

North America | Europe | Pacific Rim

FILECENSUS

User Manual

Version 4.4

Table of Contents

1. Welcome	6
1.1. About Intermin, Inc.	6
1.2. About FileCensus	6
1.2.1. Software Overview	6
1.2.2. Supported Platforms	6
2. FileCensus Setup & Navigation Overview	7
2.1. Installation (Wizard)	7
2.2. Login	11
2.3. Agent Deployment	15
2.3.1. Agents on Microsoft Windows Operating Systems	17
2.3.2. Agents on NetWare Operating Systems	20
2.3.3. Agents on Microsoft Windows Operating Systems	21
2.4. Agent Interface	22
2.5. Agent Scans	22
2.5.1. Schedule	22
2.5.2. Capture (Ad Hoc Scanning)	23
2.6. FileCensus Console	25
2.6.1. Menu Bar	25
2.6.2. Tabs	36
3. Reporting	63
3.1. Rebuilding Catalogs	63
3.2. Report Input Criteria ("Options")	63
3.2.1. View	64
3.2.2. Settings	69
3.2.3. Layers	69
3.2.4. File Filter	70
3.3. Report Viewers	71
3.3.1. Table	72
3.3.2. Tree Map	72
3.3.3. Pie Chart	72
3.3.4. Bar Chart	73
3.3.5. Time Series	73
3.3.6. About	74
3.4. Reports	74
3.4.1. Browse Reports	74
3.4.2. Forecast Reports	81
3.4.3. Group By Reports	85
3.4.4. Largest Reports	100
3.4.5. Search Reports	113
3.4.6. Security Path Rights Reports	117
3.5. Saving Reports	121
3.5.1. Creating/Running Saved Reports	121
3.5.2. Notifications	122
3.5.3. Documents	123
4. Glossary	124
4.1. Agent	124
4.2. "*.fsi" File	124
4.3. Library	124
4.4. Catalog	124
4.5. Scope	124
4.6. Collection	124
4.7. Container	124

1. Welcome

1.1. About Intermin, Inc.

Established in 1999, Intermin, Inc. is a software company specializing in enterprise-wide storage resource management solutions. Intermin's suite of software products (FileCensus, FileArchive and FileBilling) empower information technology (IT) administrators to effectively manage file growth by visualizing opportunities for space acquisition and effective file movement. The results of these efforts include increased company-wide efficiencies, reduced day-to-day input on the part of data managers and overall cost savings.

Intermin's products are used by Global Fortune 1000 companies with offices in the United States, Europe and Southeast Asia. For more information, please contact Intermin by visiting the company's website (<http://www.intermin.com>), by phone (INSERT COMPANY PHONE # HERE) or by email (support@intermin.com).

1.2. About FileCensus

1.2.1. Software Overview

Intermin's robust suite of products begins with FileCensus, the company's flagship software application. FileCensus allows IT administrators to pinpoint file and data storage space improvement opportunities by systematically collecting, analyzing and reporting metrics on all files contained in an organization's network. As a cross-platform, scalable software application, FileCensus provides an effective way to eliminate file system overloads by showing organizations where their file-related problems exist, the specific types of files that are impairing the system, and how to streamline their file storage, resulting in process efficiencies and cost savings.

FileCensus integrates with Intermin's other products, FileArchive and FileBilling, to enable organizations to move and retrieve files optimally within their storage management system.

1.2.2. Supported Platforms

FileCensus operates on several different platforms including Windows (NT, 95, 98, 2000 and XP), Netware (4.x, 5.x and 6.x) and Linux (Intel and W.I.N.E.):

Platform	Server	Agent
Windows NT4, NT2000, XP	X	X
Windows 95 & 98	X	X
NetWare 4.x, 5.x, 6.x	X	X
Linux (Intel & W.I.N.E.)	X	X
Linux (Intel, OS390, Itanium)		X
Solaris (Sparc)		X
True64 (Alpha)		X
BSD (Intel)		X
HPUX		X

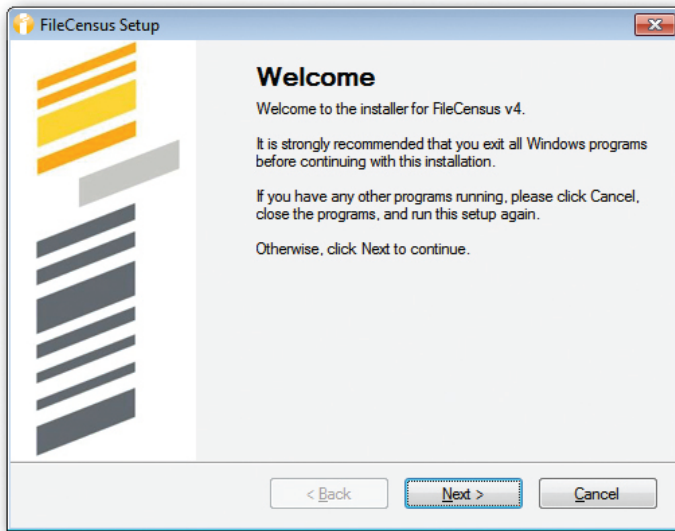
Table 1 - FileCensus Supported Platforms

2. FileCensus Setup & Navigation Overview

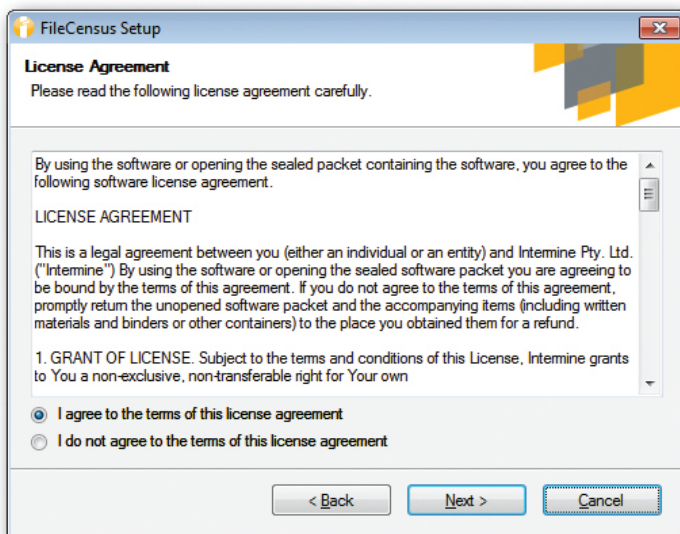
2.1. Installation (Wizard)

The FileCensus setup program file is downloadable from the Intermine website. There are no software- or hardware-related prerequisites for installing and running the software. Here are the installation instructions:

1) After downloading the FileCensus setup program file ("fcsetup.exe"), a Welcome window appears.



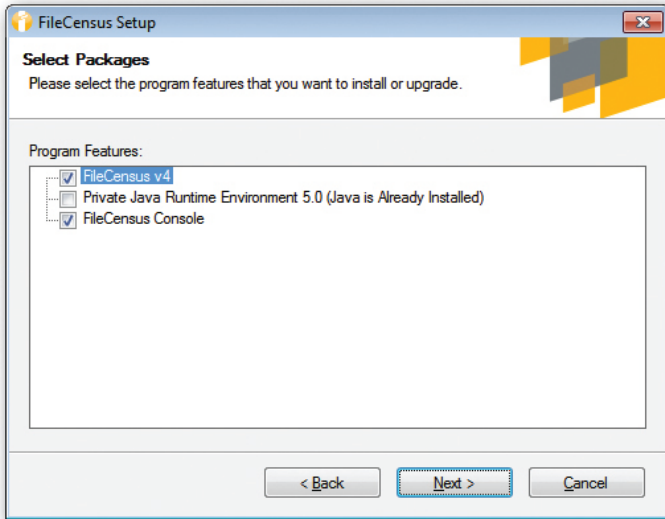
2) To continue the installation process, click the "Next" button. The License Agreement appears. At any time during the installation process, if the "Cancel" button is clicked the installation process is terminated. Note that FileCensus may be partially installed if the "Cancel" button is clicked during the latter stages of the installation process. The "Back" button may also be clicked at any time in order to change previously-selected installation options.



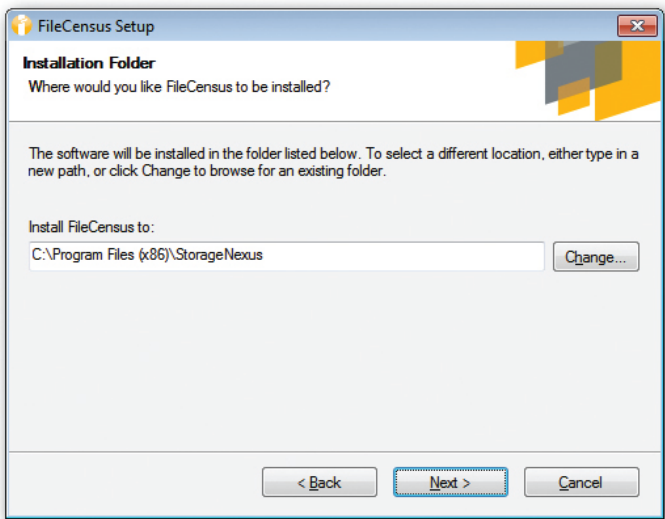
3) To continue the installation process, select the "I agree to the terms of this license agreement" radio button and click the "Next" button.

4) The next window presents a list of FileCensus features to install (it is recommended to select all three applications and click the “Next” button):

- a. FileCensus (Server) V4 is server-hosted, so an organization does not need to install a copy of FileCensus on every user’s machine.
- b. JRE is the Java Runtime Environment that supports FileCensus operations.
- c. Console allows users to access FileCensus from the Windows Start menu, for example.

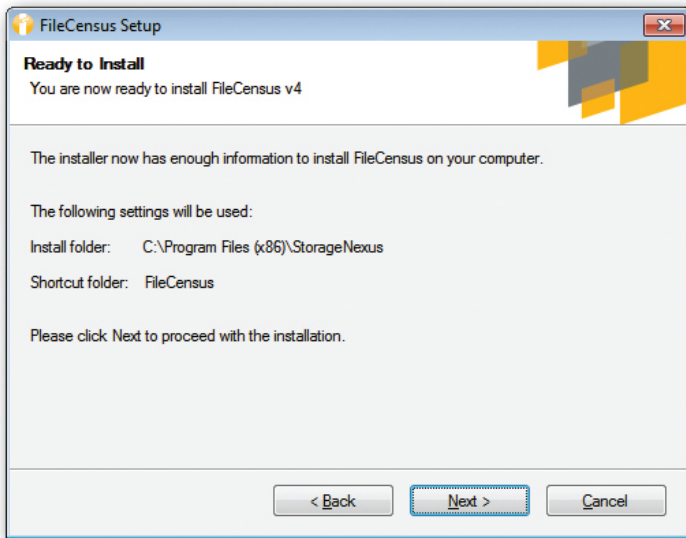


5) Although FileCensus can be installed on any server drive with ample free space, it is normally installed in a newly-created “StorageNexus” file folder under Program Files on the server (although theoretically any server location can be chosen for the installation). “StorageNexus” is a reference to the Intermin platform architecture for File Census, FileArchive and FileBilling (only one copy of the server is required even if all products are purchased).

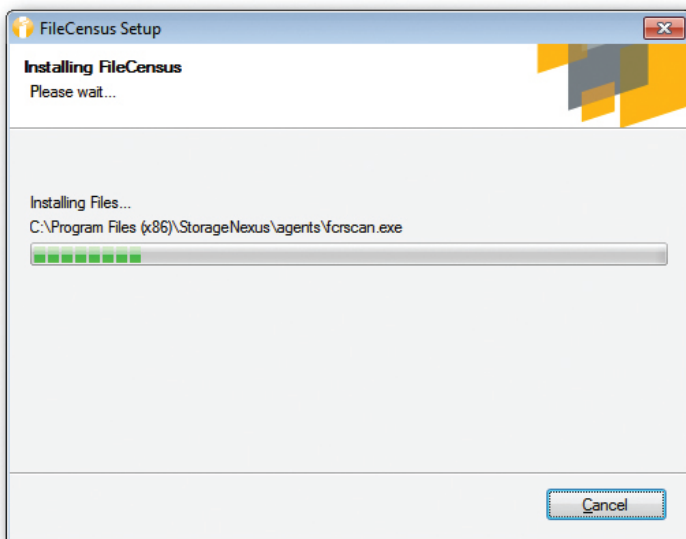


6) Click the “Next” button to continue the installation. The installation program now has enough information to begin the actual installation on the server. The next window is a summary of the installation selections.

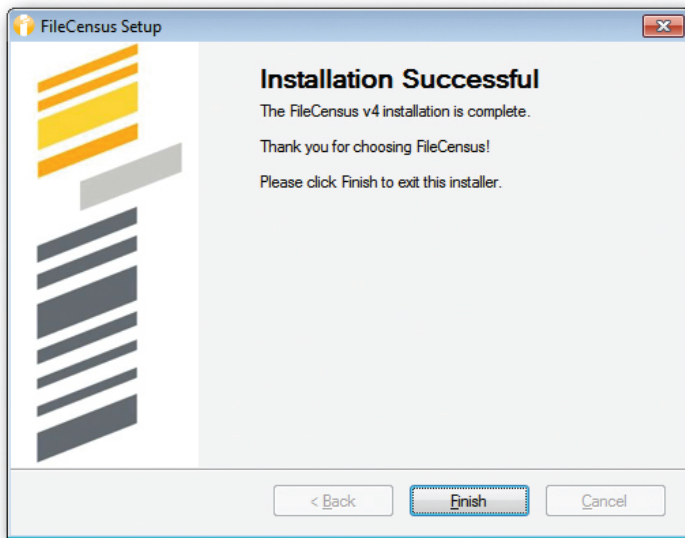
7) Click the "Next" button to install FileCensus.



8) The installation progress bar is now displayed:



9) When the installation successfully completes, click the “Finish” button to close the setup window.

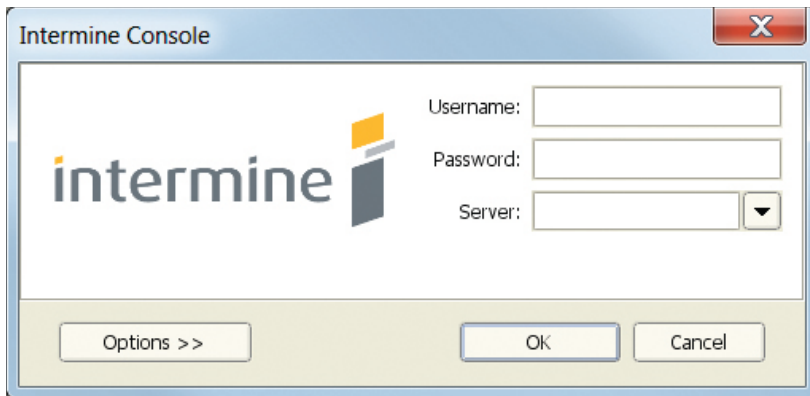


Users CANNOT log in immediately after FileCensus is installed on the server. To log in, the license file must be moved to C:\Program Files\StorageNexus (it is presumed that the user has already contacted Interminc to obtain the license file).

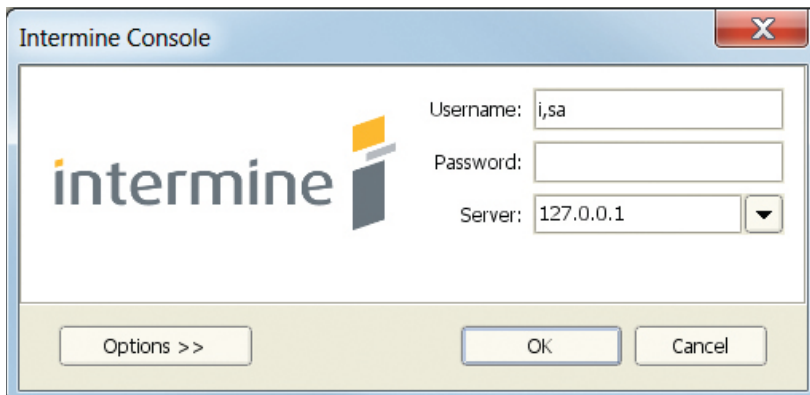
2.2. Login

FileCensus is accessed or from the Start menu. Here are the login instructions:

1) Click Start, Program Files, FileCensus and FileCensus Console to open the application. The Login screen appears. All fields will be blank for first-time users. Otherwise, the fields are pre-populated with user information if the software has previously been operated. For first-time users:

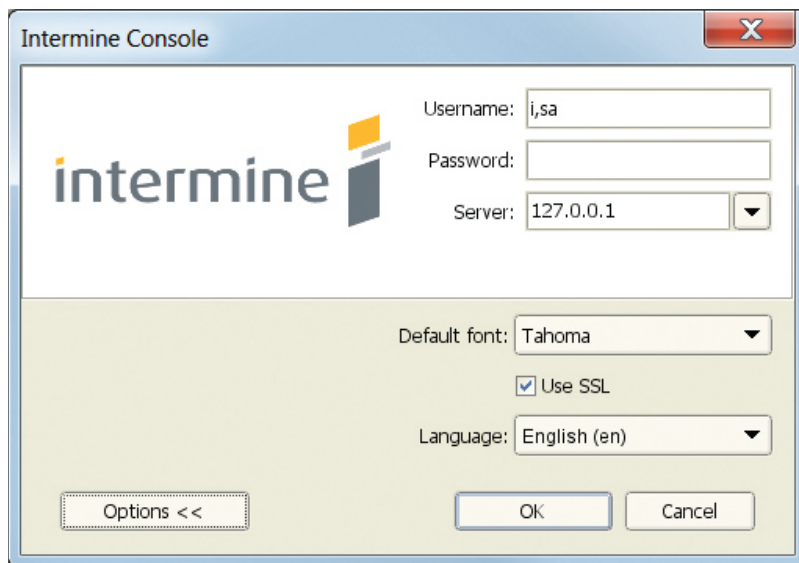


2) To log in, enter "i,sa" (the "i" refers to the internal authentication system within FileCensus and "sa" is the system administrator account) into the User Name field. Leave the Password and Server fields blank (a Password will be set up later; leaving the Server field blank is the equivalent of typing "localhost," which is fine since in this example the user is logging in to FileCensus from the host server itself; otherwise, the server's IP address would be entered here if logging in from another workstation).

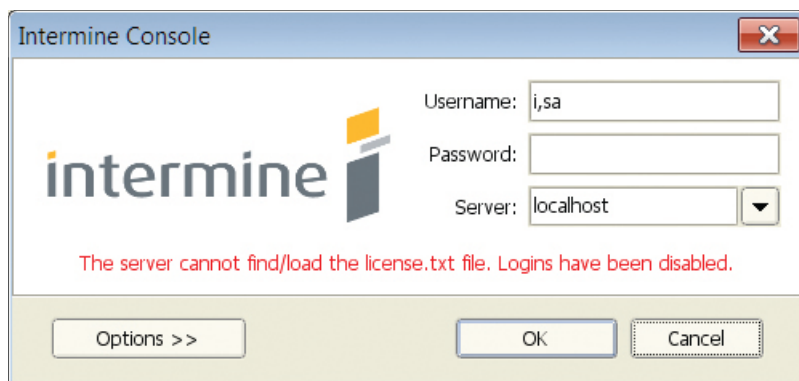


3) When logging into FileCensus, there are a few options that can be changed. Click on the “Options” button to view and/or alter these options:

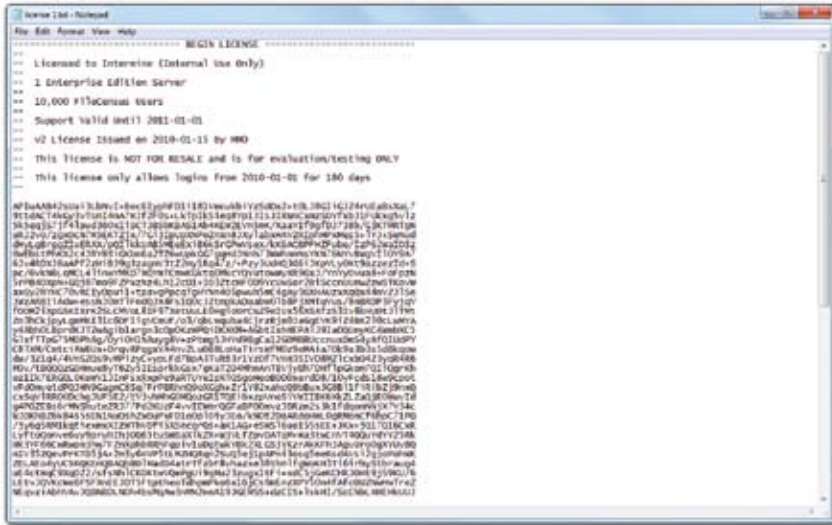
- a. The default Font is Tahoma and can be changed if desired at this time.
- b. The Use SSL option controls encryption between the server and the FileCensus Console. It is **HIGHLY RECOMMENDED** to leave it configured “on.” Aside from the associated security risks, turning this option “off” also requires server reconfiguration, which is covered in separate instructions.
- c. A Language field allows the user to specify language preferences.
- d. Click OK to confirm the chosen user preferences and enter FileCensus.



