Sun StorageTek™ Business Analytics Host Statistics Agent Installation Guide

Release 5.0 SP1

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Introduction to the Host Statistics Agent

The Sun StorageTek Business Analytics Host Statistics Agent (GSMstats) collects data that can be categorized as:

- **IO** – Can be disk IO or perhaps network traffic. All capacities are measured and stored in bytes to enforce uniformity. It is the responsibility of the agent to translate the raw data to this common unit.
  - **SCSI** - The SCSI sub-category targets the TAPE and DISK devices residing on a SCSI bus. The READ and WRITE information that is collected shows both number totals and capacity data. For example, the agent will collect the number of reads in an interval. The EVENTS unit denotes this. However, it will also capture the number of bytes read in an interval, denoted by the units BYTES. Same is true for TAPE devices.
  - **FIBRE –** The FIBRE sub-category is very similar to the SCSI sub-category; it also contains TAPE and DISK devices. These are devices that are connected to a Fibre Channel SAN. Again, READ and WRITE are the main metrics of these devices.
  - **ENET –** The ENET sub-category captures network information for a specific network interface card (NIC). Information such as collisions, data transferred, and errors are collected. Data transfers (READ and WRITE) will be stored as BYTES. Collisions and errors will are stored as counts with the units being EVENT.
- **CPU** – Shows CPU utilization. All capacities are measured and stored in seconds. The statistics are divided into four different groups: WAIT, USER, SYSTEM, and IDLE. The Performance Agent measures the number of CPU seconds used in a given interval.
- **Memory** – Shows information about the current memory resources, including page faults and the amount of swap memory in use.

Note: With the acquisition of StorageTek, Sun Microsystems has re-branded and re-named Global Storage Manager (GSM) as Sun StorageTek Analytics, a member of the Enterprise Storage Manager portfolio of software solutions. The functionality of Business Analytics is identical to GSM, only the name has changed.

To upgrade, uninstall the previously installed Host Statistics Agent before you install the current version of the Sun StorageTek Business Analytics Host Statistics Agent. The decision to upgrade an existing Host Statistics Agent to may be performed because:

- The Sun StorageTek Business Analytics Release Notes indicate a problem has been fixed or a new feature added (e.g., agent support on new hardware platform).

- The upgrade is recommended by your Sun representative.

Automatic and Static Agent Registration

Automatic agent registration is a configuration option for agent data collection. In the storability.ini file, automatic agent registration is configured as follows:

- **Local Manager** – Specify the IP address or host name of the Local Manager to be contacted to activate agent registration.
- **Local Manager Registration Port** – Specifies the TCP port number used by the Local Manager for agent auto registration. The default port number is 17146.
- **Enable Auto Registration** – Turns agent auto registration on (default) or off.

To register the Host Statistics Agent (GSMstats) statically, proceed as follows:

- Enter false in the **Enable Auto Registration** field.

- Modify the Routing Agent static agent configuration to include an entry (port number|<agent IP address/name>)
- Restart the Routing Agent
- Restart the companion Central Manager agents

HOST STATISTICS AGENT MATRIX

Item	Description
Operating Systems	
Solaris	• Package installation. • Required Server Access: Administrator privileges • GSMbase
AIX	• root user privileges • UNIX Agents Installation CD (Tar Archive installation)
HP-UX	• "Tar/install.sh" installation • Required Server Access: root access
Configuration Parameters	• **Local Manager** – Specifies the IP address or host name of the Local Manager to be contacted for agent auto registration. The default value is local host. • **Local Manager Registration Port** – Specifies the TCP port number used by the Local Manager for agent auto registration. The default port number is 17146. • **Enable Agent Auto Registration** – Turns agent auto registration on (default) or off. • **Enable Stats Collection**- Turns performance statistics collection on or off (default). Performance data collection is turned off by default because the agent should only run when you are monitoring a performance bottleneck. You can enable them by: (a) manually changing this configuration setting in the storability.ini file to Yes (enabled), and (b) restarting the agent to have the configuration change take effect. • **Statistics Collection Interval** – Specifies the frequency of collection for statistics. The default value is every 5 minutes (300 seconds). • **Statistics Retention Period** – Specifies how long the agent caches performance statistics. The default value is 14,400 seconds.

Table 1 – Host Statistics Agent Matrix

HOST STATISTICS AGENT TABLE

The Host Statistics Agent populates one main table, **gsa_performance_statistics**, whose columns are briefly described below.

