administrator's reference

hp OpenView Storage Area Manager Reporter Integration

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Part Number: T2533-90013

This guide describes how to integrate hp OpenView Storage Area Manager with hp OpenView Reporter.

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Storage Area Manager Reporter Integration administrator’s reference
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Introduction

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About hp OpenView storage area manager

HP OpenView Storage Area Manager provides comprehensive, centralized management across distributed, heterogeneous storage networks. The Storage Area Manager product suite includes the following five applications: Storage Node Manager, Storage Optimizer, Storage Builder, Storage Accountant, and Storage Allocater.

These applications work within a framework that is available regardless of which applications are installed and licensed. Among other features, this framework provides:

Device discovery and mapping

Storage Area Manager automatically discovers hosts, interconnect devices, and storage devices in direct attached (Fibre Channel or SCSI) and networked storage (SAN and NAS) environments. Discovered devices are placed in the Resources tree and a device map. Storage Area Manager illustrates the relationship of these devices by displaying their links within each device map.

If the storage network is using interconnect hardware to support fabric zoning, Storage Area Manager identifies the pre-configured zones and lists them under the Storage Networks node in the Resources tree. Storage Area Manager also creates a corresponding device map of each zone.

Event management

Based on its status inquiries of the storage network and its own processes, Storage Area Manager generates and displays events in the event panel. Framework and discovery-related events are displayed regardless of which applications are installed and licensed. Device status, performance, capacity, billing, and LUN security related events only appear if the applicable application is installed and licensed.

Storage Area Manager is able to receive SNMP traps from devices that support trap forwarding. You can also configure event triggers to perform certain actions based on event criteria. For example you can configure an event trigger to send e-mail notification to your on-call administrator for all events of a particular severity level.

Storage Area Manager also provides several features to manage the events that appear in the event panel. You can configure filters so only events that meet the filter's criteria are displayed in the event panel. You can also export all or selected events to a .txt, .csv, or .xml file. Finally, you can configure Storage Area Manager to automatically delete events based on a maximum number or on certain criteria such as event age, event severity level, or event category.

Manager of Managers

The Manager of Managers (MoM) enables you to monitor several storage domains from one console. You can configure MoM to retrieve and display status and event information from each Storage Area Manager management server in your environment. This feature allows Storage Area Manager to easily scale in large, complex storage environments.

User authentication and authorization

When starting Storage Area Manager, users must login with their unique user name and password. Storage Area Manager users accounts can be configured with different levels of privilege. User accounts with Administrator privilege are able to save changes to the Storage Area Manager database and may perform all Storage Area Manager tasks. User accounts with Guest privilege are only able to view information provided by Storage Area Manager, and are not able to save changes. User account privileges apply to tasks conducted both through the graphical user interface (GUI) and command line user interface (CLUI).

Storage Node Manager

Storage Node Manager provides device status monitoring and reporting capability to the Storage Area Manager product suite. Among other features, Storage Node Manager provides:

Device status monitoring

Storage Node Manager monitors and graphically displays the status of each discovered device in your storage network. Device status is displayed wherever the device is referenced in the user interface, including the Resources tree, device map, and event panel.

Based on its status inquiries of the storage network, Storage Area Manager generates and displays status-related events as they occur in your storage network.

Application linking

You can link device-specific applications to Storage Area Manager and then start them from the user interface. The applications are linked to specific devices or device models. Many default device-specific application links are provided with Storage Node Manager.

Storage Optimizer

Storage Optimizer monitors and reports device performance in a storage network. Performance metrics vary by device; however, a set of common metrics are available for all devices supported by Storage Optimizer. Among other features, Storage Optimizer provides:

Performance views

Performance views for host disks, volumes, interconnect devices, ports, storage devices, and LUNs. Performance lists, displayed for groups of devices in the Resources tree, allow you to compare common metrics for all disks, volumes, storage devices, and so on. Performance charts show you the performance analysis of individual devices over time.

Top-N analysis

You can sort performance lists by order of performance and limit the length of the list to the first 5, 10, 15, and so on to 100 devices.

Past and future trends

Performance charts display a line graph of past and future performance. Storage Optimizer predicts future performance by identifying trends in past data. You can turn this feature on or off, and you can select from a full range of predictive models.

Performance thresholds and threshold events

Storage Optimizer monitors the current and predicted performance of individual resources for threshold violations. If performance differs significantly from a mathematically derived baseline, Storage Optimizer sends a threshold violation to Storage Area Manager's event panel. Administrators can turn baselines on or off and configure event triggers.

Data export

You can save the contents of performance charts in a comma-delimited (.csv) file.

Storage Builder

Storage Builder monitors and reports storage capacity in a storage network. It routinely discovers the physical capacity of storage devices and logical capacity of hosts and NAS devices, and analyzes the information for current usage, past and future usage trends, and threshold violations. Among other features, Storage Builder provides:

Capacity data for host resources

Host resources include directories, disks, users, volumes, and volume groups. Clicking any of these labels in the Resources tree displays a list of the individual resources and their capacities. Selecting a resource from the list displays additional information about the individual directory, disk, user, and so on.

Capacity views

For hosts and NAS devices, view panels show the used and free file space. For storage devices, view panels show the disk space that is visible to hosts, that is unformatted, and that is spent in overhead. At the group level in the Resources tree--the domain Hosts, NAS Devices, and Storage Devices nodes, Capacity view panels display summarized capacity information for the corresponding resources.

Past and future usage trends

From the Capacity view panel, you can display a line graph of past and future capacity. Storage Builder predicts future capacity by identifying trends in past data. You can turn this feature on or off, and you can select from a full range of predictive models.

Capacity thresholds and threshold events

Storage Builder monitors the current and predicted capacity of individual resources for threshold violations. If measured capacity exceeds or falls below a specified target, Storage Builder sends a threshold violation to Storage Area Manager's event panel. Administrators can set thresholds and configure event triggers.

Data export

You can save the contents of capacity graphs and pie charts in a comma-delimited (.csv) file.

File Analysis

You can generate a report on stale files, junk files, the largest files, largest directories, and all files and directories on each and all hosts in the domain. You can modify the default reports and create original reports.

Storage Accountant

Storage Accountant meters storage space in organization accounts and reports the associated cost at the end of each month. Accounts belong to internal or external organizations. Among other features, Storage Accountant provides:

Service Level, Organization and Account nodes in the Applications tree

Storage Accountant associates LUNs with service levels and then associates the service-rated LUNs with organization accounts. You can view, create, add LUNs to, and maintain service levels and organization accounts from these nodes.

Centralized setup functions

The Accounting view panel provides all the tools you need to set up storage billing. You can view, create, and add LUNs to service levels; view and create organizations; add organization accounts; and attach LUNs to accounts. You can also view the total number of service levels, organizations, and LUNs in service levels, and the total storage value that is billed and not billed.

Monthly and interim bill reports

Storage Accountant rolls up daily charges into a monthly bill that is arranged by organization and account. Detailed bills describe the charges for each LUN. Summary bills show only the total charges for each organization and account. Using the Bill Viewer, you can view, export, and print bills for the current (interim) or past billing periods and for all or individual organizations.

Storage device and service level billing reports

Storage Accountant creates monthly billing reports that are organized by storage device or service level. Summary reports show the total charges for the storage device or service level LUNs in accounts and LUNs not in accounts. Detailed reports show summary information and a LUN-by-LUN description of charges.

Exported bills

Storage Accountant automatically exports monthly bill reports in a format and location that you choose. Available formats include CSV, HTML, and XML. You can set event triggers that launch a third-party billing application once the report is exported.

