



Sun StorageTek™ Resource Manager 6.0 Guide

Sun Microsystems, Inc.
www.sun.com

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Revision History

Short Name	Part Number	Dash	Date	Comments
RESOURCE MANAGER GUIDE	817-7925-16	-05	January 2008	

Preface

This document describes how to use Sun StorageTek™ Resource Manager 6.0. This document assumes you have a basic understanding of the following:

- *Networking*
- *Storage Area Networks (SANs)*
- *The Common Information Model (CIM)*

Before You Read This Book

In order to fully use the information in this document, you must have thorough knowledge of the topics discussed in these books:

- *Sun StorageTek™ Operations Manager Installation Guide*
- *Sun StorageTek™ Operations Manager User Guide*

Using UNIX Commands

Use this section to alert readers that not all UNIX commands are provided.

For example:

This document might not contain information on basic UNIX® commands and procedures such as shutting down the system, booting the system, and configuring devices. See the following for this information:

- Software documentation that you received with your system
- Solaris™ operating environment documentation, which is at

`http://docs.sun.com`

Table with descriptions and examples of the typographic conventions that are used in this book.

Related Documentation

Application	Title	Part Number
Installation	Release Notes	-----
Operations Manager	<i>Sun StorageTek™ Operations Manager 6.0 Installation Guide</i>	817-7922-16
Operations Manager	<i>Sun StorageTek™ Operations Manager 6.0 User Guide</i>	817-7923-16
CLI	<i>Sun StorageTek™ Operations Manager 6.0 CLI Guide</i>	817-7924-16
Application Module	<i>Sun StorageTek™ Application Module 6.0 Guide</i>	817-7926-16

Table listing other documents that are related to this book or product.

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Sun StorageTek™ Resource Manager 6.0 Guide, part number 817-7925-16

Overview of File Server SRM

Depending on your license, File Server SRM may not be available. See the List of Features to determine if you have access to File Server SRM. The “List of Features is accessible from the Documentation Center (**Help > Documentation Center**).

Your business is only as good as your storage infrastructure. You depend on data for the core functions of your business. The growth of your business or just maintaining day-to-day business activities adds even more data. The challenge is in knowing if your file storage infrastructure is growing in a managed, organized, and efficient manner. Given the sheer volumes of data, obtaining this sort of information can be difficult.

With the industry’s most versatile scanner, which creates an information store about your storage system, the management software for file systems has been designed to scale to the needs of enterprise file systems.

Also, by combining file, logical, and physical storage resource monitoring and reporting with active SAN management, this software provides a single integrated system for managing your entire file storage infrastructure.

It provides detailed analysis of your file storage in four key areas:

- **Composition – Aging, Size**
 - Why are there files on a system that have not been accessed for more than six months?
 - What is the size group distribution on various file systems?
 - Do we need hierarchical storage management or a store and delete policy?
- **Content – Extensions**
 - Are file systems being used properly?
 - Is there misuse of storage space?
 - If there is, then who are the offenders?
- **Consumer - Users, Ownership, Applications**
 - Who is using how much space?
 - Is the usage planned?
- **Capacity - Used and Available**
 - What is the total available capacity?

- How much is being used?

File Server SRM does a recursive lookup on the file system and stores the information in an embedded database. File Server SRM can scan files very quickly for several reasons, because File Server SRM never opens the files.

Keep in mind the following:

- If you do not see information for the file server, verify that the collector for the file server is running. You can verify that the collector is running by selecting **Configuration > FSRM**. On the Data Collection tab, look in the Running? column. See “Managing Collectors for File Server SRM” in the user guide.
- If you plan to have File Server SRM scan a host, make sure you have 80-120 MB for each set of 1 million files. The actual size is dependent on the length of the file names.
- If you want to use File Server SRM bulk import capability for non-ASCII characters (such as Chinese, Japanese, or Korean), the file should be created with UTF-8 encoding. Notepad, among other tools, lets you specify the encoding in its “Save As” dialog.
- Reparse points (junctions) for file servers on Microsoft Windows are scanned. For example, assume you create a junction named C:\DDrive, which points to the root of the D drive. The content of the D drive is available under C:\DDrive. After a scan, information on capacity and amount used are displayed for the C drive; however, the sum of the file sizes on the C drive also includes the junction (C:\DDrive), which points to the root of the D drive. If you do not want to include the scanning of reparse points, see “Enable the Scanning of Reparse Points” on page 7. Reparse points created using the Windows Disk Management tool are discovered as a drive that can be scanned independently.

About Reports for File Server SRM

Reporter provides a variety of detailed reports for file servers. You can view reports for File Server SRM in Reporter by selecting **System > File Server** in Reporter. To access Reporter, select **Reporter**.

Data collectors gather information for reports. If you stop a data collector, its reports are not updated. You might want to verify that a collector is running if you are having difficulty viewing a report or you believe the report is not displaying the latest information. See the user guide for more information.

In addition, you can configure File Server SRM to gather specific information based upon user-defined rules for gathering the information, through the capability to add rules, delete rules, edit rules, and map volumes to the rules. This is described in more detail later in this guide.

Also, you can create multiple schedules for a single fileserver. You can add volumes to schedules, and can remove them from schedules. A schedule can not contain volumes (details) for more than one file server; however, each file server may have more than one schedule.

After a successful file server scan, the upload process starts. During this time, details (i.e., extensions, aging and size groups, etc.) are collected. After that, the File Server SRM custom report data collection begins.

The first part of the process enumerates all rules for the given volume; the process then executes according to the rules specified.

The reporter reads the results, to display the information according to the display criteria specified.

The management server provides reports that display performance information in a variety of formats:

- **HTML (default)** - The software displays the report in a Web page by default.
- **PDF** - The software displays the report in Adobe Acrobat, a good option if you need to print the report. The software assumes you already have Adobe Acrobat Reader installed on your computer. To obtain a copy of Adobe Acrobat Reader, go to <http://www.adobe.com>.
- **Excel** - The software displays the report in Microsoft Excel, providing you have a copy of Microsoft Excel already installed.
- **XML** - The software displays the report in the XML format.

Examples of reports include those that list files not accessed in the past n years, files with specific file extensions and which exceed a given size, etc. For example, File Server SRM can group the file extensions into different categories, so that users can generate reports for the different applications, such as office-related files (*.doc, *.ppt, *.xls) or music-related files (*.mp3, *.avi). Supported reports can be used by external reporting tools.

Report information can be filtered. Unix Global Permissions allows users to filter files into the report based on the selection of rwx permissions. Files with other permissions will be present in the report if they satisfy the selection. For example, the report corresponding to global write permission also may contain files with global execute permission, provided the files also have the global write permission.

The Windows Attributes option allows users to filter files into the report based on the selected set of attributes. Only the files that have the selected attributes will be collected against the rule (irrespective of the state of the other attributes). For example, selecting Archive and Encrypted attributes will filter all files that have these attributes; some of the files in the report may contain files of other attributes (i.e., Hidden), if they have the archive and encrypted attributes.

Note – Non-ANSI text—for example Asian characters and the Euro symbol—included in a comma-separated values file is not displayed properly by Microsoft Excel. Excel replaces the non-ANSI text with a question mark (?).

Policies for File Server SRM

This section contains the following topics:

- “Accessing Policy Manager for File Server SRM” on page 4
- “Creating Policies for File Server SRM” on page 5

Accessing Policy Manager for File Server SRM

This topic provides the various techniques for accessing Policy Manager. You have multiple options for accessing utilization policies for file servers. The flexibility for accessing utilization policies lets you easily create and manage utilization policies without interrupting your work flow.

Policy Manager provides the following options for accessing utilization policies:

- To easily access other functionality, such as the Events, Topology, and Volumes tabs:

Double-click a file server in System Explorer, and then select the **Policies** tab. This method displays the utilization policies for just the file server that was double-clicked.

- To easily access all utilization policies:

Select **Policy Manager**. In the Policy Manager tree in the middle pane, expand the **Utilization Policies** node, and then expand the **Applications** and **File Servers** nodes for the file server. Select the name of the file server for which you want to create a policy. To view all utilization policies, select the **Utilization Policies** node.

- To easily access other functionality for file servers: Access the Policies tab in Application Explorer. Expand the **Applications** and **File Servers** nodes in the tree in Application Explorer. Select the file server name in the Application Explorer tree. Select the **Policies** tab in the right pane.

Creating Policies for File Server SRM

You can create a utilization policy that generates an event, sends an e-mail, or runs a custom command when an element is being overused. For example, you can configure Policy Manager so you receive an e-mail message when the amount of free space on a server decreases to a specified level.

Caution – If you plan to use e-mail notification with your policy, first assign an SMTP server from which the management server can send its e-mail notifications.

To create a utilization policy for a file server:

1. Access Policy Manager as described in the “Accessing Policy Manager for File Server SRM” on page 4.
2. In the right pane, select **Add**.
3. Select a policy, and then select **Next**.

The following table lists types that may be displayed.

TABLE 1-1 Policy Templates

Policy Type	Description
Free Space	Amount of free space on the file server.
Percent Used	Percentage of disk space used.
Free Space Trending	Free space trending for file server.
Trending for Percent Used	Trending for percent of storage used for file server

4. In the Name box on the Policy Properties tab, modify the name of the policy or keep the default.
5. In the Description box, modify the description for the policy or keep the default.
6. In the Re-arm Period box, specify a re-arm period in minutes.

The re-arm period is the amount of time after the policy executes before it can execute again. It is useful for limiting the number of times the same actions will execute.

Important: Specify shorter periods for important applications.

7. To the right of the comparison operator menu, enter a percentage or an amount in gigabytes (GB), depending on the box name displayed.

8. For trending policies, enter the number of days in the Historic period box (min=7; max=180) and Projection period box (min=1; max=180).
9. Select an action to occur when the policy condition is fulfilled, by selecting one or more of the following buttons (more than one action can be assigned to a policy):
 - **Send E-mail** - Policy Manager sends an e-mail when the condition is fulfilled. Enter a comma-separated list of e-mail addresses, and then select **OK**.
 - **Generate Event** - Policy Manager generates an event of the specified event type. The event appears in Event Manager. Select one of the following event types.

Important: Since the severity level for an element is set by the manufacturer, the meanings of the severity levels vary. It is best to view the description of the event.

Unknown - The severity level is not known.

Informational - An example of an informational event is a progress report event for firmware download operation currently in progress.

Warning - An example of a warning is when one or more new physical fabric objects (device port, switch, or fabric) have appeared.

Minor - An example of a minor event is when a physical fabric object (switch port or fabric) has changed state.

Major - An example of a major event is when one or more physical fabric objects (device port, switch, or fabric) have disappeared.

Critical - An example of a critical event is Brocade switches that have a failed firmware download and the failure reason code for each respective switch.

After you select an event level, select **OK**.

- **Execute a Custom Command** - Policy Manager executes a custom command on the management server when the condition is fulfilled. Enter a command that will execute the script in the box, and then select **OK**. The software assumes you are in the [Install_Dir]\JBossandJetty\server\appiq\remotescripts directory on the management server when the script is executed. You can use environment variables in your script, such as `POLICY_NAME` and `POLICY_DESCRIPTION`. `POLICY_NAME` provides the policy name and `POLICY_DESCRIPTION` provides the policy description. See "Software Environment Variables for Scripting" in the user guide.

Prefix the command with `start` if the custom command triggers a UI component, such as a program that uses the UI (for example, Microsoft Internet Explorer) or a command prompt window.

For example, assume you want the custom command to open a command prompt window and list the contents in the directory. You would prefix the command with `start`:

```
start dir
```

10. Select **Finish**.
11. To test a policy, select the **Test** button in the Utilization Policy table.
12. For more information about editing, deleting, and e-mailing policies, see the “Managing Policies” chapter in the user guide.

Enable the Scanning of Reparse Points

Reparse points (junctions) for file servers on Microsoft Windows are scanned. For example, assume you create a junction named C:\DDrive, which points to the root of the D drive. The content of the D drive is available under C:\DDrive. After a scan, information on capacity and amount used are displayed for the C drive; however, the sum of the file sizes on the C drive also includes the junction (C:\DDrive), which points to the root of the D drive.

To enable the scanning of reparse points on Windows file servers:

1. Select **Configuration > Product Health**, and then select **Advanced** in the Disk Space tree.
2. Select **Show Default Properties** at the bottom of the page.
3. Copy the `fileSrm.disableReparsePointsScan` property. How you copy the text depends on your Web browser. If you are using Microsoft Explorer or Netscape Navigator, select the text, and then right-click the selected text, and then select **Copy**.
4. Return to the Advanced page (**Configuration > Product Health**, and then select **Advanced** in the Disk Space tree).
5. Paste the copied text into the Custom Properties box. How you paste the text depends on your Web browser. If you are using Microsoft Explorer or Netscape Navigator, right-click the box and select **Paste**.
6. Change the value assigned to the `fileSrm.disableReparsePointsScan` property to **false** in the Custom Properties box.
`fileSrm.disableReparsePointsScan=false`
7. When you are done, select **Save**.

Working with Rules for Gathering File Server Information

You can create specific rules for the kind of information the system gathers and reports about file server volumes and directories (rule-based reporting). You do this by adding, deleting, and assigning rules to selected file server volumes and directories. In addition, you can edit previously created rules to accommodate changing reporting needs.

The Report Rules tab in the File System Viewer (Configuration > File System Viewer) provides the user interface and wizards to create and modify these rules. The following graphic shows a representative display of the page.

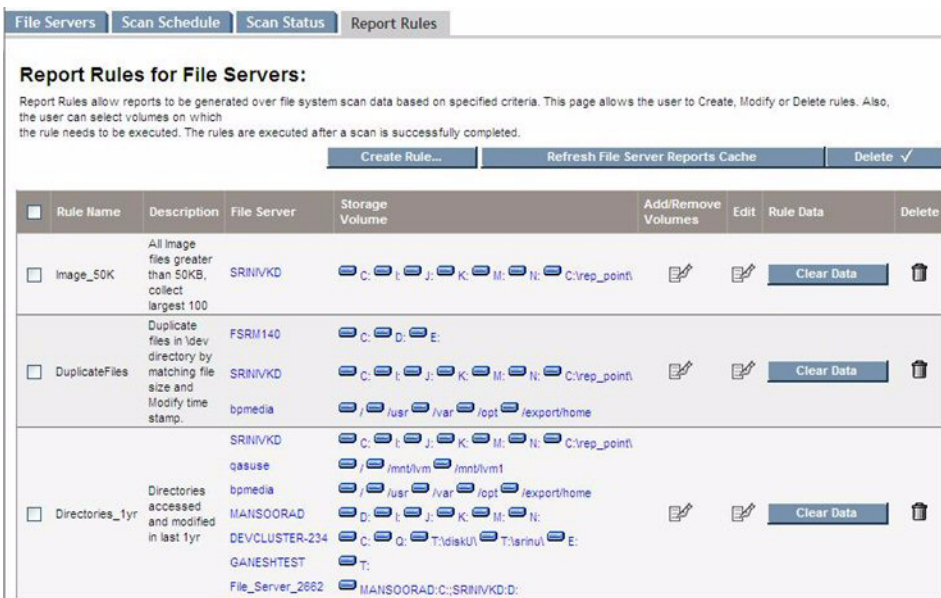


FIGURE 1-1 Report Rules Tab

Using the buttons and checkboxes on this screen, you have functionality to Add, Delete, and Edit rules, Add/Remove volumes associated with the rules, Refresh File Server Reports Cache, and Clear Data.

Data collected for the rules is reflected in reports according to the reports refresh schedule. The Refresh File Server Cache button refreshes the reports cache immediately with data acquired using latest rules for gathering the data.

The Clear Data button deletes the data collected against a Rule. Clearing the data for a Rule, then refreshing the reports cache using the Refresh File Server Reports Cache button also removes the rule's earlier data from the reports cache.

Add Remove Volumes

The Add/Remove volumes icon starts a wizard that lets you map volumes to rules (or remove them). The wizard has two tabs, Available Volumes and Selected Volumes, as shown in the following representative display.

Available Volumes Selected Volumes

Select Operating System or specify the File Server Name or both and apply Filter button to list the file servers.