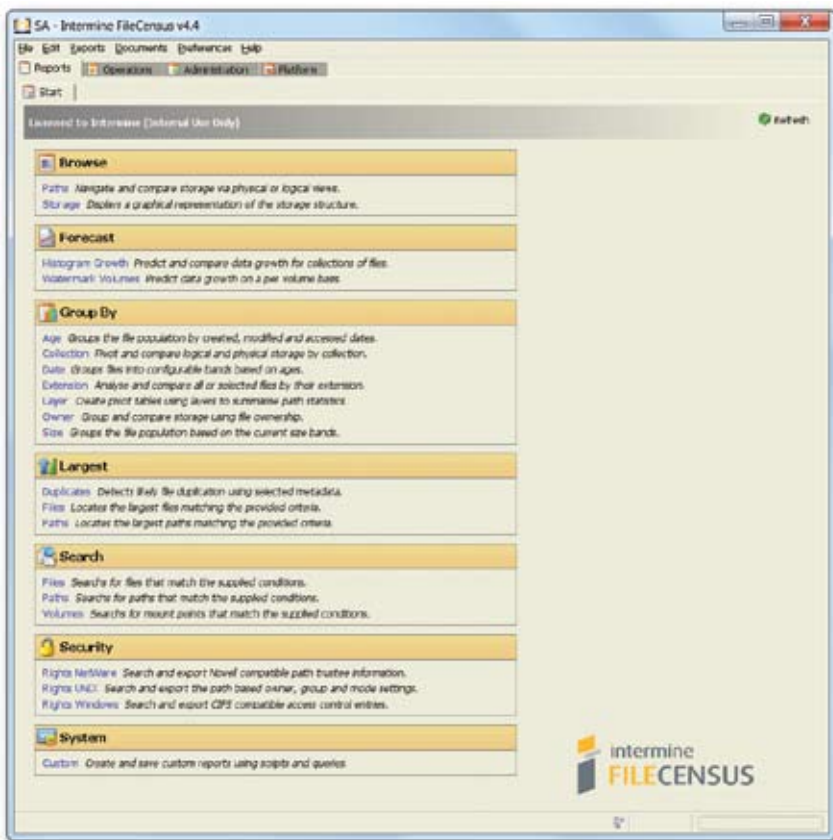
4) An error may occur if the FileCensus license file is missing from the installation. The license file is called “license.txt” and must be located in FileCensus’ install directory. The default paths are:
Windows (64 bit): “C:\Program Files (x86)\StorageNexus”
Windows (32 bit): “C:\Program Files\StorageNexus”



- a. If so, the user is prompted by the following window to install the license, which is a text file (“license.txt”) located where it has been previously saved. The license file looks like this (the file itself contains summary information and the license):



- b. Copy and paste the license file from the location where it was previously saved to the server's StorageNexus directory file previously created.
- c. Although the server does NOT need to be restarted, the FileCensus Console needs to be logged into again. Of note, the server checks for the license file once every seven (7) seconds, so the user may need to wait briefly before attempting to log in again.
- 5) Once logged in (as an administrator in this case), FileCensus displays its Console Start Page.



The FileCensus product name and the account name appear in the title bar of the Console window and several tabs (some of which only appear for administrators) and links appear.

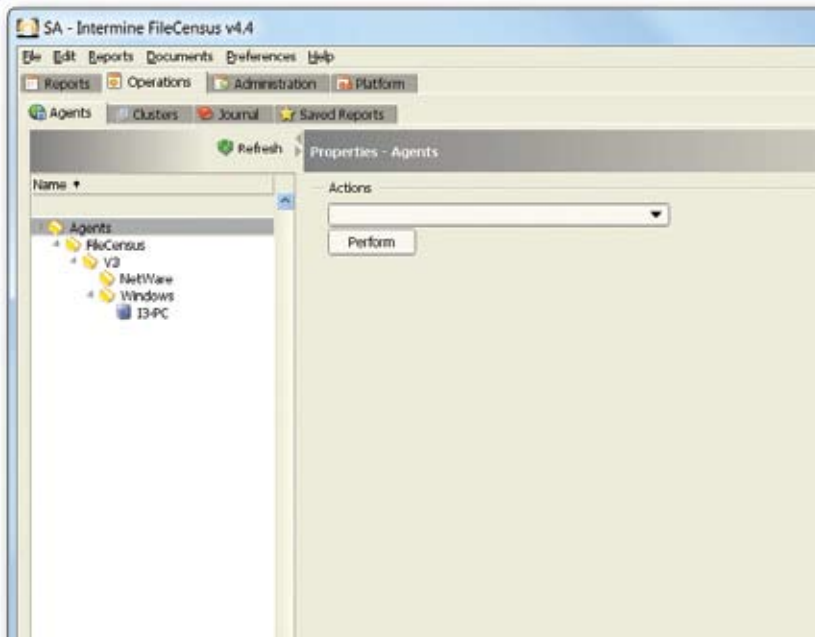
The next step is to deploy the Agents, or the services that actually perform the storage information collection. If the user attempts to run a Report before deploying the Agents, then an error will appear indicating the absence of any report data.

FileCensus uses Agents to scan an organization's servers, analyze their files and associated file-level metadata and report all findings. Agents must first be deployed before they can function.

2.3. Agent Deployment

Once the FileCensus server is running, it is ready to receive data from Agents. The first step with Agents is to deploy them. To deploy the Agents:

- 1) Click on the Operations tab in the Console.



- 2) The Agents tab provides information about the network servers that have Agents deployed to them. The screen is divided into two sections:
 - a. On the left side is a treeview listing each server to which an Agent has been deployed. These servers are organized into Containers (more on Containers later in this manual) based on the type of Agent deployed to them.
 - b. On the right side, every Container and server can have a short description assigned to it. In addition, the following information is provided for each server:
 - i. Time at which the deployed Agent was last started
 - ii. Version of the deployed Agent
 - iii. Communication status ("Up" or "Down") of the deployed Agent
 - iv. Total size and current free space available for each volume on the server (note that this is a second tab on the right hand side of the screen and the user must click "Run" to see this information)

- 3) Select “Deploy Agents to Windows” from the right-hand dropdown menu.
- 4) Click the “Perform” button to begin the deployment.



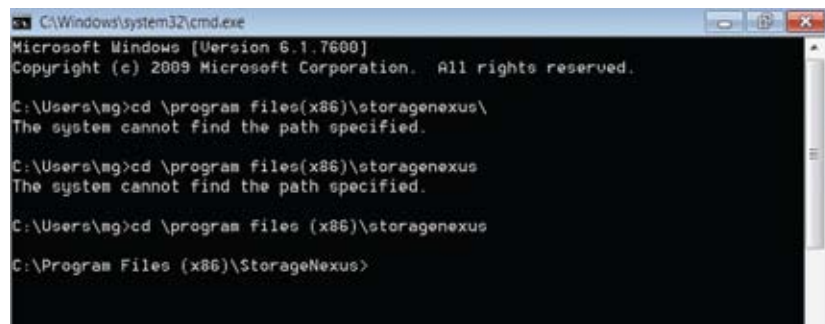
5) FileCensus deploys Agents automatically in some cases, or an administrator deploys them manually in other cases. Success with the automated method depends on the extent to which an organization’s network server domain environment is properly configured. Many organizations’ Production environments meet or exceed FileCensus’ configuration requirements. If so, after clicking Perform, a list of domains appears. The user is prompted to select a domain and from there, a complete list of computers within that domain is presented.

6) Choose the desired computer(s) and click Deploy. The Agents are then automatically deployed to all selected computers.

7) Alternatively, when the user clicks the Perform button in an attempt to automatically deploy Agents, FileCensus may not return the list of domains. If it does, then it still may not correctly return all computers within that domain. This is when manual Agent deployment is required.

8) Manually deploying FileCensus Agents is an administrative function. Open a command (DOS) window from the Start menu.

9) On the server’s hard drive, under Program Files, then StorageNexus, open the “agents” directory.



There are different types of Agents for different types of server operating systems:

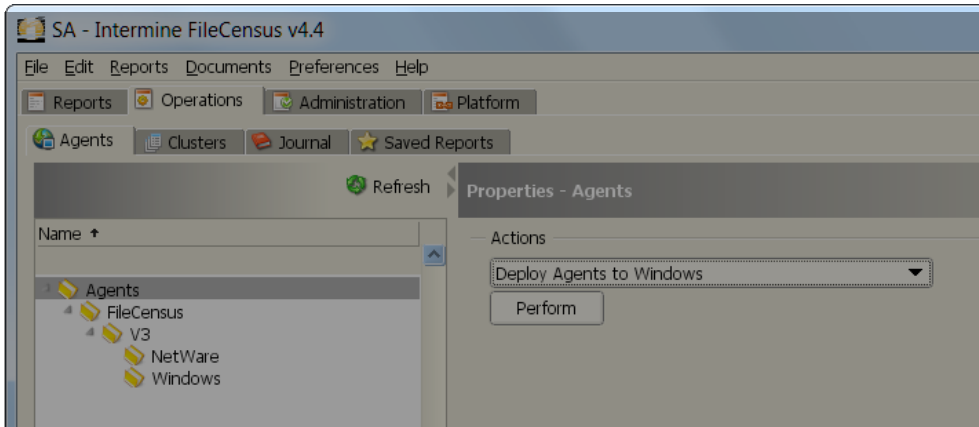
- 1) “fcagent.exe” is the Agent for Windows
- 2) “fcagent.nlm” is the Agent for Netware
- 3) “fcagent.pl” is the (Perl) Agent for UNIX systems

These Agents are present in the agents directory along with “fcrscan.exe,” which is a remote graphical scanner. The manual deployment of each Agent type is explained in the following sub-sections.

2.3.1. Agents on Microsoft Windows Operating Systems

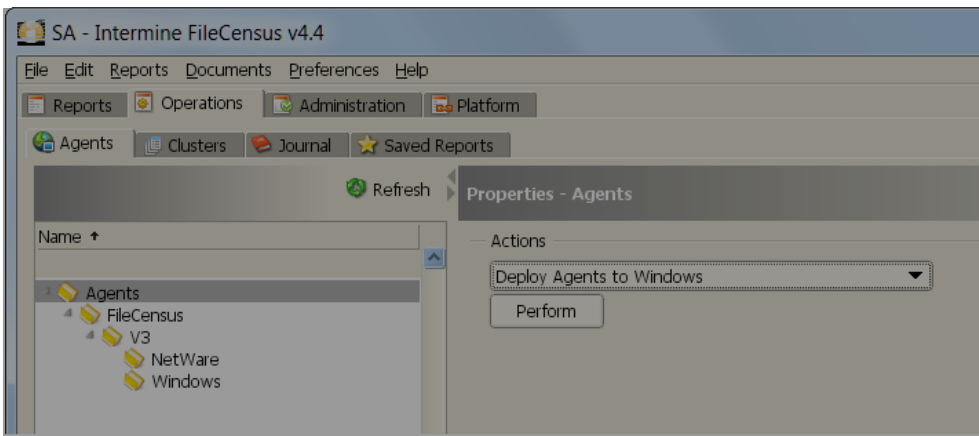
To manually deploy an Agent on a Microsoft Windows server operating system:

1) When manually setting up an Agent, the first step is to copy it from the Agents directory to a new location. Create a new directory named "FileCensus" under Program Files.



[Chapter 5_Screenshot_B: Command prompt – Zoom on "\Program Files\FileCensus"]

2) Copy the "fcagent.exe" file from the \Program Files\StorageNexus\Agents directory to \Program Files\FileCensus.



[Chapter 5_Screenshot_C: Zoom on Copy fcagent.exe]

3) Open the FileCensus directory.

```
C:\Windows\system32\cmd.exe
30-Jan-10 05:09 PM <DIR> Skype
01-Feb-10 10:45 AM <DIR> StorageNexus
28-Jan-10 08:32 AM <DIR> TechSmith
14-Jul-09 03:37 PM <DIR> Windows Defender
14-Jul-09 03:37 PM <DIR> Windows Mail
30-Jan-10 10:24 AM <DIR> Windows Media Player
14-Jul-09 03:32 PM <DIR> Windows NT
14-Jul-09 03:37 PM <DIR> Windows Photo Viewer
14-Jul-09 03:32 PM <DIR> Windows Portable Devices
30-Jan-10 10:24 AM <DIR> Windows Sidebar
0 File(s) 0 bytes
30 Dir(s) 218,048,794,624 bytes free

C:\Program Files (x86)>cd FileCensus
C:\Program Files (x86)\FileCensus>dir
Volume in drive C has no label.
Volume Serial Number is 06D7-A12F

Directory of C:\Program Files (x86)\FileCensus
30-Jan-10 04:17 PM <DIR> .
30-Jan-10 04:17 PM <DIR> ..
31-Jan-10 03:01 PM 28 fcagent.cfg
18-Sep-09 04:54 PM 391,168 fcagent.exe
2 File(s) 391,196 bytes
2 Dir(s) 218,048,794,624 bytes free

C:\Program Files (x86)\FileCensus>
```

4) View the Command Line Options available for "fcagent.exe."

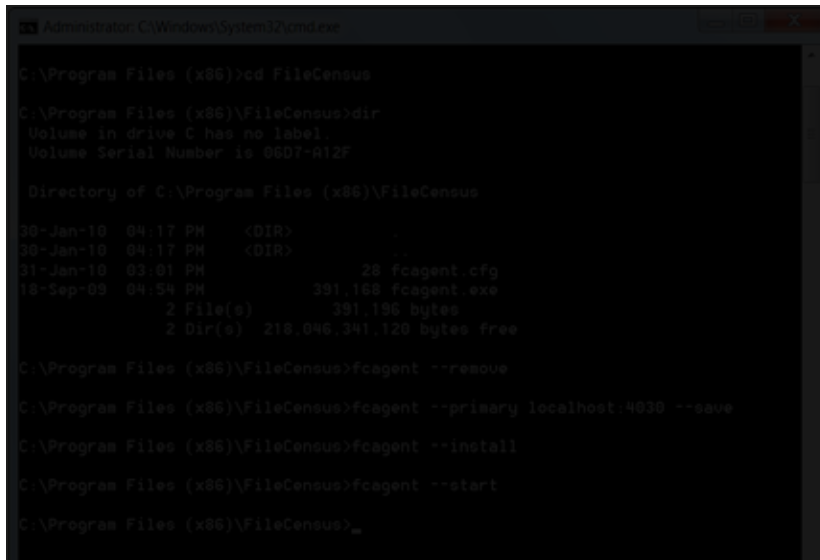
```
Administrator: C:\Windows\System32\cmd.exe
C:\Program Files (x86)>cd FileCensus
C:\Program Files (x86)\FileCensus>dir
Volume in drive C has no label.
Volume Serial Number is 06D7-A12F

Directory of C:\Program Files (x86)\FileCensus
30-Jan-10 04:17 PM <DIR> .
30-Jan-10 04:17 PM <DIR> ..
31-Jan-10 03:01 PM 28 fcagent.cfg
18-Sep-09 04:54 PM 391,168 fcagent.exe
2 File(s) 391,196 bytes
2 Dir(s) 218,046,341,120 bytes free

C:\Program Files (x86)\FileCensus>fcagent --remove
C:\Program Files (x86)\FileCensus>fcagent --primary localhost:4030 --save
C:\Program Files (x86)\FileCensus>fcagent --install
C:\Program Files (x86)\FileCensus>fcagent --start
C:\Program Files (x86)\FileCensus>
```

5) Primary server is the address where the FileCensus server is installed. Knowing this is helpful because typically the Agents run on a machine on the network and then a separate copy is on the server, and the copies need this address information for communication purposes. To enable this communication, a configuration file needs to be created. Click OK on the Command Line Options window to close it.

6) Type “fcagent.exe -p localhost:4030 --save” at the command line.



```
C:\Program Files (x86)>cd FileCensus
C:\Program Files (x86)\FileCensus>dir
Volume in drive C has no label
Volume Serial Number is 0607-012F

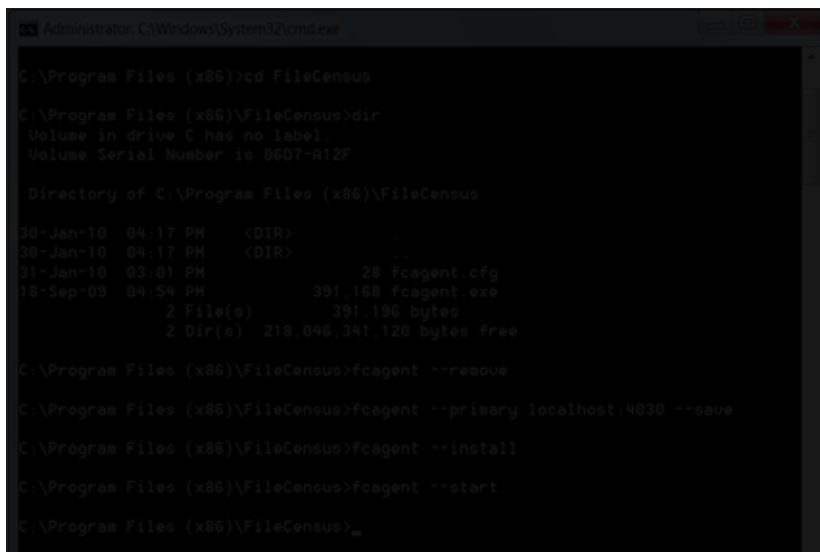
Directory of C:\Program Files (x86)\FileCensus
20-Jan-10  04:17 PM    <DIR>
20-Jan-10  04:17 PM    <DIR>
31-Jan-10  03:01 PM                28 fcagent.cfg
18-Sep-09  04:54 PM            391,168 fcagent.exe
                2 File(s)            391,196 bytes
                2 Dir(s)  218,046,341,120 bytes free

C:\Program Files (x86)\FileCensus>fcagent --remove
C:\Program Files (x86)\FileCensus>fcagent --primary localhost:4030 --save
C:\Program Files (x86)\FileCensus>fcagent --install
C:\Program Files (x86)\FileCensus>fcagent --start
C:\Program Files (x86)\FileCensus>
```

[Chapter 5_Screenshot_O: Zoom command line - FileCensus]

7) Type “dir” at the command line. Note that a file named “fcagent.cfg” now exists in the FileCensus directory on the server. This is the Agent configuration file.

8) Type “type fcagent.cfg” at the command line. The name of the server (“primary”) and the communication socket for the FileCensus Agents (localhost:4030) appear on a single line.



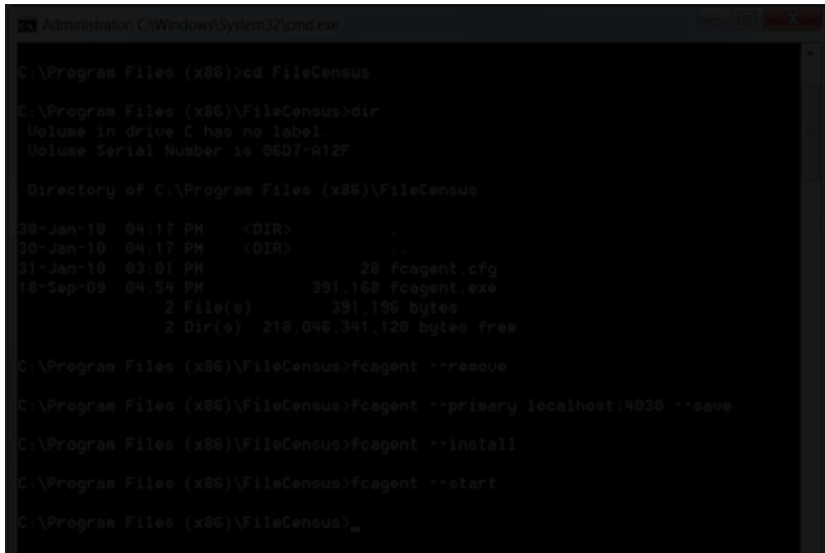
```
C:\Program Files (x86)>cd FileCensus
C:\Program Files (x86)\FileCensus>dir
Volume in drive C has no label
Volume Serial Number is 0607-012F

Directory of C:\Program Files (x86)\FileCensus
20-Jan-10  04:17 PM    <DIR>
20-Jan-10  04:17 PM    <DIR>
31-Jan-10  03:01 PM                28 fcagent.cfg
18-Sep-09  04:54 PM            391,168 fcagent.exe
                2 File(s)            391,196 bytes
                2 Dir(s)  218,046,341,120 bytes free

C:\Program Files (x86)\FileCensus>fcagent --remove
C:\Program Files (x86)\FileCensus>fcagent --primary localhost:4030 --save
C:\Program Files (x86)\FileCensus>fcagent --install
C:\Program Files (x86)\FileCensus>fcagent --start
C:\Program Files (x86)\FileCensus>
```

[Chapter 5_Screenshot_P: Zoom- fcagent.cfg config file]

9) Type “fcagent.exe --install --start” at the command line. This command installs and starts the Agents as services on the current machine. The Agents are now communicating with the server.



```
C:\Program Files (x86)\FileCensus>cd FileCensus
C:\Program Files (x86)\FileCensus>dir
Volume in drive C has no label
Volume Serial Number is 0607-012F

Directory of C:\Program Files (x86)\FileCensus

30-Jan-10  04:17 PM    <DIR>
30-Jan-10  04:17 PM    <DIR>
31-Jan-10  03:01 PM                28 fcagent.cfg
18-Sep-09  04:54 PM            391,168 fcagent.exe
                2 File(s)          391,196 bytes
                2 Dir(s)  218,046,341,120 bytes free

C:\Program Files (x86)\FileCensus>fcagent --remove
C:\Program Files (x86)\FileCensus>fcagent --primary localhost:4030 --save
C:\Program Files (x86)\FileCensus>fcagent --install
C:\Program Files (x86)\FileCensus>fcagent --start
C:\Program Files (x86)\FileCensus>
```

[Chapter 5_Screenshot_Q: Zoom-fcagent.cfg install]

2.3.2 Agents on NetWare Operating Systems

To manually deploy an Agent on a NetWare server operating system:

- 1) Copy the “fcagent.nlm” file to the required server (if a suitable “fcagent.cfg” file has been created, it can also be copied and no other configuration is necessary).
- 2) Edit the “autoexec.ncf” file to load the Agent.