Storage Allocater

Storage Allocater controls storage access and provides security by assigning logical units (LUNs) to specific hosts or groups. Assigned LUNs cannot be accessed by any other hosts. With this application, you can assign, unassign, and reassign storage and related devices from a diverse pool. Among other features, Storage Allocater provides:

Security Groups

Share groups and associated LUN groups streamline your storage assignments. Share groups allow multiple hosts to share the same storage devices. Associated LUN groups keep sets of logical units (for example, stripe sets or mirror sets) together, requiring them to be assigned and unassigned as a unit.

Organizational Groups

Host groups and LUN groups allow you to arrange hosts and logical units into hierarchical groups in the Storage Area Manager user interface.

Reports

Storage Allocater can generate reports that show all LUNs, assigned LUNs, or unassigned LUNs. These reports allow you to quickly view the assignment status of all of the LUNs in the current storage domain.

System availability

Storage Allocater provides increased system availability by enabling storage to be assigned, unassigned, and re-assigned without reboots.

Automation of LUN allocation operations

Hooks in the Storage Area Manager command-line interface allow you to automate LUN allocation operations with scripts.

hp OpenView storage area manager architecture

Storage Area Manager's hardware and software architecture consists of the bridge, management server, managed host(s), management client(s), and the Manager of Managers (optional). This section offers an overview of each of these elements.

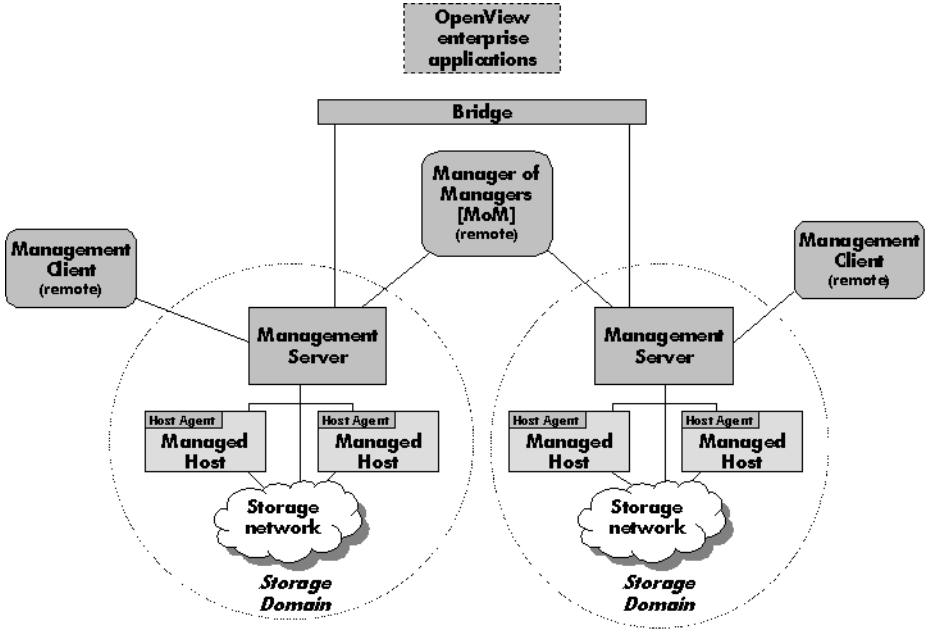

Figure 1: hp OpenView storage area manager architecture

Bridge

The Storage Area Manager bridge is a web server application that allows other applications access to Storage Area Manager's functionality. This access enables Storage Area Manager to have tight integration with other hp OpenView enterprise applications. The bridge is able to consolidate information from multiple management servers for use by the application integrating with the bridge.

The bridge is automatically installed on the management server when you install Storage Area Manager from the CD.

Management Server

The management server is a server application that hosts the majority of Storage Area Manager functionality. This framework includes Storage Area Manager's database, discovery subsystem, event handling subsystem, configuration files, and server components for each of the five applications that comprise the product suite.

The management server software is installed from the Storage Area Manager CD on a dedicated Windows 2000 server or workstation. One management server manages a single storage domain. A storage domain consists of storage resources that are visible to the storage network hosts associated with the management server. Storage Area Manager is capable of managing direct-attached, SAN-attached, or network-attached storage resources.

Managed Host

The managed host contains the host agent software, which includes all components that require access to the storage resources that are visible to the hosts. These components include discovery, status and event inquiry, and performance and capacity data collection.

The host agent software can be installed remotely from the management server or locally from the Storage Area Manager CD on to a Windows, HP-UX, Solaris, Linux, AIX, Tru64 Unix, OpenVMS, or Netware host. Upon successful installation, the host becomes associated with and dedicated to the management server. The host agent runs as a service on Windows hosts and as a daemon on Unix hosts.

Management Client

The management client is a graphical user interface (GUI) application that uses a common navigation and presentation framework to display the storage information that is stored by the management server.

The management client software is automatically installed on the management server. The management client can also be downloaded from the management server to remote client systems running Windows, HP-UX, Solaris, or Linux.

Manager of Managers

The Manager of Managers (MoM) is a graphical user interface (GUI) application that consolidates storage information from multiple storage domains. This allows an administrator to view from a single location the high-level status and filtered event information of a large or geographically dispersed storage network. The administrator can also launch the management client for a particular storage domain to view the detailed information displayed by the client.

The MoM software can be downloaded from the management server to remote Windows, HP-UX, Solaris, and Linux hosts. It is an optional piece of the Storage Area Manager architecture.

OpenView Enterprise Applications

Storage Area Manager integrates with various OpenView enterprise applications. Through the bridge, the Storage Area Manager SMART Plug-In (SPI), and the integration packages contained on the Storage Area Manager CD, Storage Area Manager information and control can be integrated with:

- hp OpenView Reporter (OVR)
- hp OpenView Service Information Portal (SIP)
- hp OpenView Operations for Windows (OVW)
- hp OpenView Operations for Unix (OVO)
- hp OpenView Internet Usage Manager (IUM)
- hp OpenView Service Navigator
- hp OpenView Service Activator
- hp OpenView Service Desk

hp OpenView storage area manager user interfaces

Storage Area Manager provides two interfaces within which you can perform storage management tasks: the graphical user interface (GUI) and the command line user interface (CLUI).

Graphical User Interface

Storage Area Manager's intuitive, tri-pane GUI allows you to monitor the status of your storage network, view event information, and easily perform administrative tasks. Figure 2 illustrates some of the key elements of the Storage Area Manager GUI.

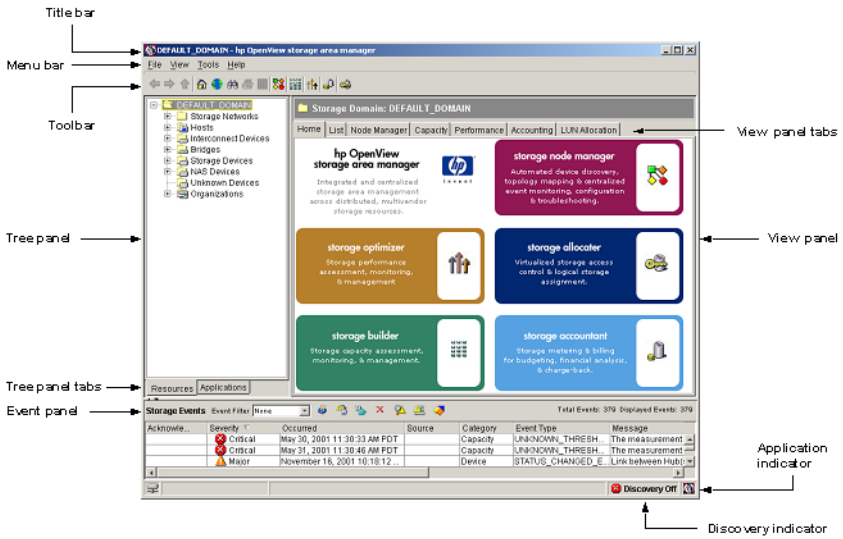

Figure 2: hp OpenView storage area manager GUI

Title bar

The title bar indicates the node or subnode currently selected in the tree panel and the product name. For example, "DEFAULT_DOMAIN - hp OpenView storage area manager".