Filter by OS: File Server Name:

File Servers:

Select the radio button against a file server to list storage volumes

File Server	Operating System	On Cluster
<input type="radio"/> casuse	Linux	
<input type="radio"/> GAMESHTEST	Windows(R) Server 2003	✓
<input type="radio"/> DEVCLUSTER234	Windows(R) Server 2003	
<input type="radio"/> File_Server_2662	Windows XP	✓
<input type="radio"/> FSR01140	Windows(R) Server 2003	
<input type="radio"/> QA75	Windows(R) Server 2003	
<input type="radio"/> DEVCLUSTER235	Windows(R) Server 2003	
<input checked="" type="radio"/> SR01VND	Windows XP	
<input type="radio"/> MANSOORAD	Windows XP	
<input type="radio"/> bpmidia	Solaris	

Storage Volumes:

List of volumes available for mapping

File Servers: SR01VND

Storage Volume	File System Type	Drive Type
<input type="checkbox"/> C:	NTFS	Local Disk
<input type="checkbox"/> C:\veg_point	NTFS	Local Disk
<input type="checkbox"/> I:	NTFS	Network Drive
<input type="checkbox"/> J:	NTFS	Network Drive
<input type="checkbox"/> K:	NTFS	Network Drive
<input type="checkbox"/> M:	NTFS	Network Drive
<input type="checkbox"/> N:	NTFS	Network Drive

FIGURE 1-2 Available Volumes and Selected Volumes Tabs

From the Available Volumes tab display, use the Filter button to display a list of file servers. Select the radio button(s) to select the volumes from those available for mapping the rules. After making your selections, use the **Add** button to confirm the choices selected. You can repeat the process for other file servers in the table, or use the **Filter** button to populate a new list.

Select the **Next** button to open the Selected Volumes tab, shown in the following representative display.

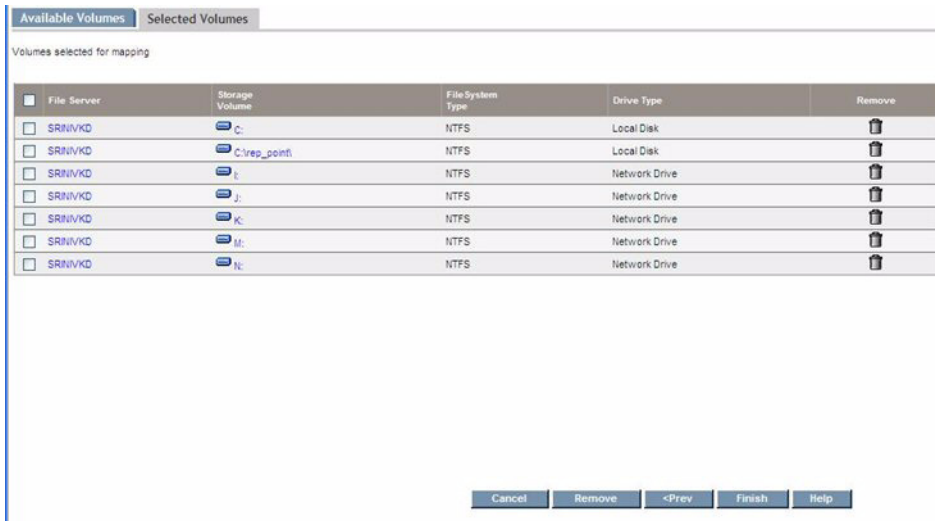


FIGURE 1-3 Selected Volumes

This wizard helps you map volumes on Multiple file servers at the same time. If you need to edit your selections, select the **Prev** button. When you are finished, select the **Finish** button to map volumes to a rule, or select the **Remove** button to remove them from.

Create Rule Wizard

Use the Create Rule wizard to help you create report rules for files. The Create Rules button was shown earlier in this section, in the Report Rules Tab screen display.

The Create Rule wizard opens a page similar to the following.

Create File Server Report Rule

Create Rule with the specified criteria based on various file attributes.

Rule Name *

Description

Apply this rule to : ☒ Files

☐ Duplicate Files

☐ Directories

Rule criteria :

Select corresponding checkboxes to include the criterion in the rule. Where a range is allowed, leaving the lower limit blank would be deemed as no lower limit and leaving the upper limit blank would be deemed as no upper limit.

<input type="checkbox"/> File Size	>=	<input type="text"/>	bytes	<=	<input type="text"/>	bytes
<input type="checkbox"/> Last Accessed	>=	<input type="text"/>	day(s)	<=	<input type="text"/>	day(s)
<input type="checkbox"/> Last Modified	>=	<input type="text"/>	day(s)	<=	<input type="text"/>	day(s)
<input type="checkbox"/> Create	>=	<input type="text"/>	day(s)	<=	<input type="text"/>	day(s)
<input type="checkbox"/> Owned by	<input type="text"/>					(Example: Administrator,guest)
<input type="checkbox"/> Include extensions	<input type="text"/>					(Example: txt,exe)
<input type="checkbox"/> Include directories	<input type="text"/>					(Example: Windows/bash/core)
<input type="checkbox"/> Windows Attributes	<input type="checkbox"/> Read Only <input type="checkbox"/> Hidden <input type="checkbox"/> System <input type="checkbox"/> Archive <input type="checkbox"/> Device <input type="checkbox"/> Normal <input type="checkbox"/> Temporary <input type="checkbox"/> Sparse File <input type="checkbox"/> Reparse point <input type="checkbox"/> Compressed <input type="checkbox"/> Offline <input type="checkbox"/> Not Content Indexed <input type="checkbox"/> Encrypted					
<input type="checkbox"/> Unix Global Permissions	<input type="checkbox"/> Read <input type="checkbox"/> Write <input type="checkbox"/> Execute					
<input type="checkbox"/> Limit Rows	<input type="text"/>					

FIGURE 1-4 Create Rule Wizard Display

To create rules for files, use the radio buttons to select the files or directories to which the rules will be applied.

Use the screen to input the following information for the rule:

1. Select corresponding checkboxes to include the criteria in the rule
2. Rule name is mandatory

3. Select the appropriate text box before entering value in text box. Otherwise, text box is disabled.
4. All checkboxes are unchecked, by default.
5. Description is optional.
6. At least one checkbox should be selected, in addition to RULENAME and Limit Rows.
7. Maximum value should be greater than minimum value. (i.e., File Size ≥ 5 and ≤ 4 is invalid.)
8. In the "Owned by" text field, you can set single user, or multiple users separated by commas.
9. In the "Include directories" text field, you can set single directory, or multiple directories separated by commas.
10. In the "Include directories" text field, you can set single directories, or multiple directories separated by commas.
11. Enter a value in the "Limit Rows" field, to limit the number of rows in the result of rule, such as 100. Otherwise, a generic rule may return a very large number of rows; if no value is entered, then all data is returned. Limit Rows fetches the Top "n" largest from the total result set.
12. Drop down choices for sizes shows units for bytes, KB, MB, and GB. Maximum number of digits allowed is five.
13. Drop down choices for days shows units for day(s), week(s), month(s), and year(s). Maximum allowed digits to enter is five, and accepts a maximum of 43,800 days (120 years) only after converting the units (weeks, months, years) into days.
14. Windows Attributes only affects Windows file servers even though a Report Rule is mapped to a Unix-type file server.
15. Unix Global Permissions only affects Unix-type servers even though a Report Rule is mapped to Windows file servers.
16. When you select **OK**, the rule is created for all the fields whose checkboxes are selected. At the time of information gathering, the associated rules are applied to the gathering process to collect the data prescribed by the rule, and to store the data in the database.

Edit Rule

Use the Edit wizard to edit rules by modifying the Rule criteria. The Edit wizard icon was shown earlier in this section, in the Report Rules Tab screen display. When you start the Edit wizard, a screen similar to the following display.

Edit File Server Report Rule

Create Rule with the specified criteria based on various file attributes.

Rule Name:

Description:

Apply this rule to : ☒ Files
☐ Duplicate Files
☐ Directories

Rule criteria :

Select corresponding checkboxes to include the criterion in the rule. Where a range is allowed, leaving the lower limit blank would be deemed as no lower limit and leaving the upper limit blank would be deemed as no upper limit.

<input checked="" type="checkbox"/> File Size	>=	<input type="text" value="50"/>	KB	<=	<input type="text"/>	bytes
<input type="checkbox"/> Last Accessed	>=	<input type="text"/>	day(s)	<=	<input type="text"/>	day(s)
<input type="checkbox"/> Last Modified	>=	<input type="text"/>	day(s)	<=	<input type="text"/>	day(s)
<input type="checkbox"/> Create	>=	<input type="text"/>	day(s)	<=	<input type="text"/>	day(s)
<input type="checkbox"/> Owned by	<input type="text" value=""/> (Example: Administrator,guest)					
<input checked="" type="checkbox"/> Include extensions	<input type="text" value="jpg,jpeg,bmp,gif,png,pcx"/> (Example: txt,exe)					
<input type="checkbox"/> Include directories	<input type="text" value=""/> (Example: \Windows,/bash/core)					
<input type="checkbox"/> Windows Attributes	<input type="checkbox"/> Read Only <input type="checkbox"/> Hidden <input type="checkbox"/> System <input type="checkbox"/> Archive <input type="checkbox"/> Device <input type="checkbox"/> Normal <input type="checkbox"/> Temporary <input type="checkbox"/> Sparse File <input type="checkbox"/> Reparse point <input type="checkbox"/> Compressed <input type="checkbox"/> Offline <input type="checkbox"/> Not Content Indexed <input type="checkbox"/> Encrypted					
<input type="checkbox"/> Unix Global Permissions	<input type="checkbox"/> Read <input type="checkbox"/> Write <input type="checkbox"/> Execute					
<input checked="" type="checkbox"/> Limit Rows	<input type="text" value="100"/>					

OK Cancel Help

FIGURE 1-5 Edit Rule Screen

The input field for the rule name is disabled so that you cannot change the rule name for any report. Also, the radio buttons for “Apply this rule to” are disabled so the type (files, duplicate files, directories) cannot be changed.

The preceding “Create Rules” requirements also apply to the “Edit Rule” screen.

Create Rule (for Directories)

The Create Rule (for Directories) wizard helps you create rules for reporting about directories.

Start by selecting the **Create Rule** button shown earlier in this section, in the Report Rules Tab screen display. This opens the Create File Server Report Rule page, where you must select the **Directories** radio button. Selecting the Directories radio button displays a screen similar to the following.

Create File Server Report Rule

Create Rule with the specified criteria based on various file attributes.

Rule Name

Description

Apply this rule to : ☐ Files
☐ Duplicate Files
☒ Directories

Rule criteria :

Select corresponding checkboxes to include the criterion in the rule. Where a range is allowed, leaving the lower limit blank would be deemed as no lower limit and leaving the upper limit blank would be deemed as no upper limit.

<input type="checkbox"/> Last Accessed	>=	<input type="text"/>	day(s)
<input type="checkbox"/> Last Modified	>=	<input type="text"/>	day(s)
<input type="checkbox"/> Limit Rows		<input type="text"/>	

OK Cancel Help

FIGURE 1-6 Create Rule (for Directories)

The screen then displays the input fields for creating the Rule criteria for Directories. The criteria includes Last Accessed time interval (days, weeks, months, years) and Last Modified time interval.

Enter the Access and Last Modified Days criteria. Reports will be generated for directories that have been accessed greater than the Access days value, and greater than the Last Modified days value.

Provide input to the screen according to the following rules:

1. Rule name is mandatory
2. At least one checkbox should be selected, in addition to the Limit Rows, and the respective input box should be filled.
3. The description is optional.
4. Enter a value in the "Limit Rows" field, to limit the number of rows in the result of rule, such as 100. Otherwise, a generic rule may return a very large number of rows; if no value is entered, then all data is returned. Limit Rows fetches the Top "n" largest from the total result set.
5. The drop down for days will show units for day(s), week(s), month(s), and year(s). You can enter a maximum of 5 digits; input accepts a maximum of 43800 days (120 years) only after converting the units (week(s), month(s), year(s) into days.
6. When you select **OK**, the rule is created for all the fields whose checkboxes are selected.

Edit Rule (for Directories)

The following shows a representative screen display for the Edit Rule (for directories) wizard.

Edit File Server Report Rule

Create Rule with the specified criteria based on various file attributes.

Rule Name: *

Description:

Apply this rule to : ☐ Files ☐ Duplicate Files ☒ Directories

Rule criteria :

Select corresponding checkboxes to include the criterion in the rule. Where a range is allowed, leaving the lower limit blank would be deemed as no lower limit and leaving the upper limit blank would be deemed as no upper limit.

<input checked="" type="checkbox"/> Last Accessed	>=	<input type="text" value="1"/>	year(s) ▼
<input checked="" type="checkbox"/> Last Modified	>=	<input type="text" value="1"/>	year(s) ▼
<input checked="" type="checkbox"/> Limit Rows		<input type="text" value="100"/>	

FIGURE 1-7 Edit Rule (for Directories)

With the Edit Rule (for Directories) screen, you can change the access and modified days. The input field for the rule name is disabled; you cannot change the rule name for any report. Also, the radio buttons for “Apply this rule to” are disabled so that you cannot change the type (Files, Duplicate Files, Directories) of the rule. The criteria for the other remaining entries are the same as described previously for creating a rule for Directories.

Duplicate Files

The system takes various inputs (i.e., match file size, match modified time stamp and directory) which are used as criteria to collect the duplicate files, and then generates a rule that you can map to any volume across file servers. When the system gathers information, it applies the rules that exist for the particular volume(s), and then collects the data and stores it in the database.

Add Rule (for Duplicate Files)

Start by selecting the **Create Rule** button shown earlier in this section, in the Report Rules Tab screen display. This opens the Create File Server Report Rule page, where you must select the **Duplicate Files** radio button. Selecting the Duplicate Files radio button displays a screen similar to the following.

The following shows the following representative screen:

Create File Server Report Rule

Create Rule with the specified criteria based on various file attributes.

Rule Name *

Description

Apply this rule to : ☐ Files
☒ Duplicate Files
☐ Directories

Rule criteria :

Select corresponding checkboxes to include the criterion in the rule. Where a range is allowed, leaving the lower limit blank would be deemed as no lower limit and leaving the upper limit blank would be deemed as no upper limit.

<input type="checkbox"/> Match File Size	
<input type="checkbox"/> Match Modify Timestamp	
<input type="checkbox"/> Include directories	<input type="text"/> (Example: Windows./bash/core)
<input type="checkbox"/> Limit Rows	<input type="text"/>

OK Cancel Help

FIGURE 1-8 Add Rule (for Duplicate Files)

Rules for this screen are:

1. Rule name is mandatory.
2. In “Include directories” text field, set single or multiple directories separated by commas.
3. Enter a value in the “Limit Rows” field, to limit the number of rows in the result of rule, such as 100. Otherwise, a generic rule may return a very large number of rows; if no value is entered, then all data is returned. Limit Rows fetches the Top “n” largest from the total result set.

4. The description is optional.
5. When you select **OK**, the rule is created based upon the selected checkboxes.

Edit Rule (for Duplicate Files)

With the Edit Rule screen, you edit the rule by changing the Rule Criteria and description, as shown in the following representative screen display.

Edit File Server Report Rule

Create Rule with the specified criteria based on various file attributes.

Rule Name: *

Description:

Apply this rule to: ☐ Files ☒ Duplicate Files ☐ Directories

Rule criteria:

Select corresponding checkboxes to include the criterion in the rule. Where a range is allowed, leaving the lower limit blank would be deemed as no lower limit and leaving the upper limit blank would be deemed as no upper limit.

<input checked="" type="checkbox"/>	Match File Size	
<input checked="" type="checkbox"/>	Match Modify Timestamp	
<input checked="" type="checkbox"/>	Include directories	<input type="text" value="\dev"/> (Example: Windows./bash/core)
<input checked="" type="checkbox"/>	Limit Rows	<input type="text" value="100"/>

OK Cancel Help

FIGURE 1-9 Edit Rule (for Duplicate Files)

The Rule Name is disabled so that you cannot change the rule name for any report. Also, Radio buttons for “Apply this rule to” are disabled so that you cannot change the rule type (Files, Duplicate Files, Directories). The remaining criteria to enter is the same as described previously to create a rule for duplicate files.

Deleting Rules

To delete rules, use the screen displayed with the Report Rules tab. The following shows a representative screen display.