Table	Description
acom_id	Local Manager unique identifier
ip_address	IP address of the host on which the agent is installed
system_type	Currently always "Host"
system_id	Server unique identifier
class	IO, memory, and CPU

Table	Description
subclass	Will be one of the following values: SCSI - Describes a device on a SCSI bus. FIBRE - Describes a device on a FIBRE channel ENET - Describes an Ethernet device. CPU - Describes a CPU class. PHYSICAL - Describes actual physical memory. VIRTUAL - Describes virtual memory.
device_type	Will be one of the following values: TAPE - Describes a tape drive. DISK - Describes a disk drive. ADAPTER -Describes an adapter card (e.g. NIC, HBA). CPU- Describes a CPU OVERALL - Describes the overall usage. RAM - Describes amount of RAM. DISK - Describes virtual memory on disk.
instance	Name of the device being monitored (e.g. DevRmt0).
stat_type	Identifies what kind of statistic being measured (e.g. READ, WRITE).
collect_interval	Identifies the configured interval to collect data.
start	Start of data collection timestamp
end_time	End of data collection timestamp
duration	Computation of end minus start in seconds.
count_value	Value (count) of the measurement being collected. The meaning of this value will change based on the unit column.
unit	Defines how to interpret the results in the count column (e.g. BYTES, SECONDS).
timestamp	Agent timestamp
agg_gmt_timestamp	Timestamp (GMT) when the row was inserted into the database

Table 2 – gsa_performance_statistics

SOLARIS INSTALLATION

The installation procedure for the Host Statistics Agent follows. You must install the base and Host Agent software if these packages are not already installed. However, since these packages are required for the Backup Agent, the following procedure assumes these packages are already installed on the Solaris server.

1. Open a terminal window on the desktop of the Sun host.

2. Mount the Local Manager installation CD in your CD-ROM drive. For example:

```
mount –o  ro  –F hsfs /dev/dsk/c0t6d0s0 /cdrom
```

3. Change directory to the CD directory corresponding to the host's Operating System. For example:

```
cd /cdrom/Unix/Solaris/8
```

4. Run the **pkgadd** command to access the package installation main menu.

```
pkgadd -d . GSMstats
```

```
root@symmsun01# cd /mnt/Unix/Solaris/8
root@symmsun01# pkgadd -d . GSMstats

Processing package instance <GSMstats> from </mnt/Unix/Solaris/8>

Storability GSM Host Stats Agent
(sparc) prod-4.0.1
Copyright (c) 2002 Storability, Inc
All Rights Reserved

This is licensed software.  By installing this software you agree
to the terms of the license agreement included with the package in
/opt/storability/GSM-license.txt

GSMstats was built on SunOS 5.7.

The 'advanced' settings all have reasonable default values, which most
likely need not be changed.

Modify advanced settings? [n] [y,n,?] y

Automatically restart this agent from agentMonitor? [n] [y,n,?]
```

Figure 1 - Performance Agent Package Installation

5. When prompted, enter **y** and press **Enter** to review/ modify the **Advanced Settings** or **n** to accept the default values. For the **Advanced Settings**, you can view/modify the following configuration settings:

   - Specify whether (y/n) to start the Performance Agent (if down) using the agentMonitor. Agent Monitor will send an SNMP trap and restart an agent if it is detected as not running. The default value is n(o) or disabled.

   - For "Enable Stats Collection", specify whether (y/n) to enable collection of performance statistics. The default value is n (o) meaning that performance statistics collection is disabled. Keep in mind that running the Performance Agent (GSMstats) will impact the server resources. Therefore, you should only collect performance statistics when you specifically want to measure performance or diagnose problems on the backup server.

   - For "Interval (in seconds) at which statistics are collected", specify the frequency statistics are collected. The default value is 600 seconds. If you are initially testing the agent, you may want to set this to less time than 10 minutes.

   - For "Period (in seconds) for which historical statistics are retained", specify how long that historical statistics are cached. The default interval is 14400 seconds.

   - Review/modify the enable agent auto registration; agent auto registration is enabled by default.

   - Enter the IP address/network resolvable host name of the Local Manager to be contacted for agent auto registration. In the above screen, the Local Manager's IP address is 10.250.2.11.

- Review/modify the TCP port number the Local Manager uses for agent auto registration. The default TCP port number is 17146.

- Specify (y/n) whether to restart the agents after installation. If the agent is already running, the install script displays this operational status when the agents are restarted.