Menu bar and toolbar

The menu bar and toolbar provide access to commonly performed tasks. Application icons are included on the toolbar, which provide direct navigation to each application's home page.

Tree panel

The tree panel includes two views, Resources and Applications, which are controlled by the Tree panel tabs at the bottom of the tree panel.

- The Resources tree lists resources managed by the storage domain including storage networks, devices, and organizations. Storage networks are defined as islands of Fibre Channel connectivity, which indicates that each device in the storage network is able to send Fibre Channel commands to all other devices in the storage network. Each storage network is represented by a corresponding device map.

  Device types include hosts, interconnect devices, bridges, storage devices, NAS devices, and unknown devices.

  Organizations include various resources in their membership and are used by Storage Accountant as part of its billing functionality.
- The Applications tree includes a node for each of the five applications that make up the Storage Area Manager product suite. Each application node includes shortcut navigation to that application's primary tasks.

Event panel

The event panel lists events received and reported by Storage Area Manager as it monitors the storage network. Each event listed in the event panel includes its severity level, the date and time it occurred, the source of the event, the event's category and type, and the message provided by the event itself.

The Storage Area Manager event management subsystem enables several features to help you manage the events displayed in the event panel. These features are conducted through use of the toolbar icons near the top of the event panel and include such tasks as acknowledging, deleting, and exporting events. You can also create event filters, which enable you to display only those events that meet the criteria you set when creating the event filter.

View panel

The view panel displays detailed content for the node or subnode that is currently selected in the tree panel.

This may include lists (for example, a list of all storage devices), specific device properties information (for example, identifying information for a particular disk array), device capacity or performance data (for example, the amount of unconfigured space for a particular disk array), or device maps that illustrate the storage network.

Tabs near the top of the view panel provide navigation to other areas of content for the displayed device.

Application indicator

The application indicator reflects which application's information is currently displayed in the view panel.

Discovery indicator

The discovery indicator reflects if Storage Area Manager's ongoing device discovery process is on or off.

Command Line User Interface

Storage Area Manager's CLUI provides an alternative interface to the GUI. Nearly all tasks that can be performed in the GUI can also be performed from the CLUI.

Like the GUI, the tasks that can be performed within the CLUI are restricted by the Storage Area Manager applications that are installed and licensed and by the privileges assigned to the user name that is used to log into the CLUI.

The CLUI offers several forms of assistance for each command including purpose statements, help text, and man pages.

- Purpose statements offer a high-level description of the command. To view the purpose statement for a particular command, enter:

  purpose <“command name”>

Note: You must include the command name in quotes (**“”**) when running the purpose command. This is not required for the help text or man page commands.

- Help text offers detailed usage information for each of the command’s options and arguments. To view the help text for a particular command, enter:

  help <command name>

- Man pages are the highest level of assistance for each command. Each man page includes an expanded description of the command, its options and arguments, the license and user account privilege required to run the command, an example, and a list of other CLUI commands that are closely related to this command. To view the man page for a particular command, enter:

  man <command name>

What is the hp OpenView storage area manager Reporter integration?

HP OpenView Storage Area Manager is a suite of products designed to manage and monitor the usage of a Storage Area Network environment. The Reporter integration for Storage Area Manager integrates HP OpenView Reporter for Windows with the Storage Area Manager management servers by:

1. Periodically gathering data from the Storage Area Manager databases through the Storage Area Manager bridge and writing them into the Reporter database.
2. Creating HTML reports from these gathered data using Crystal Report templates.

Once configured, the Reporter allows the administrators to create schedules for gathering and reporting of Storage Area Manager data in their reporting station. Web based reports of their storage network can be created, so that they can be shared among other users too. The Storage Area Manager Reporter integration allows Reporter users to collect and create reports from not only one Storage Area Manager management station, but a multiple number of them. Data from various Storage Area Manager management stations are collected through the Storage Area Manager bridge and consolidated reports are created from them. Reporter integration also creates customer based reports where data are grouped by the customer.

The Gatherer program that comes along with the Storage Area Manager Reporter integration is the one which queries the Storage Area Manager bridge to collect storage network related data and uses them to populate the Reporter repository. The Crystal Report templates provided in the integration package are used to format these data from the Reporter repository into Web based HTML reports. Additionally, On Demand reports can be generated directly from the data collected by gatherer to give a historical capacity overview for an user specified time interval.

Features of the hp OpenView storage area manager Reporter integration

The features provided by the Reporter integration are:

- Automatically collect storage network related data from multiple Storage Area Manager management stations and populate the Reporter repository with these data
- Segregate these data according to the part of the storage network it describes. For example, the hosts, NAS devices, storage devices, bridges, and so on.
- Consolidate data from all Storage Area Manager management stations into a single report
- Create reports on the data collected. The following type of reports will be created:
  - Inventory reports
  - Capacity reports
  - Capacity overview by domain reports
  - Service level information reports
  - On Demand reports

Except for the On Demand reports, all the above reports will also be available grouped by customers.

The table below shows the web link names that get created for each of the Storage Area Manager based reports, the report heading and the description of each report.

Table 1: List of Storage Area Manager Reports

Web Link Name	Report Heading	Report Description
Inventory Reports		
Inventory of Bridges	Inventory of Bridges	This report lists the bridges and their attributes discovered in the storage network.
Inventory of Hosts	Inventory of Hosts	This report lists the managed hosts and their attributes discovered in the storage network.

Table 1: List of Storage Area Manager Reports

Web Link Name	Report Heading	Report Description
Inventory of Interconnect Devices	Inventory of Interconnect Devices	This report lists the interconnect devices and their attributes discovered in the storage network.
Inventory of NAS Devices	Inventory of NAS Devices	This report lists the NAS devices and their attributes discovered in the storage network.
Inventory of Storage Devices	Inventory of Storage Devices	This report lists the storage devices and their attributes discovered in the storage network.
Capacity Reports		
Capacity of Applications	Capacity of Applications	This report summarizes the capacity information for the Managed applications in Storage Area Manager.
Capacity of Exchange Admin Groups	Capacity of Exchange Admin Groups	This report depicts the top 20 Exchange admin groups occupying the most space in all the storage domains. It also lists the capacity information for each Exchange admin group in the storage network, grouped by Exchange groups.
Capacity of Hosts	Capacity of Hosts	This report summarizes the capacity information for the file systems on the managed hosts in the storage network.
Maximum Directory Consumption	Maximum Directory Consumption (top 20)	This report depicts the top twenty managed directories consuming the most space in the storage network.
Maximum Consumption by User	Maximum Consumption by user (top 20)	This report depicts the top twenty users consuming the most space in a storage domain.

Table 1: List of Storage Area Manager Reports

Web Link Name	Report Heading	Report Description
Capacity of NAS Devices	Capacity of NAS Devices	This report summarizes the capacity information for the file systems visible to the managed hosts that are on NAS devices discovered in the storage network.
Capacity of Oracle Database Components	Capacity of Oracle Database Components	This report depicts the top 20 Oracle database components occupying the most space in all the storage domain. It also lists the capacity information for each Oracle database component in the storage network, grouped by Oracle database.
Capacity of Storage Devices	Capacity of Storage Devices	This report shows capacity information on storage devices discovered in the storage network.
Capacity of Volumes	Capacity of Volumes	This report shows capacity information for the file systems contained on managed hosts and NAS devices discovered in the storage network.
Capacity of Volume Managers	Capacity of Volume Managers	This report shows capacity information for volume managers on the managed hosts discovered in the storage network.
Capacity Overview by Domain		
Allocation on Storage Devices	Capacity Overview by Domain - Reports - Allocation on Storage Devices	This report displays a summarized graph by storage domain showing the allocation of storage devices discovered in the storage network.
Consumption on Hosts	Capacity Overview by Domain Reports - Consumption on Hosts	This report displays a summarized graph by storage domain for each customer showing the space consumption on managed hosts discovered in the storage network.