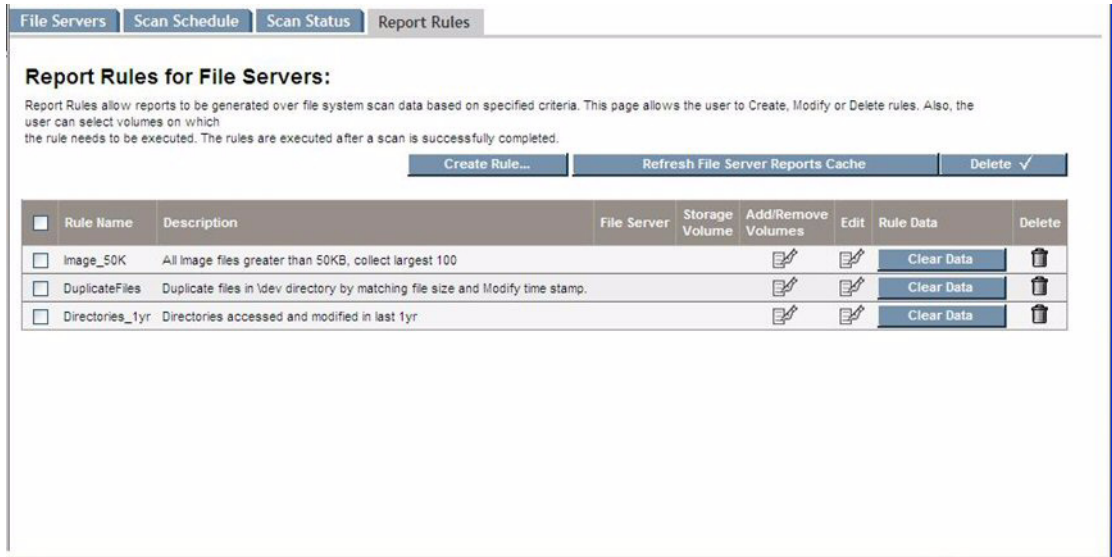


FIGURE 1-10 Delete Rules

You can select the **Delete** button to delete multiple rules (those with checked boxes next to the rule name), or you can delete individual using the Delete icon for the specific rule.

The result from removing (deleting) rules depends upon whether or not the rule is mapped to a volume, and whether the data has been collected for that rule. The following summarizes the conditions and effects:

1. If you remove a rule that is not mapped to a volume(s), the rule is deleted directly.
2. If you remove a rule that is mapped to a volume(s), AND the data is not collected, the system deletes both the rule AND the mapping data.
3. If you remove a rule that is mapped to a volume(s), AND the data is collected, the system deletes the rule, the mapped data, and also the collected data (report).
4. When you select the **Clear Now** button, the system clears the data related to the rule.

Viewing Results in Report Tree

When the system gathers data for a volume, it checks to see if any rules are mapped to that volume. If rules are mapped to that volume, the system collects the data according to the parameters defined in the rule, then stores this information in the data tables. The collected information can then be viewed from the Reporter tree (Reporter > System > File Server).

Sometimes the File System Viewer report data might not be visible immediately after the rule executes because the reports cache has not yet been updated. To refresh the File System Viewer-related report cache data, select the **Refresh FSRM Reports Cache Now** button. The button is on the Custom Reports tab screen, and is located next to the **Add** and **Delete** buttons in the upper right part of the screen.

Working with Scans and Schedules in File System Viewer

The File System Viewer simplifies the process of specifying file servers for scan schedules and for working with the scan schedules. The following shows the File System Viewer main page, with a representative list of file servers displayed.

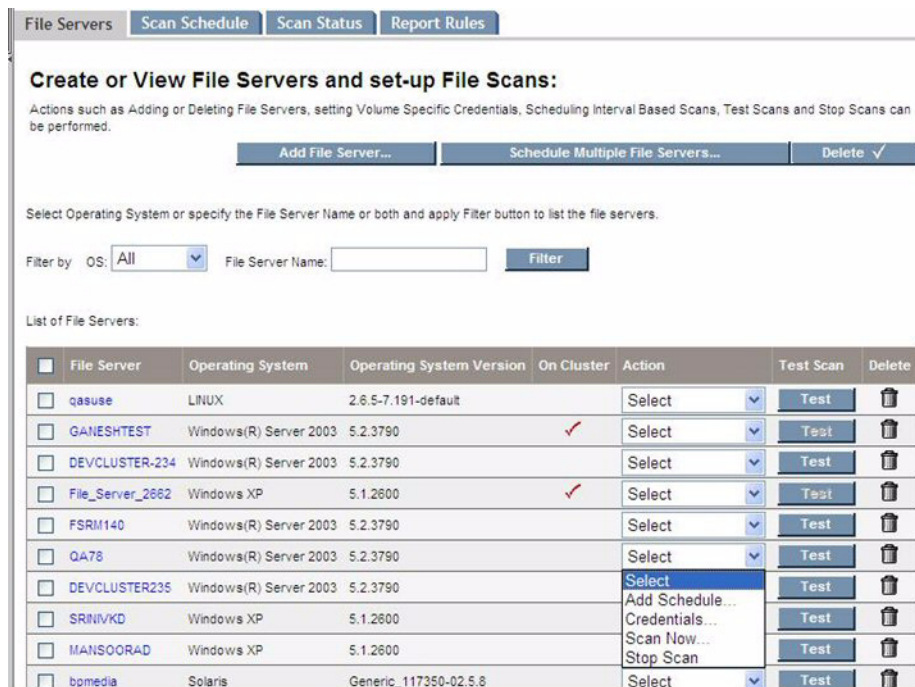


FIGURE 1-11 File System Viewer - File Servers Tab

The File Servers tab also displays a List of file servers, from which you can identify. You can select the following actions in the associated pull-down menus: Select, Add Schedule, Credentials, Scan Now, and Stop Scan. These are described further in the following paragraphs.

The screen lets you filter by operating system, or file server name, or both. The screen contains these three buttons located across the upper part of the page:

- Add File Server - Adds a file server
- Schedule Multiple File Servers - Opens a wizard to schedule more than one file server at a time.
- Delete - This button at the upper corner of the page allows you to delete more than one file server at a time. A user first selects the file servers to be deleted, and then selects this Delete button. A confirmation page appears before the deletion occurs.

The screen displays a list of file servers and indicates the name, the operating system and version, and whether a file server is part of a cluster. Associated pull-down menus (in the Action column) let you select the following actions for selected file servers:

- **Add Schedule** - This opens the Add Schedule wizard to enable the addition of a new File Server Viewer schedule. Only one schedule can be added for file servers on hosts with agents prior to 6.0.
- **Credentials** - Starts a wizard for you to specify the credentials to be used for scan volumes on the file server. This functionality is supported for CIFS shares in case of Windows file servers and all types of volumes for Unix file servers that are supported by File Server Viewer.
- **Scan Now** - Allows user to perform a “run once” scan on a selected set of volumes on a specified file server immediately. Selecting Scan Now opens a wizard where you can select a set of volumes to scan immediately.
- **Stop Scan** - Stops all the File Server Viewer scans currently running on the file server. This stops all scans running globally on the file server at the moment, but it does not stop the schedule.
- **Test Scan** - Allows you to preform the Test Scan functionality. The feature is not available for file servers on virtual cluster hosts. See “Performing a Test Scan” on page 36.
- **Delete File Server** (icon) - deletes the File Server Application that was created on the host. It deletes all File Server Viewer information collected on the file server.

Other tabs on the File System Viewer main screen include the Scan Schedule tab, the Scan Status tab, and the Reports Rules tabs:

The Scan Schedule tab displays the screen used to setup and associate scan schedules to a selected file server. Functions available at the Scan Schedule screen include the Start and Stop scan buttons, Edit the schedule, and Delete (for individual file server schedule deletion and for deleting all the selected file server schedules). The Scan Schedule tab page is described in more detail later in this section of the guide.

The Scan Status tab provides information about the status of the most recent scan on each of the configured volumes.

The Report Rules tab was described previously in this chapter, and displays the screen used to set up the rules for creating reports for specific needs.

The following paragraphs describe the process of setting up and working with scan schedules.

Scheduling Single and Multiple Scans

You can create single scan and multiple scan schedules for a file server. The multiple scan schedule feature lets you schedule scans of different volumes at different intervals and at different start times. However, you can add only one schedule for file servers on hosts with agents prior to 6.0.

To begin configuring for single or multiple scans, you must first declare the intended host a file server, and then you use the Add Schedules wizard to create the schedule(s) for the intended file server.

Declaring the Host a File Server

To declare the host a file server, select the **Add File Server** button on the File System Viewer main Page, File Servers tab (Configuration > File System Viewer > File Servers).

The Add File Server button on the File System Viewer main Page will display a list of available file servers that support File System Viewer. (Data collection must be enabled on these file servers.) From the displayed list of available file servers, add intended file server by selecting the check box for the file server, and select **OK**. You can select multiple file servers before pressing **OK**.

Add (Create) Schedule

On the File System Viewer Main page (File Servers tab), locate the file server on which you want to setup the scan schedule. To do this, select **Add Schedule** from the pull-down menu choices (in the Action column). Select the **Create Schedule** wizard, which opens and displays a screen similar to the following:

File Server FSRM-1

Available Volumes

<input checked="" type="checkbox"/>	File Server	Storage Volume	File System Type	Type
<input checked="" type="checkbox"/>	FSRM-1	C:	NTFS	Local Disk
<input checked="" type="checkbox"/>	FSRM-1	D:	NTFS	Local Disk
<input checked="" type="checkbox"/>	FSRM-1	E:	NTFS	Local Disk
<input checked="" type="checkbox"/>	FSRM-1	S:	NTFS	Network Drive
<input checked="" type="checkbox"/>	FSRM-1	T:	NTFS	Network Drive
<input checked="" type="checkbox"/>	FSRM-1	X:	NTFS	Network Drive

Add

Selected Volumes

<input checked="" type="checkbox"/>	File Server	Storage Volume	File System Type	Type	<input type="checkbox"/> Collect Owner Info	<input type="checkbox"/> Map User To Owner	Exclude Directories	Remove
-------------------------------------	-------------	----------------	------------------	------	---	--	---------------------	--------

Remove

Start Date: 2007-05-21 15:05 15

Interval: 1 week(s)

Thread Count: 1

OK **Cancel** **Help**

FIGURE 1-12 Add (Create) Schedule

The wizard contains two volume lists.

- **Available Volumes** - This table shows volumes that are available for scheduling
- **Selected Volumes** - This table shows volumes selected for scan.

The lower part of the display contains scan schedule information (start date and time, interval for the scan). The display also shows the number of threads, representing the number of parallel scans to be performed for this schedule. Minimum value for the field is 1. Start time can not be earlier than the current time, and thread count can not be more than the number of volumes.

Volumes can be selected for inclusion in a schedule by selecting corresponding check boxes and clicking the **Add** button. This removes the selected volumes from the Available Volumes table and adds them to the Selected Volumes table.

You can correct inadvertent selections by using the **Delete** button below the selected volumes table. This moves the corresponding volumes from the Selected Volumes table to the Available Volumes table.

Each volume can be individually configured. The options for each volume in the Selected Volumes table are:

- Volume specific exclude directory list. The default exclude directory list is based on value of JBOSS property `fileSrm.excludeDirectories`.
- Option to collect ownership. For Unix file servers, default is true; For Windows file servers, it is based on the JBOSS property `fileSrm.collectWindowsSID`.
- Option to map users to ownership. The option is enabled only if the ownership collection is selected.
- Option to collect ACL information for Windows file server. By default, this option is disabled. You can enable this by setting the `fileSrm.collectACL` property to **true**.

The JBOSS properties specified above are to help a user in the Add Schedule wizard. Once the schedule is saved, any changes to the JBOSS properties will not affect already saved schedules. All schedules can be viewed and edited in the Scan Schedules page.

Credentials

You can specify or edit the credentials used by the File Server Viewer to scan volumes on the File Server Viewer. To assign or clear credentials, select **Credentials** from the pull-down menu choices (in Action column). The wizard opens a display similar to the following:

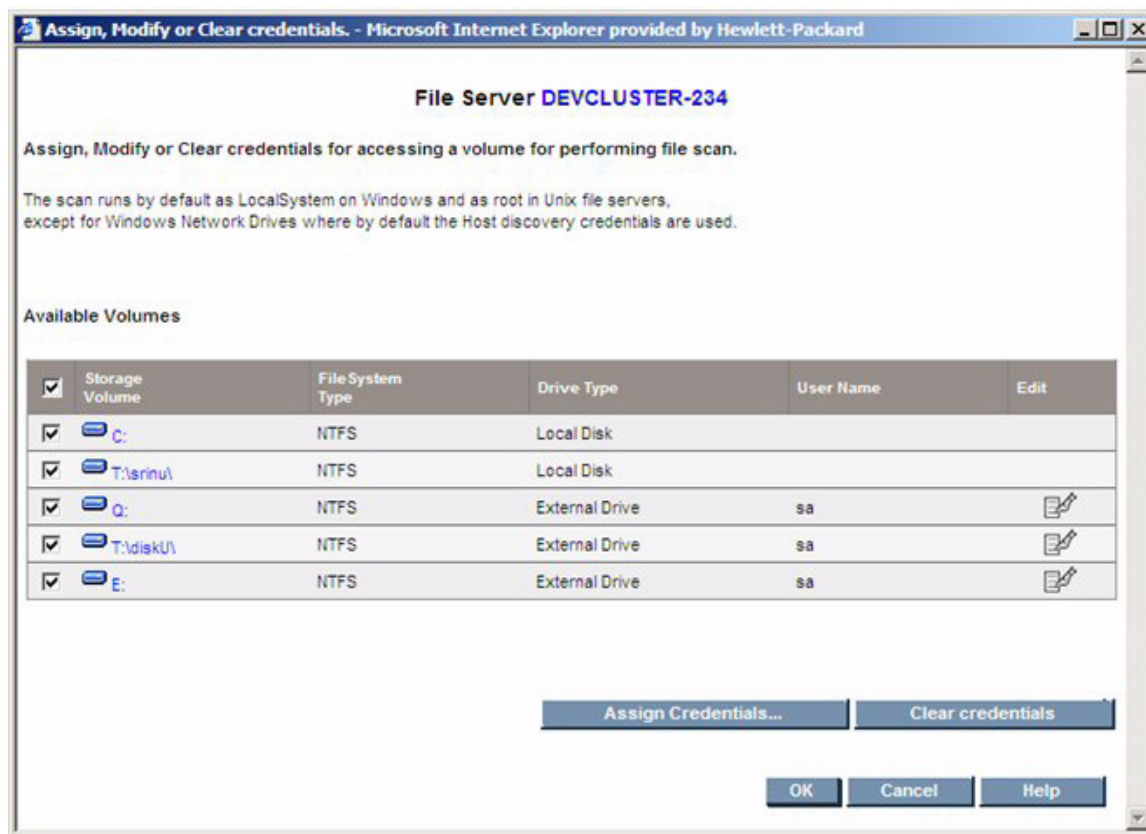
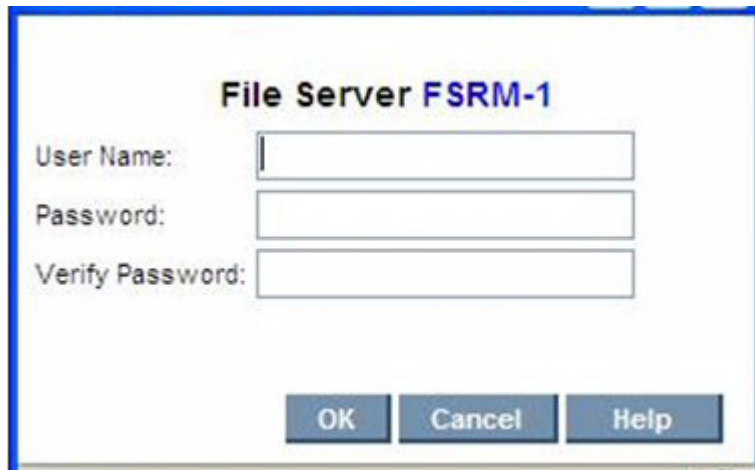


FIGURE 1-13 Credentials Wizard

The screen lets you assign credentials, clear credentials, and edit credentials. To assign credentials to a given set of volumes, choose the volume and select the **Assign Credentials** button.

A display similar to the following opens to let you assign (specify) the user name and password to use for scanning the volume.

A screenshot of a Windows-style dialog box titled "File Server FSRM-1". The dialog box has a white background and a blue border. It contains three text input fields stacked vertically. The first field is labeled "User Name:", the second is labeled "Password:", and the third is labeled "Verify Password:". Below the input fields are three buttons: "OK", "Cancel", and "Help", each in a blue button with white text.

File Server FSRM-1

User Name:

Password:

Verify Password:

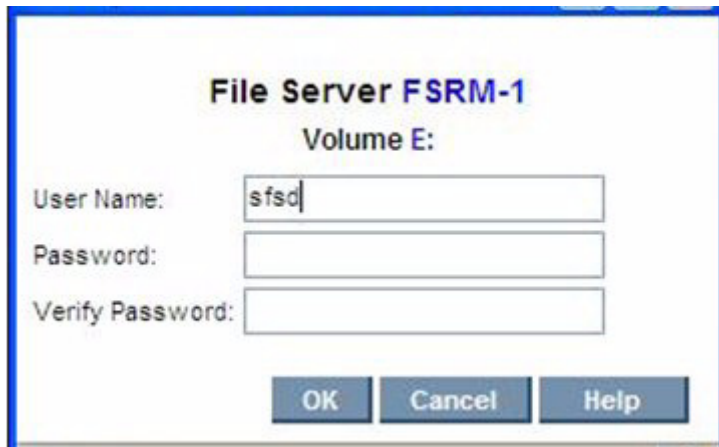
OK **Cancel** **Help**

FIGURE 1-14 Assign Credentials

In the display, specify the user name and password, and then select **OK**. The credentials are saved into the database after the wizard completes.