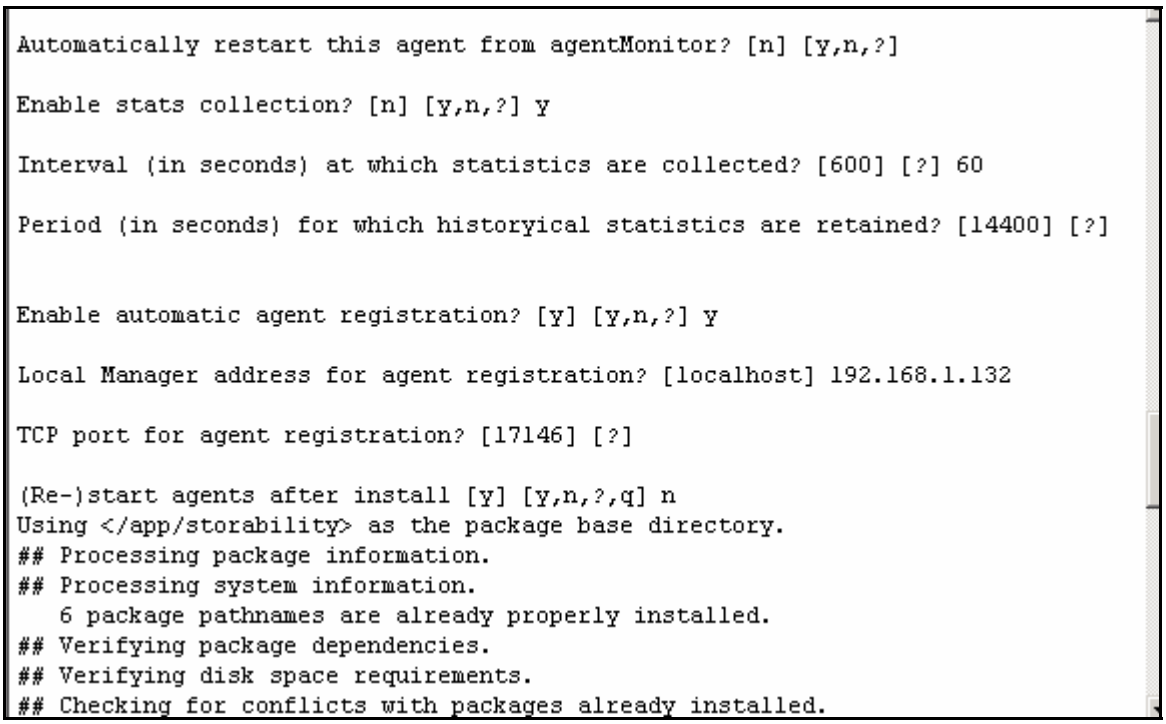

Figure 2 - Advanced Settings for Performance Agent

6. Enter **y** to confirm continuing with the installation of the Performance Agent (GSMstats), when prompted.

7. The installation completes and returns you to the command line.

8. Proceed to the **Verifying the Performance Agent** section.

IBM AIX Host Statistics Agent Installation

The Host Statistics Agent is provided with both the hostStatsAgent-AIX.tgz (gzipped tar) file and the install script. Ensure that the "hostStatsAgent-install.sh" and hoststatsAgent-AIX.tgz files reside in the same location.

1. Mount the installation CD in the CD-ROM drive of the AIX server. For example:

```
mount -v cdrfs -r /dev/cd0 /mnt # /mnt must exist
```

2. Change directory to the software installation directory. For example:

```
cd /cdrom/Unix/AIX/5.2
```

3. Run the installation script:

```
hostStatsAgent-install.sh
```

4. The installation script installs and starts the Host Statistics Agent.

Note: Performance data collection is turned off by default because the agent should only run when you are monitoring a performance bottleneck. You can enable them by: (a) manually changing this configuration setting in the storability.ini file to Yes (enabled), and (b) restarting the agent to have the configuration change take effect.