Table 1: List of Storage Area Manager Reports

Web Link Name	Report Heading	Report Description
Consumption on NAS Devices	Capacity Overview by Domain Reports - Consumption on NAS Devices	This report displays a summarized graph by storage domain showing the space consumption on NAS devices discovered in the storage network.
Service Level Information		
Accounting Summary	Accounting Summary Report	This report gives the accounting summary information.
Organization Detail	Accounting Detail Report - Organization Detail	This report gives the accounting detail of each organization.
Organization Summary	Accounting Detail Report - Organization Summary	This report gives the accounting summary of the Organization.
Service Levels Summary	Service Levels Summary Report	This report depicts the space utilization in each Service Level.
Customer Based Reports		
Allocation on Storage Devices	Capacity Overview by Domain Reports - Allocation on Storage Devices	This report displays a summarized graph by storage domain for each customer showing the allocation of storage devices discovered in the storage network.
Consumption on hosts	Capacity Overview by Domain Reports - Consumption on Hosts	This report displays a summarized graph by storage domain for each customer showing the space consumption on managed hosts discovered in the storage network.
Consumption on NAS Devices	Capacity Overview by Domain Report - Consumption on NAS Devices	This report displays a summarized graph by storage domain for each customer showing the space consumption on NAS devices discovered in the storage network.

Table 1: List of Storage Area Manager Reports

Web Link Name	Report Heading	Report Description
Capacity of Hosts	Capacity of Hosts	This report summarizes the capacity information by customer for the file systems on the managed hosts in the storage network.
Inventory of Bridges	Inventory of Bridges	By customer, this report lists the bridges and their attributes discovered in the storage network.
Inventory of Hosts	Inventory of Hosts	By customer, this report lists the managed hosts and their attributes discovered in the storage network.
Inventory of Interconnect Devices	Inventory of Interconnect Devices	By customer, this report lists the interconnect devices and their attributes discovered in the storage network.
Inventory of NAS Devices	Inventory of NAS Devices	By customer, this report lists the NAS devices and their attributes discovered in the storage network.
Inventory of Storage Devices	Inventory of Storage Devices	By customer, this report lists the storage devices and their attributes discovered in the storage network.
Maximum Directory Consumption	Maximum Directory Consumption (top 20)	By customer, this report depicts the top twenty managed directories per customer consuming the most space in the storage network.
Capacity of NAS Devices	Capacity of NAS Devices	By customer, this report summarizes the capacity information for the file systems visible to the managed hosts that are on NAS devices discovered in the storage network.

Table 1: List of Storage Area Manager Reports

Web Link Name	Report Heading	Report Description
Organization Detail	Accounting Detail Report - Organization Detail	This report gives the accounting details of each organization.
Capacity of Storage Devices	Capacity of Storage Devices	By customer, this report shows capacity information on storage devices discovered in the storage network.
Capacity of Volume Managers	Capacity of Volume Managers	By customer, this report shows capacity information for volume managers on the managed hosts discovered in the storage network.
Capacity of Volumes	Capacity of Volumes	By customer, this report shows capacity information for the file systems contained on managed hosts and NAS devices discovered in the storage network.

The table below shows the Graph names and the corresponding Graph titles for all the On Demand reports shipped with this product.

Table 2: List of Storage Area Manager On Demand Reports

Graph Name	Graph Title
Domain Hosts: Total vs Free Space	Free Space vs Total Space in all hosts, grouped by domain
Domain NAS devices: Total vs Free Space	Free Space vs Total Space in all NAS devices, grouped by domain
Domain Storage devices: Total vs Free Space	Free Space vs Total Space in all Storage devices, grouped by domain
Domain Utilization	Domain Based utilization of hosts and NAS devices
Customer Hosts: Total vs Free Space	Free Space vs Total Space in all hosts, grouped by customers
Customer NAS devices: Total vs Free Space	Free Space vs Total Space in all NAS devices, grouped by customers

Table 2: List of Storage Area Manager On Demand Reports

Graph Name	Graph Title
Customer Storage devices: Total vs Free Space	Free Space vs Total Space in all Storage devices, grouped by customers
Customer Utilization	Customer based utilization of hosts and NAS devices
Hosts: Total vs Free Space	Free Space vs Total Space per host in the domain
Hosts Utilization	Utilization per host in the domain (top 20)
NAS devices: Total vs Free Space	Free Space vs Total Space per NAS device in the domain
NAS device Utilization	Utilization per NAS device in the domain (top 20)
Storage devices: Total vs Free Space	Free Space vs Total Space per Storage device in the domain
Storage device Utilization	Utilization per Storage device in the domain (top 20)

Installation

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Installation prerequisites

This section lists the prerequisites for the installation of the Reporter integration. To avoid problems during the installation of the integration, it is essential that you read this section, and any other documents recommended in the section, before you start the installation process.

Hardware requirements

For a detailed list of hardware requirements for the Reporting station, refer to the *HP OpenView Reporter Installation and Configuration Guide* included with the Reporter product. The additional disk space requirements are shown in table below:

Table 3: Disk Space Requirements

Machine	OS Installation	Installation	Runtime Files	Total
Reporting Station	Windows 2000	10 MB	8 MB	18 MB

Note: No additional memory (RAM) is required on the Reporting station for installation of this integration.

Software requirements

For a detailed list of software requirements for the Reporting station, refer to the *HP OpenView Reporter Installation and Configuration Guide* included with the Reporter product.

The tables below describe the software versions supported by the integration.

Table 4: Reporter Supported Versions

Operating System	Reporter Version
Windows 2000	A.03.50 A.03.60

Note: If you are using a Reporter in a japanese locale and are using Oracle as the database, you must have the Reporter database configured for the right character set. You can do this either by re-creating the database or by changing the character set of the Reporter database to "JA16SJIS". The corresponding oracle client installed in the Reporter system should also have the NLS_LANG set to Japanese_Japan.JA16SJIS. For information on how to do this, please refer to the documentation that comes along with the Oracle database product.

Table 5: Storage Area Manager Supported Versions

Operating System	Storage Area Manager Version
Windows 2000	03.20.xx

Note: Even if the integration installs fine and is configured properly, it is important that the Storage Area Manager bridge is up and running for the proper functioning of the integration. For details on how to configure the Storage Area Manager bridge, refer to chapter 7, "Configuring the Bridge," in the *hp OpenView storage area manager administrator's guide*.

Installing the hp OpenView storage area manager Reporter integration

This integration can be installed using the InstallShield setup program. The InstallShield executable verifies whether the correct version of the Reporter software is installed before actually installing it. It also updates the Reporter with the Storage Area Manager specific templates and schedules and loads the Gatherer program with a default configuration.

To install the integration on the Reporting station, you can use the *setup* command as described in the following steps:

1. Run **`setup.exe`** to begin the installation.
2. Follow the online instructions to complete the installation.

Upgrading the hp OpenView Storage Area Manager Reporter Integration

If you already have hp OpenView Storage Area Manager Reporter integration version 03.10.00 installed and want to upgrade to version 03.20.30, complete the following steps:

1. Install hp OpenView storage area manager Reporter integration. For more information, see page 34.
2. Verify the installation of hp OpenView storage area manager Reporter integration, version 03.20.30 as given on page 36.
3. Re-configure the OpenView SAM Gatherer after installation. For more information, see page 40.

