the zombie alarm thresholds by entering invalid data. Re-enter using data within the specified numeric range.

`STORM Error: Memory alarm threshold must be a numeric value.`

The user incorrectly entered non-numeric data in one of the memory alarm threshold fields.

`STORM Error: Memory alarm threshold must be between 1 and 100.`

The user tried to change one of the memory alarm thresholds by entering invalid data. Re-enter using data within the specified numeric range.

`STORM Error: Please enter at least one new threshold value.`

The user inadvertently left the field empty when trying to change an alarm threshold.

`STORM Error: The threshold for a critical alarm must be greater than that for a major alarm.`

The user tried to enter a set of alarm thresholds where the value of the major alarm exceeded the value of the critical alarm.

`STORM Error: The threshold for a major alarm must be greater than that for a minor alarm`

The user tried to enter a set of alarm thresholds where the value of the minor alarm exceeded the value of the major alarm.

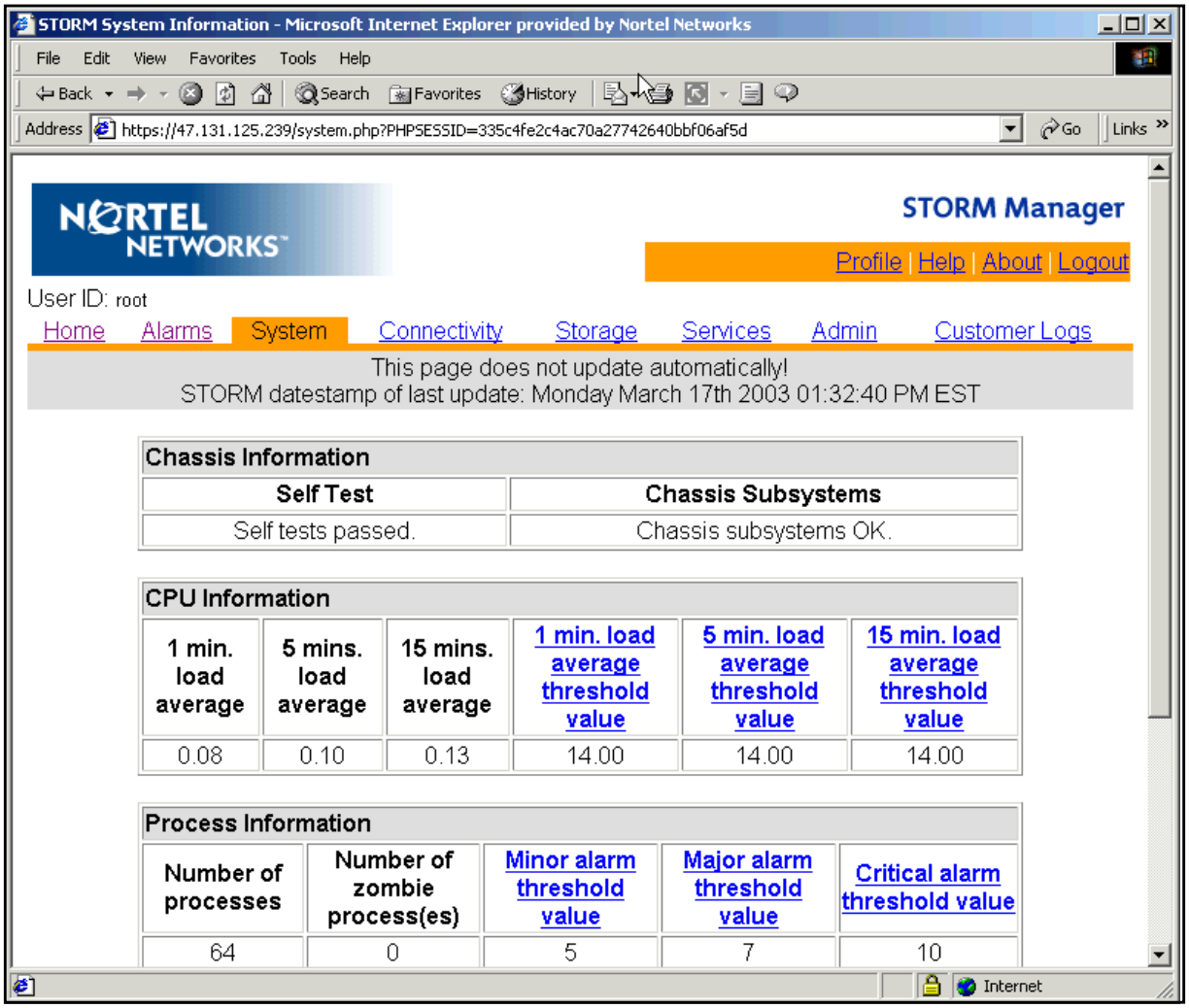
Viewing alarm threshold information

Use this procedure to view alarm threshold information for the central processing unit (CPU), number of zombie processes on the STORM card, and memory usage thresholds.