Agent Auto Registration on IBM AIX
To configure agent auto registration after installation, you can add the Host Statistics Agent to a Local Manager Routing Agent configuration or manually add the required entries to the storability.ini file. Sample storability.ini entries for the Host Statistics Agent appear below.

```
GSM_LM_HOST = 10.192.1.15
GSM_LM_PORT = 17146
GSM_ENABLE_LM_REGISTRATION = true
```

HP-UX HOST STATISTICS AGENT INSTALLATION

The following notes apply to installing Sun Storagetek Business Analytics agents on this platform:

- The agent installation must be carried out locally by root.
- You may mount the software media directly using the local CD-ROM drive or copy the CD contents to some location on the server.
    - `# ioscan –funC disk  # Identifies cdrom device`
    - Sample mount command:

      `# pfs_mount –o xlat=unix /dev/rdsk/cXtXd0 /SD_CDROM`

      (where /dev/rdsk/cXtXd0 is the cdrom device)
- Depending on which filesystem extensions are recognized by the host, the location, relative to the CD root, will be:

```
UNIX/HP-UX/<version>     (basic ISO 9660 filesystem)
Unix/HP-UX/<version>     (ISO 9660 with extensions)
```

- The software installation directory contains both the .tgz (gzipped tar) file and the install script.
- The agent should be started and stopped using the init scripts in the /sbin/init.d directory.
- Use the following command to confirm which agents are running:

```
$ ps -ef | grep Agent
```

- Refer to the READ.TXT file on the installation CD for additional information on installing smart agents on a HP-UX server.

1. Mount the installation CD in the CD-ROM drive of the HP-UX server.
2. Change directory to the software installation directory. For example:

```
cd /cdrom/UNIX/HPUX/11.00
```

3. Run the Host Statistics Agent installation script. For example:

```
./hostStatsAgent-install.sh
```

Note: Performance data collection is turned off by default because the agent should only run when you are monitoring a performance bottleneck. You can enable them by: (a) manually changing this configuration setting in the storability.ini file to Yes (enabled), and (b) restarting the agent to have the configuration change take effect.

Agent Auto Registration on HP-UX
To configure agent auto registration after installation, you can add the Host Statistics Agent to a Local Manager Routing Agent configuration or manually add the required entries to the storability.ini file. Sample storability.ini entries for the Host Statistics Agent appear below.

```
GSM_LM_HOST = 10.192.1.15
GSM_LM_PORT = 17146
GSM_ENABLE_LM_REGISTRATION = true
```

VERIFYING THE HOST STATISTICS AGENT

Use the GSM Agent Diagnostic Tool (GSMDiag) to verify the Host Statistics Agent functionality. GSMdiag is installed in the Storability Local Manager Utilities folder as part of the Central Manager or Local Manager software installation. It represents the primary tool to verify agent functionality or troubleshoot agent problems. The GSMdiag utility runs only on Microsoft Windows.

Proceed as follows:

1. Wait approximately 60 seconds after the Host Statistics Agent has started to allow it to initialize before querying it with GSMdiag.

   a. In the **Agent location** input box, enter the IP Address or network resolvable Host Name of the server where the agent is installed in the **ip address/host name** input box.

   b. Set the port to 17168 (or select the agent from the drop down list of service names).

   c. Click the **Get Object List** button and you should receive a list of objects published by the Perfromance Agent.

   d. Select the **gsa_ini_control-2_0** object to verify its configuration settings in the storability.ini file.