Note: After upgrading the software, the database tables and the data in the database tables that was created by the earlier version of hp OpenView storage area manager Reporter integration is not deleted.

Verifying the installation of the hp OpenView storage area manager Reporter integration

To verify whether the installation of the Storage Area Manager Reporter integration was completed successfully in the Reporting station, check whether an entry is added under **Start**-> **Programs**-> **HP OpenView** -> **OpenView SAM Integration**. Also ensure that the Storage Area Manager related reports, metrics and schedules are visible on the Reporter GUI. To verify this, click on **Reports**->**Storage Area Manager** in the left pane of GUI and you should see a list of 37 Storage Area Manager reports in the right pane. To verify the Storage Area Manager metrics, click on **Metric Lists** in the left pane of the GUI and a list of 5 Storage Area Manager metrics should be listed in the right pane. To verify the Storage Area Manager schedules, click on **Schedule->Gather** in the left pane of GUI and you should see the **gather_sam.exe** as a program scheduled in the right pane. The graphic below shows the **Reporter GUI** after the Storage Area Manager Reporter integration is installed.

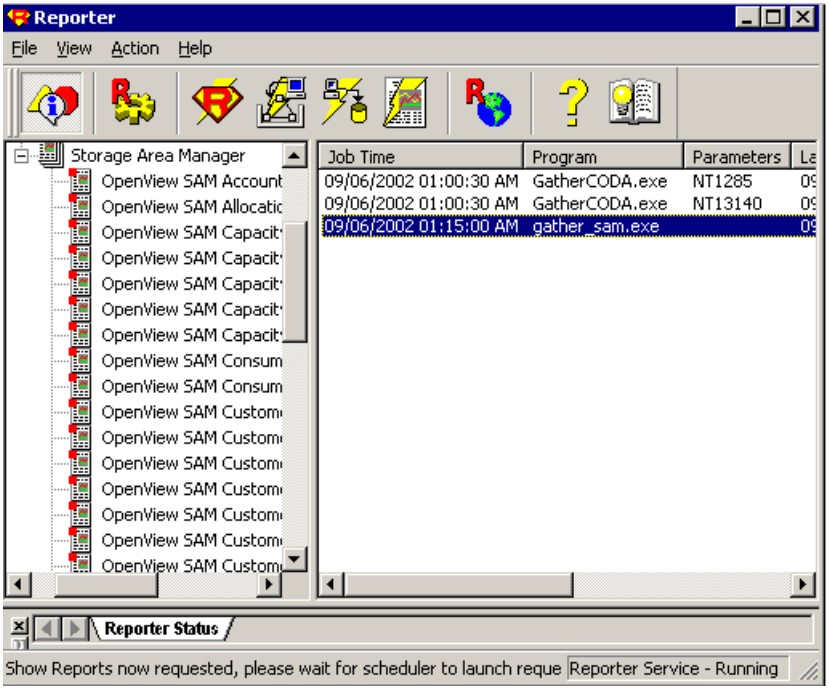

Figure 3: Reporter GUI after installation

Installed file locations

The installation process copies the necessary files to the Reporting station. Table below shows the directories that are created during the installation process on the Reporting station for the Storage Area Manager Reporter integration.

Table 6: File locations of each of the Storage Area Manager Reporter integration components on the Reporting station

File Type	Description
Templates	<Reporter Data Path>\reports\SAM <Reporter Application Path>\OpenView SAM Integration\SAM*
Customer related templates	<Reporter Data Path>\reports\SAM\customer <Reporter Application Path>\OpenView SAM Integration\SAM\customer*
Gatherer Program	<Reporter Application Path >\bin
Gatherer Configuration Editor	<Reporter Application Path>\OpenView SAM Integration\bin
Documentation	<Reporter Application Path>\OpenView SAM Integration\doc

* The templates will be first installed here and then copied to the <Reports Data Path>\reports where the Reporter expects them to be. Do not edit these templates here as they can be used as a backup for the Storage Area Manager templates present in the Reporter Data path.

Configuration

3

- Configuring the hp OpenView storage area manager Reporter integration, page 40

Configuring the hp OpenView storage area manager Reporter integration

This section describes how to configure the Storage Area Manager integration for Reporter. The main configuration is the input required by the Gatherer program. Perform the steps below to configure the Storage Area Manager Gatherer program:

1. Start the OpenView SAM Integration Configuration Editor from **Start->Programs-> HP Openview-> OpenView SAM Integration->Gatherer Configuration Editor.**
2. The Configuration Editor loads with preconfigured default values for each of the item as shown below.

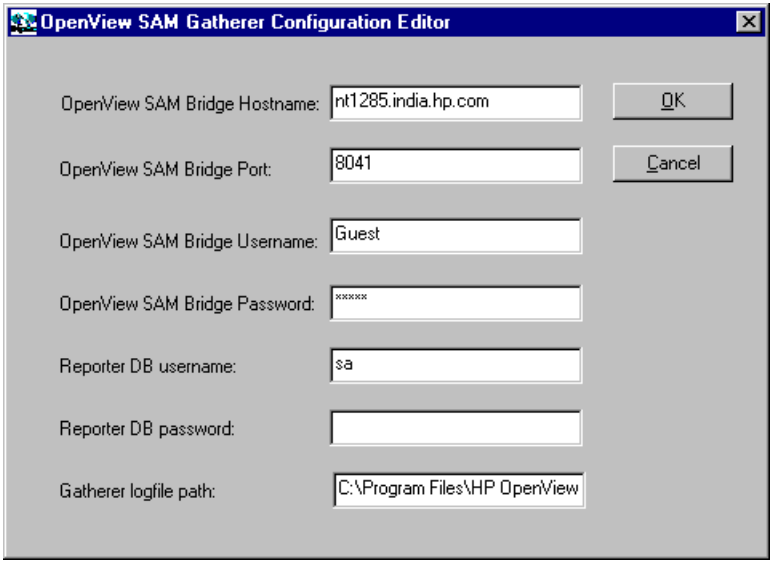

Figure 4: OpenView SAM Gatherer Configuration Editor

3. Enter the new desired values in the fields and click **OK**. Ensure that no error occurs while saving the values.
4. Make sure that the values of the bridge hostname, port and the credentials to access it are accurate. The bridge hostname may or may not include the domain in which it resides.

5. Ensure that the Storage Area Manager bridge configured in the configuration editor is up and running.
   a. Make sure that the Storage Area Manager bridge is configured to include the list of the management server from which you want to gather data. Otherwise, data will be gathered only from the management server located on the same node as the bridge. For details on how to configure the Storage Area Manager bridge, refer to chapter 7, “Configuring the Bridge,” in the *hp OpenView storage area manager administrator’s guide*.
6. Ensure that the Storage Area Manager related templates and schedules are available in the Reporter GUI. These will be uploaded automatically during installation.
7. The default schedule for the Storage Area Manager Gatherer program (gather_sam.exe) to run in the Reporter will be at 01:15 am local time every day. You can change the schedule and frequency as desired. To do this, right-click on the "**gather_sam.exe**" program in the right pane of the Reporter GUI**,** ("gather_sam.exe" program entry is shown in the right pane only when the "Schedule->Gather" is selected on the left pane) and select **Edit**. An Edit Schedule Entry window will open as shown below. Here, you can change the **Job Reset** entry to change the frequency in days or the **Job Time** entry to change frequency of time.