At the STORM Manager client workstation

1 Click on the System panel tab.

The STORM System panel appears.



2 Continue to one of the following procedures, as needed, to make modifications to the STORM System panel:

- Modifying thresholds for the STORM CPU usage
- Modifying thresholds for the STORM zombie processes
- Modifying thresholds for the STORM memory usage

Modifying thresholds for the STORM CPU usage

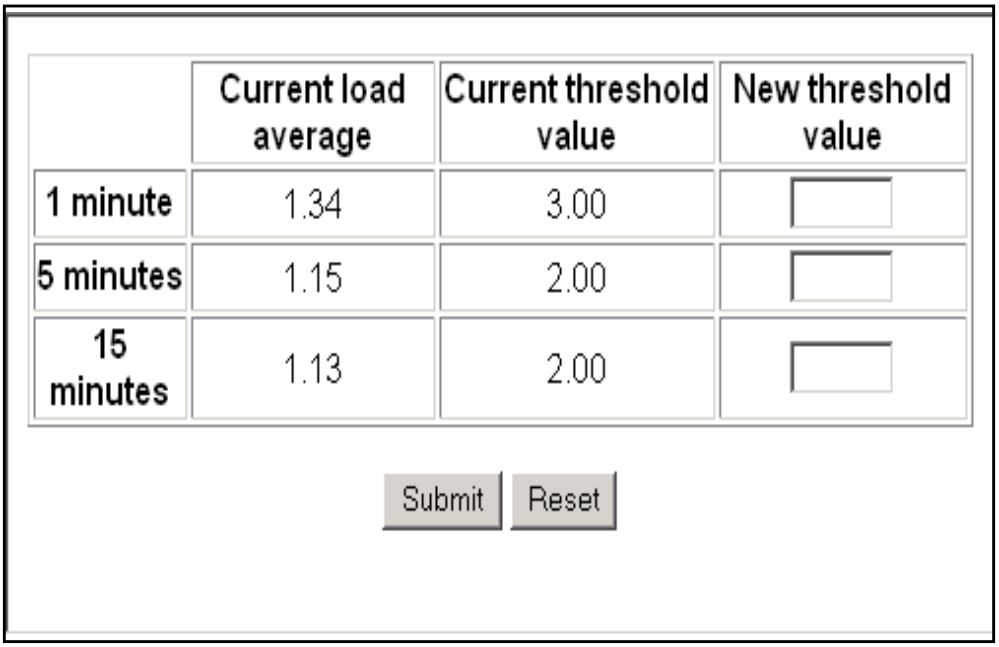
Use this procedure to modify the threshold values for the STORM CPU usage.

Refer to section “CPU Information” in the STORM System panel module for descriptive information.

At the STORM Manager client workstation

1 Click on the System panel tab and then on one of the three levels of alarm threshold values under the “CPU Information” group.

The following screen appears.



2 To change a threshold value for CPU usage for the 1-minute, 5-minute, or 15-minute thresholds, enter a number between 0.01 and 20 in the appropriate field under column New threshold value.