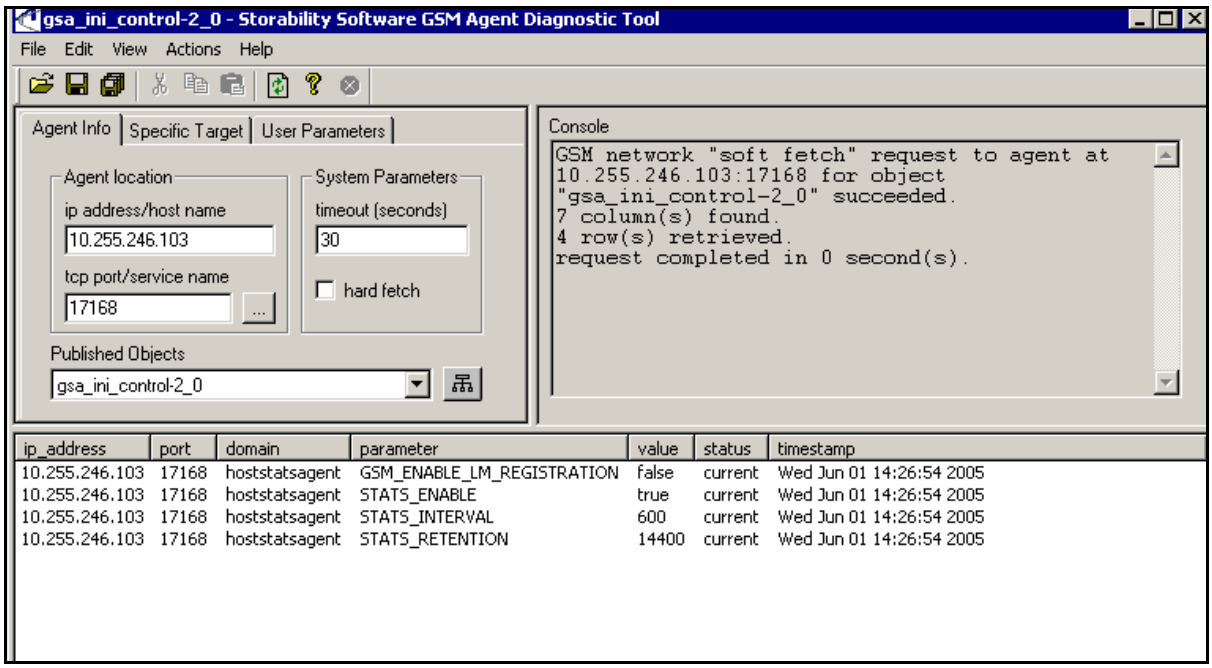

Figure 3 - GSMdiag: gsa_ini_control-2_0 Object

e. Select the **gsa_stats_config** and verify the IP address, system type (Host) and system ID columns return data.

f. After the first polling interval has expired, select the **gsa_statistics** object and verify that data is returned.

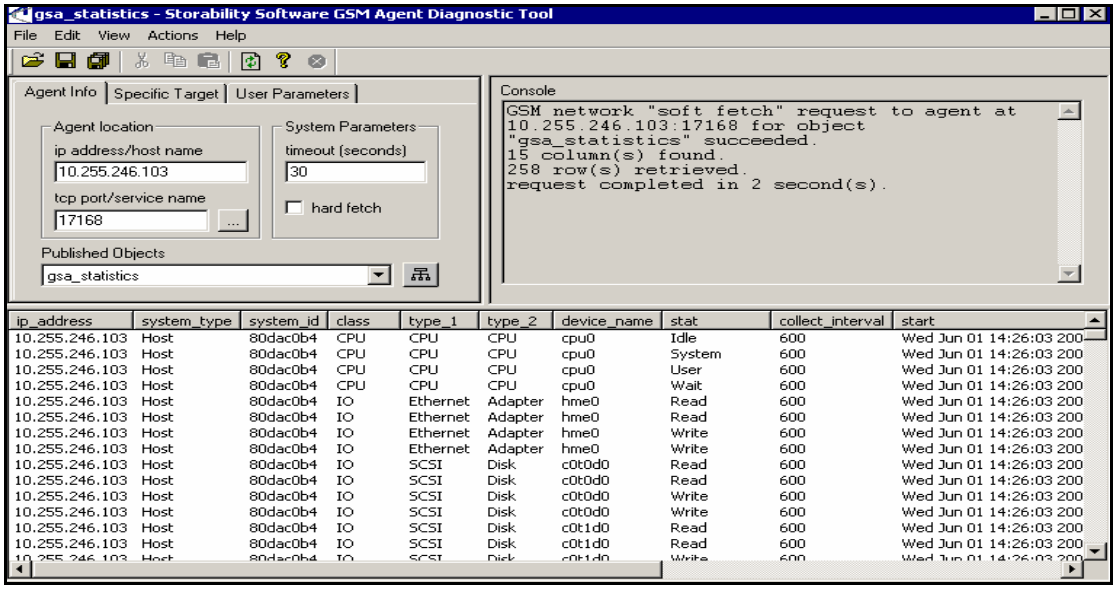

Figure 4 - GSMdiag: gsa_statistics

2. To verify the agent (GSMstats) has registered successfully with its configured Local Manager:

   a. In the **Agent location** input box, enter the IP Address or network resolvable Host Name of the Local Manager in the **ip address/host name** input box and

set the port to 17146 (or select the Storability Routing Agent from the drop down list of service names).

b. Click the **Get Object List** button and you should receive a list of objects published by the Routing Agent.

c. Select the **gsa_agent_register** table.

d. Verify this collected object reports the Host Agent using the following fields:

- port – 17168 (Host Statistics Agent default TCP port number)
- peer_list – IP Address or Host Name of the server where the Performance Agent is running
- last_freshened – Date/time agent last registered
- application_status – Should be 'ACTIVATED'
- network_status – Should be 'Up'

VERIFYING MANAGEMENT CONSOLE FUNCTIONALITY

The following procedure describes how the administrator verifies the Host Statistic Agent's report in the Management Console. Refer to the *Administration* chapter to obtain information on the administrative menus you can access from the **Tools** pull down menu, including the **Polling** menus.