Edit Credentials

If you chose Edit Credentials from the wizard shown previously, the following screen displays to allow you to change a user name and password previously assigned.



File Server FSRM-1

Volume E:

User Name:

Password:

Verify Password:

FIGURE 1-15 Edit Credentials

The associated volume is shown in the header. Enter the new credentials and then select **OK**.

Scan Now

Select the **Scan Now** pull-down menu choice (Action column) to perform an immediate scan on a given set of volumes. The wizard and functionality are similar to configuring an interval-based scan, except that the start time and interval are not required. See the following figure showing a representative Scan Now display.

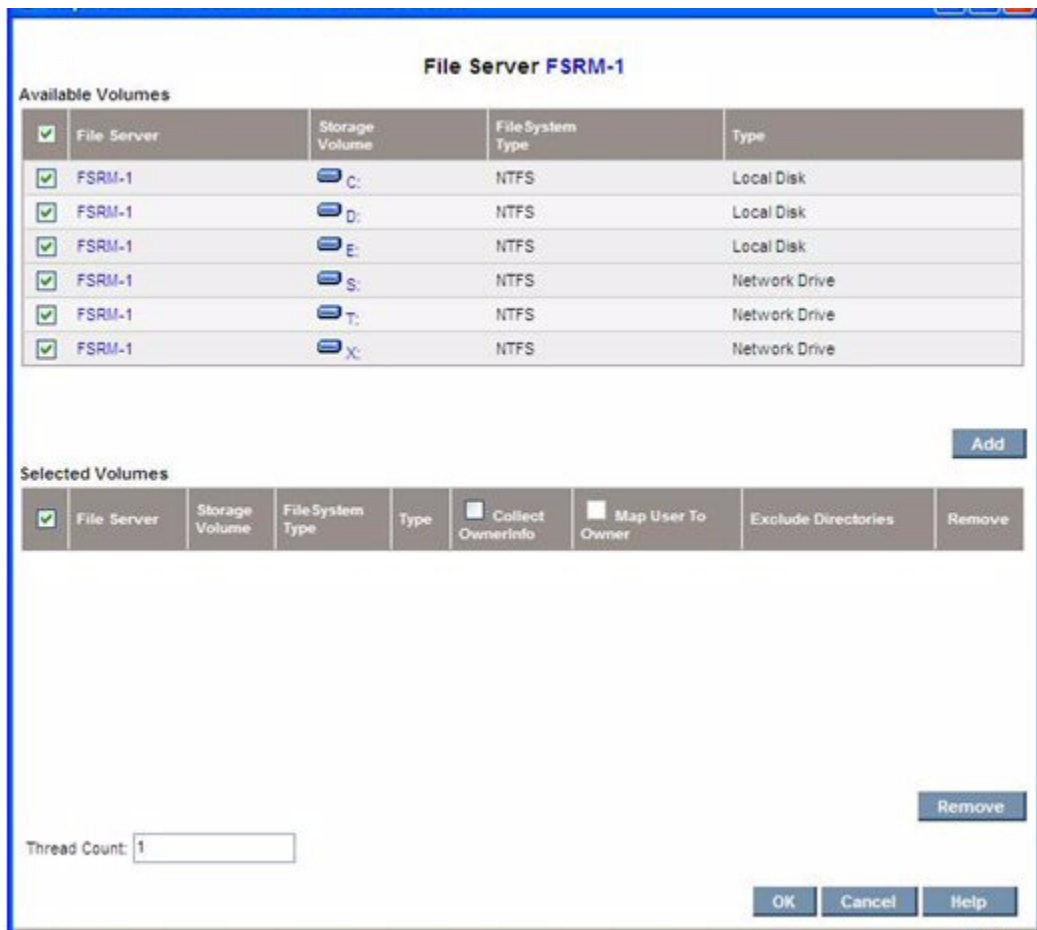


FIGURE 1-16 Scan Now

The “@” symbol appended to the drive name indicates that the volume is scheduled for a scan in an interval schedule. The “Thread Count” feature allows you to specify the number of parallel scans to be run in the schedule.

Note – The Scan Now option creates a “run once” schedule, and that the schedule information is not stored for future use. Exercise caution when using the Scan Now option, because a scheduled scan might be already in-process at the instant a forced scan is invoked. In these situations, the volumes currently being scanned, or the volumes currently in the scan queue, will be omitted from the new scan request.

Schedule for Multiple File Servers (Multiple Scans)

The Schedule Multiple File Servers button on the main FSRM display page, File Servers tab, was shown previously and provides functionality similar to the Add Schedule button. It also provides the additional capability to create multiple schedules across multiple file servers. Selecting the button starts a wizard which contains two tabs, Available Volumes and Selected Volumes.

The following representative screen shows the Available Volumes display.

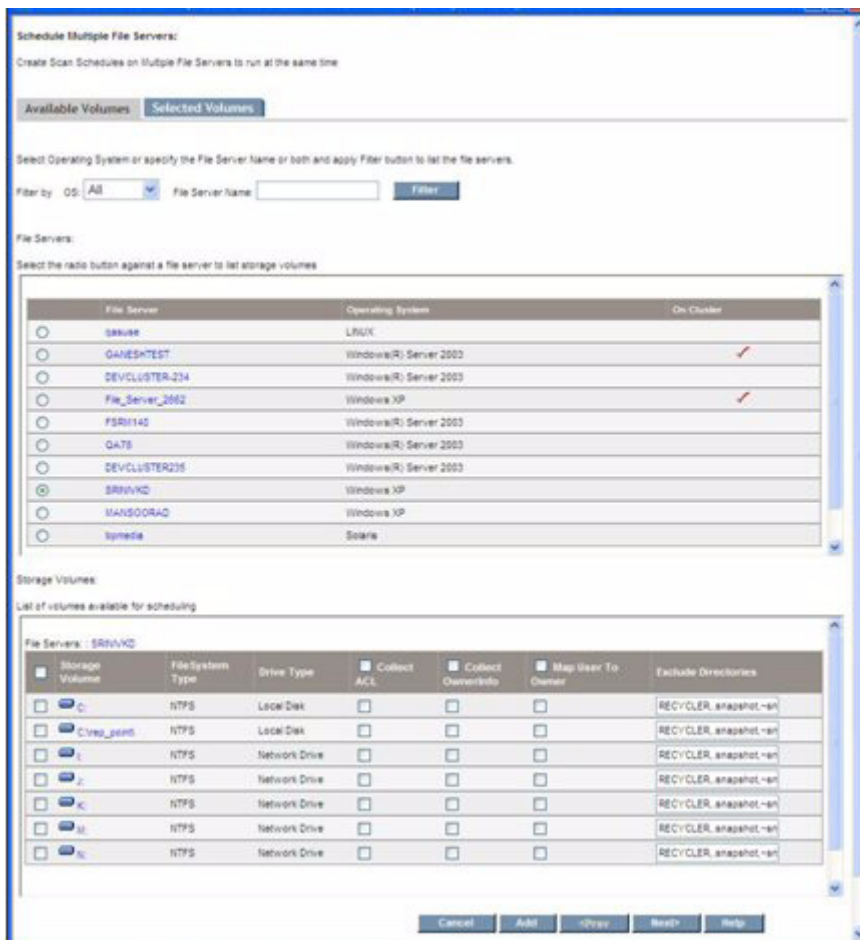


FIGURE 1-17 Schedule Multiple File Servers (Available Volumes Tab)

The filter lets you narrow the list of file servers displayed. After filtering, the File Servers list shows the list of file servers available for scheduling. Use the corresponding radio button(s) to populate the list of volumes available for scheduling (Storage Volumes table).

Multiple volumes can be selected and configured from the table to be added in the schedule. After the configuration is finished, select the **Add** button to confirm the number of volumes selected for the schedule.

You can repeat the previous steps for other file servers in the File Servers table, or you can filter new file servers. After you add the volumes for the file servers, select the **Next** button to open the Selected Volumes tab display. The following is a representative display.

Schedule Multiple File Servers:
Create Scan Schedules on Multiple File Servers to run at the same time

Available Volumes Selected Volumes

Volumes selected for scheduling

File Server	Storage Volume	File System Type	Drive Type	Collect ACL	Collect Ownerinfo	Map User To Owner	Exclude Directories	Remove
<input type="checkbox"/> SRV01VD	C:	NTFS	Local Disk	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	RECYCLER, snapshot, ...	
<input type="checkbox"/> SRV01VD	C:\reg_path	NTFS	Local Disk	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	RECYCLER, snapshot, ...	
<input type="checkbox"/> SRV01VD	I:	NTFS	Network Drive	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	RECYCLER, snapshot, ...	
<input type="checkbox"/> SRV01VD	J:	NTFS	Network Drive	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	RECYCLER, snapshot, ...	
<input type="checkbox"/> SRV01VD	K:	NTFS	Network Drive	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	RECYCLER, snapshot, ...	
<input type="checkbox"/> SRV01VD	L:	NTFS	Network Drive	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	RECYCLER, snapshot, ...	
<input type="checkbox"/> SRV01VD	N:	NTFS	Network Drive	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	RECYCLER, snapshot, ...	

Start Date: 2007-11-05 13:23

Interval: 1 week(s)

Thread Count: 1 (Specify number of parallel scans on each File Server)

Cancel Remove < Prev Finish Help

FIGURE 1-18 Schedule Multiple File Servers (Selected Volumes Tab)

The display shows the volumes added for the various file servers in the Available Volumes tab. The Selected Volumes tab display does not permit editing volumes. To edit configurations, or remove volumes, select the **Prev** button to go back and make the changes.

The Selected Volumes tab displays the date and time, the interval, and the thread count for the schedules created. After you assign the required values, select the **Finish** button to create schedules for the multiple file servers.

The wizard helps you create multiple schedules at the same time. Once submitted, schedules are created for each file server that was configured.

The thread count for the schedule created is computed by the formula:

Thread Count = minimum (Number of Volumes Selected, value in Thread Count field)

Scan Schedules Tab

The Scan Schedules Tab on the File System Viewer main page lists all the schedules created for the various file servers, as shown in the following representative display.

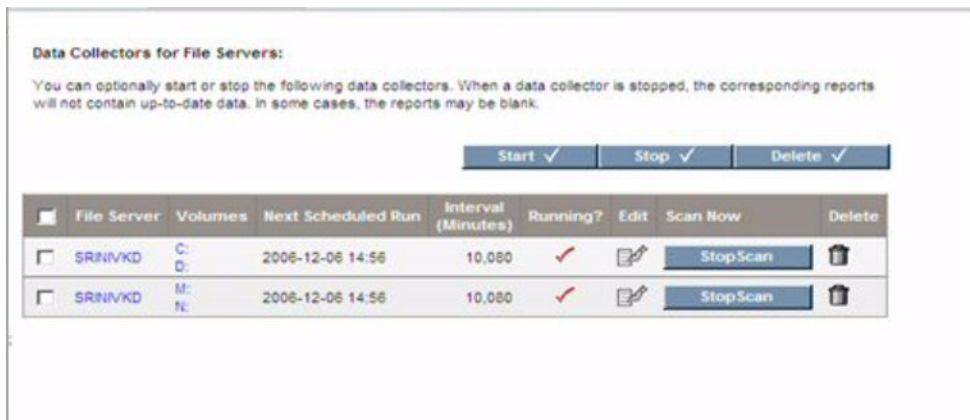


FIGURE 1-19 Edit Schedule (Scan Schedule Tab)

The **Start** and **Stop** buttons near the middle of the screen, at the right, can be used as batch operations to start or stop the selected multiple schedules. The **Delete** button can be used as a batch operation to delete selected multiple schedules.

Each schedule lists the file server, volumes selected for scan on the file server, the time the schedule is invoked next, the interval in minutes, and its status (running or stopped). The display also contains the following:

- **Stop Scan** - This button attempts to stop the scan on the volumes selected in the schedule. It does not stop the schedule and the schedule can run at the next interval. If you want to disable a schedule, select the **Stop** button (at the top of the page) after selecting the schedule to be disabled.

- **Delete Schedule icon** - Select this icon to delete the schedule. It stops the scan on the volumes selected for the schedule before the deletion. However, this does not alter any File Server Viewer data already collected for the volumes in the schedule.
- **Edit icon** - This starts the Edit wizard, letting you modify the schedule to change the volume list or its other scan options. Edit is described further in the following paragraphs.

Edit

Edit lets you change the scan configuration by changing the volume list for the scan, changing the start time (next scheduled time to run if one is already started), interval, and thread count. You can also change volume specific information, such as ownership collection, mapping users to ownership, exclude directory list, and ACL collection for the Windows file server.

Selecting the Edit icon starts a wizard. The screen contains two tabs, Available Volumes and Selected Volumes, as shown in the following representative screen displays.

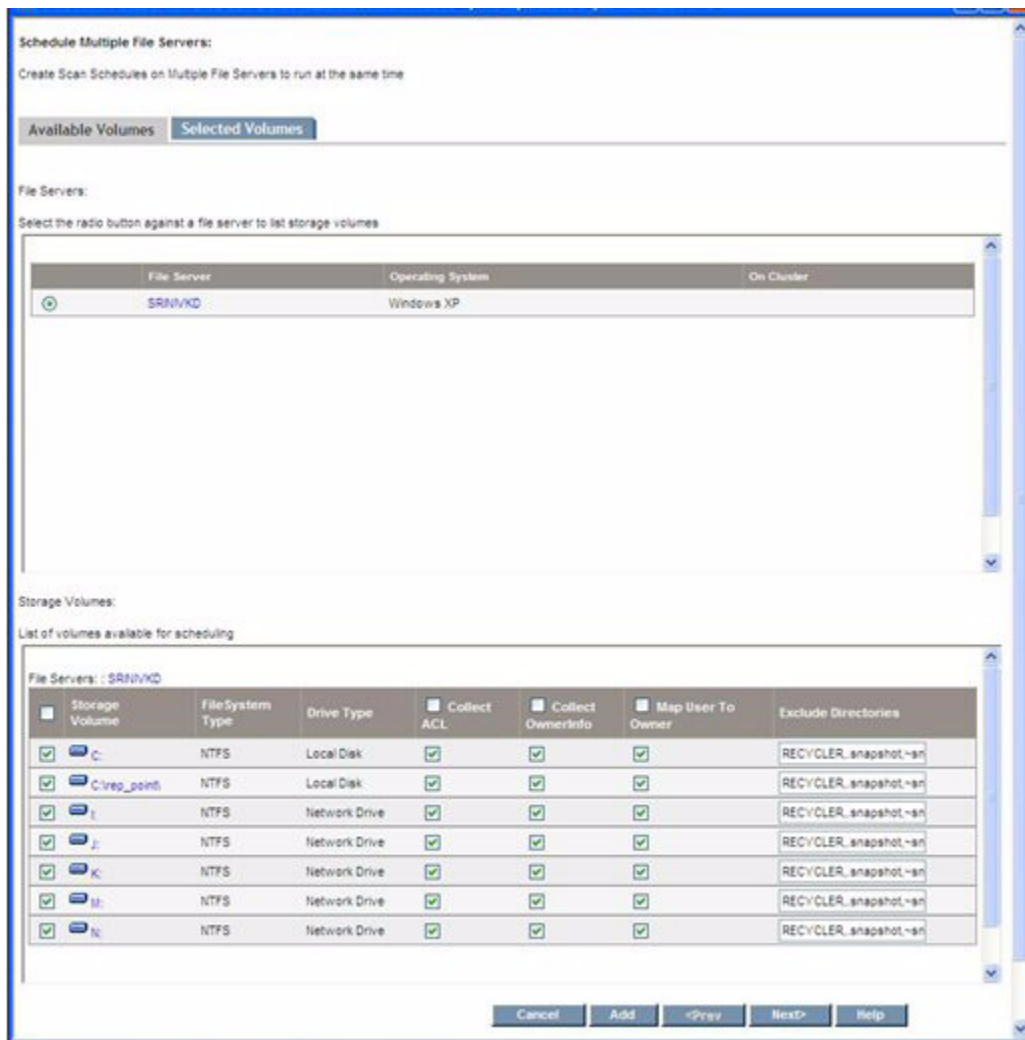


FIGURE 1-20 Scan Schedule Edit (Available Volumes Tab)

This screen lets you select volumes available for further addition to the schedule by checking the corresponding check box. You can also modify the default configuration information for each volume. After making your selections, select the **Add** button to confirm your intent to add them to the schedule.