Of note, NetWare servers can also be scanned using Microsoft Windows Agents (“fcagent.exe”). The “--scan” command line option can be used to initiate the scan. For example, to scan both the SYS and DATA volumes on a NetWare server, the user would run the following command:

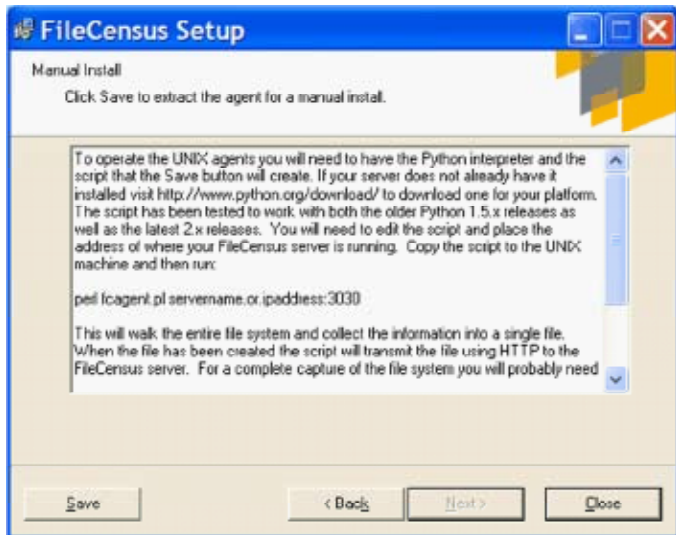
```
Fcagent --scan \\[SERVER NAME]\SYS;\\[SERVER NAME]\DATA
```

This process can be very slow (due to latency) and may take several hours to complete if the server is large or is accessed across a slow network connection.

2.3.3. Agents on Microsoft Windows Operating Systems

To manually deploy an Agent on a UNIX server operating system:

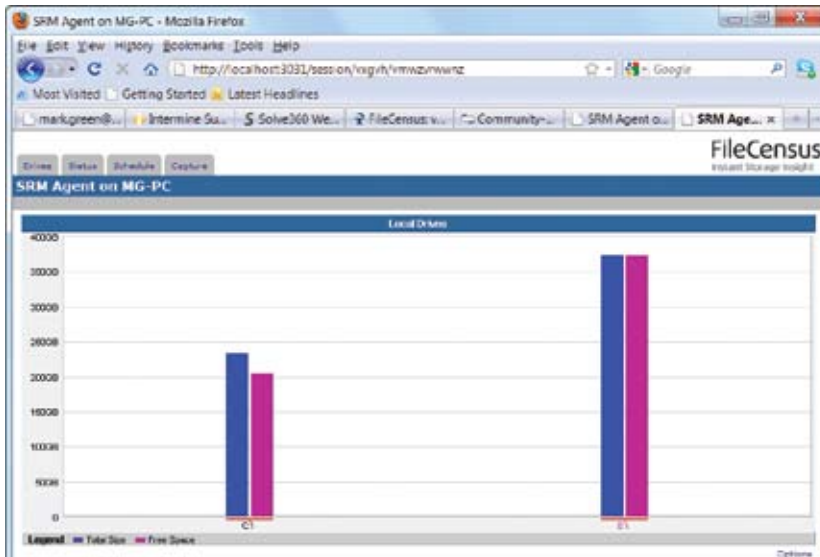
- 1) Ensure the Perl interpreter is operational in your UNIX environment.
- 2) Click the Save button on the UNIX installation window. A FileCensus script called "fcagent.pl" is created.



- 3) If the Perl version on the UNIX server needs to be upgraded, then visit <http://www.perl.org> to download the most recent version.
 - 4) Edit the FileCensus Perl script and enter the IP address and port number of where the FileCensus server is running.
 - 5) Once the script has been changed, copy the script to the UNIX server and then run the following:
perl fcagent.pl
 - 6) This command scans the entire file system and collects information into a single file.
 - 7) When the file has been created the script will transmit the file using HTTP to the FileCensus server.
 - 8) For a complete capture of the file system, run the script as root.
 - 9) To automate this process, use the crontab scheduling system or an equivalent scheduling tool.
- Of note, Japanese Perl versions must be version 5.8.0 or greater due to the encoding requirements.

2.4. Agent Interface

Type `http://localhost:3031` in the URL address field of the browser window and press Enter. The web interface for the Agents appears.



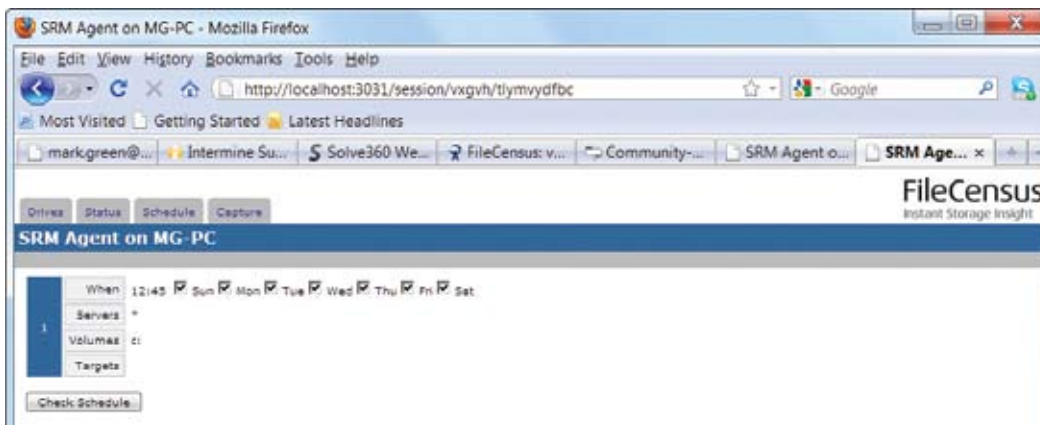
Every drive on the server is shown, and for each, a measurement (in gigabytes) of the total amount of disk space and the total amount of free space, respectively.

2.5. Agent Scans

Once they are deployed, configured and running on the server, Agents begin scanning the server. The very first Agent scan on a given server will take longer than subsequent scans because the Agent has never “seen” the drives and files on the specific server upon which it has just been installed.

2.5.1. Schedule

Click on the Schedule tab of the Agent interface (the tabs are located at the top of the screen).

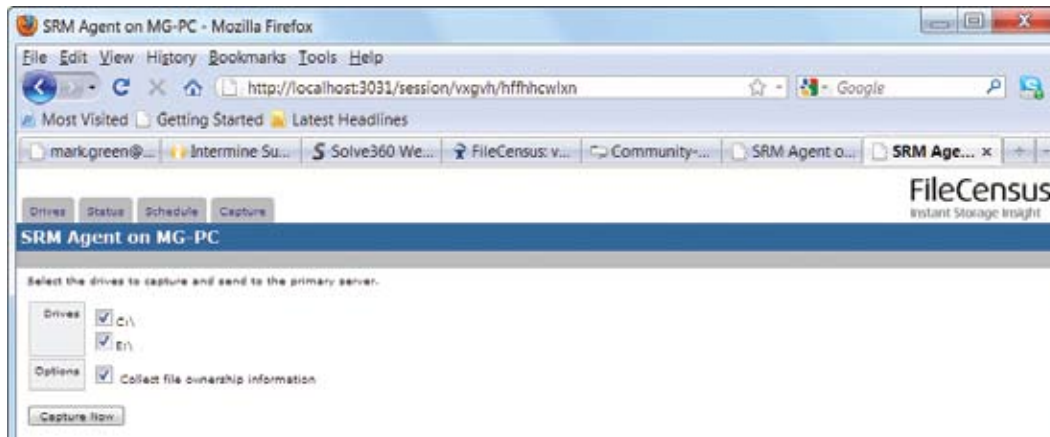


The Schedule tab shows the time of day and days of the week that specific volumes and drives on the server are scheduled to be scanned by the Agent. By default, the Agent scan is set to run at 2am (server time) every day of the week.

2.5.2. Capture (Ad Hoc Scanning)

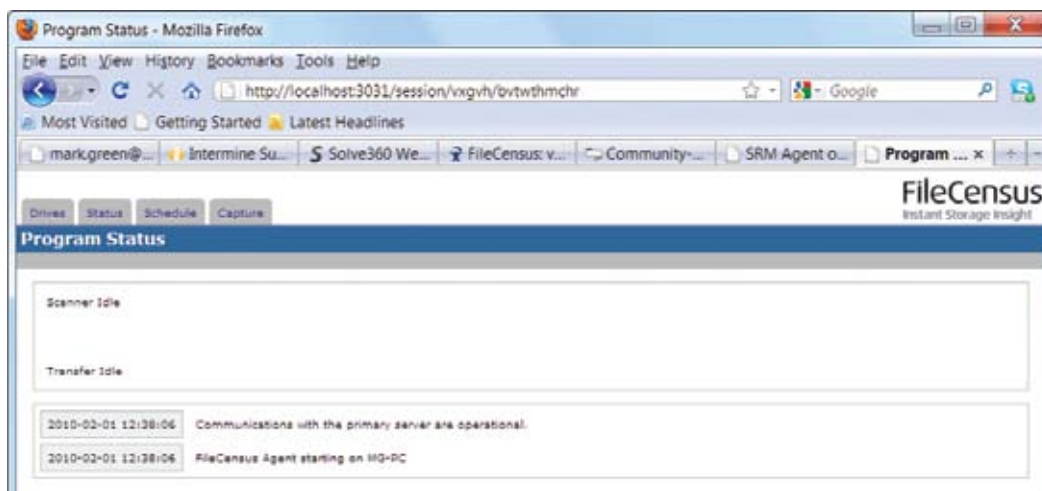
In addition to the schedule, scans can be started manually on an ad hoc basis when needed. Here is how to start Agent scans manually:

- 1) Click on the Capture tab of the Agent interface.



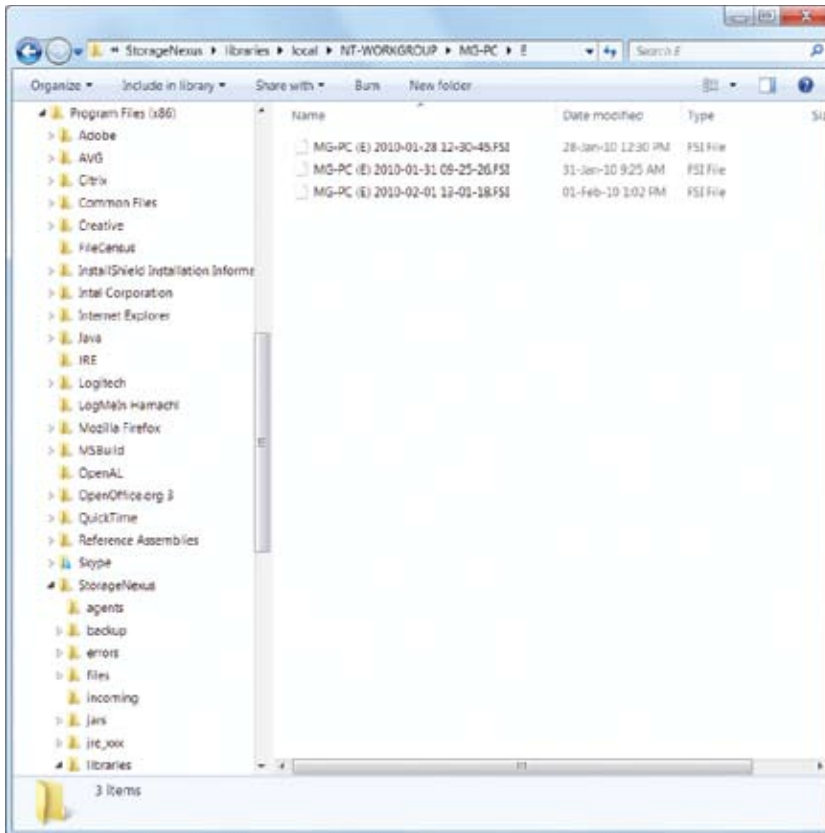
- 2) The Capture tab allows the user to select and scan one or more available drives on the server. Choose the drive(s) to scan and click the "Capture Now" button (there is an option for the Agent to "Collect file ownership information" when performing the scan, if desired).]

- 3) Click on the Status tab once the scan is running.

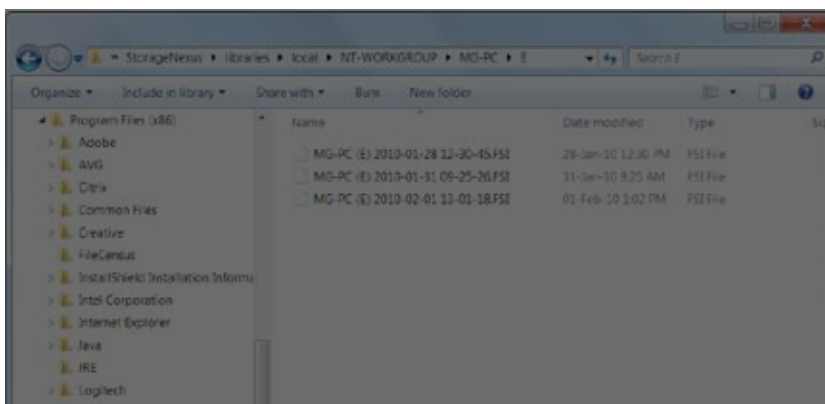


- 4) The Program Status tab displays the current scan's progress in terms of:
 - a. Drive and file path/directory being scanned at the moment
 - b. Total number of paths, files and users scanned thus far
 - c. Date/time series of events

As the Agent scans the drive, it builds an “.fsi” file (or an image) associated with the scan.



FileCensus writes this file temporarily to the directory upon which the Agent is installed, and then transfers it over to the server being scanned.



Note the specific location of the .fsi file on the server (StorageNexus > libraries > local > (DOMAIN) > (MACHINE) > (DRIVE)). The structure of these directories can be modified in the Administration tab (Library sub-tab).

2.6. FileCensus Console

The FileCensus Console user interface has a menu bar and tabs that enable the user to perform all functions.

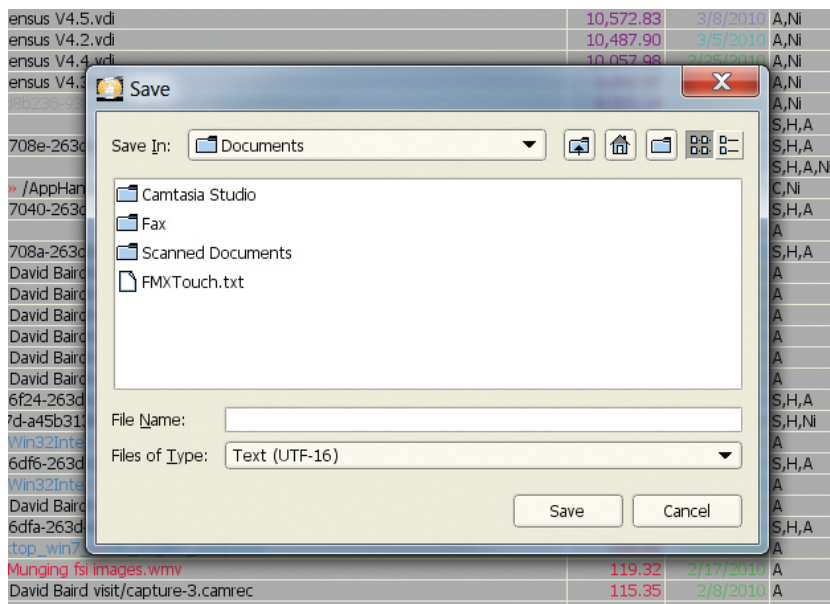
2.6.1. Menu Bar

2.6.1.1. File

Click on "File" in the menu bar.

2.6.1.1.1. Save As

"Save As" allows the user to save report data currently visible on the screen as a file with a specific filename and to a specific location. Some screen views are not designed to be saved as a file. If this is the case, then the "Save As" File menu option is disabled.



2.6.1.1.2. Logout

"Logout" ends the current FileCensus server session and returns the user to the Login screen.

2.6.1.1.3. Exit

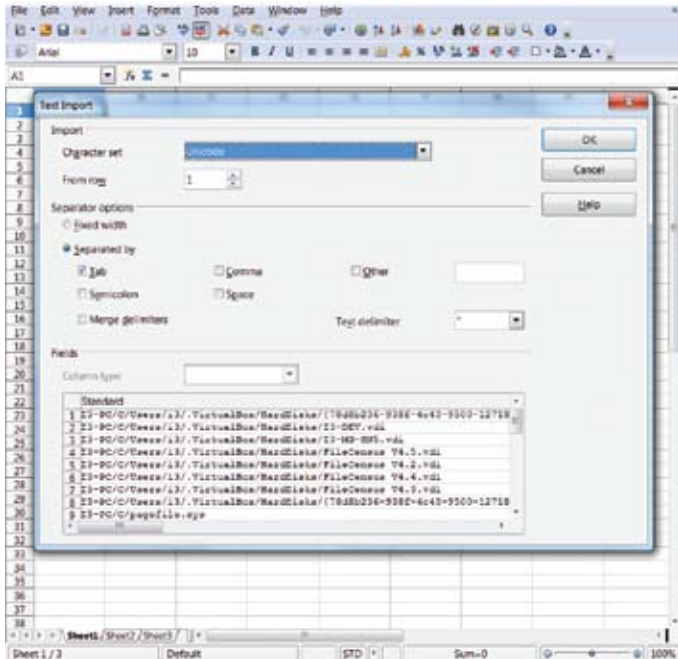
"Exit" closes the FileCensus application.

2.6.1.2. Edit

Click on "Edit" in the menu bar.

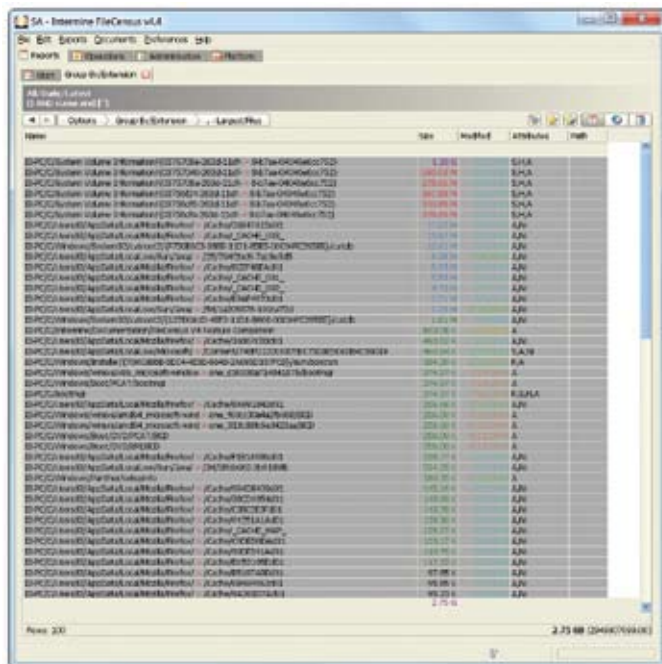
2.6.1.2.1 Copy

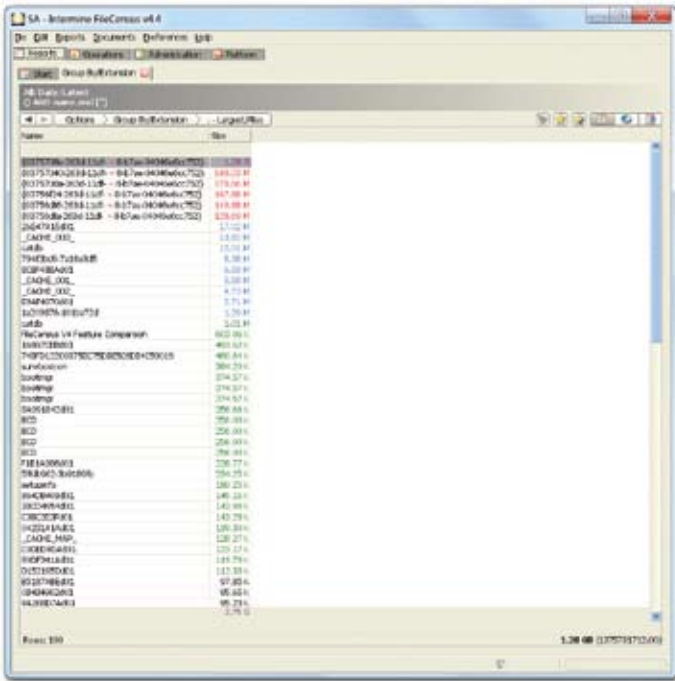
“Copy” copies the selected row(s) in a table displayed on the screen. If a table is not currently being displayed on the screen, then the “Copy” Edit menu option is disabled. The copied rows can then be pasted into a spreadsheet file. The column delimiter is a “Tab” character.



2.6.1.2.2. Table Columns

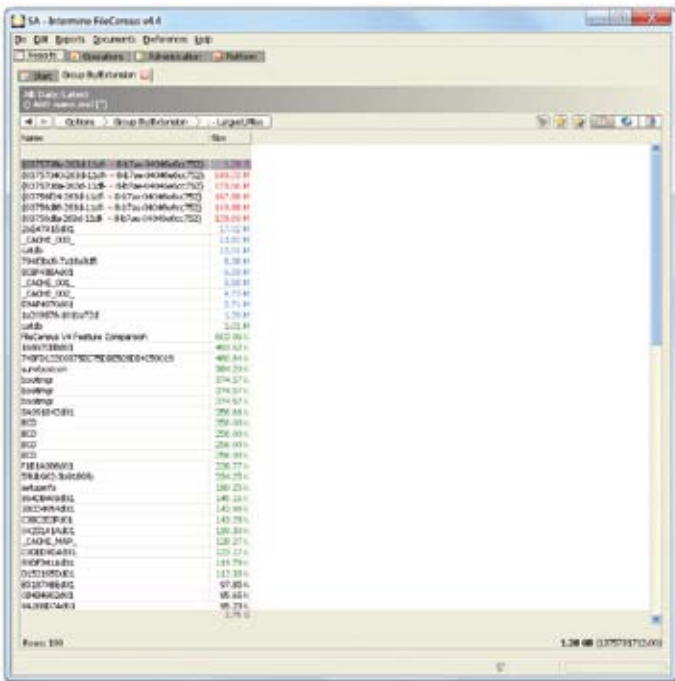
“Table Columns” allows the user to change a table’s column configuration, notably the order in which the columns appear from left to right and whether a specific column is visible or hidden. If a table is not currently being displayed on the screen, then the “Table Columns” Edit menu option is disabled.