1. Log in to the Management Console as an administrative user (e.g., gsmuser) whose views provide access to the desired assets (e.g., hosts).
2. Select **Tools->Data Polling Schedule** and the Polling Schedules window is displayed.

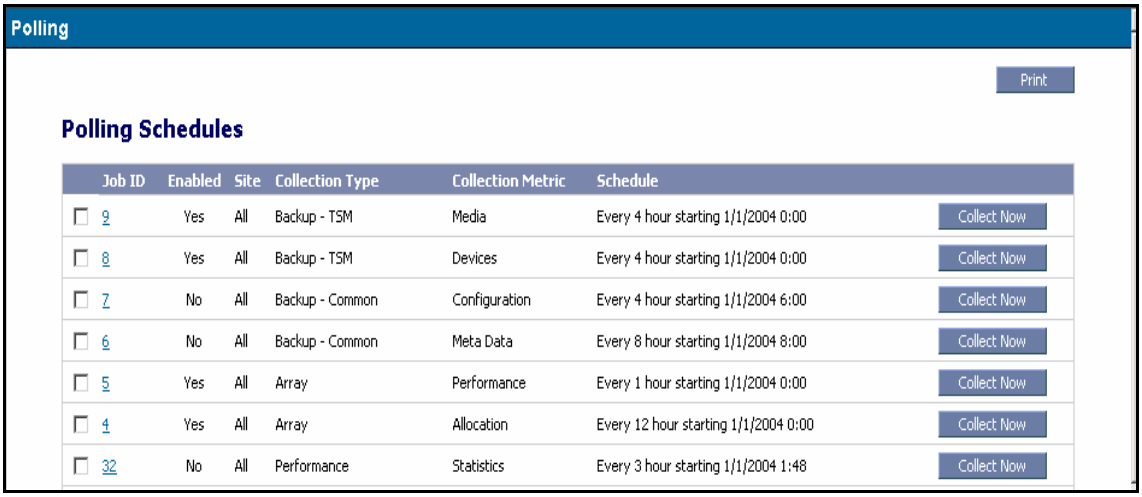

Figure 5 - Polling Schedules - Performance

3. Click the **Collect Now** button to collect the **Performance** (collection type) and **Statistics** (Collection Metric) data.
4. Verify the polling job information appears at the bottom of the menu, such as "data collection request(s) are being processed, Job ID(s):32". See also Figure 6 – Polling Menu.
5. Close the **Data Polling Schedule** window.

6. On the Management Console Home Page, select **Assets->Charting** Wizards.
7. Use the radio button to select "Host Performance Chart Wizard" and click Next>>.
8. In the "Select a Statistics (Host Performance Chart Wizard)" window, select (highlight) the default data column, which is Rate (Total (SUM) / Duration (SUM), and click Next>>.
9. In the "Select Report columns (Host Performance Chart Wizard)" window, select from the Available columns input box the columns (or all columns) you want in the report and click Next>>.