3 To enter the new values, click the Submit button. Or to clear any entries, click the Reset button.

4 This procedure is complete.

Modifying thresholds for the STORM zombie processes

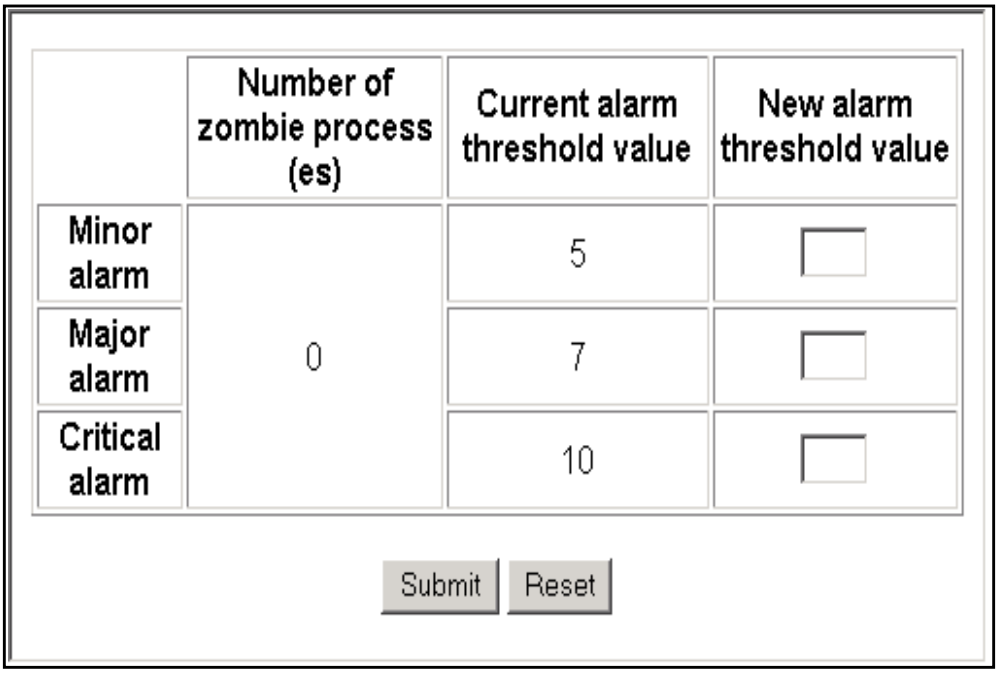
Use this procedure to modify the threshold values for the STORM zombie processes.

Refer to section “Process Information” in the STORM System panel module for descriptive information.

At the STORM Manager client workstation

1 Click on the System panel tab and then one of the three levels of alarm threshold values under the “Process Information” group.

The following screen appears.



2 To change a threshold value for a zombie process, enter a number between 1 and 20 for the appropriate alarm category under column New alarm threshold value.

Note: Values for zombie process thresholds must increment from one category to the next subsequent category. That is, the value in a critical alarm category must always exceed values in the major and minor categories.

3 To enter the new values, click the Submit button. To clear any entries, click the Reset button.

4 This procedure is complete.

Modifying thresholds for the STORM memory usage

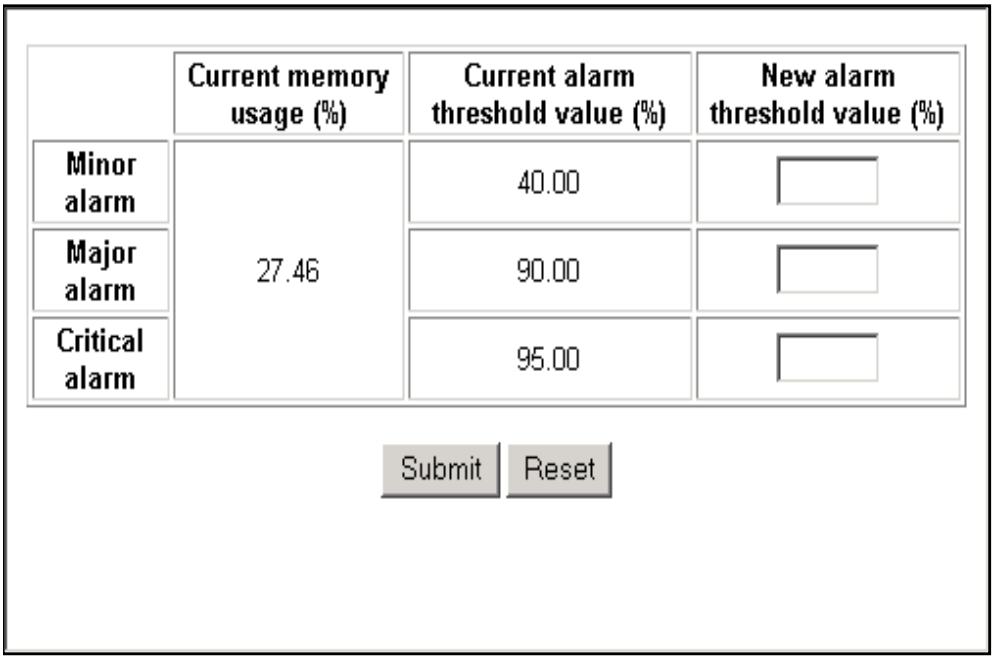
Use this procedure to modify the threshold values for the STORM memory usage.

Refer to section “Memory Information” in the STORM System panel module for descriptive information.

At the STORM Manager client workstation

1 Click on of System panel tab and then one of the three levels of alarm threshold values under the “Memory Information” group.

The following screen appears.



2 To change a threshold value for memory usage, enter a number between 1 and 100 for the appropriate alarm category under column New alarm threshold value (%).