2.6.1.2.3. Revert to Defaults

“Revert to Defaults” undoes any table configuration changes that the user has previously made. The table is then once again displayed onscreen based on the default settings. If a table is not currently being displayed on the screen, then the “Revert to Defaults” Edit menu option is disabled.

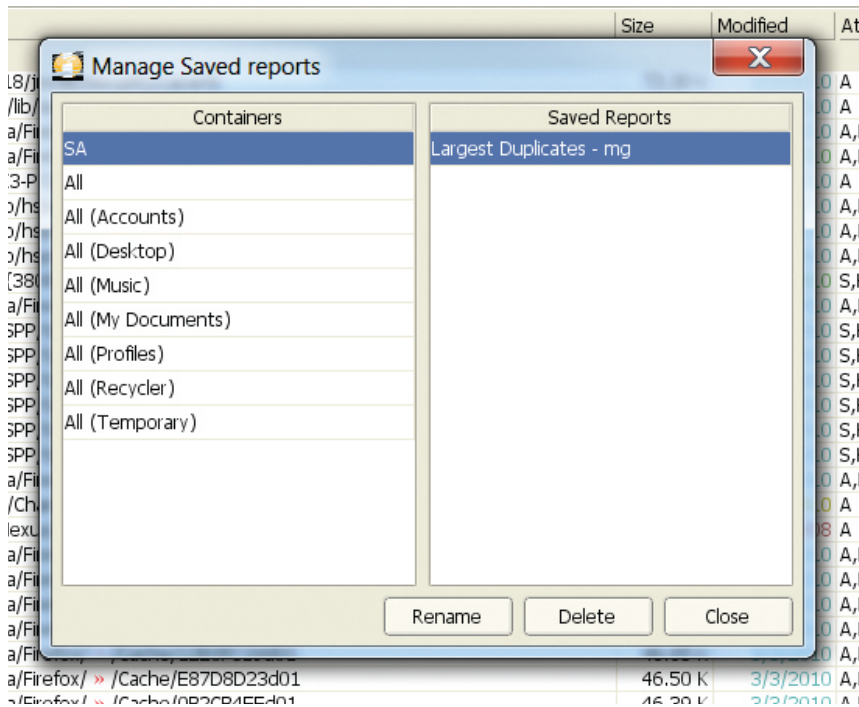


2.6.1.3. Reports

Click on “Reports” in the menu bar.

2.6.1.3.1. Manage

“Manage” opens the “Manage Saved Reports” dialogue window. This window allows the user to rename or delete any personal saved reports, as well as access any shared saved reports to which the user is authorized.



2.6.1.3.2. Launching Saved Reports

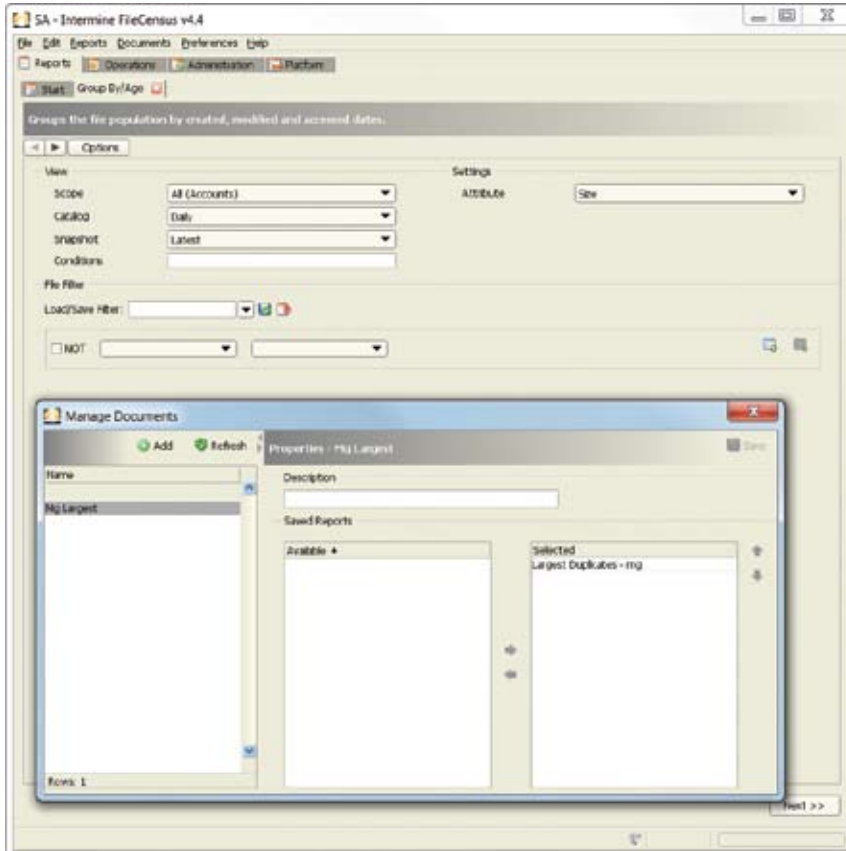
“Launching Saved Reports” provides the user with menu-based access to all authorized personal and shared saved reports. The shared saved reports are grouped by Scope in the menu. Click on a saved report’s name to launch the report, noting that no options need to be entered, as they have been previously saved.

2.6.1.4. Documents

Click on “Documents” in the menu bar.

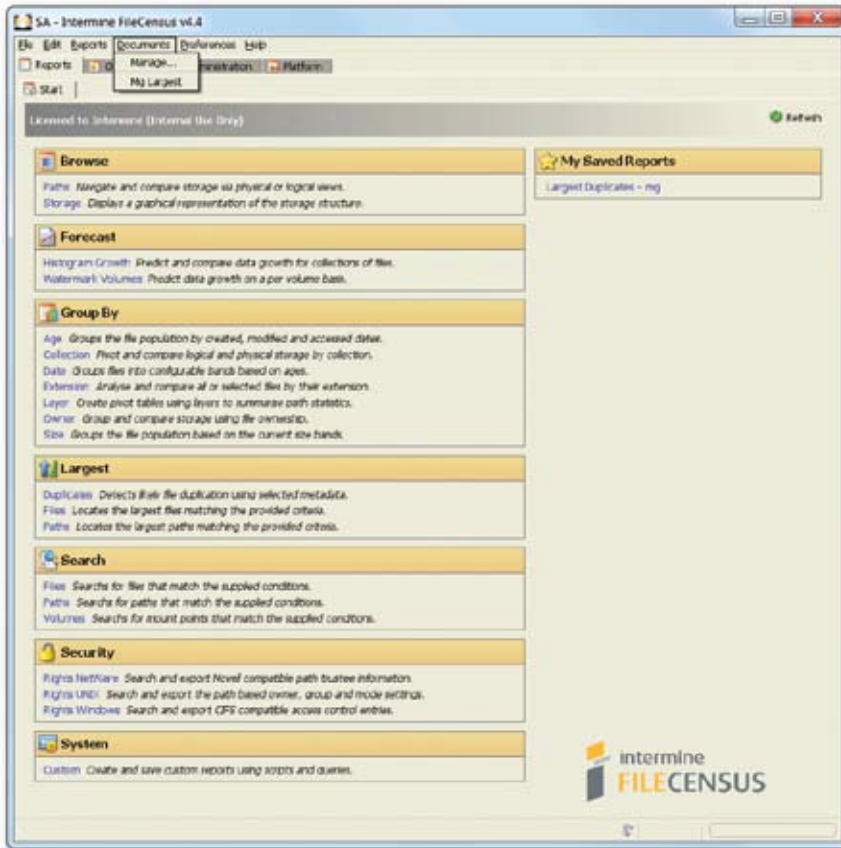
2.6.1.4.1. Manage

“Manage” opens the “Manage Documents” dialogue window. This window allows the user to create, rename or delete documents associated with saved reports. It also permits the user to edit a document’s description and the source saved reports. The saved documents appear as menu items under the top level menu item “Documents.”



2.6.1.4.2. Viewing Documents

“Viewing Documents” provides the user with menu-based access to all authorized report-based documents. From the Documents menu, click on a document’s name to view it.

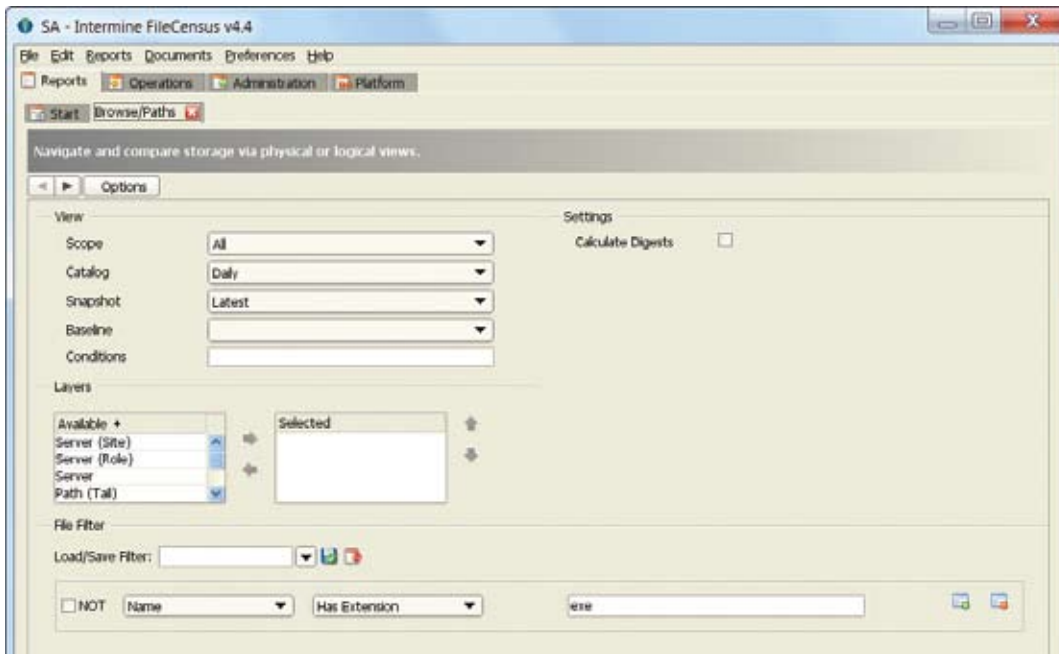
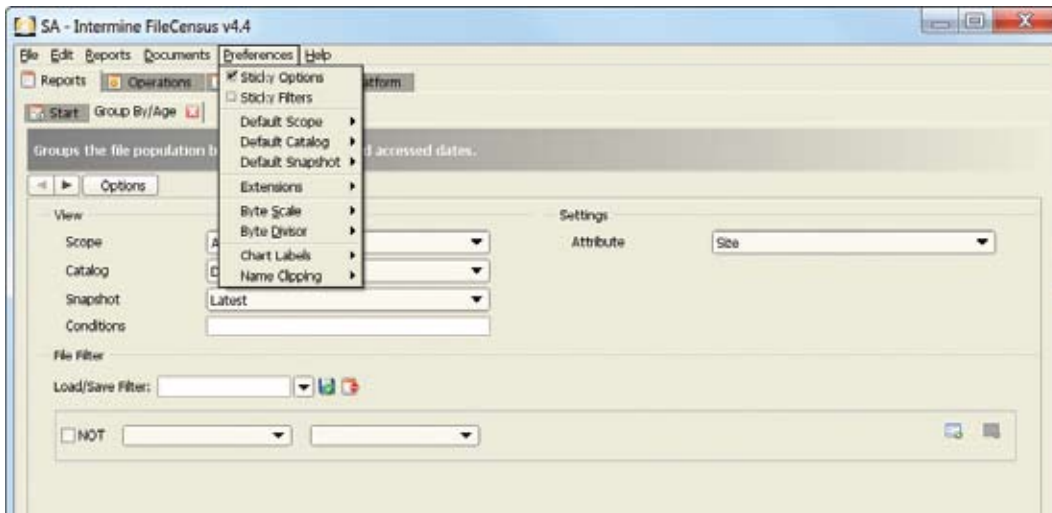


2.6.1.5. Preferences

Click on “Preferences” in the menu bar.

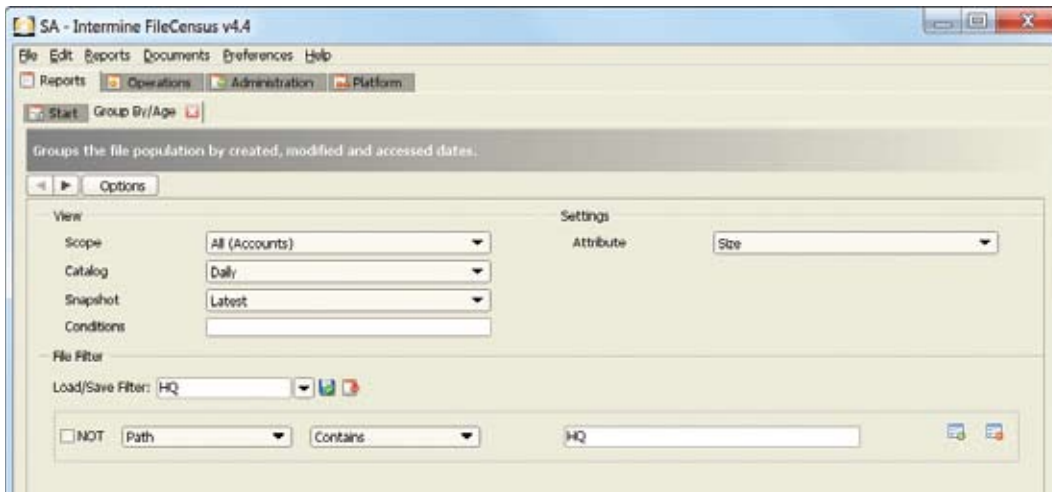
2.6.1.5.1. sticky Options

“Sticky Options” controls the persistence of selected options when the user runs a report. This preference is selected (signified by a check mark in the checkbox) from the menu line before the user chooses any report options. When the user selects the report, enters options and runs the report, “Sticky Options” defaults these options in any subsequent instances of any report. For example, if a specific Scope is selected for a report, then it becomes the default Scope for all reports.



2.6.1.5.2. Sticky Filters

“Sticky Filters” controls the persistence of selected filters when the user runs a report. This preference is selected (signified by a check mark in the checkbox) from the menu line before the user chooses any report filters. When the user selects the report, enters filters and runs the report, “Sticky Filters” defaults these filters into the report options for any subsequent instances of running any report. For example, if the user enters a filter to limit files to those from a specific path, saves the filter and launches the report, then all reports that use filters will have this filter as the default filtering option.



2.6.1.5.3. Default Scope

“Default Scope” sets the default file path on the server that is used as the “scope” of reports when run. The selected scope under “Default Scope” is the one used whenever a report is run, unless another one is chosen on the Report Options screen beforehand.

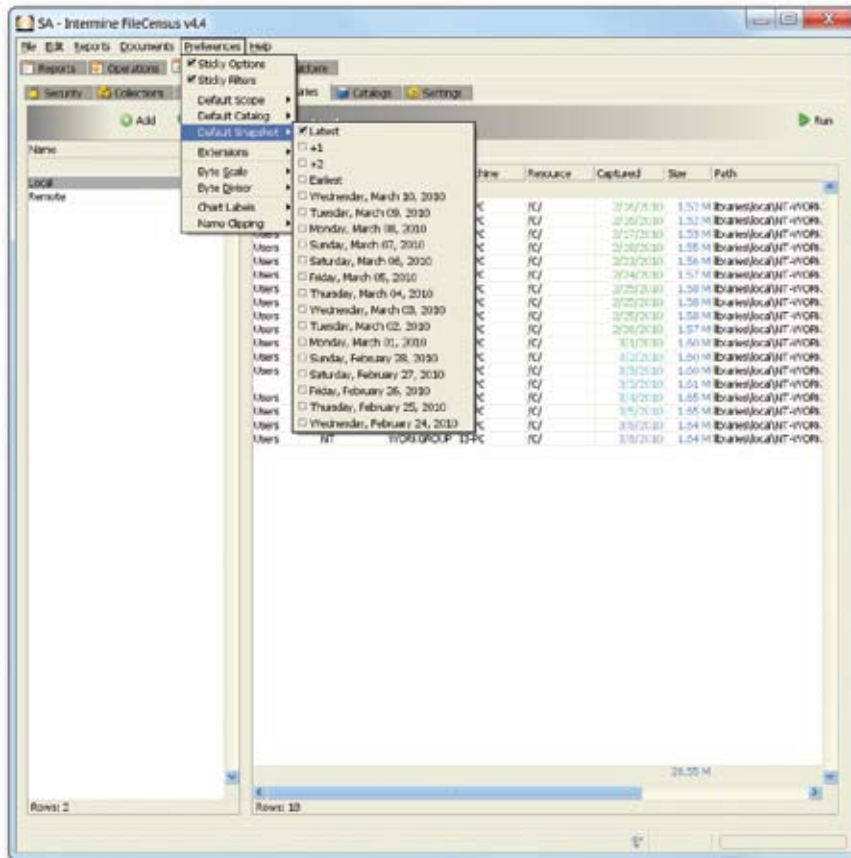
2.6.1.5.4. Default Catalog

“Default Catalog” sets the default file system metadata (or set of “*.fsi” files) that is processed by reports when run. The selected catalog under “Default Catalog” is the one used whenever a report is run, unless another one is chosen on the Report Options screen beforehand.

2.6.1.5.5. Default Snapshot

“Default Snapshot” sets the default point in time at which report results apply. For example, a “1/31/2010” snapshot yields report results valid as of 1/31/2010 (but not before or after that date).

When selecting a default snapshot, the 15 most recent ones the user has created are available to choose. They are listed by date and time and can be individually selected. In addition, the user can choose “Latest” to use the most recent snapshot as the default, or “Earliest” to use the least recent one in the list.



There is also a way to configure a custom date and time as the default snapshot (not using the Console) .

The selected snapshot under “Default Snapshot” is the one used whenever a report is run, unless another one is chosen on the Report Options screen beforehand.

2.6.1.5.6. Extensions

“Extensions” allows the user to select the default file collections used by the “Group By Collection” report. This Preferences menu option also controls the coloration of filenames in report table viewers.

Groups of collections created under “Extensions” in the collections tree appear as options to select. In a default FileCensus configuration, the options are:

- 1) “Type” – Files are categorized by their types (i.e. documents, images, programs, etc.)
- 2) “Values” – Files are categorized according to their perceived importance to the organization

Of note, Extensions can be modified from the Administration tab as well.

2.6.1.5.7. Byte Scale

“Byte Scale” determines the format in which file byte values are displayed throughout FileCensus. The possible selections are:

- 1) “Auto” – Automatically selects the best format for each individual byte value (this is the default)
- 2) “None” – All byte values are presented as a raw quantity of bytes
- 3) “Kilo” – All byte values are presented as a quantity of kilobytes
- 4) “Mega” – All byte values are presented as a quantity of megabytes
- 5) “Giga” – All byte values are presented as a quantity of gigabytes
- 6) “Tera” – All byte values are presented as a quantity of terabytes
- 7) “Exa” – All byte values are presented as a quantity of exabytes
- 8) “Cost” – All byte values are presented as the storage cost for that amount of storage (the storage cost per gigabyte can be set on the Settings tab of the Console)

2.6.1.5.8. Byte Divisor

“Byte Divisor” determines the exact number of bytes contained in one kilobyte, kilobytes contained in one megabyte, and so on when FileCensus displays byte values. Historically, software applications use 1024 as the byte divisor for computer storage measurements. More and more modern applications are using 1000. The following table summarizes the byte value conversions for the two different byte divisors:

2.6.1.5.9. Chart Labels

“Chart Labels” controls the type of sector labels displayed for pie charts in FileCensus. Here are the available values:

- 1) “None” – no labels are displayed
- 2) “Short” – only the size (in byte denominations) of each sector is displayed
- 3) “Long” – the name, size and percentage value of each sector are displayed

2.6.1.5.10. Name Clipping

Byte Denomination	Byte Divisor = 1000	Byte Divisor = 1024
Kilobyte	1000 bytes	1024 bytes
Megabyte	1000 kilobytes	1024 kilobytes
Gigabyte	1000 megabytes	1024 megabytes
Terabyte	1000 gigabytes	1024 gigabytes
Exabyte	1000 terabytes	1024 terabytes

Table 2 - Byte Value Conversions

“Name Clipping” allows the user to specify a character limit for server directory paths or filenames when they are displayed in table views. When a path or filename is clipped (or abbreviated) in a table, the removed characters are replaced with “>>.” Of note, only the table-displayed path or filename is clipped. If it is copied to the clipboard for pasting elsewhere, then the full correct name will be copied.

Name Clipping always attempts to preserve the suffix portion of the path or filename, especially the extension if it is a filename being clipped. The possible selections are:

- 1) "None" – no clipping is performed
- 2) "Short" – names are clipped to be less than or equal to 20 characters in length
- 3) "Long" – names are clipped to be less than or equal to 40 characters in length

2.6.1.6. Help

Click on "Help" in the menu bar.

2.6.1.6.1. About

"About" displays FileCensus' "About" window which contains version and license information.

2.6.1.6.2. Help

"Help" displays the FileCensus online help. Of note, context-sensitive online help is available from any screen by pressing the F1 key.

2.6.1.6.3. Environment

"Environment" summarizes the user's current FileCensus security environment, including:

- 1) "Scopes" – the scopes to which the user has access
- 2) "Privileges" – the user's security privileges
- 3) "Contexts" – the security contexts to which the user belongs

2.6.2. Tabs

2.6.2.1. Reports

Every FileCensus report is accessed from the Reports tab on the Console. Click on the Reports tab. There is only one sub-tab (Start) under Reports.