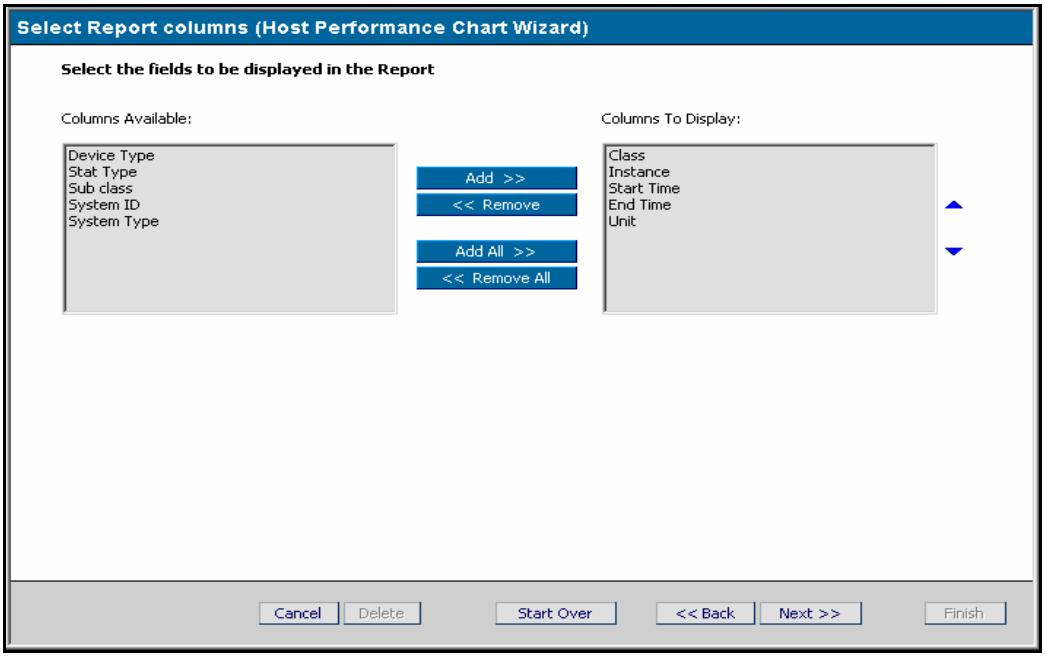

Figure 6 - Select Report Columns

Note: The columns selected for display in the above screen are for illustrative purposes only. The Columns to Display box will be empty until you select your desired columns.

10. In the "Select Record Filter (Host Performance Chart Wizard)" window, specify any optional record selection criteria for the database query and click Next>>.
11. In the "Select Type of Chart (Host Performance Chart Wizard)" window, type a chart title in the **Chart Title** input box. Use the radio button to choose the desired chart type (line graph, column chart, or pie chart) and click Next>>.
12. In the "Select the X-Axis column (Host Performance Chart Wizard)", select the data column(s) to be used for the chart's X-axis and click Next>>.

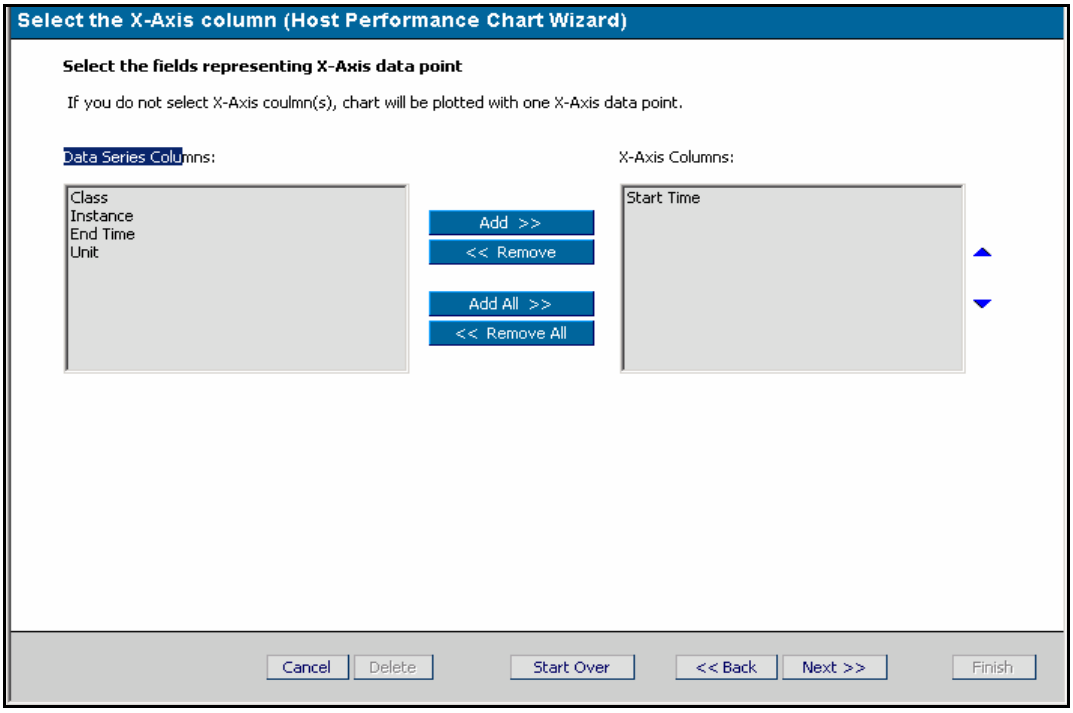

Figure 7 - Select the X-Axis Column (Host Performance Chart Wizard)

13. The chart is displayed. Verify minimally that data is available to produce Host Performance Charts. If desired, type a chart name in the Chart Name input box and click **Save** to save the chart to the database for easy subsequent displaying or editing.
14. Close the browser session with the Management Console as the above steps complete verifying the Management Console functionality.