Note – The **Add** button does not add the volumes to the schedule yet; it only confirms they are considered for addition.

After selecting the **Add** button, select the Next button to open the **Selected Volumes** tab. A screen similar to the following displays.

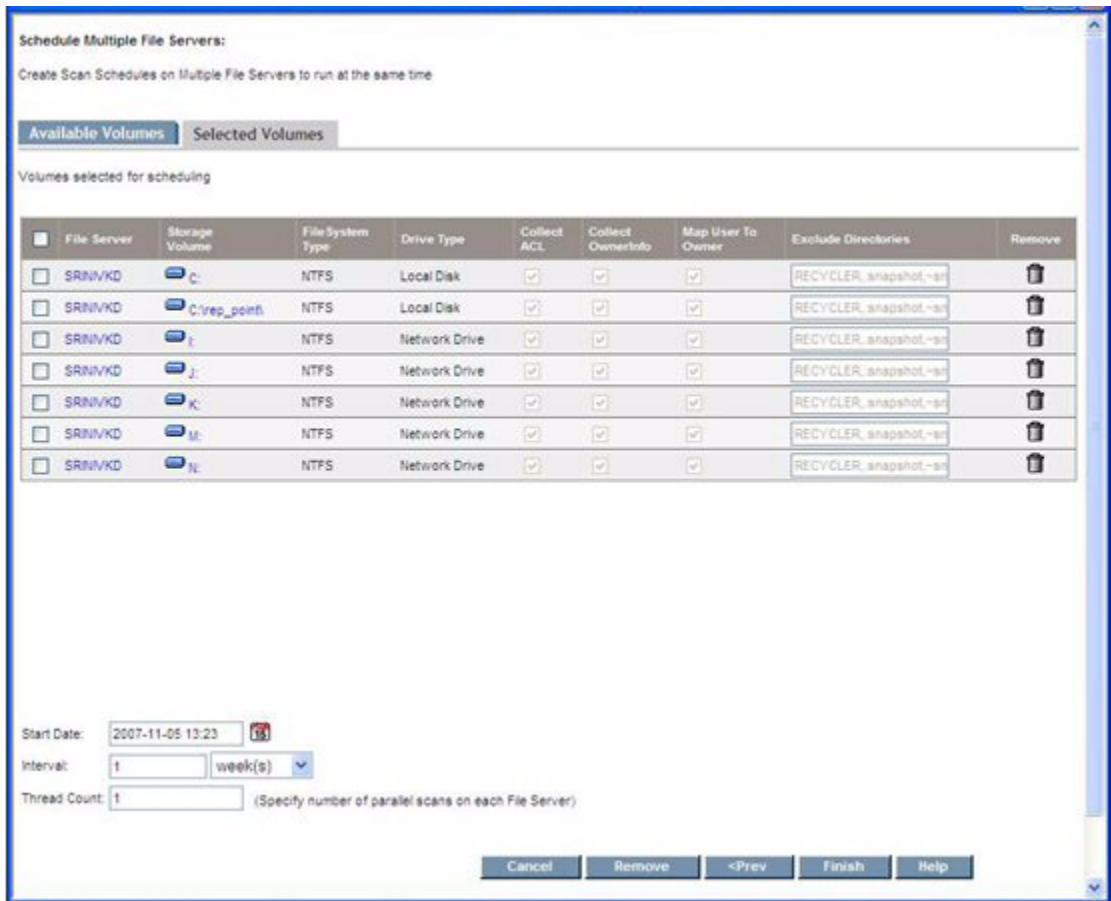


FIGURE 1-21 Scan Schedule Edit (Selected Volumes Tab)

This display provides a list of volumes for this schedule. You can remove volumes by selecting the **Remove** button.

Note – There must be at least one volume in the Selected Volumes tab. You cannot delete the schedule by simply removing all the volumes from the Select Volumes tab. If you attempt to delete all the volumes in the Selected Volumes tab, an alert is raised.

Scan Status Tab

You can review the status of the current scan or the most recent scan that took place on each of the volumes on which a scan was started. To check the status of a scan:

1. Select **Configuration > File SRM**.
2. Click the **Scan Status** tab.

The following table provides details about the **Scan Status** tab:

TABLE 1-2 About File Server SRM Scan Status

Column Heading	Description
File Server	Displays the name of the file server from which this collector gathers information.
Volume	Displays the volume selected for scanning on a file server.
Scan Start	Displays the time that the scan began.
Last Polled	If the scan is still in progress, displays the latest time status.
Scan End	If the scan is completed, displays the completion time.
Scanned Space	Displays the amount of scanned space in megabytes (MB).
No. Of Files	Displays the number of files that have been scanned.
Current Directory	Displays the directory that is currently being scanned.
Scan Status	<p>The following scan statuses are possible:</p> <ul style="list-style-type: none">■ No Data■ Scan in Progress■ Scan Done■ Scan Failed■ Transferring Data■ Transfer Completed■ Uploading Data■ Uploading Completed■ Error

Performing a Test Scan

If you have changed your network configuration, and you are not sure the management server can still scan the server running File Server SRM, you can perform a test File Server SRM scan. During this scan, the management server

verifies that it can access the server and perform a high-level File Server SRM scan. It also verifies whether or not it can scan network volumes with host discovery credentials.

Keep in mind the following:

- This feature only works with CIM extensions builds 5.1 and later.
- If you want to scan network-mounted drives on a host running Windows, you must make sure a user is logged onto the Windows host. The user must have permission to mount the network drives. Network drives mounted on Windows 2000 hosts are not visible as storage volumes on the Navigation tab or in the topology.

To perform a test File Server SRM scan:

1. Select **Configuration > File SRM**.
2. Verify that the File Servers tab is selected, and then click **Test** in the Test Scan column of the File Servers table.

After you click the **Test** button, the management server attempts to access the server and perform a test File Server SRM scan.

Access Control Entry Data Collection for Directories on Windows Servers

There is a facility to collect the Access Control Entries for directories on Windows file servers running 6.0 CIM Extensions. This is enabled when you select the **Collect ACL** option from the Create Schedule user interface for a given volume. The availability of the user interface option is governed by the global property, `fileSrm.collectACL`. The property governs the user interface, and for each volume, the option needs to be set while scheduling a scan.

If the collection option is enabled, the file scan process collects each directory's Discretionary ACL information, governed by the following considerations:

1. The process collects only the information allowed by the access rules and ignores the information denied by the access rules.
2. The process considers allowing access based upon all the related rules, whether directly assigned on the directory or whether they are inherited from one of the parent directories.
3. The trustees corresponding to the Well Known SIDs as defined by Microsoft (ref: <http://Support.microsoft.com/kb/243330>) are excluded from being listed in the output.

4. The effective permissions for each trustee are designated as “Full Access” and/or “Write Access” and/or “Read Access”.
 - Write Access is the combination of the rights - List Directory, Traverse Directory, Add File, Add Subdirectory, Write Directory, Traverse Directory, Read Attributes, and Read Permissions.
 - Read Access is a combination of rights - List Directory, Traverse Directory, Read Attributes, and Read Permissions.
 - Full Access is the combination of rights as defined by “Full Control by Windows”.
5. Data Collection treatment is similar for both individual users and groups; i.e., groups are not drilled down to get a list of individual users.
6. The collection attempts to get the name of the various security entries from the corresponding security ID (SID). However, the name resolution from the SID may fail if the SID is from a different host or domain from the file server through which the file system is being scanned. In such cases, the SID itself would be listed as the trustee, instead of the name.

The collected data is sent to a file on the disk along with other scan data files. Then, the data file created by the process is transferred to the management server along with other scan files. On the management server, the data is parsed to extract the effective usage by each trustee.

Note – The process can have a performance impact during the scan. If the Access Control Lists are extracted, the scan times can be larger than they would be otherwise.

On the management server, the data is parsed to extract the effective usage by each trustee. This is calculated by the summation of effective usage by the trustee on each directory has permission to access. The following shows how the effective space calculations are determined for the statistics shown in the example.

TABLE 1-3 Directory Statistics

Directory Name	Full Size	Own Size	Trustee	Rights
A	10GB	8GB	X	F
			Y	R
			Z	-
B	18GB	12GB	X	-
			Y	F
			Z	W
C	14GB	6GB	X	F
			Y	F
			Z	F

The following is the effective space calculation:

- X: From A + From B + From C = $(8/2) + 0 + (6/3) = 6\text{GB}$
- Y: From A + From B + From C = $(8/2) + (12/2) + (6/3) = 12\text{GB}$
- X: From A + From B + From C = $0 + (12/2) + (6/3) = 8\text{GB}$

The “own” size of a directory is considered for calculation and not the full size (which includes the size of its subdirectories), because the subdirectories are being calculated separately anyway.

User interface screens are available to display the ACL information at various levels, including the Enterprise level (all file servers), a selected file server, and a Volume level, for all the trustees. In addition, drilldown is available for selected trustees at various levels.

The following shows the user interface display showing All Trustees at the Enterprise level.



FIGURE 1-22 All Trustees at Enterprise Level

The following shows the user interface display showing All Trustees at a file server.



FIGURE 1-23 All Trustees at File Server

The following shows a user interface display showing All Trustees at a file server volume.

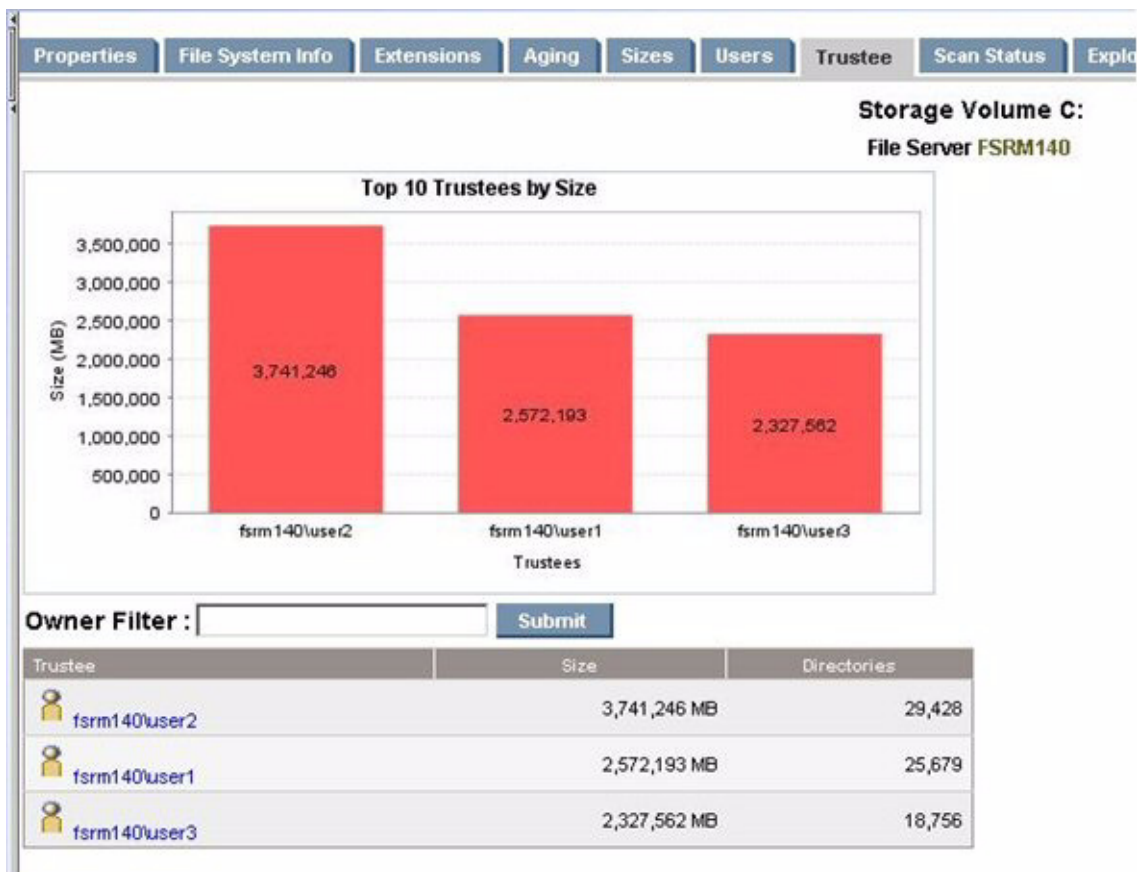


FIGURE 1-24 All Trustees at File Server Volume

The following shows the user interface display showing selected Trustee drilldown at Enterprise Level.

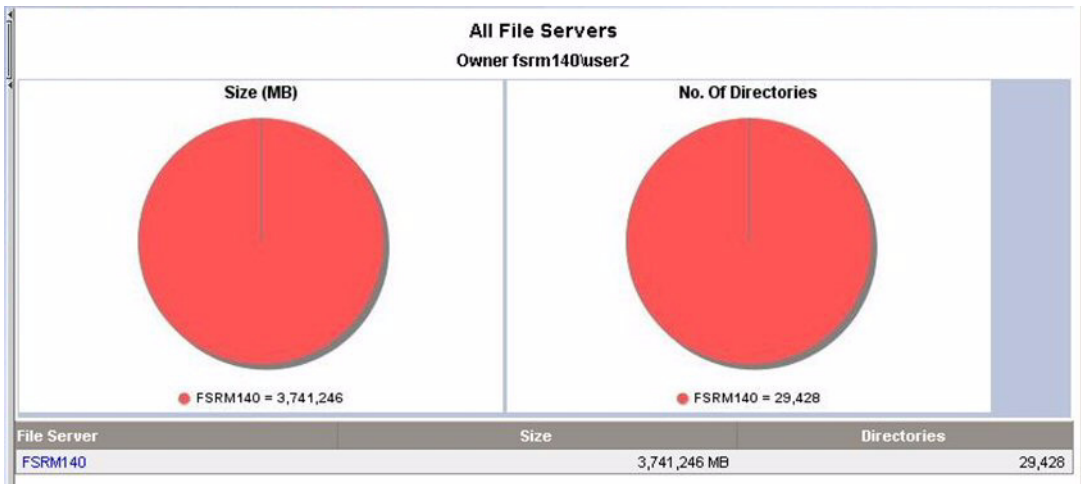


FIGURE 1-25 Selected Trustee Drilldown at Enterprise Level

The following shows a display of Selected Trustee Drilldown at file server level.

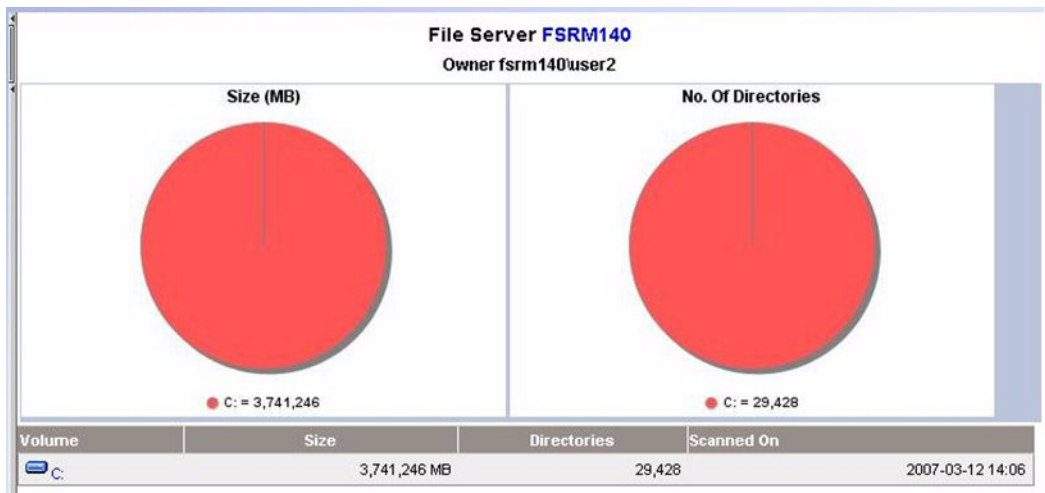


FIGURE 1-26 Selected Trustee Drilldown at File Server Level

The following display shows Selected Trustee drilldown at Volume level.