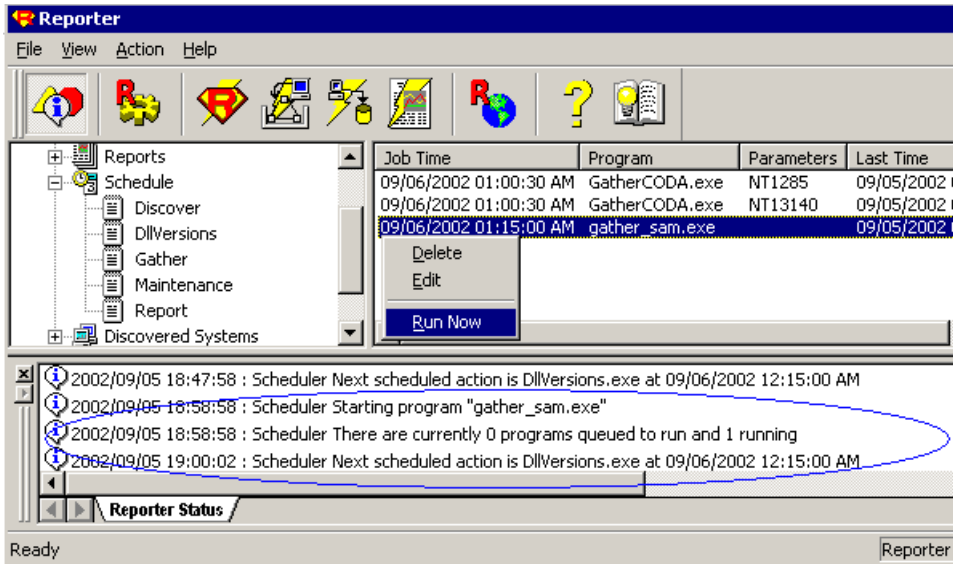

Figure 5: Edit Schedule Entry

Using

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- Using the hp OpenView storage area manager Reporter integration, page 44
- On Demand Reporting, page 49

Using the hp OpenView storage area manager Reporter integration

To view your storage network related reports on your browser right away, you need to populate the Reporter repository with data related to the storage network. To do this, you could:

- Wait for the Reporter scheduler to start the Storage Area Manager Gatherer program, which is by default at 01:15 am everyday.
- Run the **OpenView SAM Gatherer** program from the **Reporter GUI**.

  a. Open the Reporter GUI.

  b. Click on **Schedule** on the left pane.

  c. In the right pane, right-click on **gather_sam.exe** and select **Run now**.

  d. Wait for the scheduler to start the program.

  In the **Reporter status** window, look for the message:

  ```
  Scheduler starting program “gather_sam.exe”
  ```

  e. The right pane should also show the status as **OK** against **gather_sam.exe** entry.

  f. When a message such as

  ```
  Scheduler Next scheduled action......
  ```

  appears in the **Reporter** Status window, the gather program would have completed its work.

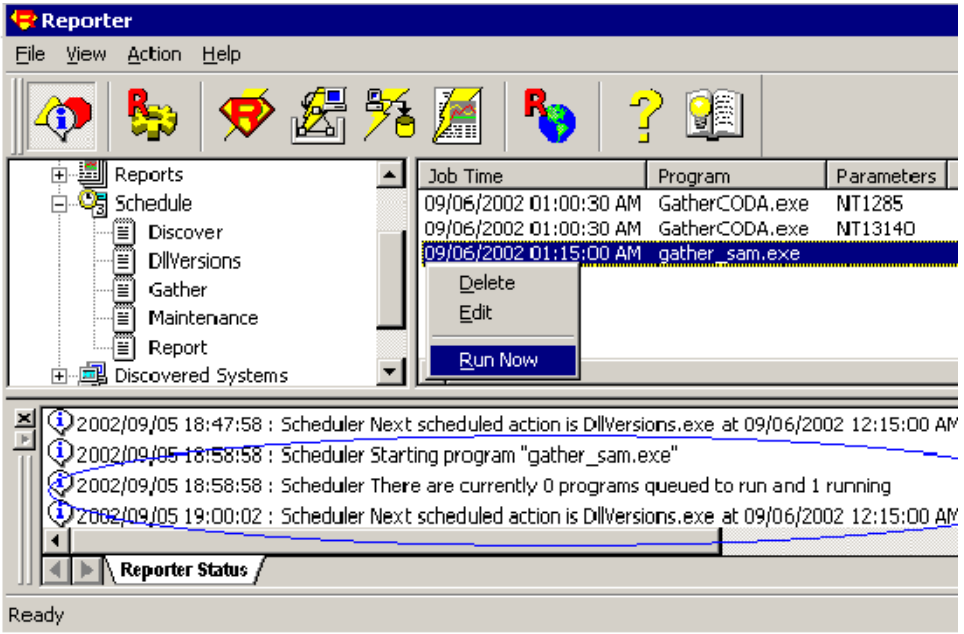

Figure 6: Starting OpenView SAM Gatherer

There are three ways to run the reports:

- Select the **Generate Reports** option from the pull-down menu
- Select the **Generate Reports** icon from the taskbar
- Wait for the scheduler to run reports again. By default, this will occur every day at 02.00 am.

The following graphic points out the pull-down menu and the taskbar options:

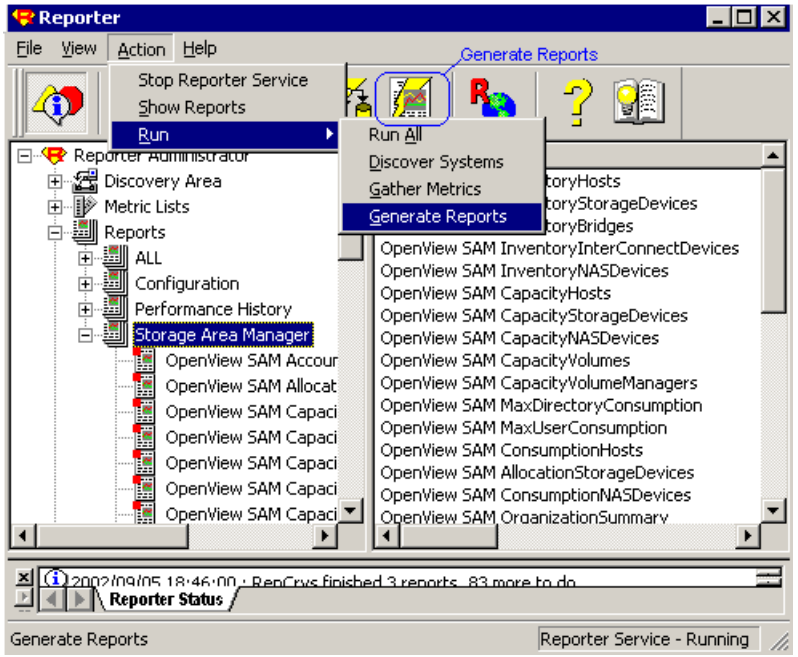

Figure 7: Generate Reports

Once the reports are generated, your main reports page index should have the **Storage Area Manager** link included in it. Click on this link to view a list of available reports for your storage network. The lists also includes the customer based reports.

The list is as shown below:

Figure 8: OpenView SAM Reports

You can use your browser's **Back** or **Forward** button to navigate through the visited reports.