All available standard reports are shown here and are grouped into the following sections:

- 1) Browse
- 2) Forecast
- 3) Group By
- 4) Largest
- 5) Search
- 6) Security Path Rights
- 7) System

See Section 5 below for an explanation of all reports and how to run them from the Reports tab.

2.6.2.2. Operations

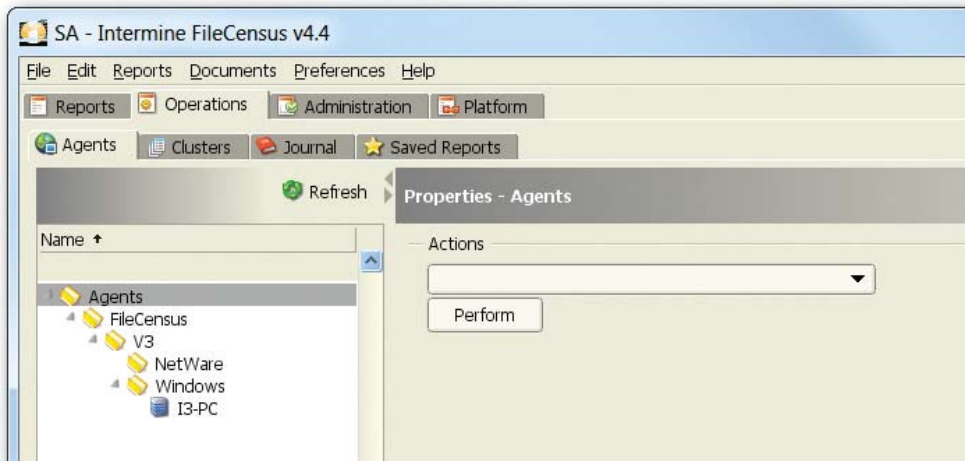
Click on the Operations tab of the Console. There are four (4) sub-tabs under Operations: Agents, Clusters, Journal and Saved Reports. Each of these sub-tabs and their available functions are described below.

2.6.2.2.1. Agents

The Agents sub-tab allows the user to:

- 1) Deploy the Agent to a server.
- 2) Remove the Agent from a server.
- 3) Manage the FileCensus Agents that have been deployed to one or more file system servers.

This sub-tab shows a tree view of all servers to which an Agent has been deployed. The user can create Containers (categorizations) for different servers based on the type of Agent that has been deployed to each server. The Container-based categorizations are manageable and displayed on this sub-tab.

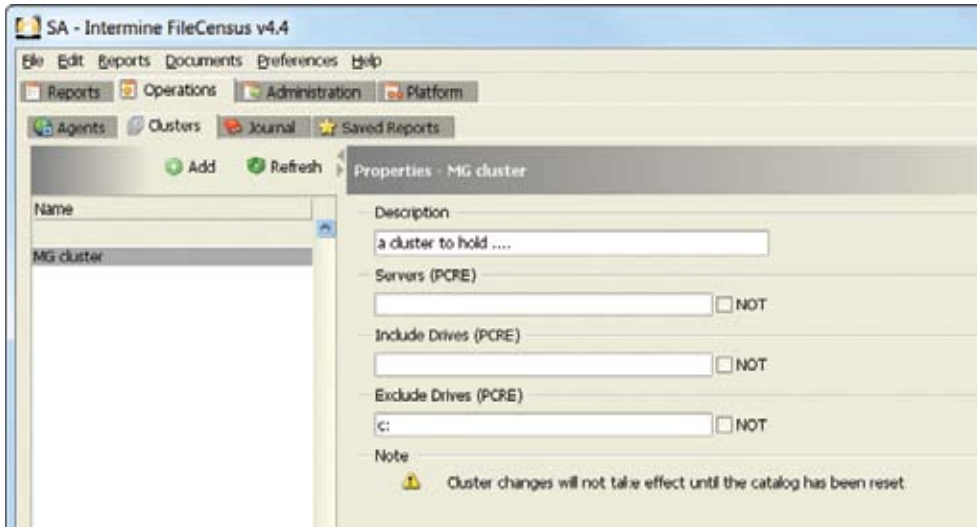


A short description can be assigned to each Container. For every server shown, not only can a short description be assigned, but also the following information is displayed on the Agents sub-tab:

- 1) Date/time at which the Agent deployed to the server was last started
- 2) Version of the Agent deployed to the server
- 3) Communication status of the Agent ("Up" or "Down")
- 4) Total file size and available free space on the server

2.6.2.2.2. Clusters

The Clusters sub-tab allows the user to organize servers with Agents deployed on them into Clusters, much like the file system servers themselves may be set up as server clusters for performance purposes. FileCensus allows users to group Agent-hosting servers into Clusters on this sub-tab for organization and reporting purposes (servers and volumes assigned to a Cluster are designated as one entity in reports).



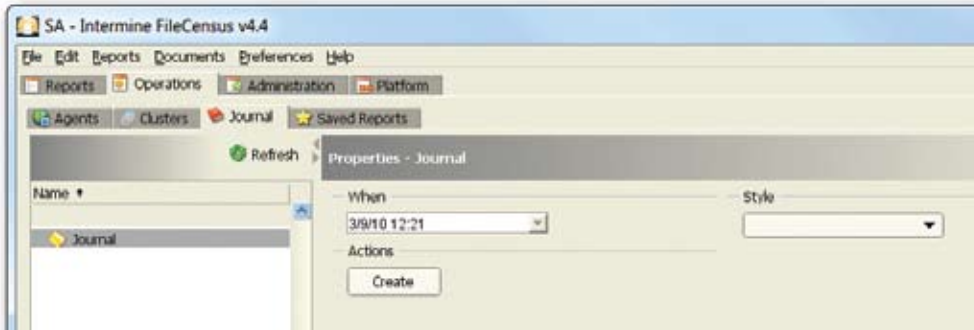
To configure Clusters, perform the following steps on the Clusters sub-tab:

- 1) Enter a Description for the Cluster.
- 2) In the "Servers (PCRE)" field, use a regular expression to define the server(s) to be included in the Cluster. Otherwise, leave the field blank to include ALL servers in the Cluster.
- 3) In the "Include Drives (PCRE)" field, use a regular expression to define the server drive(s) or volume(s) to be included in the Cluster. Otherwise, leave the field blank to include ALL drive(s) or volumes(s) on included servers in the Cluster.
- 4) In the "Exclude Drives (PCRE)" field, use a regular expression to define the server drive(s) or volume(s) that are NOT to be included in the Cluster. Otherwise, leave the field blank to include ALL drive(s) or volumes(s) on included servers in the Cluster.

Clusters can be copied (cloned) if they are very similar. They can also be deleted if they are no longer required. Note that the Catalogs must be rebuilt for the Cluster changes to take effect.

2.6.2.2.3. Journal

The Journal sub-tab allows the user to note and review all changes made to file storage entities within the storage system. All Journal entries are listed by year, month and day.



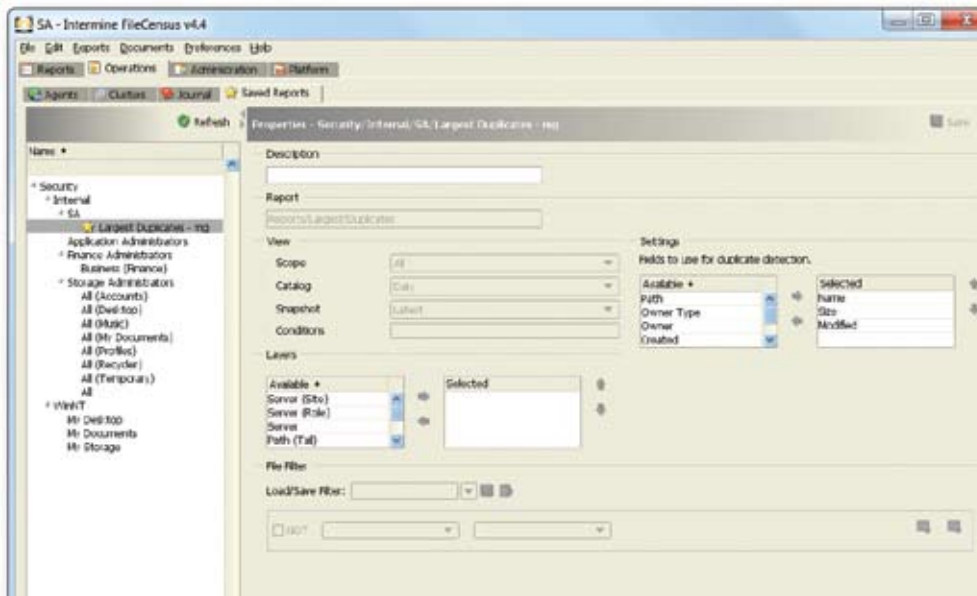
Click on a Journal entry to review specific details that were entered at the time of the entry.



2.6.2.2.4. Saved Reports

The Saved Reports sub-tab allows the user to view the properties of all Saved Reports (reports can be saved after they are run from the Reports tab). This sub-tab contains two (2) areas:

- 1) "Security Tree" – shows the hierarchy of created Security objects and the location of any Saved Reports within this hierarchy
- 2) "Advanced Mode" – controls the display of options (View, Settings, Layers, File Filter) for Saved Reports

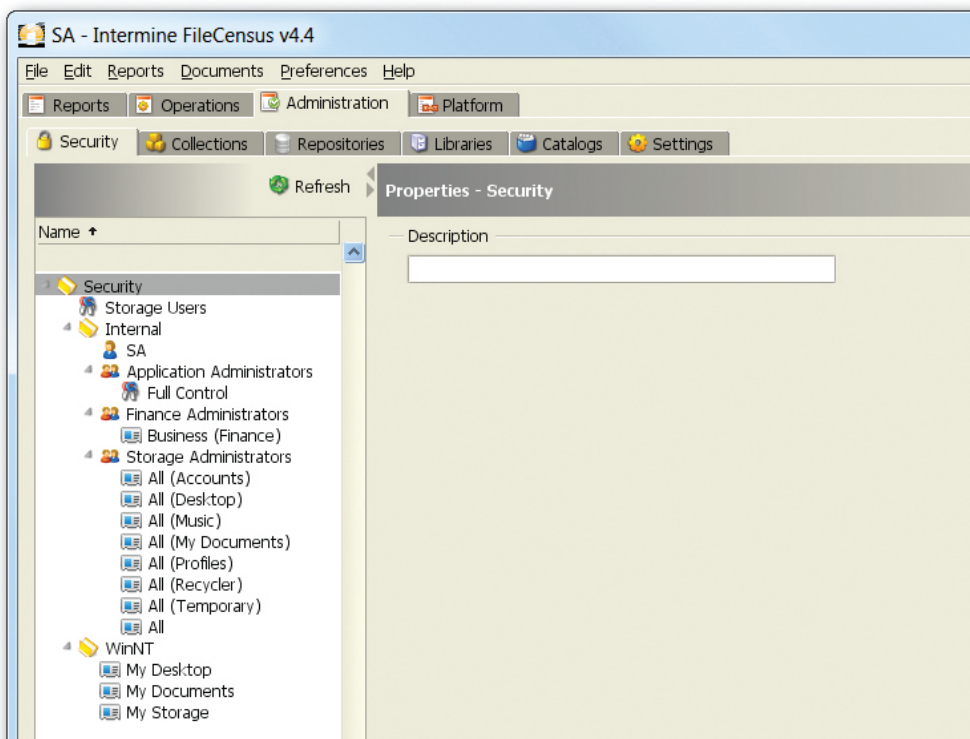


2.6.2.3. Administration

Click on the Administration tab of the Console. There are six (6) sub-tabs under Administration: Security, Collections, Repositories, Libraries, Catalogs and Settings. Each of these sub-tabs and their available functions are described below.

2.6.2.3.1. Security

The Security sub-tab allows the user to define and maintain all FileCensus security settings. This sub-tab is divided into two (2) areas: one area shows a tree view of all security objects and the other area allows the user to create or maintain the properties of a selected security object.



In the security objects tree view, the hierarchy of security objects is presented to the user. It has two (2) branches of security object types: "Internal" and "Active Directory." The "Internal" branch contains all the security objects related to FileCensus and the storage system, and it is the only branch of the two allowing security objects to be created, modified or deleted.

To create a new security object (or modify an existing one):

- 1) Click on the desired branch (where the new security object is to be located) to select it.
- 2) Right-click on the branch. The Context menu appears.
- 3) Click on the "New" sub-menu, and choose the specific type of security object to be created (the available security objects depends on the selected branch). Here are the available types:
 - a. "Container" – organizes the Security tree view by acting as a directory for other types of security objects
 - b. "Group" – one or more Users and/or Groups comprising the list of members of the Group; Group members originate from either the "Internal" or "Active Directory" branches and have access to all Scopes and Privileges to which the Group has been granted access
 - c. "User" – person who has been granted FileCensus access credentials; a User runs reports and has access to specific Scopes and/or Privileges either directly or as a Group member
 - d. "Scope" – list of paths that is used as a basis for report results
 - e. "Privilege" – controls access to specific operations within FileCensus
- 4) A new security object appears under the selected branch. It remains selected for naming (renaming) purposes.
- 5) Name (or rename) the security object by clicking on it. A text box appears with the security object's current name highlighted. Edit the name and press the Enter key.
- 6) In the properties area of the Security sub-tab, specify the security object's characteristics (fields that appear here depend on the type of security object):
 - a. Container – only a "Description" field is present where the user can identify the Container
 - b. Group
 - i. "Description" – purpose or identification of the Group
 - ii. "Members" – lists the Group members (other Groups and/or Users) and allows for further selection/removal
 - iii. "Email Address" – email address to where (report) Notifications are sent
 - c. User
 - i. "Description" – role or identification of the User
 - ii. "Full Name" – user's full name
 - iii. "Password" – user's FileCensus password
 - iv. "Email Address" – email address to where (report) Notifications are sent
 - d. Scope
 - i. "Description" – purpose or identification of the Scope
 - ii. "Conditions"
 - iii. "Catalogs" – lists the Catalogs available to any Group or User with access to the Scope
 - iv. "Make This the Default Scope" – Scope that is defaulted when running any report
 - v. "Hash Path Names" – toggled when the organization wants to suppress path names with hash codes in report results for security reasons (otherwise full path names appear in report results)
 - vi. "Hash File Names Deeper Than 2 Levels" – toggled when the organization wants to suppress file names with hash codes in report results for security reasons (otherwise full file names appear in report results)
 - vii. "Hash All File Names"
 - viii. "Hash All User Details"
 - ix. "Allow De-duplication on This Scope" – toggle to allow de-duplication (done after running the Largest Duplicates report) of files within the Scope (otherwise de-duplication is not permitted on any files within the Scope)

x. "Style" – determines the list of paths that comprise the Scope; the following values are available (the list of paths defined by a Scope can be previewed by clicking the "Preview Paths" button):

1. "Collection"
2. "Dynamic" – fed from Catalogs
3. "Shares"
4. "Source" – uses an external data source (*.csv file) to define it
5. "Static"
6. "Variable"
7. "Virtual"
8. "Wildcard"

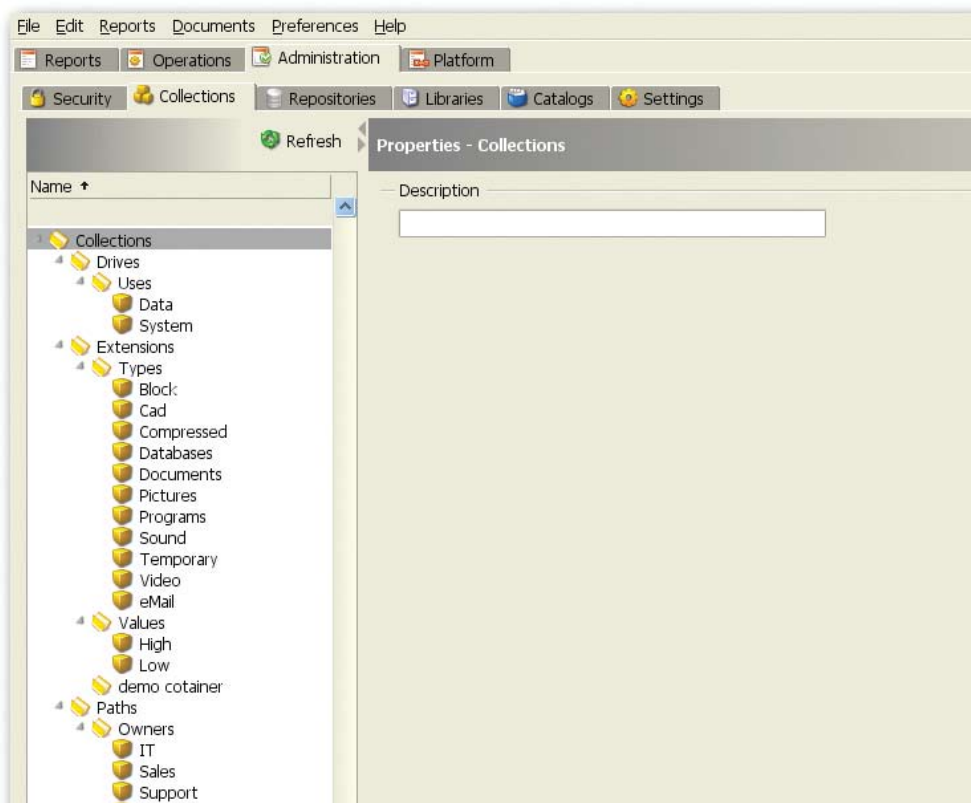
e. Privilege

- i. "Description" – purpose or identification of the Privilege
- ii. "Privilege Table" – a table with a row per Privilege right; the right is either "Granted" or "Denied"

To delete an existing security object, select it from the list of security objects and then right-click it. In the Context menu that appears, select "Delete." Of note, deleting an entire security object branch not only deletes the branch, but it also deletes any security objects contained within the branch.

2.6.2.3.2. Collections

The Collections sub-tab allows the user to define and maintain all FileCensus Collections, which are used to categorize files. This sub-tab is divided into two (2) areas: one area shows a tree view of all Containers (which help organize Collections) and Collections and the other area allows the user to create or maintain the properties of a selected Container or Collection.



In the Collections tree view, the hierarchy of Containers and Collections is presented to the user. Containers and Collections are created, modified or deleted from here.

To create a new Container or Collection (or modify an existing one):

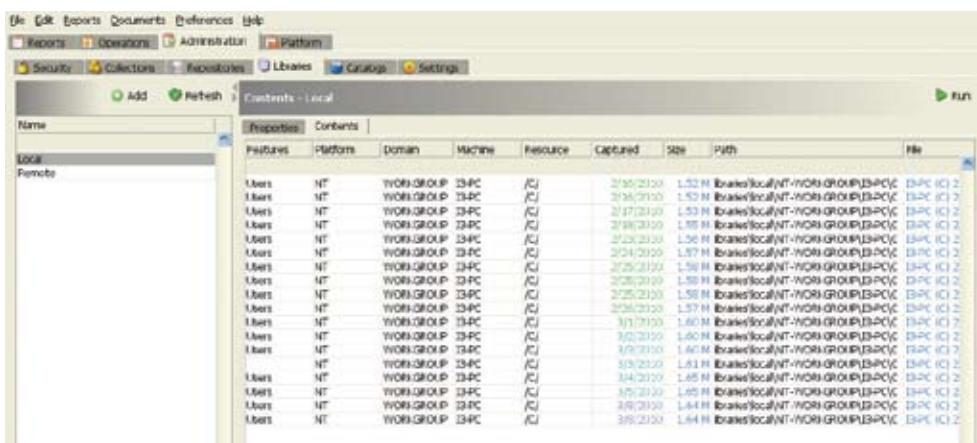
- 1) Click on the desired branch (where the new Container or Collection is to be located) to select it.
- 2) Right-click on the branch. The Context menu appears.
- 3) Click on the "New" sub-menu, and choose the specific type of object to be created (the available objects depends on the selected branch). Here are the available types:
 - a. "Container" – organizes the Collections tree view by acting as a directory for other Collections
 - b. "Collection" – objects of interest that define their contents
- 4) A new Container or Collection appears under the selected branch. It remains selected for naming (renaming) purposes.
- 5) Name (or rename) the Container or Collection by clicking on it. A text box appears with the security object's current name highlighted. Edit the name and press the Enter key.
- 6) In the properties area of the Collections sub-tab, specify the Container's or Collection's characteristics (fields that appear here depend on the type of object):
 - a. Container – only a "Description" field is present where the user can identify the Container
 - b. Collection
 - i. "Description" – purpose or identification of the Collection
 - ii. "Priority" – determines the Collection chosen for a path when running a report if two or more paths match the same Collection of the same type; if two or more of these Collections have the same Priority, then the Collection is chosen for the path alphabetically
 - iii. "Color" – assigned color for file names assigned to a Collection that appear in report results
 - iv. "Style" – determines how the Collection is constructed; possible values are:
 1. "Static" – list of character strings that does not change based on report data; has a "Values" property that defines the list of strings
 2. "Dynamic" – list of rules that changes from report to report; has the following properties:
 - a. "Include" – regular expression applied to each server in the file system; matching servers are included in the Collection contents
 - b. "Exclude" – regular expression applied to each server in the file system; matching servers are excluded from the Collection contents
 3. "Match Everything"
 4. "Match Nothing"
- 7) On the Linking sub-tab under Collections, associate the Collection with a Repository by editing the following settings:
 - a. "Allowed" – determines whether linking is permitted for files under the Collection
 - b. "Priority" – assists with resolving linking for a file
 - c. "Repository" – Repository to which the file should be linked
- 8) On the Authentication sub-tab under Collections, provide operating system authentication as to how files should be moved when necessary by editing the following settings:
 - a. "Allowed" – determines whether authentication is permitted for files under the Collection
 - b. "Priority" – assists with resolving authentication for a file
 - c. "Username" – username to use when authenticating with the operating system (FileCensus prefers User Principal Name format (user@domain.com) to Down-Level Logon Name format (domain\user))
 - d. "Password" – password to use when authenticating with the operating system

- 9) When FileCensus needs to perform an operation that involves moving a file, the linking and authentication settings to use for that file need to be determined. The following process is used to resolve linking for a file:
 - a. Obtain the list of all collections that the file matches. We will call these the candidate collections:
 - i. All collections from the Servers container that match the file's server name.
 - ii. All collections from the Drives container that match the file's drive name.
 - iii. All collections from the Paths container that match the file's path name.
 - iv. All collections from the Extensions container that match the file's extension.
 - b. If the Allowed field on the linking tab is set to No for any of the candidate collections then linking is not permitted for this file.
 - c. If the Allowed field on the linking tab is not set to Yes for any of the candidate collections, then linking is not permitted for this file.
 - d. Sort the candidate collections:
 - i. Order by the priority set on each collection's linking tab, from highest priority to lowest priority.
 - ii. Then by collection type, from most specific to least specific - Extensions, Paths, Drives, Servers.
 - iii. Then alphabetically according to the fully-qualified collection names.
 - e. Select the first collection in the sorted list of candidate collections. Use the linking settings set for this collection when linking the file.
- 10) An identical process to the above is used when resolving authentication for a file.