File Server SRINIVKD							
Volume C: as of 2007-05-28 13:27							
Trustee: ASIAPACIFICsrinivk							
Directories							
Name	Current Directory Size	Including Subdirectories Size	No. of Trustees	Trustee's Share	Attributes	Permissions	
lginnivk\photos\Apple photos	351 MB	351 MB	1	351 MB	D	F	
lginnivk\mails\Outlook	348 MB	348 MB	1	348 MB	D	F	
lginnivk\hp photos	281 MB	674 MB	1	281 MB	D	F	
lginnivk\downloads\Printer_drivers_xplac software	244 MB	244 MB	1	244 MB	D	F	
lginnivk\downloads\Printer_drivers_S8 software	244 MB	244 MB	1	244 MB	D	F	
lginnivk\hp photos\trurocelebration123CANON	231 MB	231 MB	1	231 MB	D	F	
lginnivk\photos\2005-11 (Nov)	139 MB	139 MB	1	139 MB	D	F	
lginnivk\mails	132 MB	480 MB	1	132 MB	D	F	
lginnivk\photos\chilukuru	131 MB	131 MB	1	131 MB	D	F	
lginnivk\late	115 MB	142 MB	1	115 MB	D	F	
lginnivk\downloads	107 MB	739 MB	1	107 MB	D	F	
lginnivk\downloads\idea	95 MB	95 MB	1	95 MB	D	F	
lginnivk\hp photos\trurocelebration124CANON	76 MB	76 MB	1	76 MB	D	F	
lginnivk\photos\trurocelebration124CANON	71 MB	71 MB	1	71 MB	D	F	

FIGURE 1-27 Selected Trustee Drilldown at Volume Level

File Server Details

This chapter contains the following topics:

- “Viewing Summary Information About File Servers” on page 45
 - “Types of Files on the File Servers” on page 46
 - “Age Properties of Files on File Servers” on page 51
 - “Viewing Security and User Identifiers for All File Servers” on page 53
 - “Viewing Size Group Distribution Information” on page 56
 - “Managing Users” on page 58
-

Viewing Summary Information About File Servers

The management server provides a page that displays the summary information about all the file servers. To access the Summary page, expand the **Applications** node in the tree in Application Explorer, and then click the **File Servers** node. The Summary page is displayed by default. It provides a snapshot of the applications the management server detects by displaying the following:

- A graph showing the top five file servers by usage and the amount of space they occupy.
- A summary table to the right of the graph displaying the number of:
 - Total file servers
 - Total volumes
 - Total capacity
 - Used space
 - Free space
 - Percent used space
 - Percent free space
 - Total users
 - Total users space

- A table under the graph displaying the following for each file server:
 - File server name
 - Total volumes
 - Capacity
 - Used
 - Percentage used
 - Number of users
 - User space

Types of Files on the File Servers

The Extensions tab provides information about the types of files on the file servers. For example, it can let you know how many mpg files are stored on the file servers and their file size. In the extensions tab, there is a drop down menu to select Extension Groups, in which files are grouped by file type.

To access the Extensions tab:

1. Select **AppExplorer**.
2. Expand the **Applications** node in the tree in Application Explorer.
3. Click **File Servers** node.
4. Click the **Extensions** tab in the right pane.

You see the following:

- A graph showing the top 10 extensions and their size.
- A table below the graph displaying the extensions and the following properties:
 - Size** - The size of all the files with this extension. This property lets you see which types of files are using the most space on the file servers.
 - Count** - The number of files with this extension.

5. To filter extensions, enter the extension name, and click **Submit**.
6. In the right pane, click an extension under the Extension column.

The following is displayed:

- A pie chart showing the sizes of the files with this extension on each server.
- A pie chart showing the number of files with this extension on each server.
- A table showing the number of files with this extension on each server, the amount of space they occupy, and the collection time.

Data less than 1 MB is not displayed in the graphs. This could result in an empty graph if all data points are less than 1 MB.

7. To view more information about the extensions on a volume, click a file server in the File Server column in the table.

The following is displayed:

- A pie chart showing the sizes of the files with this extension on each volume
- A pie chart showing the number of files with this extension on each volume
- A table showing the number of files with this extension on each volume and the amount of space they occupy.

Note – Data less than 1 MB is not displayed in the graphs. This could result in an empty graph if all data points are less than 1 MB.

8. To view a listing of the largest *n* and oldest *n* files with this extension on each volume, click a volume in the Drive column in the table. The value of *n* is governed by the property `fileSrm.countForFSRMDrilldowns`, which has a default value of 25 and is configurable in the range 10 to 100.

Note – You can save the files with the extension for a volume in a comma-separated values list by clicking the **Save Extension Detail** button in the right pane.

Filtering Files

Filters use the following expressions:

- `d*` will return all extensions starting with `d`
- `*d` will return all extensions ending with `d`
- `*d*` will return all extensions having `d` in the extension

You can enter a list of extensions separated by a comma.

Extension Groups

The following shows a representative display of the Extensions tab selected, and the drop-down menu choices for selecting Extension Groups.

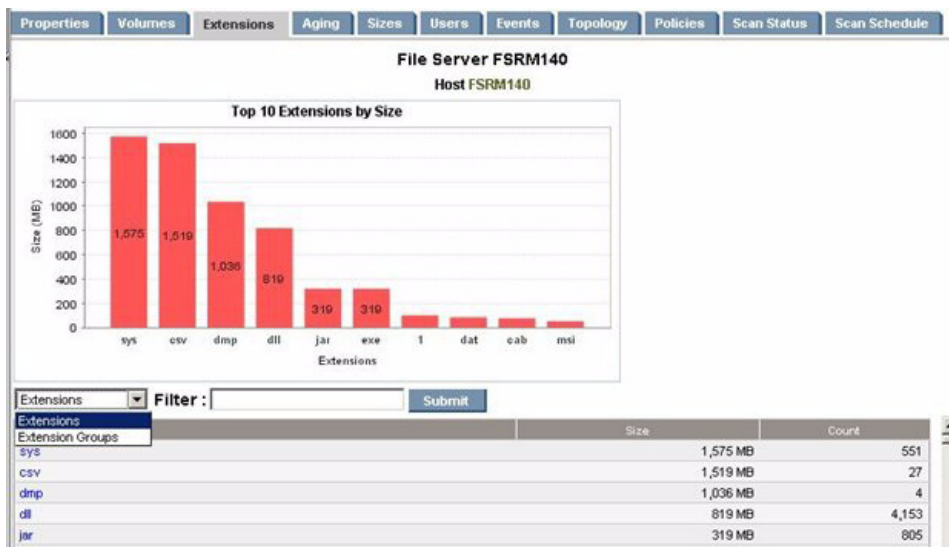


FIGURE 2-1 Extensions Group Drop-Down Menu

Select Extension Groups to display a screen showing the extension groups along with the extensions. A screen similar to the following displays.



FIGURE 2-2 Groupings for Extension Groups

You can edit or delete extension groups using the Edit or Delete icons. To create a new extension group, select the New Extension Group button, and a screen similar to the following displays.

Extension Name:*

Extensions:*

OK Cancel Help

Done

FIGURE 2-3 Create Extension Group Screen Display

You can enter the new extension group name and the extensions separated by commas. After extension groups are created, extension group detail information will appear in the extension tab when the extension group is selected from the drop-down menu.

From the volume level extension groups chart page, you can go to an intermediate page before a final drill-down page. The intermediate page lists constituent extensions with hyperlinks to the drill-down page to that specific extension. The following shows a representative display of the screen.

File Server FSRM140		
Volume C: as of 2007-01-04 18:13		
Extension zip, tar, war, jar		
Extension	Size	Count
jar	319 MB	805
zip	517 MB	138
war	2 MB	5

The display lists constituent extensions with hyperlinks to the drill down page to that specific extension.

Age Properties of Files on File Servers

The Aging tab provides information about the age of the files on the file servers. It is accessible by doing the following:

1. Select **AppExplorer**.
2. Expand the **Applications** node in the tree in Application Explorer.
3. Click **File Servers** node.
4. Click the **Aging** tab in the right pane.
5. To save the aging details to a comma-separated values file:
 - a. In the right pane under the File Server column on the Aging tab, click a link for a file server.
 - b. Click a link for a volume in the right pane.
 - c. Click one of the following headings in the right pane:
 - 0-30 days**
 - 30-60 days**
 - 60-90 days**
 - 90-180 days**
 - 180 days-1 year**
 - 1-2 years
 - 2-3 years
 - 3-4 years
 - 4-5 years
 - 5+ years
 - d. Click **Save Aging Details**.

By default the page displays the following information about the last time a file was accessed.

- A graph showing the size of each set of files belonging to an age group:
 - **30** - Files accessed in the last 30 days
 - **60** - Files accessed between 30 and 60 days ago
 - **90** - Files accessed between 60 and 90 days ago
 - **180** - Files accessed between 90 and 180 days ago
 - **180 days-1 year** Files accessed between 180 days and 1 year ago

- 1-2 years - Files accessed between 1 and 2 years ago
- 2-3 years - Files accessed between 2 and 3 years ago
- 3-4 years - Files accessed between 3 and 4 years ago
- 4-5 years - Files accessed between 4 and 5 years ago
- 5+ years - Files accessed over 5 years ago
- A graph showing the number of files belonging to an age group:
 - **30** - Files accessed in the last 30 days
 - **60** - Files accessed between 30 and 60 days ago
 - **90** - Files accessed between 60 and 90 days ago
 - **180** - Files accessed between 90 and 180 days ago
 - **180 days-1 year** Files accessed between 180 days and 1 year ago
 - 1-2 years - Files accessed between 1 and 2 years ago
 - 2-3 years - Files accessed between 2 and 3 years ago
 - 3-4 years - Files accessed between 3 and 4 years ago
 - 4-5 years - Files accessed between 4 and 5 years ago
 - 5+ years - Files accessed over 5 years ago
- **Age Distribution** menu. You can change this page to display information according to when the files were last modified or created. Select one of the options, and click **Submit**.
- A table under the graph displaying the number of files accessed within the specified time period and the size of those files.

Viewing Individual Files

To view a listing of files with a particular age attribute, do the following:

1. Click the one of the following headings in the table on the Age tab for the file servers.
 - **0-30 days**
 - **30-60 days**
 - **60-90 days**
 - **90-180 days**
 - **180 days-1 year**
 - 1-2 years
 - 2-3 years
 - 3-4 years
 - 4-5 years
 - 5+ years

The following is displayed:

- A pie-chart showing the size of the files that fit the criteria. They are color coded by server.
- A pie-chart showing the number of files that fit the criteria. They are color coded by server.

- A table listing the file servers and the size of files and number of files fitting the criteria.
2. Click a file server in the **File Server** column.
The volumes on the file server are listed.
 3. Click a volume. The largest n files that meet the criteria are listed. The value of n is governed by the property `fileSrm.countForFSRMDrilldowns`, which has a default value of 25 and is configurable in the range 10 to 100.
 4. To save the aging details to a comma-separated values file, click **Save Aging Details**.

Viewing Security and User Identifiers for All File Servers

You can get owner-related details by accessing the Ownership tab. This tab also lets you determine how many files this owner is using on file server.

Caution – The Ownership tab is disabled by default for file servers running on Microsoft Windows. To view the Ownership tab, you must set the `fileSrm.collectWindowsSID` property to true as described in “Enabling the Ownership Tab on Windows” on page 55, or you can select the **Collect Ownership Information** checkbox when configuring a file server scan.

The Ownership tab is accessible by doing the following:

1. Select **AppExplorer**.
2. Expand the **Applications** node in the tree in Application Explorer.
3. Click the **File Servers** node.
4. Click the **Ownership** tab in the right pane. The following is displayed:
 - A graph showing the top 10 owners, who use the most in megabytes.
 - A table displaying the following:
 - Ownership** - The security identifier (Windows) or user identifier (UNIX).
 - Files** - The files that the security identifier or user identifier uses.
 - Size** - The total size of the files the security identifier or user identifier uses.
5. To filter by owner, enter the owner name, and click **Submit**

6. To learn more about an owner, click the owner's name.

The following is displayed:

- A pie chart showing the sizes of the files with the owner on each server.
- A pie chart showing the number of files with the owner on each server.
- A table showing the number of files with the owner on each server and the amount of space they occupy.

Note – Data less than 1 MB is not displayed in the graphs. This could result in an empty graph if all the data points are less than 1 MB.

7. To view more information about the owner on a volume, click a file server in the File Server column in the table.

The following is displayed:

- A pie chart showing the sizes of the files with the owner on each volume
- A pie chart showing the number of files with the owner on each volume
- A table showing the number of files with the owner on each volume and the amount of space they occupy.

8. To learn more about what is assigned to the owner of a volume, click the volume name.

This page not only displays owner details, but it also lets you save them. See "Saving Owner Details" on page 54. The following tabs are provided on this page:

- **Aging** - Aging information of files owned by the owner.
- **Extensions** - The Extension summary of files owned by the owner.
- **Sizes** - The size group information of the files assigned to the owner.
- **Largest Files** - The list of n largest files assigned to the owner.
- **Aged Files** - The list of n most aged files by access assigned to the owner.

Note – Clicking on the hyperlinks provided in each of these tabs allows the download of a comma-separated values file that lists the files that match the criteria.

Saving Owner Details

The management server lets you save owner details for a volume to a comma-separated values file, which can be opened in Microsoft Excel or in a text editor, such as Notepad.

To save owner details:

1. Select **AppExplorer**.

2. Expand the **Applications** node in the tree in Application Explorer.
3. Click the **File Servers** node.
4. Click the **Ownership** tab in the right pane.
5. Click an owner's name.
6. Click the file server name.
7. Click the volume name.
8. Click **Save Owner Details**.

Owner details for a volume are saved to a comma-separated values file.

Note – Non-ANSI text—for example Asian characters and the Euro symbol—included in a comma-separated values file is not displayed properly by Microsoft Excel. Excel replaces the non-ANSI text with a question mark (?).

Enabling the Ownership Tab on Windows

The Ownership tab is disabled by default for file servers running on Microsoft Windows. To view the Ownership tab, you must set the `fileSrm.collectWindowsSID` property to true. To set the `fileSrm.collectWindowsSID` property to true:

1. Select **Configuration > Product Health**, and then click **Advanced** in the Disk Space tree.
2. Click **Show Default Properties** at the bottom of the page.
3. Copy the `fileSrm.collectWindowsSID` property. How you copy the text depends on your Web browser. If you are using Microsoft Explorer or Netscape Navigator, select the text, and then right-click the selected text, and then select **Copy**.
4. Return to the Advanced page (**Configuration > Product Health**, and then click **Advanced** in the Disk Space tree).
5. Paste the copied text into the Custom Properties box. How you paste the text depends on your Web browser. If you are using Microsoft Explorer or Netscape Navigator, right-click the box, and select **Paste**.
6. Make your changes in the Custom Properties box.

Change the value assigned to the `fileSrm.collectWindowsSID` property to `true`.

```
fileSrm.collectWindowsSID=true
```

7. When you are done, click **Save**.

Viewing Information for Owners on a Volume

1. Select **Configuration > FSRM**.
2. Click the volume you want to find more information about.
Information about the volume is displayed.
3. Click a link under the **Ownership** column.

The following information is displayed for an owner:

- **Age tab** - Displays the number of files, and their size, that have been accessed, modified, and created.
- **Extension tab** - Lists the file extensions by size and count.
- **Sizes tab** - Lists the files by size.
- **Aged Files tab** - Lists each file and the last date and time it was accessed, modified, or created. The date and time are based on the management server.
- **Largest files tab** - Lists the largest files first by size and displays the date and time each file was last accessed, modified, or created.

The information is saved to a comma-separated values file, which can be viewed in a text editor as well as Microsoft Excel.

The following information is saved in the file:

- File name
- Size
- Last accessed
- Last modified
- When created

Viewing Size Group Distribution Information

The Sizes tab displays size distribution information for file servers.

To access the Sizes tab:

1. Select **AppExplorer**.
2. Expand the **Applications** node in the tree in Application Explorer.
3. Click the **File Servers** node.
4. Click the **Sizes** tab in the right pane.

The page displays the following:

- A bar chart displaying the size group distribution by usage
- A bar chart displaying the size group distribution by count
- A table listing the number of files and the total size for each size group on each file server.

5. Click one of the following headings in the table on the Sizes tab:

- **0 Bytes**
- **0 -10 KB**
- **10 -100 KB**
- **100 -1 MB**
- **1 -10 MB**
- **10 - 100 MB**
- **100MB - 1GB**
- 1GB - 10GB
- 10GB+

The following is displayed:

- A pie chart showing the sizes of the files with the size group on each server.
- A pie chart showing the number of files with the size group on each server.
- A table showing the number of files with the size group on each server and the amount of space they occupy.

Note – Data less than 1 MB is not displayed in the graphs. This could result in an empty graph if all the data points are less than 1 MB.