By clicking on a hyperlink, you will see a specific report. An example report is shown next:

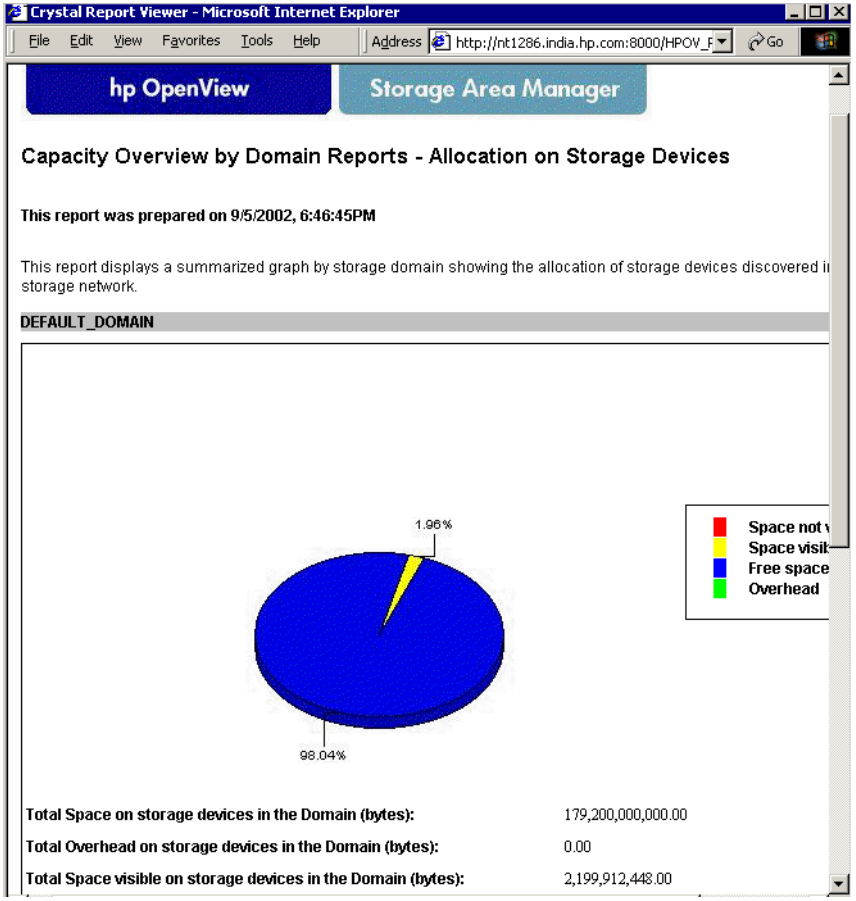

Figure 9: Sample Report

On Demand Reporting

On Demand reporting is a feature of the Reporter that lets you create customized reports from the data available in the database on demand. This feature is used to present the trend information of Storage Area Manager's various entities like the domain, organizations, hosts, NAS devices and storage devices. The graphs give a comparative overview of the free space vs the total space in each of the entities, over a period of time. In addition to this, the utilization of each of the entity is plotted over the specified time period. To view these reports, perform the following steps:

1. Make sure that the **OpenView SAM Gatherer** program has run successfully**.**
2. Click on the **All Customers** link under the **On Demand Reports** section in the main reports page index.
3. The On Demand reports initial screen will now be displayed in your browser. Select **Storage_Area_Manager** from the **Template File** menu. The **Graph Name** menu will now be populated with the 14 On Demand reports provided with this integration.
4. Select the **Graph Name** you would like to view currently.
5. Values for other fields like the **Date Range**, **Ending**, **Points Every**, **Graph Size** and **Use Java Graphs** can be selected appropriately to suit your needs. For help on selecting these values, use the **Help** tab on the top of the On Demand screen.
6. The fields **Customer**, **Group** and **System Names** are not used for any of the Storage Area Manager graphs. The On Demand initial screen will now look similar to the below screen.

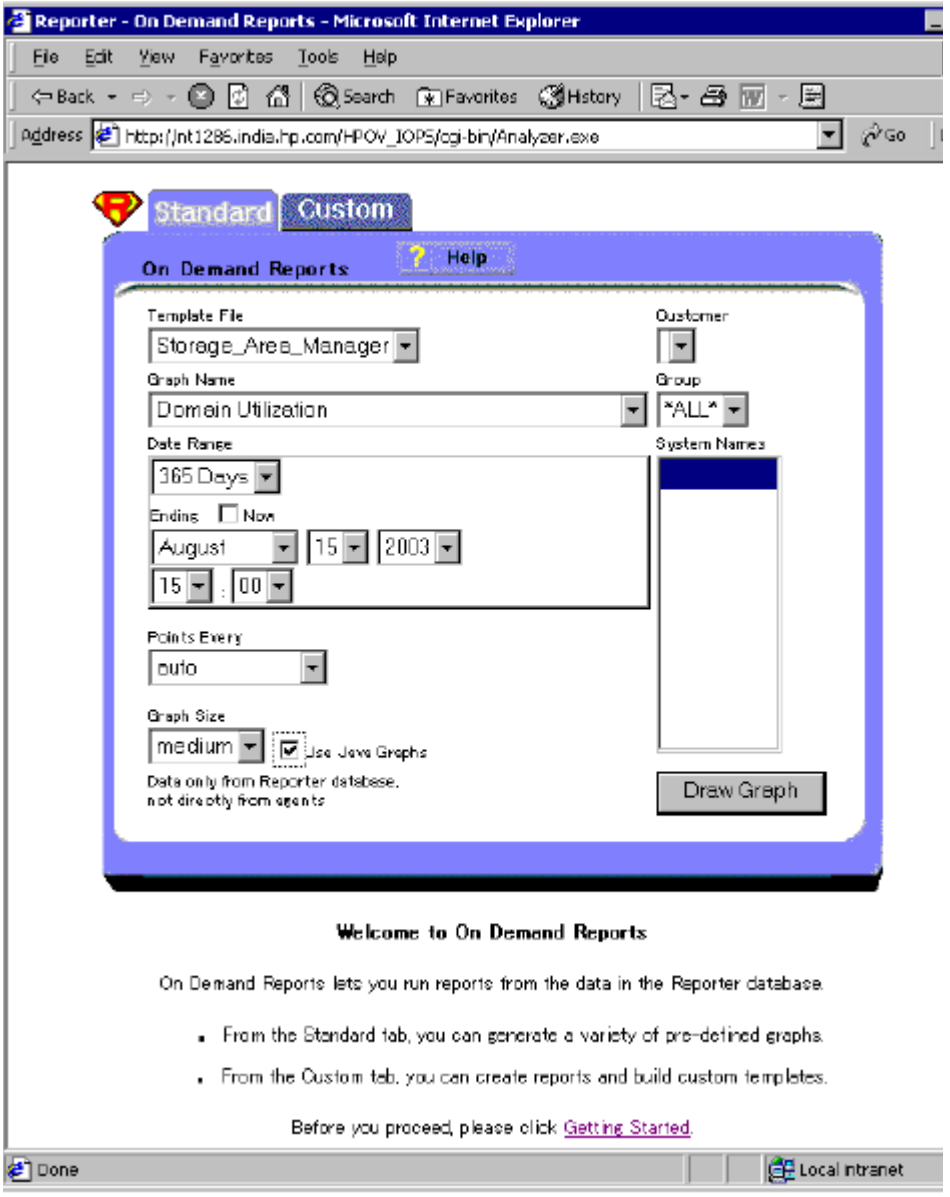

Figure 10: On Demand Reports initial screen

7. Click on **Draw Graph** button to view the graph for the selected values. A sample on demand report graph is as shown below.