To delete an existing Container or Collection, select it from the list of security objects and then right-click it. In the Context menu that appears, select "Delete." Of note, deleting an entire Container or Collection branch not only deletes the branch, but it also deletes any Containers or Collections contained within the branch.

2.6.2.3.3. Repositories

The Repositories sub-tab allows the user to define and maintain all FileCensus Repositories, which are used in the process of moving files when necessary. This sub-tab is divided into two (2) areas: one area listing all Repositories and the other area allows the user to create or maintain the properties of a selected Repository.



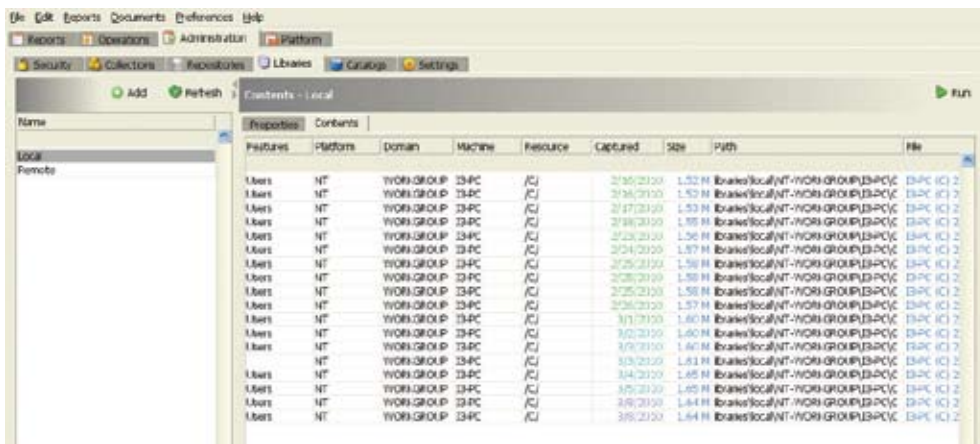
[Chapter 73_Screenshot_C: Admin > New Repository] [administration – new repository.png]

To create a new Repository (or modify an existing one):

- 1) Click on the "Add" button.
- 2) A new Repository appears under the selected branch. It remains selected for naming (renaming) purposes.
- 3) Name (or rename) the Repository by clicking on it. A text box appears with the Repository's current name highlighted (i.e. "New Repository" when adding a Repository. Edit the name and press the Enter key.
- 4) In the properties area of the Repositories sub-tab, specify the Repository's characteristics:
 - a. "Description" – short text description for the Repository
 - b. "Location (UNC)" – UNC specifying the Repository's location
 - c. "Features" – toggle the "Feature De-dupe" checkbox to set the Repository to perform de-duplication (otherwise it will not)

2.6.2.3.4. Libraries

The Libraries sub-tab allows the user to define and maintain all FileCensus Libraries, which are groups of Catalogs. This sub-tab is divided into two (2) areas: one area listing all Libraries and the other area allows the user to create or maintain the properties of a selected Library.



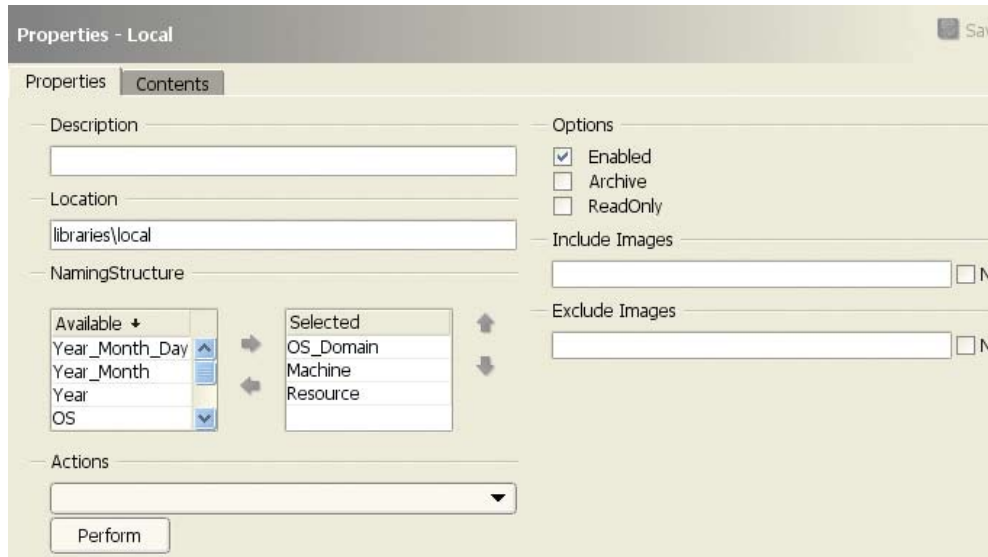
To create a new Library (or modify an existing one):

- 1) Click on the
- 2) "Add" button.
- 3) A new Library appears under the selected branch. It remains selected for naming (renaming) purposes.
- 4) Name (or rename) the Library by clicking on it. A text box appears with the Library's current name highlighted. Edit the name and press the Enter key.

A new Library can also be created by cloning an existing Library:

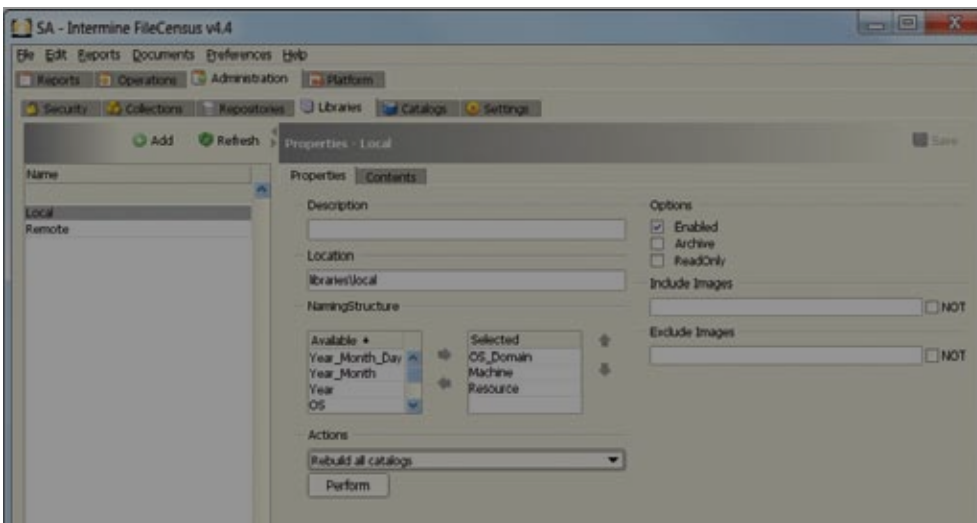
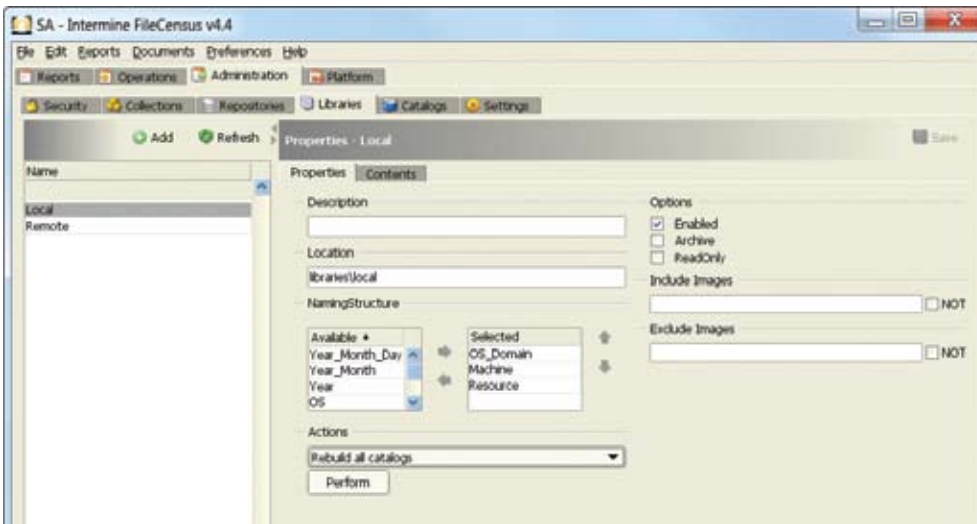
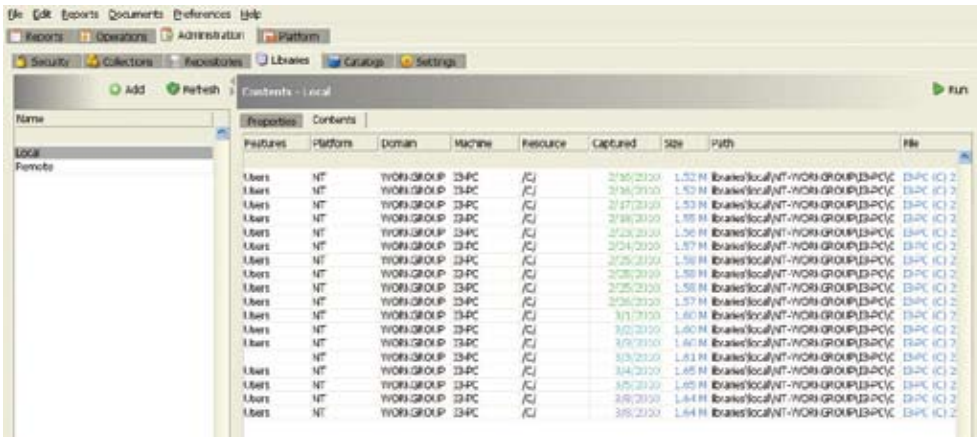
- 1) Right-click on the Library to be cloned.
- 2) Click "Clone." A new Library is automatically created and saved with the same name plus the characters "(1)" (example: cloning a Library named "Local" results in the new Library being named "Local (1)."

A Library can be deleted by right-clicking on the Library name and selecting "Delete." The user is asked to confirm the deletion request (options are "Yes" to confirm or "No" to cancel the deletion of the Library).



- 1) In the properties area of the Libraries sub-tab, specify the Library's characteristics:
 - a. "Description" – short text description for the Library
 - b. "Location" – path (relative to the location of the server executable) at which the Library's contents are located
 - c. "Options"
 - i. "Enabled" – determines whether or not the Library contributes information toward any reports
 - ii. "Archive" – designates the Library as an archive
 - iii. "Read Only" – designates the Library as read-only (FileCensus does not modify contents of read-only Libraries)
 - d. "Naming Structure" – dictates the Library's directory hierarchy for content storage purposes
 - e. "Include Images"
 - f. "Exclude Images"
 - g. "Actions"
- 2) In the actions area of the Libraries sub-tab, perform any of the following:
 - a. "Rebuild all catalogs"
 - b. "Remove the index streams (ADS) from the images (*.fsi files)"
 - c. "Move the images (*.fsi files) to their correct locations" (according to their defined naming structure)
 - d. "Compress the images using the latest compression"

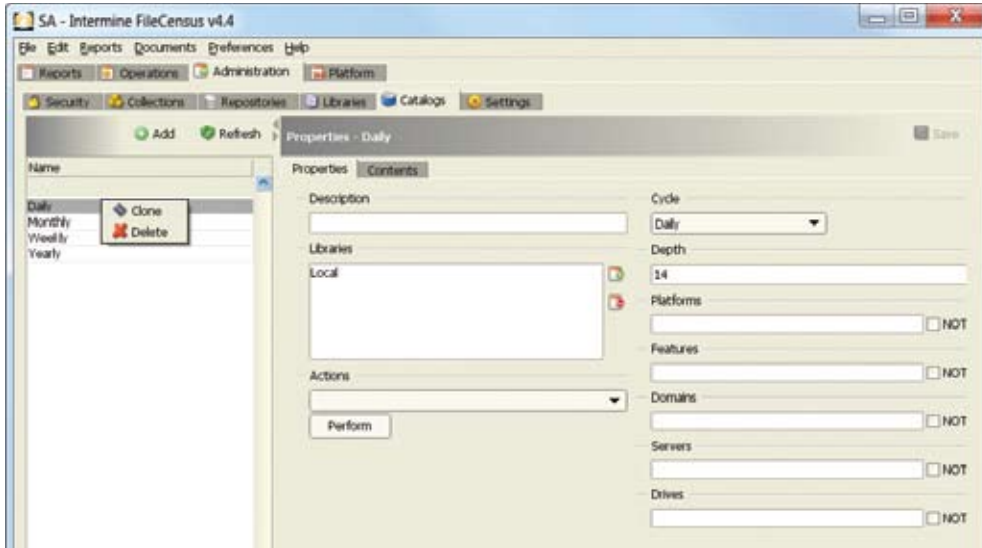
In the Contents area of the Libraries sub-tab, the user must click on "Run" to generate the list of Libraries.



[Chapter 16_Screenshot_C: Zoom Libraries, Actions correct locations]

2.6.2.3.5. Catalogs

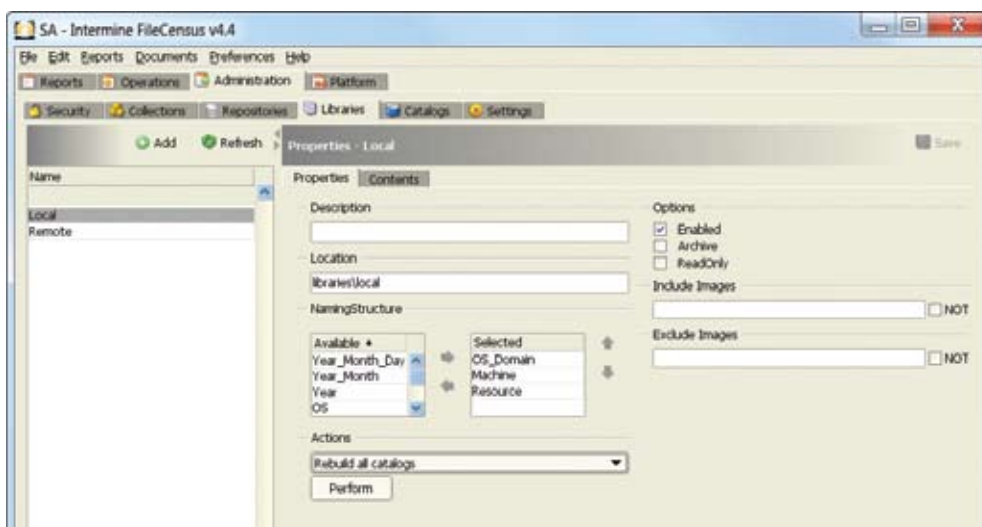
The Catalogs sub-tab allows the user to define and maintain all FileCensus Catalogs, which are used to maintain the images contained within Libraries. This sub-tab is divided into two (2) areas: one area listing all Catalogs and the other area allows the user to create or maintain the properties of a selected Catalog.



Catalogs can be created, cloned or deleted.

To create a new Catalog:

- 1) Click on the "Add" button.
- 2) A new Catalog appears under the selected branch. It remains selected for naming (renaming) purposes.
- 3) Name (or rename) the Catalog by clicking on it. A text box appears with the Catalog's current name highlighted. Edit the name and press the Enter key.
- 4) In the properties area of the Catalogs sub-tab, specify the Catalog's characteristics:
 - a. "Description" – short text description for the Catalog
 - b. "Libraries" – defines the set of Libraries used by the Catalog
 - c. "Cycle" – determines the time scale to be used by the Catalog
 - d. "Depth" – measures how many cycle steps are kept before deletion or archiving (the Catalog does not revert back earlier than the earliest image in the Library)
 - e. "Platforms"
 - f. "Features"
 - g. "Domains"
 - h. "Servers"
 - i. "Drives"
 - j. "Actions"
 - i. "Rebuild all catalogs"

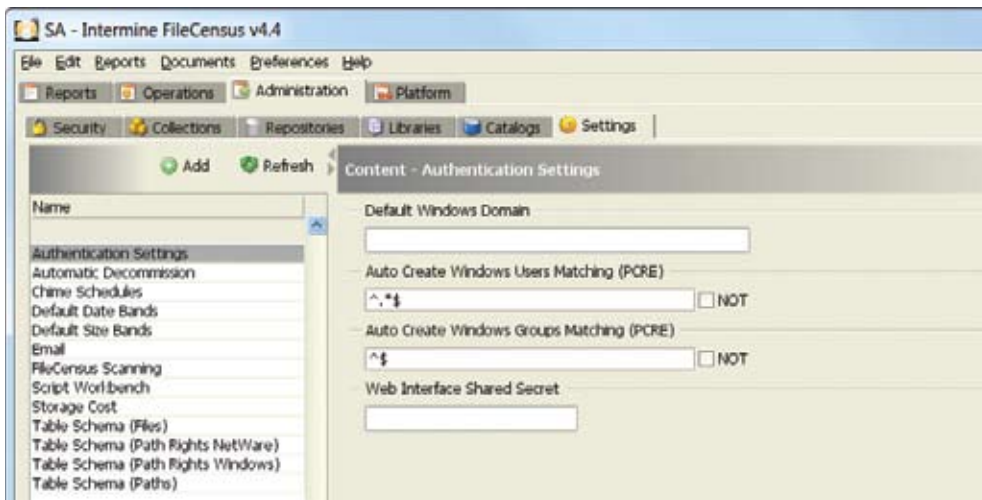


- ii. "Re-index the latest images in this catalog"
- iii. "Add this catalog to all scopes"
- iv. "Remove this catalog from all scopes"
- v. "Set the catalog as the default where selected"

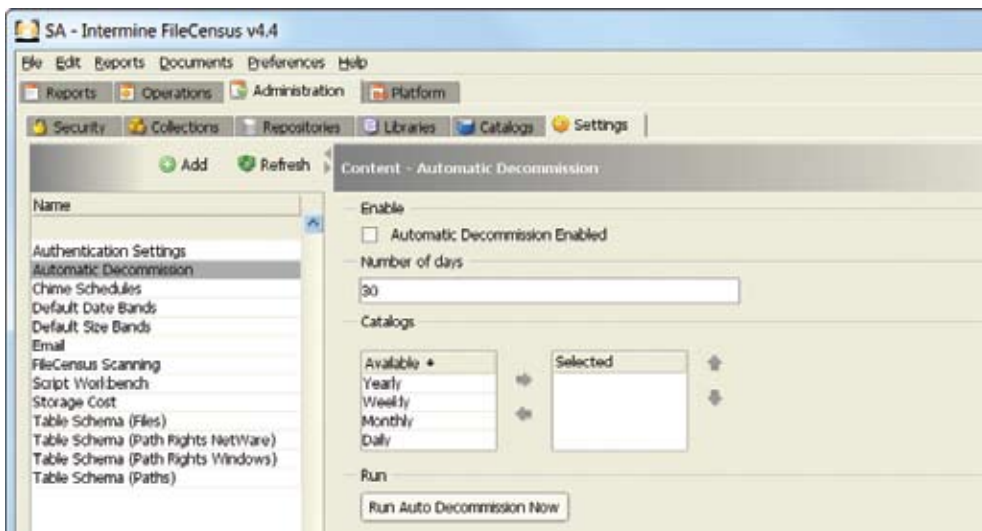
2.6.2.3.6. Settings

The Settings sub-tab allows the user to define and maintain several FileCensus general settings:

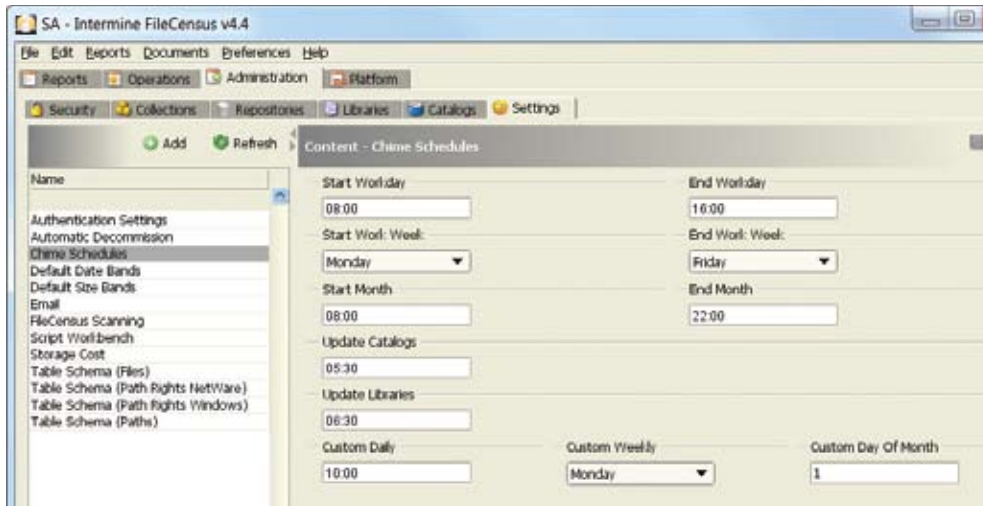
- 1) "Authentication Settings"
 - a. "Default Windows Domain"
 - b. "Auto Create Windows Users Matching (PCRE)"
 - c. "Auto Create Windows Groups Matching (PCRE)"
 - d. "Web Interface Shared Secret" is used for authentication between the FileCensus web interface and the server; it must be set when attempting to use single sign-on via Windows Authentication