HOST STATISTICS AGENT TROUBLESHOOTING

1. Use the Agent Diagnostic Tool to save the output for all the tables if escalating a problem to Sun Technical Support.
   a. Launch GSM Agent Diagnostic Tool from the Storability Program Folder.
   b. Enter the **IP Address** or **Hostname** of the server where the agent is installed and set the port to 17168 (or select the Host Stats agent from the drop down list of service names).
   c. Click the **Get Object List** button and you should receive a list of tables published by the Host Statistics Agent. If unsuccessful, verify the Ethernet connectivity to the server running the agent and that the Storability Host Statistics Agent is running.
   d. Select the **alerts-3_1** table and examine the **Description** column for each reported alert.
   e. Select **File->Save All** and the "This action will network fetch all objects published by the currently specified agent and save the data to a single file." Message appears.
   f. Click **OK** and the **Save As** dialog appears.
   g. Enter a meaningful file name and click **OK** to initiate the collection.
   h. Enter the desired file name and click **OK**.
2. **Review the Message Log** – Review/collect the Message.log file that can contain information on startup errors, configuration errors, or errors regarding accessing data or parsing output.

Solaris/AIX

- The agent's common Message.log file located by default in: /opt/storability/data.
- Can enable debug level logging by appending LOG_SEVERITY=Debug to the Host Agent section of the storability.ini file (if your support representative requests it).

3. **Verify Local Manager Registration -** The configured Routing Agent's **gsa_agent_register** table displays agents that have registered with the Routing Agent. The **Type** field indicates the type of registration. If the agent registered using agent auto registration, "AUTO_NET" is displayed in the **Type** field. If the agent was defined manually as a SUB_AGENT entry in the Routing Agent's storability.ini file, the **Type** field will display "STATIC".

4. **Review the Routing Agent Message Log** – Review/collect the Routing Agent Message Log to check for errors related to Ethernet connectivity problems contacting the Storability Host Statistics Agent and registration details.
5. **Confirm Polling Schedules** – Using the Management Console's **Data Polling Schedule** menu, review/modify the existing Polling Schedule for the **Collection Type** of Performance.
6. **Review Aggregator Message Log** – Open the Aggregator's Message Log in a text editor. Verify that the Performance object was requested (gsa_statistics) and that rows were inserted into the database. If you performed an on-demand (Collect Now) request in the **Polling** menu, look for timestamps in the log that closely approximate when that request occurred.

   The log contains two entries, TID (Transaction ID) and SID (Session ID), which can help you locate (e.g., Find) and view relevant logged entries. For scheduled polling requests, the TID will be equal to the Job ID in the Polling menu. Each SID is a unique identifier for a particular agent data collection session. For on-demand polling requests, the TID is a uniquely generated TID (not the Job ID) and SID, and the TID and SID will be equal to the same integer value.

7. **Check the assurent database** – The assurent database is the data repository for your Business Analytics application. For the Host Statistics Agent, use any MS SQL Query interface, such as **isql**, to verify rows have been inserted into the **gsa_performance_statistics** table.

8. **Verify Management Console Functionality** – As a final step in the agent troubleshooting procedure, minimally verify that there is data to allow the Host Performance Wizard to create a chart.

UNINSTALLING THE HOST STATISTICS AGENT - SOLARIS

1. Open a terminal window on the desktop of the Sun host.

2. Type the following command:

```
pkgrm GSMstats
```

REINSTALL AGENT – NON-SOLARIS UNIX HOST

The reinstallation procedure for all Storability agents supported on non-Solaris UNIX hosts, such as the Host Statistics Agent on an AIX server, requires that the installer perform the following steps **before** running the agent's installation script:

1. Make a backup copy of the existing agent configuration file (storability.ini).

2. Make a backup copy of the contents of /opt/storability/etc/agents.
3. Open the existing agent configuration file (storability.ini) in a system text editor.
4. Locate the configuration section for the agent to be reinstalled.
5. Delete all existing configuration settings for that Storability agent.
6. Save the modified agent configuration file.
7. Remove the existing /opt/storability/etc/agents directory.

At this point, you may reinstall the agent using the agent's installation script.