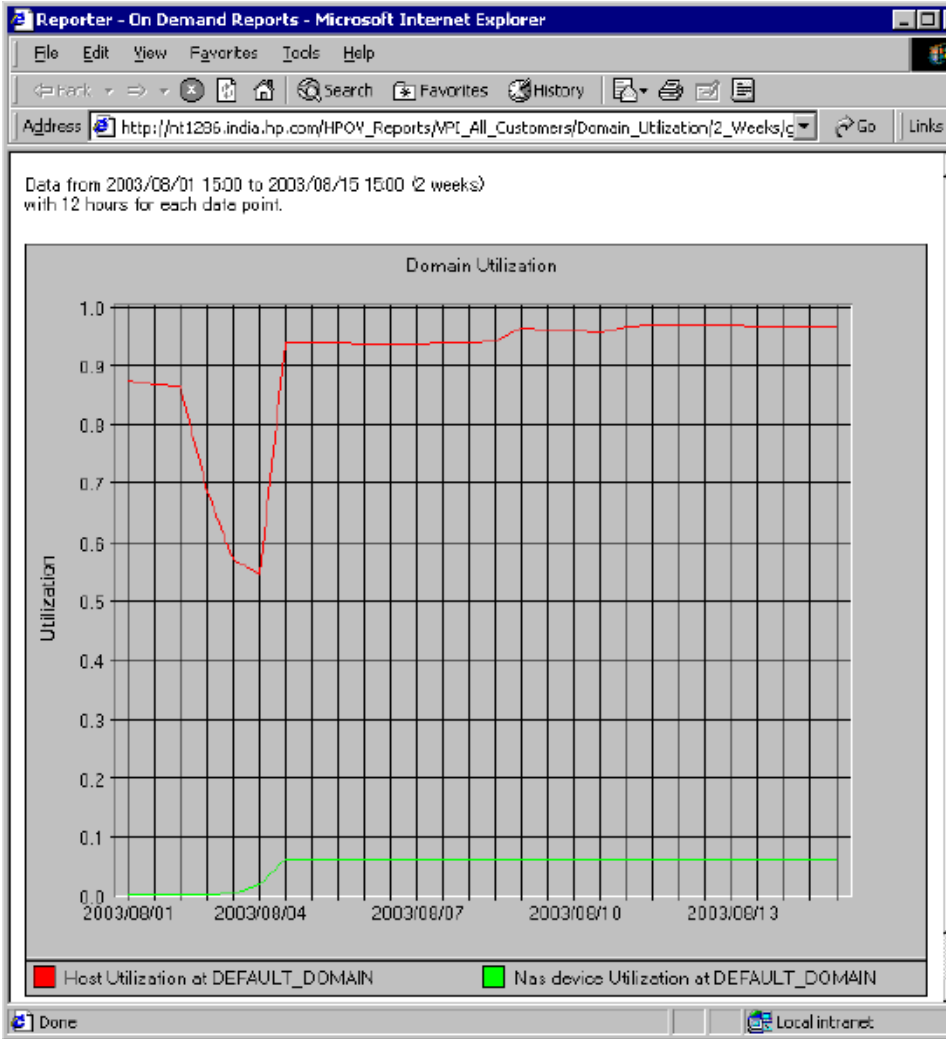

Figure 11: On Demand sample report

Note

1. The use of java graphs is recommended to be restricted to only domain based graphs. This is because, the java graphs does not span multiple pages and hence all of the trend lines will be plotted in a single page. This clutters the screen as the number of customers/hosts/devices can possibly be very high. On the other hand, the domain based reports can be viewed using java graphs

option since the number of domains is usually less. The java graphs will offer you a greater flexibility in choosing various properties of the graph and also offers drill down options for the graph.

2. In order to compare the Free vs Total space graphs of different hosts or devices, you could select the "Graph Size" as small so that the graphs appear side by side in the resulting report. This makes it convenient to compare at least four such graphs of host or devices at the same time.
3. The RepMaint utility that comes with the Reporter is used to maintain the Storage Area Manager's trend tables so that any data older than 365 days is removed periodically. This value of **365 days** can be increased or decreased to suit your needs. To change this value for each of the table, select the 5 Storage Area Manager metrics, **SAM_DOMAINMETRIC**, **SAM_CUSTOMERMETRIC**, **SAM_HOSTMETRIC**, **SAM_NASMETRIC**, **SAM_STORAGEMETRIC**, and change the value of **Retain Days** to the value desired by you.

Troubleshooting

5

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- Storage Area Manager link missing in the main Reporter page, page 55
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Overview

This section describes how to troubleshoot problems you encounter with the integration Reporter for Storage Area Manager and, where appropriate, points to additional sources of information. Some of the most common problems and their solutions are listed below.

In general, before you even try to solve any of the problems, ensure that you have correctly installed and configured the integration. Further, carry out the steps recommended in page 36.

Storage Area Manager link missing in the main Reporter page

Symptom	Cause/Solution
I don't see a "Storage Area Manager" link in my main Reporter page.	The reports for "Storage Area Manager" would have not been generated yet. After you have carried out the steps in page 44, you need to wait until you get a message like `RepCrys finished all reports of total <a number>` in the Reporter Status window. There should be no errors listed there.

Blank reports seen in my browser

Symptom	Cause/Solution
I see blank reports in my browser.	Blank reports indicate that there is no data in the Reporter repository. Do the following checks to ensure data in the repository: 1. Ensure that the Storage Area Manager Gatherer program has run at least once. Click **Schedule** in the left pane of the Reporter GUI and select **Refresh** from the **View** menu. In the left pane, there should be a last time entry against the **gather-sam.exe** program. 2. Check for errors in the log file which will be created at the location you had configured using the Storage Area Manager Configuration Editor. This will contain the details of reasons for the failure of the program to populate the repository. 3. The Gatherer program produces errors when it is not able to connect to the bridge or to the Reporter database. Ensure that the bridge and the Reporter database are up and running. 4. Make sure that the correct credentials are given to access the bridge and the Reporter repository. 5. Ensure that the Storage Area Manager management server connected to the bridge contacted by the Gatherer program indeed has data in its repository.

Japanese characters are garbled in the reports generated

Symptom	Cause/Solution
Japanese characters are garbled in the reports generated.	1. The Reporter database may not have the right character set to support storing of Japanese characters. — If you are using SQL server database, re-create it with the Japanese character set, or re-install the database with the system locale set to Japanese. For details, refer the documentation that comes along with the MS SQL server product. — If you are using Oracle database, re-create the Reporter database or change the character set of the Reporter database to "JA16SJIS". Additionally, the corresponding oracle client in the Reporter should have the NLS_LANG set to “Japanese_Japan.JA16SJIS”. For details, refer the documentation that comes along with the Oracle product. — If you are using MS Access database, you need to have the database installed in the system where the locale is set to Japanese. 2. Required fonts needed to display the Japanese characters in the reports may not be installed. Install the appropriate fonts in the system from where the reports are being viewed. Also set the encoding appropriately in the browser you are going to view the reports.

Capacity reports show wrong size values

Symptom	Cause/Solution
Capacity reports show wrong size values.	This may be due to duplicate host/device names in the same Management server. The Storage Area Manager Management Server ensures that no two devices discovered in a storage domain will have the same name even if they are of the same type. So, duplicate names can be formed only when the administrator changes the name of a discovered device to that of an already existing one. Ensure that no two devices have the same name in Storage Area Manager.

The Domain based reports give wrong capacity information

Symptom	Cause/Solution
The Domain based reports gives wrong capacity information.	This could be caused because there are duplicate storage domain names in your storage network. Ensure that no two domains in your storage network have the same name.

Errors on installation in Reporter with Oracle DB

Symptom	Cause/Solution
Errors are reported in the status window while installation in Reporter using Oracle DB.	This could be caused because of the lack of table space allocated to the RPT_INDEXES table in the Reporter. Extend the table space for this table to at least 1200MB so as to avoid this error. For information on how to extend the table space size, refer documentation that comes along with the oracle product.

Uninstalling

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- Uninstalling the hp OpenView storage area manager Reporter integration, page 62

Uninstalling the hp OpenView storage area manager Reporter integration

To uninstall the Storage Area Manager Reporter integration components from the Reporting station:

1. Select **Add/Remove Programs** from the Windows Control Panel.
2. Select the **hp OpenView SAM Reporter Integration (03.20.30)** program from the list, and click Remove.

This will remove all the templates, the Gatherer program, user guides and all components from the Reporter GUI. The Storage Area Manager related tables from the Reporter database will also be removed.