Note: Values for the memory usage thresholds must increment from one category to the next subsequent category. That is, the value in the critical alarm category must always exceed values in the major and minor categories.

3 To enter the new values, click the Submit button. Or to clear any entries, click the Reset button.

4 This procedure is complete.

SNMP performance metrics

Performance metrics are available for each STORM SAM-XTS unit in the STORM Integrated Array (STORM-IA). These metrics are transferred using SNMP from the STORM SAM-XTS unit to the host that makes the request. Nortel expects the requesting host to be the Integrated EMS server application

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The metrics retrieved from the STORM SAM-XTS unit are available for viewing at the Integrated EMS as described in this procedure. In addition, the same metrics can be stored on the Integrated EMS machine in CSV or XML format by creating a report job. Refer to “Adding a Report Job” in *Integrated EMS Performance Management*, NN10327-711. If a report job is created, the Integrated EMS can also forward the collected metrics to an OSS. Refer to a "Adding a Transfer Job" in *Integrated EMS Performance Management*, NN10327-711.

Prerequisites

Add the STORM SAM-XTS device to the Integrated EMS topology as a Network Element. Refer to "Adding a Storage Management NE (STORM NE)" in *Integrated EMS Configuration Management*, NN10330-511.

Add a Collection Job to retrieve the performance metrics from the STORM devices. Refer to "Adding SNMP Data Collection Job" in *Integrated EMS Performance Management*, NN10327-711. Use the STORM.xml template file unless a custom template file has been created by telephone operating company personnel.

Action

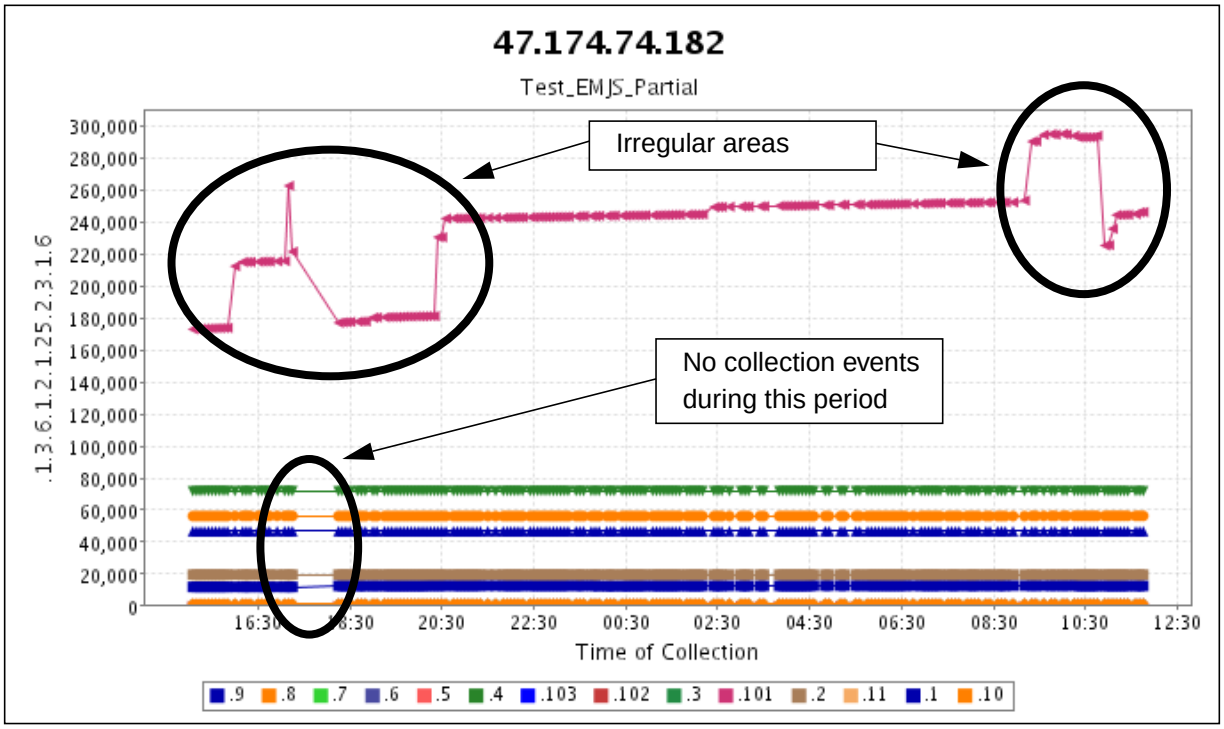
At the Integrated EMS workstation

1. View the collected statistics as described in procedure "Viewing Current Statistics" from *Integrated EMS Performance Management*, NN10327-711. View the collected statistics for DisplayName field hrStorageUsed.
2. If any of the lines are irregular as shown in the following figure, determine the hrStorageIndex from the color coded key or hover

the mouse pointer over the line. The hrStorageIndex is an integer preceeded by a decimal point such as .101 or .8.