- 2) "Automatic Decommission" – configures the FileCensus decommissioning process, which creates Journal entries to decommission any previously-existing servers or volumes that FileCensus has not encountered during scanning for a specified number of days; specific settings are:
 - a. "Enable" – select this checkbox to enables Automatic Decommission
 - b. "Number of days" – determines decommissioning threshold
 - c. "Catalogs" – Catalogs to be consulted by FileCensus when selecting servers and volumes for decommissioning
 - d. "Run" – controls whether or not decommissioning is run once per day automatically when Catalogs are updated

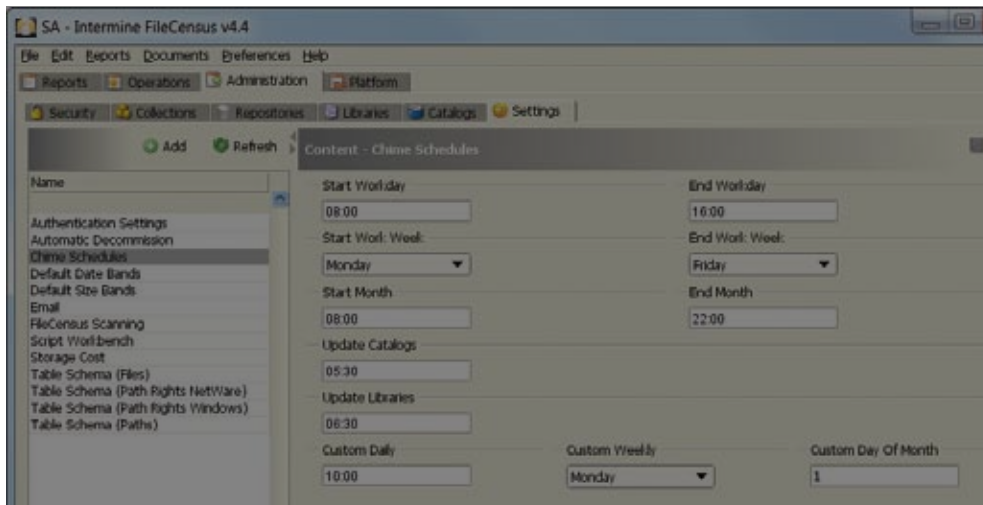


3) "Chime Schedules" – controls Chimes, which are Event triggers



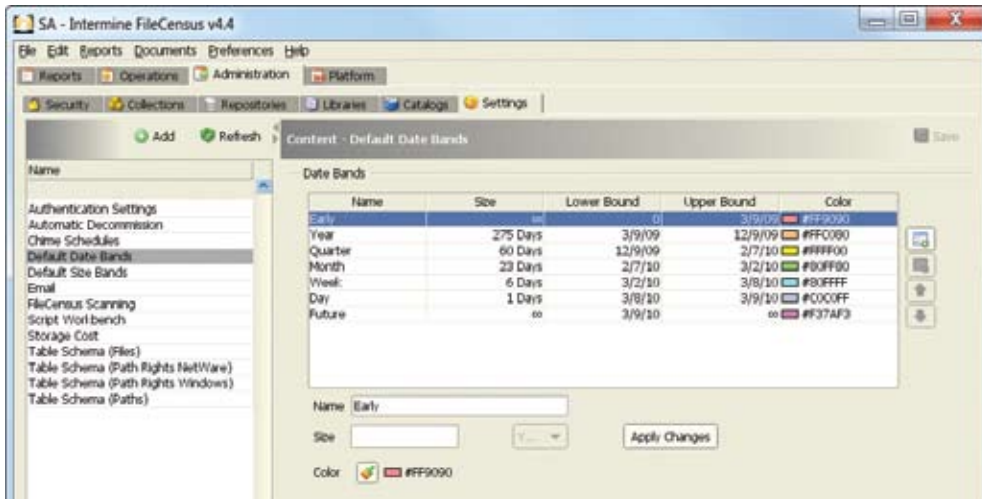
Specific settings are:

- "Start/End Workday" – occur at the start and end of every workday at the specified times
- "Start/End Work Week" – occur at the start and end of every work week at midnight (server time)
- "Start/End Month" – occur on the first and last day of every month at the specified times
- "Update Catalogs" – triggers the Update Catalogs Event at the specified time each day
- "Update Libraries" – triggers the Update Libraries Event at the specified time each day
- "Custom Daily/Weekly/End of Month" – triggers custom Events on the specified days at the specified times

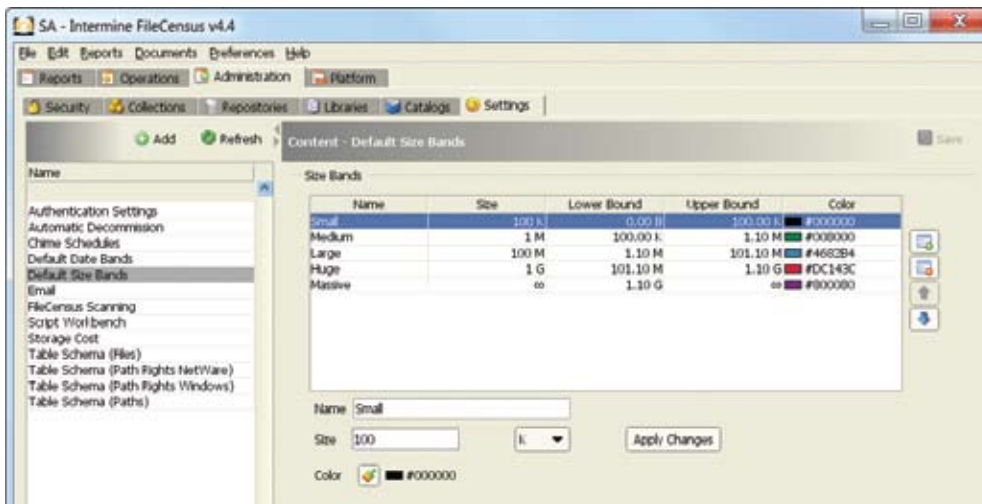


[Chapter 41_Screenshot_A: Chime Schedules – Zoom: Custom Daily]

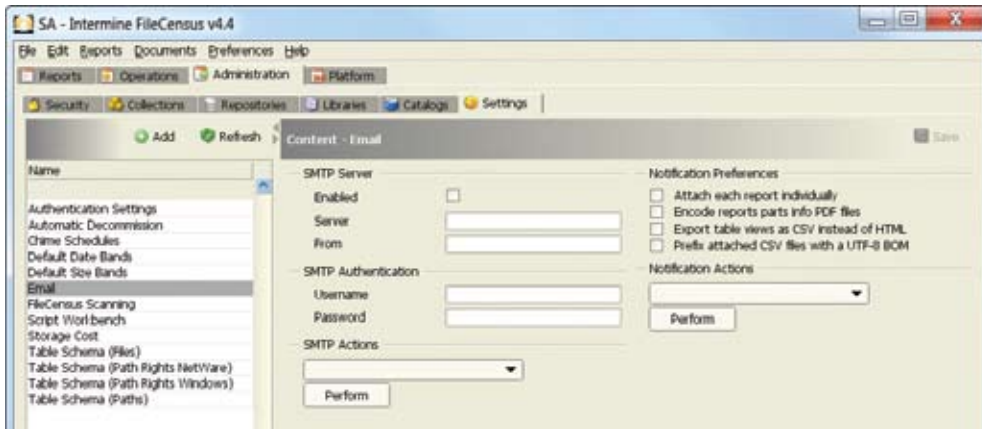
4) "Default Date Bands" – specifies categories into which FileCensus classifies dates with a Name, Color and a Size (in years, months or days)



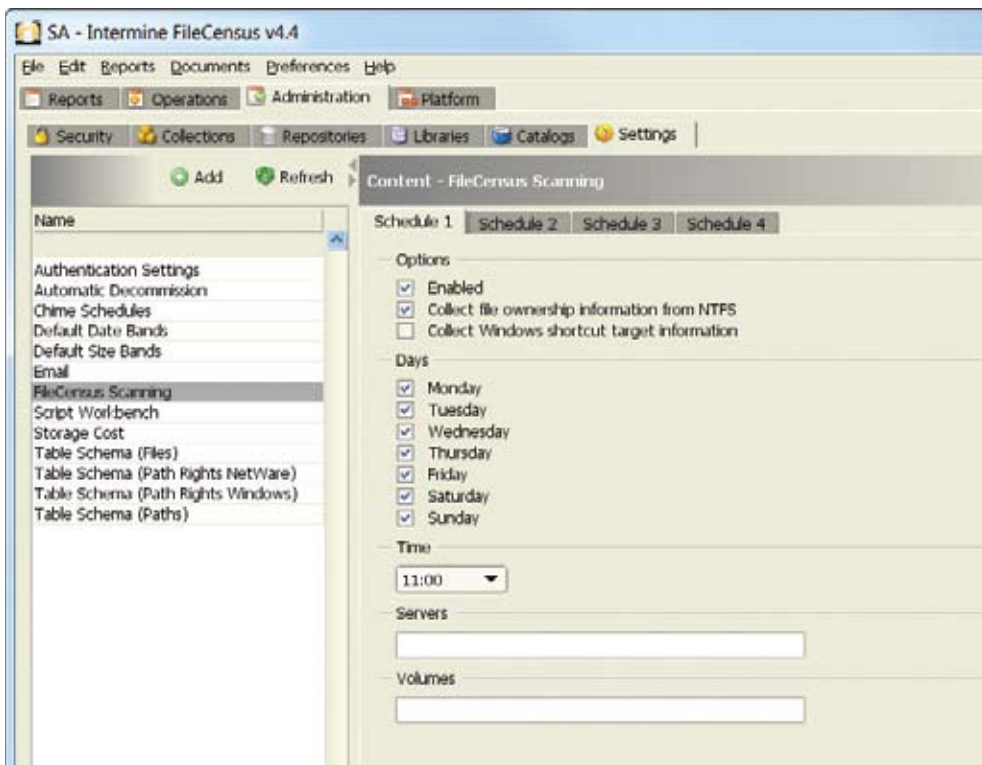
5) "Default Size Bands" – specifies categories into which FileCensus classifies byte quantities with a Name, Color and Size (in byte denominations)



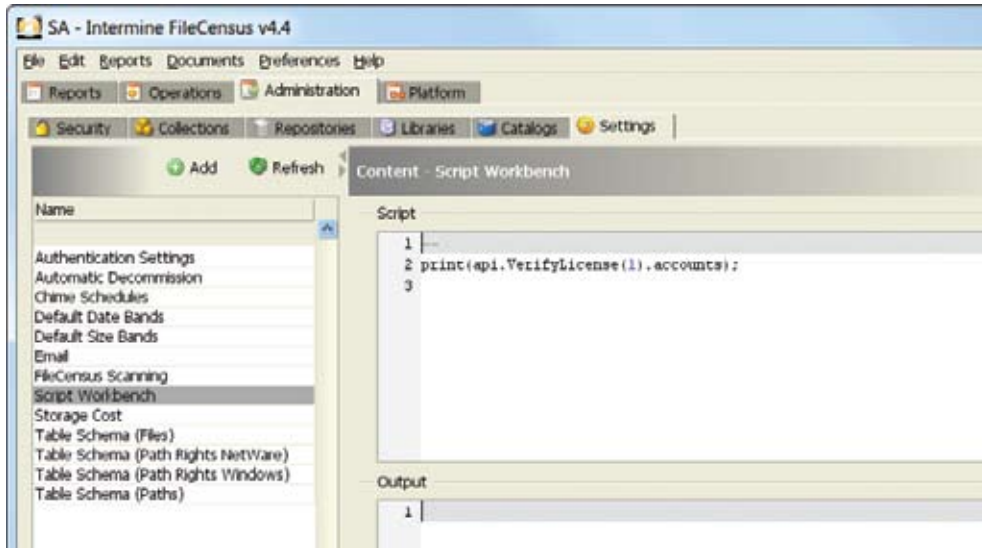
6) "Email" – controls FileCensus' ability to generate and send automated emails to Groups and Users



7) "FileCensus Scanning" – controls Agent scanning, collection of file ownership information during Agent scanning and sets the times at which Agents perform scans



8) "Script Workbench" – allows advanced Users to write and execute JavaScripts against the FileCensus server



9) "Storage Cost" – specifies a value for the cost of storage per gigabyte (in the currency denominations of the server locale)

10) "Table Schema (Files)" – controls the default columns shown in all file-based tabular report results

11) "Table Schema (Path Rights Netware)" – controls the default columns shown in all tabular Security Path Rights Netware report results

12) "Table Schema (Path Rights Windows)" – controls the default columns shown in all tabular Security Path Rights Windows report results

13) "Table Schema (Paths)" – controls the default columns shown in all path-based tabular report results

2.6.2.4. Platform

Click on the Platform tab of the Console. There are six (6) sub-tabs under Platform: Sources, Exporters, Layers, Aspects, Events and Includes. The sub-tabs and associated functions under the Platform tab allow the user to leverage the FileCensus development environment. Each of these sub-tabs and their available functions are described below.

2.6.2.4.1. Sources

The Sources sub-tab allows external data (in tabular format with rows and columns) to be imported into FileCensus for analysis purposes. An example of this is when a report Scope is set to a Style of "Source." In this case, the paths generated by the report Scope are generated by combining the data from the Source file with a path template defined by the Scope.

The Sources sub-tab is divided in two (2) areas: a left-hand sidebar that lists the available Sources and a main area containing two (2) sub-tabs: "Properties" and "Preview."

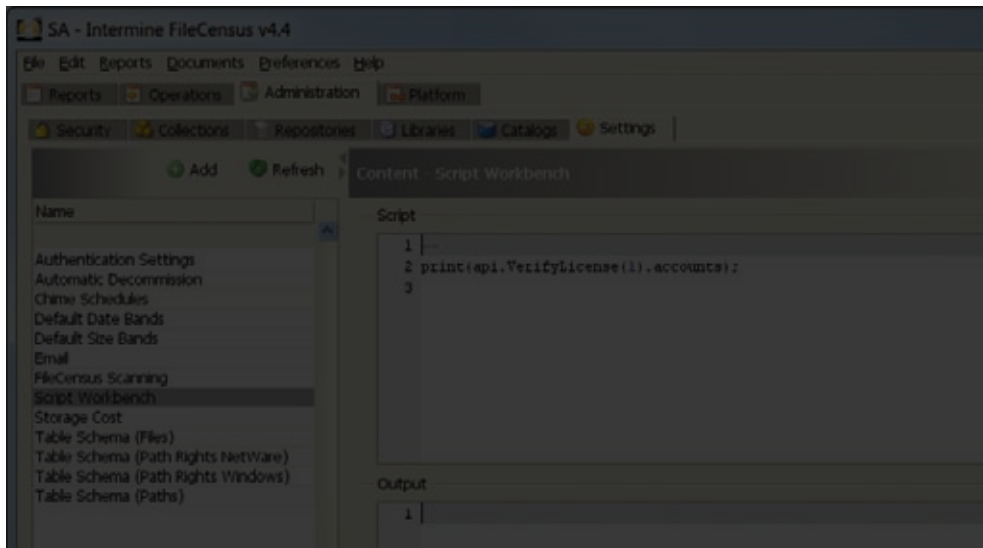
The Properties sub-tab enables the user to define some characteristics for the Source:

- 1) Description – a description for the Source
- 2) Style – a pre-defined manner in which Source data is imported; several parsing options are available from which to choose:
 - a. “CSV With Headers”
 - i. Data is read from a CSV file and it is expected that the first row of data contains the field names
 - ii. Users can specify the Source’s entire path or CSV filename
 - b. “CSV Without Headers”
 - i. Data is read from a CSV file and it is expected that the first row of data contains data itself rather than field names; virtual column names are created based on the position of each value in a row (example: the first column is named “Column_1,” the second “Column_2” and so on)
 - ii. Users can specify the Source’s entire path or CSV filename
 - c. “Iterate and Call API”
 - i. Data is read from another Source as input and a specified FileCensus API is executed
 - ii. Users can specify the following options:
 1. “Source” – the name of the data Source that supplies the original data set
 2. “API” – the name of the API that executes against each row of the data Source (the API can only accept one mandatory argument and is expected to return a list of dictionaries (associative arrays))
 3. “Field” – the name of the field in the data Source that is used as the first and only argument to the API
 4. “Fields” – a space-delimited list of fields that is to be included in the final data set
 - d. “List of Dicts from API”
 - i. A specified FileCensus API is executed without any mandatory arguments; a list of dictionaries (associative arrays) is returned
 - ii. Users can specify the name of the FileCensus API to execute
 - e. “List of Strings from API”
 - i. A specified FileCensus API is executed without any mandatory arguments; a list of string values is returned; a one-column data set is produced with the column “Name” containing the values returned
 - ii. Users can specify the name of the FileCensus API to execute

The Preview sub-tab allows the user to preview a sample of the data that will be produced by a Source configured via the Properties sub-tab. A “Run” button enables this.

2.6.2.4.2. Exporters

The Exporters sub-tab provides the ability to export data generated by a data Source into a variety of different file formats. Several of the FileCensus reports potentially produce very large data sets when run. These reports use Exporters in order to create their full sets of data for user consumption.



[Chapter 60_Screenshot_A: Exporters]

The Exporters sub-tab is divided in two (2) areas: a left-hand sidebar that lists the available Exporters and a main area that allows the user to define the Exporter selected in the left-hand sidebar. For each Exporter, the following characteristics can be configured:

- 1) "Description" – a short text description of the Exporter
- 2) "Required Columns" – the columns that must be included in the data set to be exported for the Exporter to be valid
- 3) "Style" – the export's layout; "Lua Pages" is currently the only allowed selection
- 4) "Suggested Extensions" – a list (separated by spaces) of file extensions to be used by FileCensus when exporting a file
- 5) "Before" – a Lua page template that is expanded and written before any data rows are exported; may be used to produce a report header or title, for example
- 6) "During" – a Lua page template that is expanded and written once for every row in the data set
- 7) "After" – a Lua page template that is expanded and written once all data rows have been exported; may be used to produce a report footer, for example

On the left-hand sidebar, there are two (2) pre-defined Exporters available for selection, configuration and usage:

- 1) "Generic CSV" – exports data sets in flat-file, comma-separated format;
- 2) "ZIP In Place (Batch File)" – exports data sets in Microsoft Windows batch file format where each file included in the data set is also compressed on the target file system; of note, the Before template for this Exporter includes a "goto end" statement that is a safety measure so that the associated export script does not modify data set files as it compresses them

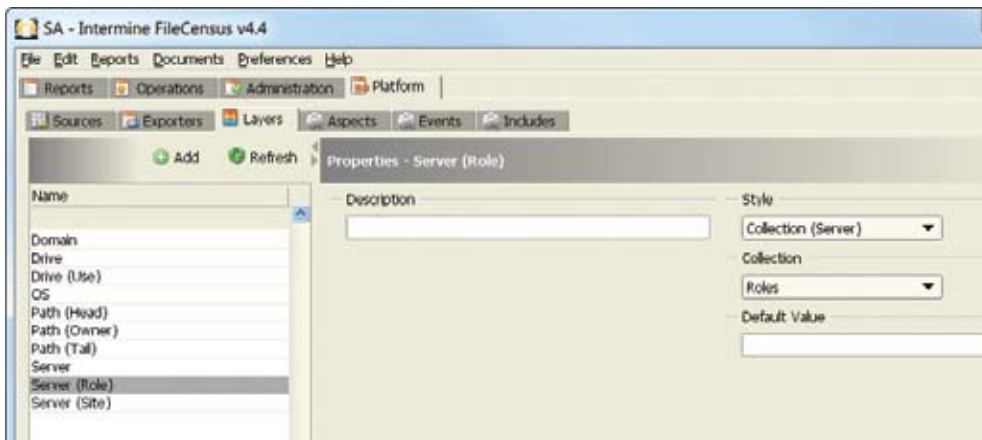
2.6.2.4.3. Layers

The Layers sub-tab allows the user to define and maintain Layers within FileCensus. Layers exist as a way to group report results by like characteristics. They are a configurable option available to users when running most reports.

Each server/volume/directory path affected by a report's defined Scope has a set of characteristics associated with it. A Layer collectively categorizes the path based on these characteristics. The Layers sub-tab is divided into two (2) areas: one area lists all the previously-created Layers set up in FileCensus and the other area allows the user to create or maintain the properties of a selected Layer.