6. To view more information about the size group on a volume, click a file server in the File Server column in the table.

The following is displayed:

- A pie chart showing the sizes of the files with the size group on each volume
- A pie chart showing the number of files with the size group on each volume
- A table showing the number of files with the size group on each volume, the amount of space they occupy, and the collection time.

7. To view a listing of the oldest n files with the size group on the volume, click a volume in the Drive column in the table. The value of n is governed by the property `fileSrm.countForFSRMDrilldowns`, which has a default value of 25 and is configurable in the range 10 to 100.

Note – You can save the files with the size group for a volume in a comma-separated values file by clicking the **Save SizeGroup Details** button in the right pane.

Managing Users

This section contains the following topics:

- “Properties of Users” on page 58
- “Viewing Details for a File Server SRM User” on page 59
- “Adding File Server SRM Users” on page 60
- “Modifying File Server SRM Users” on page 61
- “Deleting File Server SRM Users” on page 62
- “Exporting the List of Users” on page 62
- “Modifying a List of Users” on page 63
- “Importing a List of Users” on page 65
- “Viewing Information About Users on a Volume” on page 66

Properties of Users

The Users tab displays the properties of the user accounts assigned to file servers.

It is accessible by doing the following:

1. Select **AppExplorer**.
2. Expand the **Applications** node in the tree in Application Explorer.
3. Click the **File Servers** node.
4. Click the **Users** tab in the right pane.

Caution – The users described on this page are different from the users for the management server. If you are not seeing data on this page, you must first create your File Server SRM users, as described “Adding File Server SRM Users” on page 60.

The page displays the following:

- A graph showing the top five users by usage and the amount of space they use.
- A summary table to the right of the graph displaying the following:
 - **Users** - The number of users assigned to all of the file servers monitored.

- **Users Size** - The amount of space the users use.
- **Largest User** - The user who uses the most space.
- **Largest User Size** - The amount of space the largest user uses.
- A table below the graph displaying the users and the following properties:
 - **User ID*** - The ID of the user
 - **User Name*** - The name of the user
 - **Home Directory*** - The home directory of the user. The home directory is assigned to a user by the user's organization. By default, the user has full access rights (read, write, execute) to the home directory. A user can have multiple home directories.
 - **Owner*** - The owners who are associated with the user. A user can have multiple owners.
 - **Department Number** - The number of the department to which the user is assigned. The department number was entered when the department was created in Chargeback.
 - **Quota*** - The amount of space the user is allocated
 - **Used** - The amount of space the user is using
 - **Instances** - The number of file servers on which the user's home directory is present.

*These properties and the full name are entered manually.

To display the properties of just one user account, enter the full name in the Filter box, and then click **Submit**.

Viewing Details for a File Server SRM User

You can view detailed information about a File Server SRM user, such as the following:

- Department
- Quota
- Total Used by Owners
- Total Used by Directories

To view details of a File Server SRM user:

1. Access Application Explorer.
2. Expand the **File Servers** node in the tree in Application Explorer.
3. In the right pane, click the **Users** tab.
4. Under the User ID column, click the link for the user you want to know more about.

You are shown detailed information about the user.

Adding File Server SRM Users

File Server SRM provides data about users on the file servers. For example, the software provides information such as:

- The amount of space the users are using
- The user who is using the most amount of space and the amount of space being used

To obtain information about users, you must first add them in File Server SRM. These users differ from the users for the management server. When you add a File Server SRM user, you are making File Server SRM aware of that user for monitoring. That user is not granted access to the management server.

Note – If you used File Server SRM in a previous release, you may remember users were created for a specific file server. Now users are no longer dependent on a single file server.

To add a File Server SRM user:

1. Select **AppExplorer**.
2. Click the **File Servers** node.

Note – Do not click the node name for an actual file server. Click the node with the name **File Servers**.

3. In the right pane, click the **Users** tab.
4. Click the **New User** button located under the graph.
5. In the ID box, enter the user ID.
6. In the Name box, enter the name for the user.
7. In the Directories box, enter the home directory for the user. The home directory is assigned to a user by the user's organization. A user can have multiple home directories. Separate additional directories with a comma.

Note – Directory paths are case sensitive and must be fully qualified paths. Map a user's usage to the home directory when configuring a file server scan.

8. In the Owners box, enter the owners that are associated with the user. Separate multiple owners with a comma. The owner names should be similar to what the OS reports. For example, the domain\username on Windows.

Note – It is required that information be entered into either the Directories box or the Owners box, but not both. Entering information into both boxes is accepted, but not required.

9. In the **Department No** menu, select a department number corresponding to the department to which the user belongs. The department number was assigned to the department when the department was added by using Chargeback
10. In the E-mail box, enter the user's e-mail address.
11. In the Quota box, enter the maximum amount in megabytes the user can use.

Note – Entering **0** in the Quota box grants unlimited storage capacity to the selected user.

12. Click **OK**.

Modifying File Server SRM Users

You can modify the following properties for a File Server SRM user:

- **Name**
- **Directories**
- **Owners**
- **Department Number**
- **E-mail**
- **Quota**


Caution – These steps modify a File Server SRM user, not a user account for the management server.

To modify one or more of these properties for a user:

1. Select **AppExplorer**.
2. Click the **File Servers** node.

Note – Do not click the node name for an actual file server. Click the node with the name **File Servers**.

3. In the right pane, click the **Users** tab.

4. In the table below the graphic, click the **Edit** () button corresponding to the user you want to modify.
5. Modify one or more of the properties listed at the beginning of this section.
6. Click **OK**.

The File Server SRM user is updated.

Deleting File Server SRM Users


To delete a File Server SRM user:

Caution – These steps modify a File Server SRM user, not a user account for the management server. They do not impact access to the management server nor to the file server.

To delete a File Server SRM user:

1. Select **AppExplorer**.
2. Click **File Servers** node.

Note – Do not click the node name for an actual file server. Click the node with the name **File Servers**.

3. In the right pane, click the **Users** tab.
4. In the table below the graphic, click the **Delete** () button corresponding to the user you want to remove.

Exporting the List of Users

After you add your users, export the list of users in case you need to reinstall the management server. The user list is saved as a comma-separated values file, which can be opened in a text editor, such as Notepad. You can add to the comma separated list as described in “Modifying a List of Users” on page 63.

To export the list of users:

1. Select **AppExplorer**.

2. Click **File Servers** node.

Note – Do not click the node name for an actual file server. Click the node with the name **File Servers**.

3. In the right pane, click the **Users** tab.
4. Click **Export Users**.
5. When you are asked if you want to save the comma-separated values file, click **Save**, and then designate a location to save the file.

Modifying a List of Users

After you export a list of users, you can easily add to it. The attributes for each user appear on a row for that user. The format of a user's record is as follows:

```
<User ID>,<User Name>,<Home Directory(s)>,<Department>,  
<E-Mail>,<Quota><Owner(s)>
```

Assume you have a user with the following attributes:

- **User ID** - JS
- **User Name** - John Smith
- **Home Directory** - Program Files
- **Department** - Engineering
- **E-Mail** - jsmith@companyname.com
- **Quota** - 500
- **Owner** -jsmith

The information for the user would appear as follows in the list:

```
JS,John Smith,\Program  
Files,Engineering,jsmith@companyname.com,500,jsmith
```

A list with multiple users would appear as follows:

```
JS,John Smith,\Program  
Files,Engineering,jsmith@companyname.com,500,jsmith  
JD,John Doe,\Program Files,Engineering,jdoe@companyname.com,500,jdoe  
DD,David Double,\Program Files,Engineering,jdouble@companyname.com,  
500,ddouble
```

The record for a user with multiple home directories would appear as follows:

```
JS,John Smith,"\\jsmith,\home\jsmith",Engineering,  
jsmith@companyname.com,500
```

The record for a user with multiple owners would appear as follows:

```
Adm,Administrator,,netadmin@mycompany.com,,root,bin,adm,uucp,nobody,Administrator"
```

Note – The owner can be omitted if the home directory is provided, and the home directory can be omitted if the owner is provided.

The following boxes must be valid. Failure of any of these conditions causes the management server to log that record as an error and continue to the next record:

- <User ID>
- <Home Directory> or <Owner>
- *Optional*: <Department> - If you provide a department, the department must exist on the management server. The department can be empty.
- *Optional*: <Quota>
- *Optional*: <E-Mail>

TABLE 2-1 Restrictions for User Boxes

Box	Condition
User ID	Required box. Cannot include the following: <ul style="list-style-type: none">• More than 64 characters• Single quote (')• Double quote (")• Forward slash (/)• Back slash (\)
User Name	Required box. Cannot include more than 64 characters.
Home Directory	Required if the owner is not specified. List of one or more directories separated by commas, with each directory name not more than 4000 characters. Individual directory names should not contain commas.
Department	Null or an existing department.
E-Mail	Null or a string of up to 253 characters.
Quota (Megabytes)	Null or 0 to indicate unlimited, or a rational decimal number less than 999999999999. Value is in MBs.

TABLE 2-1 Restrictions for User Boxes (*Continued*)

Box	Condition
Owner	Required if the home directory is not specified. List of one or more owner names separated by commas, with each individual owner name not exceeding 256 characters. Individual owner names should not contain commas.

Importing a List of Users

You can import a list of users from a comma-separated values file. For information on how to add to the current list of users in File SRM, see “Exporting the List of Users” on page 62 and “Modifying a List of Users” on page 63.

The management server provides two ways to import a list of users:

- **Full Import** - Replaces all current users in the list with the users in the import file.
- **Partial Import** - Updates existing users and adds new users.

To import a list of users:

1. Click the **File Servers** node.

Note – Do not click the node name for an actual file server. Click the node with the name **File Servers**.

2. In the right pane, click the **Users** tab.
3. Click **Import Users**.
4. Click **Browse** to select the list of users you want import.
5. Select **Full Import** or **Partial Import**.
6. Click **OK**.

When you perform a partial or full import, you are provided with a report with the following information:

- Number of records read
- Number of users created
- Number of users updated
- Number of users that could not be created
- Format errors
- Directory and owner both unspecified
- Directory already mapped to a user
- Owner already mapped to a user

- Invalid departments
- Multiple entries for users

Viewing Information About Users on a Volume

You can view information about users on a volume, as follows:

1. Select **Configuration > FSRM**.
2. Click the volume you want to find more information about.
Information about the volume is displayed.
3. Click the **Users** tab.
Information about users on the volume is displayed.
4. Click a user.

The following information is displayed for the user:

- File Server
- Volume
- Size
- Owner

Individual File Server Details

This chapter describes the following:

- “Viewing Properties for a File Server” on page 67
 - “Finding Volume Details” on page 68
 - “Types of Files on a File Server” on page 72
 - “Aging Properties of Files on a File Server” on page 77
 - “Viewing Size Group Distribution Information” on page 79
 - “Viewing Events for a File Server” on page 80
 - “Viewing Policies for a File Server” on page 82
 - “Finding Individual Volume Details” on page 82
 - “Explorer” on page 84
-

Viewing Properties for a File Server

To view the properties for a file server:

1. Click **AppExplorer**.
2. Expand the **Applications** node in the tree in Application Explorer.
3. Expand the **File Servers** node.
4. Click a file server name in the tree.
5. Click the **Properties** tab in the right pane.

The Properties page displays the following information.

- **Custom Name** - A unique name for the file server. The custom name is displayed for the File Server SRM application instead of the file server's default name. The unique name helps in distinguishing this File Server SRM instance from the actual server. To create a unique name, type the name in the Custom Name field, and then click the **Save** button.

- ***Vendor** - The vendor that created the file server.
- **Business Cost** - Used to determine the cost impact of the application on the network. The currency displayed is dependent upon the standards and formats setting on the management server. In the Business Cost field, type an amount, for example 35.25. Then click **OK**.

Keep in mind the following:

- You cannot enter a symbol in front of the number, except for the dollar sign (\$).
- You can enter a number with decimal points, 30.50.
- ***Contacted** - The last time the software contacted the file server.
- ***Record Created** - When a record was created for the file server.
- ***Discovery Status** - The status of the last discovery. If the element was just discovered, the status is at "created."
- **Install Date** - When the file server was installed.
- ***Name Detected** - The name of the file server detected.
- **OID** - The Object Identifier
- ***Description** - Provides information about the type of element. In this instance, it would display FileServer.
- ***Target Operating System** - The operating system of the file server.
- **IdentificationCode** - The identification code of the file server.
- ***Product Name** - The product name of the file server.
- **Serial Number** - The serial number of the file server.
- **Build Number** - The build number of the file sever.
- **Version** - The version number of the file server.
- ***Host** - The name of the host
- **Business Cost (per hour)** - The business cost that was set at the top of this page.

*These fields are populated. The rest of the fields are blank by default.

Finding Volume Details

To view the properties of the volumes on a file server:

1. Click **AppExplorer**.
2. Expand the **Applications** node in the tree in Application Explorer.
3. Expand the **File Servers** node.
4. Click a file server name in the tree.
5. Click the **Volumes** tab in the right pane.

Note – You can view additional information on volumes that have had file server collection. See “Viewing Detailed Information for Scanned Volumes” on page 69 for more information.

This page displays the following:

- A graph displaying the top five volumes by usage on the file server. The amounts for free space and used space are displayed. Data less than 1 MB is not displayed in the graph. This could result in an empty graph if all data points are less than 1 MB.
- A summary table to the right of the graph displaying the following:
 - **Volumes** - The number of volumes on the file server.
 - **Capacity** - The size of all volumes on the file server.
 - **Used** - The amount of used space on all volumes on the file server.
 - **Free** - The amount of free space on all volumes on the file server.
 - **Used Percent** - The amount of used space on all volumes on the file server.
 - **Free Percent** - The amount of free space on all volumes on the file server.
 - **Users** - The number of users assigned to one or more of the volumes on the file server.
 - **Users' Space** - The amount of space the users use on the file server.
- A table below the graph displaying the volumes and the following properties:
 - **Capacity** - The size of the volume.
 - **Used** - The amount of space that is used on that volume.
 - **Used%** - The percentage used on the volume.
 - **Users** - The number of users assigned to that volume.
 - **Users Space** - The amount of space the users use.

Viewing Detailed Information for Scanned Volumes

You can find even more information about a volume by clicking a volume that has had file server collection.

To access this information:

1. Click **Configuration > FSRM**.
2. Click the volume you want to find more information about.

This page displays the following:

- A graph represented in one of the following ways:
 - If all large directories are less than 1 MB, the pie chart will have only two sectors (Free and Used).

- If the volume has lot of large directories with a size larger than 1 MB, the pie chart will have one sector for Free, 8 sectors for the top 8 directories, and a last sector for Used (Rest).
- A summary table to the right of the graph displaying the following:
 - **Total Storage** - The amount of total storage space on the volume.
 - **Used** - The amount of used space on the volume.
 - **Free** - The amount of free space on the volume.
 - **Used Percent** - The amount of used space on the volume.
 - **Free Percent** - The amount of free space on the volume.
 - **File System** - The type of file system on the volume.
 - **No. of Files** - The number of files on the volume.
 - No. of Directories - The number of directories on the volume.
- Below the chart, there are three tabs which provide the following:
 - **Largest Directories** - This table lists the largest N directories on the volume, and the size of the directory, number of files in the directory, and number of subdirectories in the directory. The information in this table consists only of the files and directories directly contained in the directory in question and not those in the subdirectories. Click the hyperlink on the directory name to display a summary snapshot of the directory where the Aging, Extension, Size, Largest Files, and Aged Files information is presented in respective tabs. Click the hyperlinks in the tabs to download a list of the files satisfying the conditions. Click the **Save All Files** button to download a list of all the files in the directory. The downloaded file is in CSV format.
 - **Largest Files** - This table lists the largest N files on the volume. It displays the name of the file, its size, and the accessed, modified, and created time.
 - **Aged Files** - This table lists the most aged N files on the volume based on the access time stamp. It displays the name of the file, its size, and the accessed, modified, and created time.

Note – The value of N in the above three tables is governed by the property `fileSrm.countForFSRMDrilldowns`.

Viewing Information About a Directory on a Volume

You can access the following detailed information about a directory on a volume:

- **Age tab** - Displays the number of files and their size that have been accessed, modified, and created.
- **Extension tab** - Lists the file extensions by size and count.
- **Sizes tab** - Lists the files by size.
- **Aged Files tab** - Lists the file and the last date and time it was accessed, modified, or created. The date and time are based on the management server.

- **Largest files tab** - It lists the largest files first by size. The date and time the file was last accessed, modified or created is displayed.