A rapid rise or fall in a line indicates a rapid change is storage use on the STORM device.

hrStorageUsed graph



At the STORM Manager

3 Click on the Storage panel tab and determine if a threshold alarms is active. If an alarm is active, perform more checks:

Filesystem Name ends in	Do
cs	• Check volume storage usage at the MAP with the SCANF command. • Determine if image dumps took place during the same time frame as the change in storage usage.
mtc	• Check if excessive CCA platform log reports are generated. • Check if the /TAPE and /TAPE1 directories are being used to hold images.

4 This procedure is complete.

Performance metrics for a STORM SAM-XTS unit

The following metrics are available:

Performance metrics for a STORM SAM-XTS unit

Metric	Value	Description
sysDescr	string	This value indicates system information. Example: `Linux <hostname> 2.4.19-xfs #1 SMP Fri Nov 7 11:18:05 EST 2003 i686`
snmpInPkts	integer	This value indicates the number of SNMP messages received by the SNMP agent on the STORM unit.
snmpOutPkts	integer	This value indicates the number of SNMP messages sent by the SNMP agent on the STORM unit.
snmpInBadVersions	integer	This value indicates the total number of SNMP messages received with an error-status field value of `badValue'.
snmpInBadCommunityNames	integer	This value indicates the total number of SNMP messages received by the SNMP agent on the STORM unit for an unsupported SNMP version.
snmpInBadCommunityUses	integer	This value indicates the total number of SNMP messages delivered to the SNMP agent on the STORM unit for SNMP operations not allowed by the SNMP community named in the SNMP message.
snmpInASNParseErrs	integer	This value indicates the total number of ASN.1 or BER errors encountered by the SNMP agent on the STORM unit when decoding received SNMP messages.

Performance metrics for a STORM SAM-XTS unit (Continued)

Metric	Value	Description
snmpInTotalReqVars	integer	This value indicates the total number of MIB objects retrieved successfully by the SNMP agent on the STORM unit as a result of receiving valid SNMP Get-Request and Get-Next messages.
snmpInTotalSetVars	integer	This value indicates the total number of MIB objects which have been altered successfully by the SNMP agent on the STORM unit as the result of receiving valid SNMP Set-Request messages.
snmpOutTraps	integer	This value indicates the total number of SNMP trap messages generated by the SNMP agent on the STORM unit.
snmpSilentDrops	integer	This value indicates the total number of GetRequest, GetNextRequest, GetBulkRequest, SetRequest, and InformRequest messages delivered to the SNMP agent on the STORM unit which were silently dropped because the size of a reply containing an alternate Response message with an empty variable-bindings field was greater than either a local constraint or the maximum message size associated with the originator of the request.
hrSystemUptime	integer	This value is measured in time ticks and indicates the amount of time since the STORM unit was last initialized. Example: "(102629487) 11 days, 21:04:54.87"
hrSystemDate	string	This value indicates the system time and date. Example: "2003-12-9, 10:12:28.0,-5:0"
hrSystemProcesses	integer	This value indicates the number of process contexts loaded or running on the STORM unit.

Performance metrics for a STORM SAM-XTS unit (Continued)

Metric	Value	Description
hrStorageIndex	integer	This value identifies a unique storage area on the STORM unit. The index starts at 1 and increments for each Filesystem Name entry at the Storage panel of the STORM Manager.
hrStorageType	string	This value indicates the type of storage associated with the hrStorageIndex. STORM reports hrStorageFixedDisk.
hrStorageDescr	string	This value indicates the string recorded as the Filesystem Name at the STORM Manager Storage panel. Examples are `/`, `/boot`, and `/storm`.
hrStorageAllocationUnits	integer	This value indicates the block size, in bytes, of the filesystem. For `/` and `/boot`, the value is 1024. For all other filesystems, the value is 4096.
hrStorageSize	integer	This value indicates the size of the filesystem represented by the entry, in units of hrStorageAllocationUnits. The returned value is equal to the output of `df -B <block_size>` where block_size is 1024 or 4096.
hrStorageUsed	integer	This value indicates the amount of allocated storage for this entry, in units of hrStorageAllocationUnits.
hrStorageAllocationFailures	integer	This value indicates number of requests for storage on this filesystem that could not be honored due to not enough free storage.