To access this page:

1. Click **Configuration > FSRM**.
2. Click the volume you want to find more information about.
3. Click the directory you want to find more information about.
4. If you want to save information about the files in this directory, click the **Save All Files** button.

The information is saved to a csv (comma separated list) file, which can be viewed in a text editor as well as Microsoft Excel.

The following information is saved in the file:

- file name
- size
- last accessed
- last modified
- when created

Viewing File Count and Size for a Volume

You can view the number of files and the amount of space they occupy on a volume.

To access this information:

1. Click **Configuration > FSRM**.
2. Click the volume you want to find more information about.

Information about the volume is displayed.

3. Click the **Sizes** tab.

Information about the file count and size for a volume is displayed.

Viewing Information for a File Size Group

You can view the file size group details for a volume, as follows:

1. Click **Configuration > FSRM**.
2. Click the volume you want to find more information about.

Information about the volume is displayed.

3. Click the **Sizes** tab.

Information about the file count and size for a volume is displayed.

4. Click a size group, for example 0-10 KB.

The files belonging to this size group are displayed, as well as information about them, such as their size, last access, last modified, and when created.

5. If you want to save this information, click the **Save SizeGroup Details** button.

The information is saved to a csv (comma separated list) file, which can be viewed in a text editor as well as Microsoft Excel.

Types of Files on a File Server

The Extensions page provides information about the types of files on a file server. For example, it can let you know how many mp3s are stored on a file server and their file size. In the extensions tab, there is a drop down menu to select Extension Groups, in which files are grouped by file type.

To access the Extension page:

1. Click **AppExplorer**.
2. Expand the **Applications** node in the tree in Application Explorer.
3. Expand the **File Servers** node.
4. Click a file server name in the tree.
5. Click the **Extensions** tab in the right pane.

You see the following:

- A graph displaying the top 10 extensions and their size.
- A table below the graph displaying the extension and its following properties:

Size - The size of all the files with that extension. This property lets you see which types of files are using the most space on a file server.

Count - The number of files with this extension.

6. To filter by extension, enter the extension name and click the **Submit** button
7. Click an extension in the Extension column in the table.

The following is displayed:

- A pie chart showing the sizes of the files with the extension per volume
- A pie chart showing the number of files with the extension per volume
- A table showing the number of files with the extension per volume and the amount of space they occupy.

Data less than 1 MB is not displayed in the graph. This could result in an empty graph if all data points are less than 1 MB.

8. To view a listing of the files with the extension on the volume, click a volume in the Volume column in the table. The largest N and most aged N files with the extension are listed in the tabs “Largest Files” and “Aged Files.” The filename with path, size, and the accessed, modified, and created time are provided.
9. You can save the extensions for a volume in a comma-separated list by clicking the **Save Extension Detail** button in the right pane. The extensions for that volume are saved in a comma-separated list (CSV file).

Note – If you attempt to view the CSV file in Microsoft Excel, keep in mind that Excel can only handle a limited number of records. If the file won’t open in Excel, it may be necessary to bring the CSV file into a database. Another option is to break the CSV file into smaller pieces that will Excel will be able to handle.

Extension Groups

The following shows a representative display of the Extensions tab selected, and the drop-down menu choices for selecting Extension Groups.

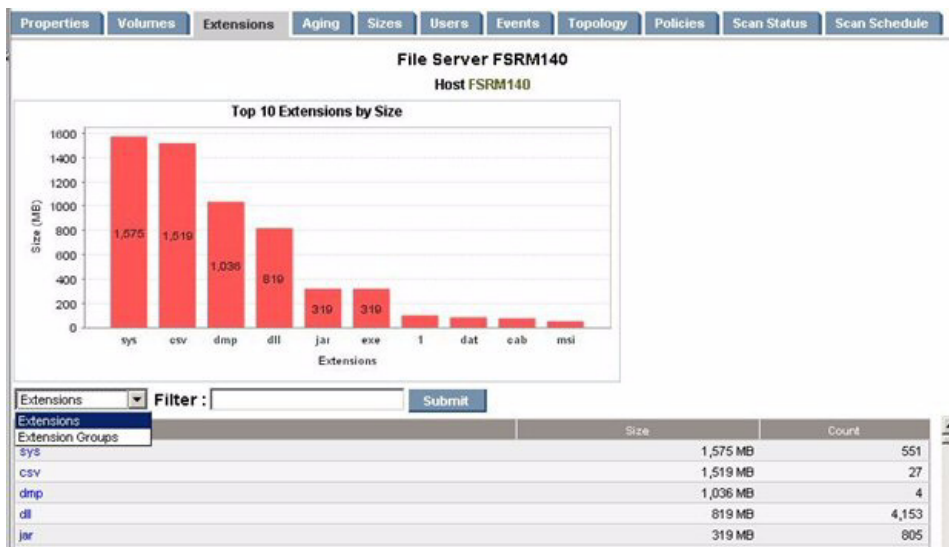


FIGURE 3-1 Extensions Group Drop-Down Menu

Select Extension Groups to display a screen showing the extension groups along with the extensions. A screen similar to the following displays.



FIGURE 3-2 Groupings for Extension Groups

You can edit or delete extension groups using the Edit or Delete icons. To create a new extension group, select the New Extension Group button, and a screen similar to the following displays.

FIGURE 3-3 Create Extension Group Screen Display

You can enter the new extension group name and the extensions separated by commas. After extension groups are created, extension group detail information will appear in the extension tab when the extension group is selected from the drop-down menu.

From the volume level extension groups chart page, you can go to an intermediate page before a final drill-down page. The intermediate page lists constituent extensions with hyperlinks to the drill-down page to that specific extension. The following shows a representative display of the screen.

File Server FSRM140		
Volume C: as of 2007-01-04 18:13		
Extension zip, tar, war, jar		
Extension	Size	Count
jar	319 MB	805
zip	517 MB	138
war	2 MB	5

The display lists constituent extensions with hyperlinks to the drill down page to that specific extension.

Filtering Files

Filters use the following expressions:

- d* will return all extensions starting with d
- *d will return all extensions ending with d
- *d* will return all extensions having d in the extension
- You can enter a list of extensions separated by a comma.

Aging Properties of Files on a File Server

To find information about the aging properties of the files on a file server:

1. Click **AppExplorer**.
2. Expand the **Applications** node in the tree in Application Explorer.
3. Expand the **File Servers** node.
4. Click a file server name in the tree.
5. Click the **Aging** tab in the right pane.
6. To save the aging details to a comma-separated list (CSV file):
 - e. Click a link for a volume in the right pane.
 - f. Click one of the following headings in the right pane:
 - 0-30 days
 - 30-60 days
 - 60-90 days
 - 90-180 days
 - 180 days-1 year
 - 1-2 years
 - 2-3 years
 - 3-4 years
 - 4-5 years
 - 5+ years
 - g. Click the **Save Aging Details** button.

By default the page displays the following information:

- A graph displaying the size of each set of files belonging to an age group:

- **30** - Files accessed in the last 30 days
- **60** - Files accessed within 30 and 60 days
- **90** - Files accessed within 60 and 90 days
- **180** - Files accessed within 90 and 180 days
- **180 days-1 year** Files accessed between 180 days and 1 year ago
- **1-2 years** - Files accessed between 1 and 2 years ago
- **2-3 years** - Files accessed between 2 and 3 years ago
- **3-4 years** - Files accessed between 3 and 4 years ago
- **4-5 years** - Files accessed between 4 and 5 years ago
- **5+ years** - Files accessed over 5 years ago

Data less than 1 MB is not displayed in the graph. This could result in an empty graph if all data points are less than 1 MB.

- A graph displaying the file count of files belonging to an age group:
 - **30** - Files accessed in the last 30 days
 - **60** - Files accessed within 30 and 60 days
 - **90** - Files accessed within 60 and 90 days
 - **180** - Files accessed within 90 and 180 days
 - **180 days-1 year** Files accessed between 180 days and 1 year ago
 - **1-2 years** - Files accessed between 1 and 2 years ago
 - **2-3 years** - Files accessed between 2 and 3 years ago
 - **3-4 years** - Files accessed between 3 and 4 years ago
 - **4-5 years** - Files accessed between 4 and 5 years ago
 - **5+ years** - Files accessed over 5 years ago

Data less than 1 MB is not displayed in the graph. This could result in an empty graph if all data points are less than 1 MB.

- A table to the right of the graph displaying the number of:
 - **Files (> 180 days)** - The number of files accessed more than 180 days ago.
 - **Files Size (> 180 days)** - The size of the files accessed more than 180 days ago.
 - **Files (< 30 days)** - The number of files less than 30 days old.
 - **Files Size (< 30 days)** - The size of the files less than 30 days old.
- **Age Distribution** combo box. You can change this page to display information according to when the files were last modified or created. Select one of the options and click **Submit**.
- A table under the graph displaying the number of files accessed within the specified time period and the size of those files.

To view aging properties for individual files, see “Viewing Aging Properties for Individual Files” on page 78.

Viewing Aging Properties for Individual Files

To view a listing of files with a particular age attribute, do the following:

1. Click the one of the following headings in the table on the Age tab for a file server.

- 0-30 days
- 30-60 days
- 60-90 days
- 90-180 days
- 180 days-1 year
- 1-2 years
- 2-3 years
- 3-4 years
- 4-5 years
- 5+ years

The files that meet the criteria are listed.

2. Click a volume. The Largest N files that meet the criteria are listed. The filename with path, size, and the accessed, modified, and created time are provided.

3. To save the aging details to a comma-separated list (CSV file), click the **Save Aging Details** button.

Note – If you attempt to view the CSV file in Microsoft Excel, keep in mind that Excel can only handle a limited number of records. If the file won't open in Excel, it may be necessary to bring the CSV file into a database. Another option is to break the CSV file into smaller pieces that will Excel will be able to handle.

Viewing Size Group Distribution Information

The Sizes tab displays size distribution information for file servers.

To access the Sizes tab:

1. Click **AppExplorer**.
2. Expand the **Applications** node in the tree in Application Explorer.
3. Click the **File Servers** node.
4. Click a filer server name in the tree.
5. Click the **Sizes** tab in the right pane.

The page displays the following:

- A bar chart displaying the size group distribution by usage
- A bar chart displaying the size group distribution by count
- A table listing the number of files and the total size for each size group on each volume.

6. Click one of the following headings in the table on the Size tab:

- 0 Bytes
- 0 - 10 KB
- 10 - 100 KB
- 100 - 1 MB
- 1 - 10 MB
- 10 - 100 MB
- 100MB - 1GB
- 1GB - 10GB
- 10GB+

The following is displayed:

- A pie chart showing the sizes of the files with the size group per server.
- A pie chart showing the number of files with the size group per server.
- A table showing the number of files with the size group per server and the amount of space they occupy.

Note – Data less than 1 MB is not displayed in the graphs. This could result in an empty graph if all the data points are less than 1 MB.

7. To view a listing of the oldest N files with the size group on the volume, click a volume in the Drive column in the table. The value of N is governed by the property `fileSrm.countForFSRMDrilldowns`, which has a default value of 25 and is configurable in the range 10 to 100.

Note – You can save the files with the size group for a volume in a comma-separated list (CSV file) by clicking the Save SizeGroup Details button in the right pane.

Viewing Events for a File Server

The Events tab lists the events that involve the file server. It provides the following information about the events:

- **ID**- The identification number assigned to the event
- **Severity** - Provides the severity level
- **Time** - The time the event was recorded.

- **Summary Text** - A brief explanation of the event. When you click the summary text, the details of the event are displayed.

You can access the Events tab by doing the following:

1. Click **AppExplorer**.
2. Expand the **Applications** node in the tree in Application Explorer.
3. Expand the **File Servers** node.
4. Click a file server name in the tree.
5. Click the **Events** tab in the right pane.

Note – Events listed on this page may not be attributed to the correct source until Getting Details has completed.

Viewing Event Details

To access event details, click the link for the event under the Summary Text column. You can also right-click an event and select **Event Details** from the drop down menu.

The Event Details pane provides information on one or more of the following:

- **Serial Number** - The number assigned to the event
- **Summary Text** - A brief explanation of the event
- **Element** - It is the source of the event. An element can be a switch, host, application, fabric or anything else on the network. If this field is blank, the event did not come from an element.
- **Source** - If the event came from an element, the name of the element is provided.
- **Time Reported** - The time the event was reported to the management server.
- **Probable Cause** - Provides an explanation of a probable cause.
- **Recommended Actions** - Provides recommendations.
- **Event Type** - Provides a description of the event.
- **Correlated Indications** - Information obtained from the provider.
- **Severity** - Provides the severity level, which can be one of the following:
 - **Clear**
 - **Unknown**
 - **Informational**
 - **Warning**
 - **Minor**
 - **Major**
 - **Critical**

- **Journal Entries** - Use this field to enter additional information and then click **Add Journal Entry**. This field is limited to 4,000 characters.

Sorting Events

To sort events, click the column title corresponding to the attribute you want to sort the event. For example if you want to sort events by time, click the Time heading on the table on the Events tab. The events are sorted by time on the Events page.

Viewing Policies for a File Server

Policy Manager can automatically send an e-mail, generate an event, or run a custom script when the file server is being overused. For example, you can configure Policy Manager so you receive an e-mail message when the amount of free space on a file server decreases to a specified level.

Use the Policy tab to do the following:

- Add Policies
- Edit Policies
- Test Policies
- Delete Policies

You can access the Policies tab by doing the following:

1. Click **AppExplorer**.
2. Expand the **Applications** node in the tree in Application Explorer.
3. Expand the **File Servers** node.
4. Click a file server name in the tree.
5. Click the **Policies** tab in the right pane.

See “Policies for File Server SRM” on page 4 for more information.

Finding Individual Volume Details

To find volume details for a volume on a file server:

1. Click **AppExplorer**.
2. Expand the **Applications** node in the tree in Application Explorer.
3. Expand the **File Servers** node.
4. Click a file server name in the tree.
5. Click a volume under the Volume column.

The File System Info tab opens in a new window.

This page displays the following:

- A graph represented in one of the following ways:
 - If all large directories are less than 1 MB, the pie chart will have only two sectors (Free and Used).
 - If the volume has lot of large directories with a size larger than 1 MB, the pie chart will have one sector for Free, 8 sectors for the top 8 directories, and a last sector for Used (Rest).
- A summary table to the right of the graph displaying the following:
 - **Capacity** - The size of the volume
 - **Used** - The amount of used space on the volume
 - **Free** - The amount of free space on the volume
 - **Used Percentage** - Percentage of used space on the volume
 - **Free Percentage** - Percentage of free space on the volume
 - **File System** - Type of the file system on the volume
 - **Number of Files** - Total number of files on the volume
 - **Number of Directories** - Total number of file on the volume
- Below the chart, there are three tabs which provide the following:
 - **Largest Directories** - This table lists the largest N directories on the volume, and the size of the directory, number of files in the directory, and number of sub directories in the directory. The information in this table consists only of the files and directories directly contained in the directory in question and not those in the sub directories. Click the hyperlink on the directory name to display a summary snapshot of the directory where the Aging, Extension, Size, Largest Files, and Aged Files information is presented in respective tabs. Click the hyperlinks in the tabs to download a list of the files satisfying the conditions. Click the **Save All Files** button to download a list of all the files in the directory. The downloaded file is in CSV format.
 - **Largest Files** - This table lists the largest N files on the volume. It displays the name of the file, its size, and the accessed, modified, and created time.
 - **Aged Files** - This table lists the most aged N files on the volume based on the access time stamp. It displays the name of the file, its size, and the accessed, modified, and created time.

Note – The value of N in the above three tables is governed by the property fileSrm.countForFSRMDrilldowns.

Explorer

The Explorer tab provides the following information:

- The path of the current directory
- A table listing the sub-directories in the current directory
- A table listing the files in the current directory

For each file and directory, properties such as size, access date, modify date, create date, and attributes are provided. In addition, sub-directories for directories and owner information for files are also listed.

Note – On Windows, the file owner listed for an encrypted file will be the account running the CIM extension service (usually the host's local administrator account).

To access the Explorer tab:

1. Click **AppExplorer**.
2. Expand the **Applications** node in the tree in Application Explorer.
3. Expand the **File Servers** node.
4. Click a file server name in the tree.
5. Click a volume under the Volume column.

The File System Info tab opens in a new window.

6. Click the **Explorer** tab.

The following table lists the potential attributes and their meaning:

TABLE 3-1 Attributes

Letter	Detail
R	Read Only
H	Hidden
S	System
D	Directory

TABLE 3-1 Attributes

Letter	Detail
A	Archive
V	Device
N	Normal
T	Temporary
P	Sparse File
J	Reparse Point
C	Compressed
O	Offline
I	Not Content Indexed
E	Encrypted

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