To create a new Layer:

- 1) Click the "Add" button on the Layer sub-tab.
- 2) Name (or rename) the Layer by clicking to select it, then click it again. A text box appears with the Layer's current name highlighted. Edit the name and press the Enter key.
- 3) Define whether the new Layer will be "Automatic" or "Collection Based" in style:
 - a. "Automatic" – these Layers behave as defined by how paths are characterized in the file system metadata (*.fsi files); available options are:
 - i. "OS"
 - ii. "Domain"
 - iii. "Server"
 - iv. "Drive"
 - v. "Path (Head)"
 - vi. "Path (Tail)"
 - b. "Collection Based" – these Layers use Collections to define them; users can define Collection Based Layers based on one of three (3) different Collection styles:
 - i. "Collection Drive" – uses the "Uses" Collection style (Collections/Drives/Uses) to define it; the Uses Collection categorizes how a drive is used
 - ii. "Collection Paths" – uses the "Owners" Collection style (Collections/Paths/Owners) to define it; the Owners Collection categorizes a path's ownership by organizational department
 - iii. "Collection Servers" – uses the "Servers" Collection style (Collections/Servers) to define it; the Servers Collection style has two (2) major Collections associated with it:
 1. "Roles" (Collections/Servers/Roles) – categorizes a server's role within the storage system



2. "Sites" (Collections/Servers/Sites) – categorizes the server's physical location

To clone an existing Layer:

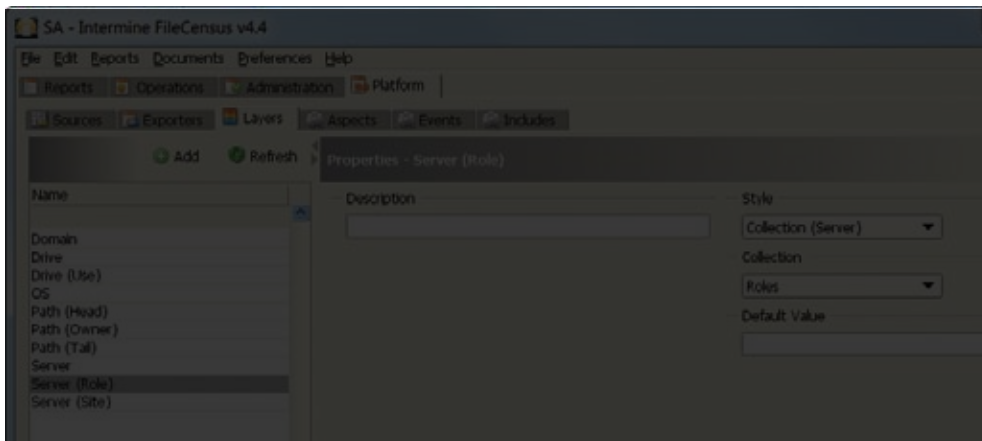
- 1) Select it from the list of Layers and then right-click on it.
- 2) In the context menu that appears, select "Clone." A new Layer is created immediately with the same name plus the characters "(1)" amended to the name.
- 3) This Layer can now be renamed and its properties changed.

To delete an existing Layer, select it from the list of Layers and then right-click it. In the Context menu that appears, select "Delete."

Of note, more than one user may be creating, editing and/or deleting Layers simultaneously. It is important to regularly refresh the Layers sub-tab. Click the "Refresh" button to do this.

2.6.2.4.4. Aspects

The Aspects sub-tab allows users to write (Lua) code to modify a FileCensus API's behavior. Aspects are bound to APIs via regular expressions.



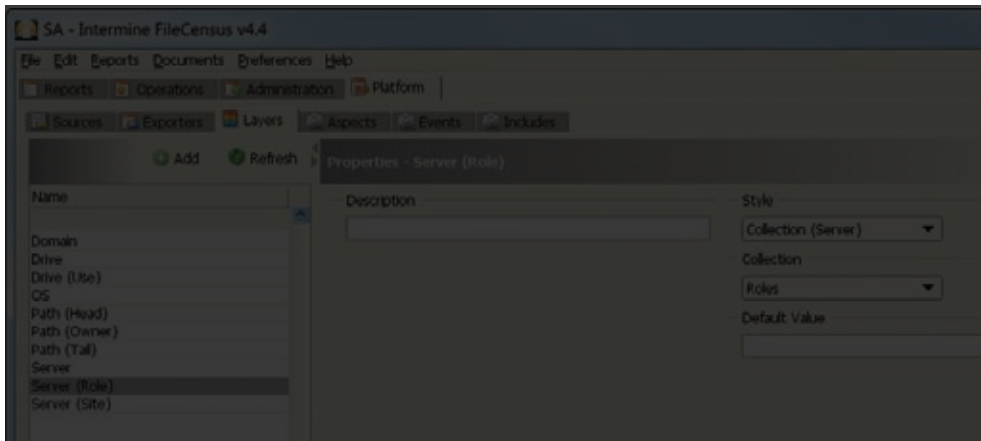
[Chapter 45_Screenshot_E: Aspects screen]

The Aspects sub-tab is divided into two (2) areas: a left-hand sidebar that lists all the available Aspects and a main area that allows the user to modify a selected Aspect's characteristics. The following are the characteristics the user can modify for each Aspect:

- 1) "Description" – a description for the Aspect
- 2) "Options" – an "Enabled" checkbox controls whether or not the selected Aspect is enabled for use
- 3) "Method" – the FileCensus API invoked by the Aspect
- 4) "Advice" – Lua code (either standard or customized) that modifies the specified FileCensus API's behavior:
 - a. Standard FileCensus Advice code appears in the format "@Aspects/[Aspect Name].lua" and produces default API behavior
 - b. Custom Advice code can be written in Lua within the Advice field (a combination of commenting out the standard code with "--" and writing the custom Lua code underneath it)

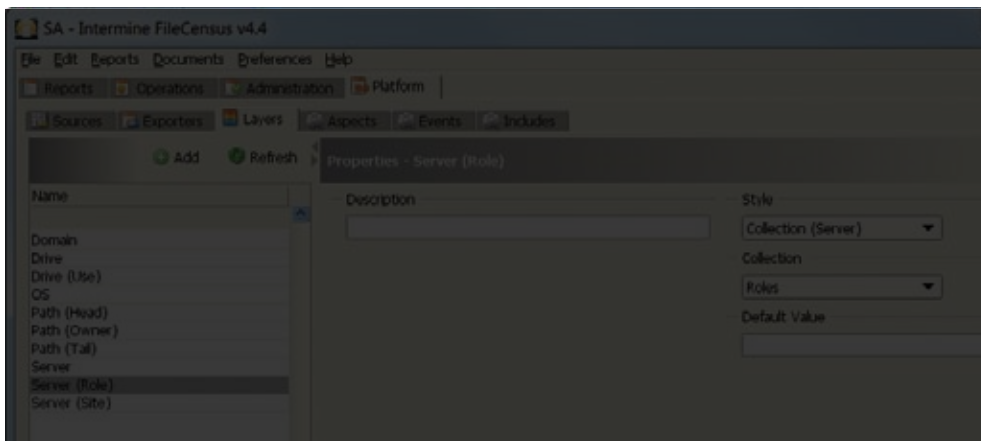
Here are the available FileCensus Aspects:

1) "Site eMail Rules" – determines a user's email address from his or her user name when FileCensus needs to send an email to the user



[Chapter 63_Screenshot_A: Aspects, eMail Rules]

2) "Site Library Rules" – controls how FileCensus Libraries are populated with *.fsi files

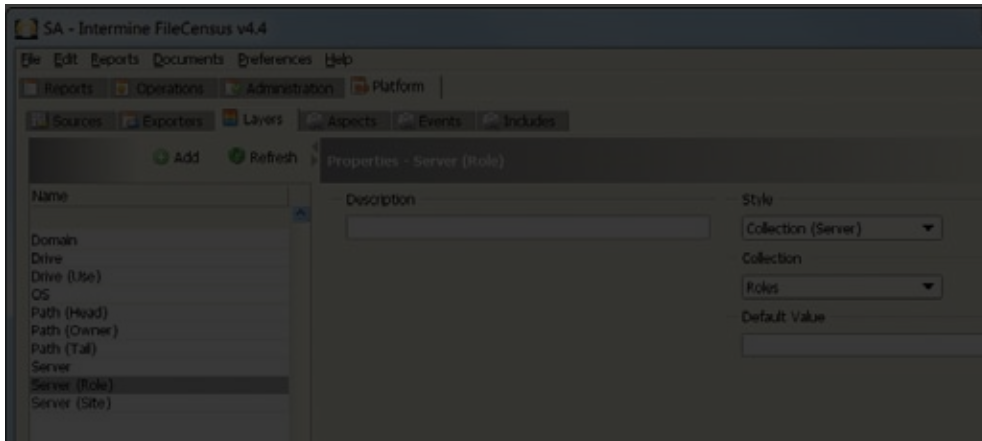


[Chapter 64_Screenshot_A: Aspects, Library Rules]

3) "Site Login Rules" – controls how users log into FileCensus (example: this Aspect can be customized to include a hard-coded Windows NT domain name if the FileCensus instance being used has only one NT domain, so that users would not have to provide the domain name when logging in (if using NT authentication))

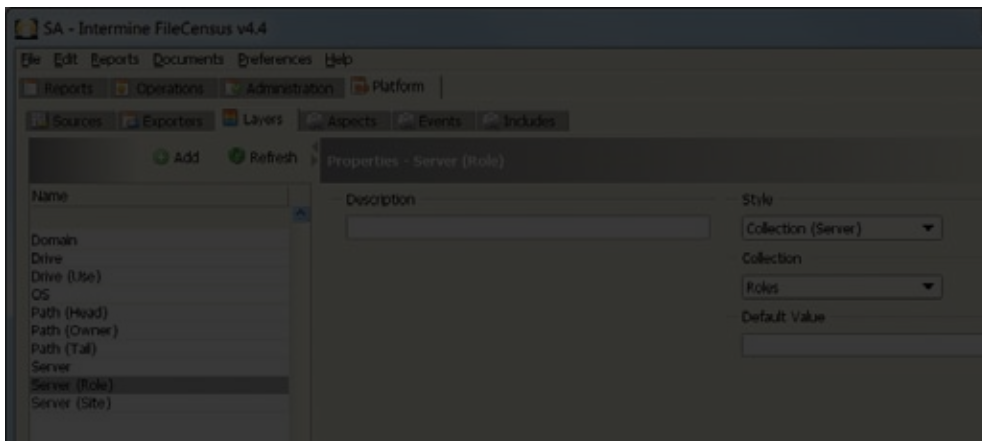
4) "Site Repository Security" – controls user access to FileCensus Repositories for file movement purposes

5) "Site Scope Conditions" – determines which site(s) or server(s) a user can access based upon the User Groups to which the user belongs



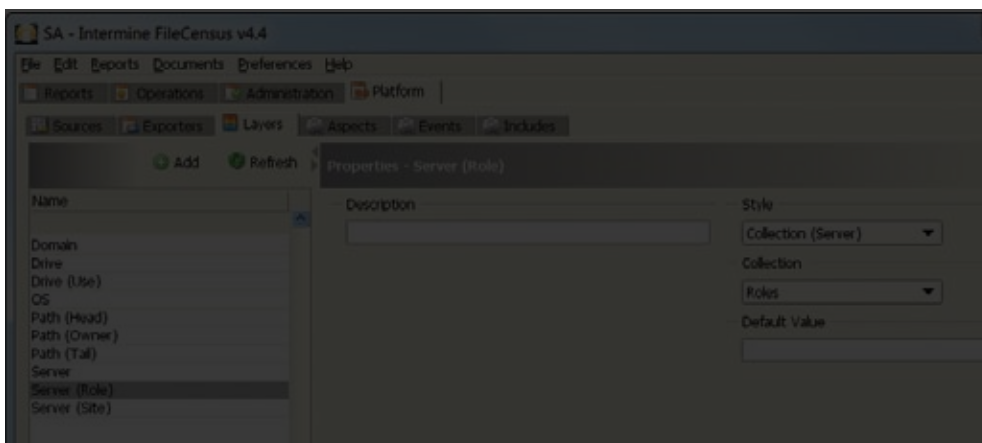
[Chapter 65_Screenshot_A: Aspects, Scope Conditions]

6) "Site Scope Variables" – controls Scope access (for Scopes set to a Style of "Variable")



[Chapter 66_Screenshot_A: Aspects, Site Scope Variables]

7) "Site User Groups" – allows the user to write Lua code that enrolls a user into a User Group

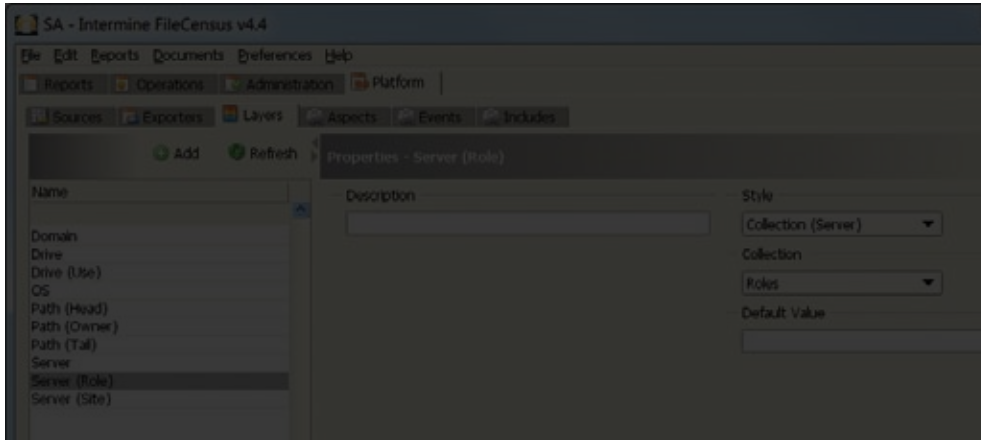


[Chapter 67_Screenshot_A: Aspects, Site User Groups]

2.6.2.4.5. Events

The Events sub-tab provides similar functionality to that of the Aspects sub-tab. It allows users to write code against FileCensus APIs via regular expressions. The differences are:

- 1) Events are executed on a separate thread than that of the API call made by Aspects
(Events are asynchronously fired, unlike Aspects)
- 2) Events use the "System" FileCensus account rather than that of the logged-in user (used by Aspects)
- 3) Events do not return any value(s) nor do they affect API behavior
- 4) Events do not use "Before," "During" or "After" functions like Aspects do; instead, one function called "Process" is used



[Chapter 68_Screenshot_A: Events]

The Events sub-tab is divided into two (2) areas: a left-hand sidebar that lists all the available Events and a main area that allows the user to modify a selected Event's characteristics. The following are the characteristics the user can modify for each Event:

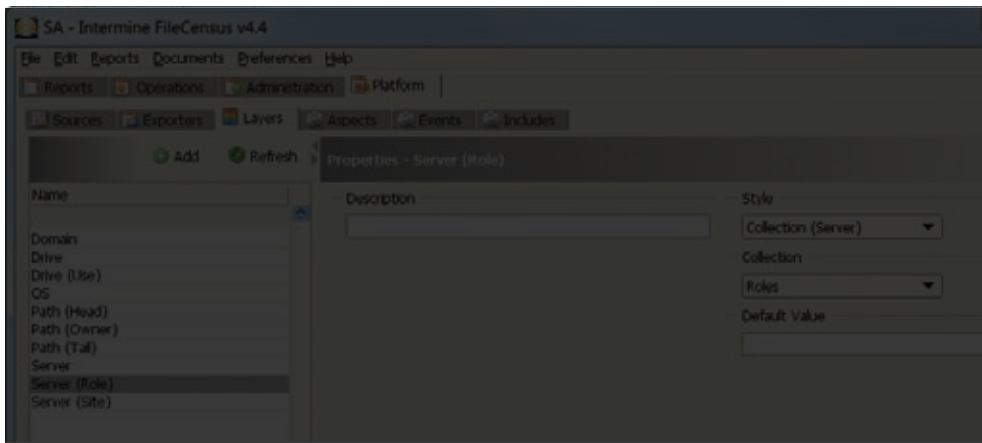
- 1) "Description" – a description for the Event
- 2) "Options" – an "Enabled" checkbox controls whether or not the selected Event is enabled for use
- 3) "Method" – the FileCensus API to which the Event is bound
- 4) "Script" – Lua code (either standard or customized) that performs the selected Event when triggered by the API call:
 - a. Standard FileCensus Event code appears in the format "@Events/[Event Name].lua" and produces default Event logic
 - b. Custom Event code can be written in Lua within the Script field (a combination of commenting out the standard code with "--" and writing the custom Lua code underneath it)

Here are the available FileCensus Events:

- 1) "Process Notifications" – processes and clears any Notifications that may have been scheduled since the last time this Event was triggered
- 2) "Start Month" – triggered automatically during the first ten (10) minutes of the first day of every month (no default behavior defined)
- 3) "Start Server" – triggered automatically when a FileCensus server is started or restarted (no default behavior defined)
- 4) "Start Week" – triggered automatically during the first ten (10) minutes of every Sunday, although the day of the week that this Event is triggered can be configured under Chime Schedules > Settings (no default behavior defined)
- 5) "Start Workday" – triggered automatically between 8:00am and 8:10am local server-time every working day (Monday through Friday), although the time of day that this Event is triggered can be configured under Chime Schedules > Settings (no default behavior defined)
- 6) "Update Catalogs" – performs *.fsi file maintenance within a Catalog's Libraries; triggered automatically at 5:30am local server-time every day, although the time of day that this Event is triggered can be configured under Chime Schedules > Settings
- 7) "Update Libraries" – triggered automatically at 6:30am local server-time every working day (Monday through Friday), although the time of day that this Event is triggered can be configured under Chime Schedules > Settings (no default behavior defined)

2.6.2.4.6. Includes

The Includes sub-tab allows users to store Lua code that is used or referred to in multiple places throughout their FileCensus instance, so that the common code only has to be written once no matter how many times it is "included" as part of other Lua code elsewhere.



[Chapter 69_Screenshot_A: Includes]

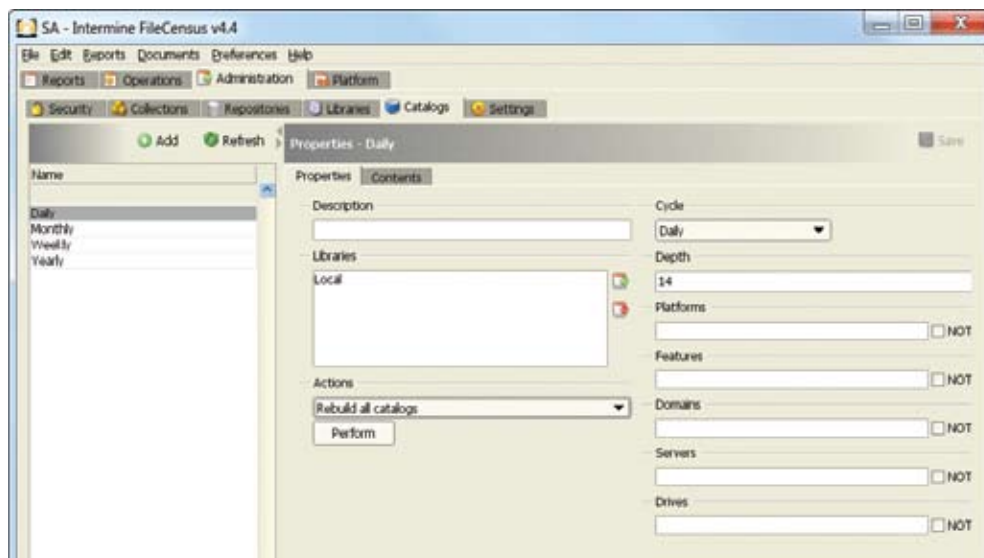
To use an Include, the user can simply call the built-in Include function from within other custom Lua code, using the name of the Include.

3. Reporting

3.1. Rebuilding Catalogs

After an Agent completes its scan of one or more server drives and transfers the .fsi file to the server, the user's next logical step is to run reports depicting the scan results. In many organizations that use FileCensus, especially those with multiple locations in many different time zones around the world, the server on which the Agent is stored may be halfway around the globe from the server that is the subject of the reports about to be run. While a report is being run in one geographic location, the Agent (from another location) may be collecting data affecting the report. To mitigate this risk of report data inconsistency, the user must first rebuild the FileCensus Catalogs before running reports. To do this:

1) In the FileCensus Console, click on the Administration tab, and then click on the Catalogs sub-tab.



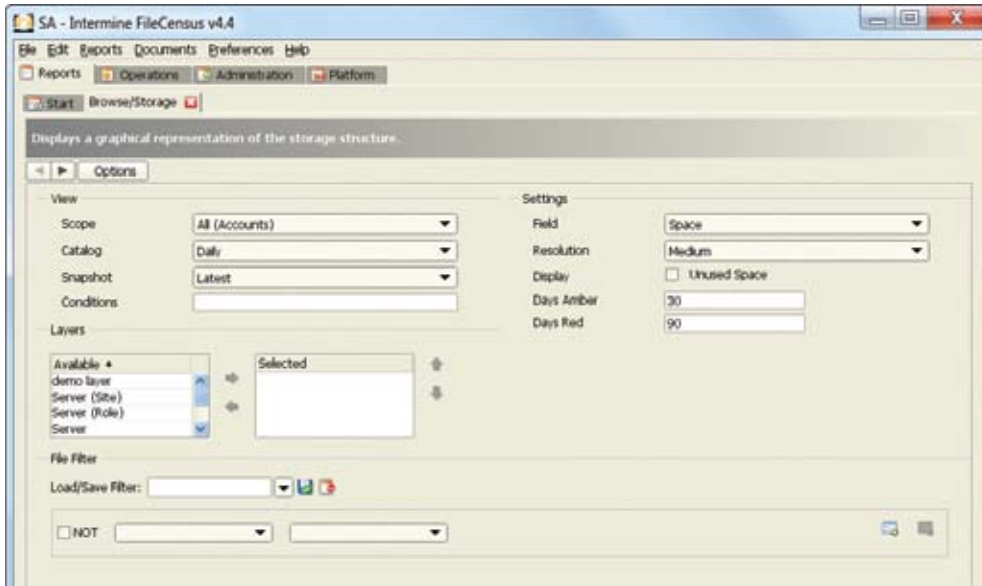
2) On the Properties sub-tab under Catalogs, select "Rebuild all catalogs" in the Actions field and click the "Perform" button. The Catalogs will rebuild and once this is completed, the user can run reports.

3.2. Report Input Criteria ("Options")

Report Options window allow the user to specify certain parameters, or input criteria, for a report before running it. A report's options vary according to the report being generated and are categorized in four (4) ways: View, Settings, Layers and File Filters.

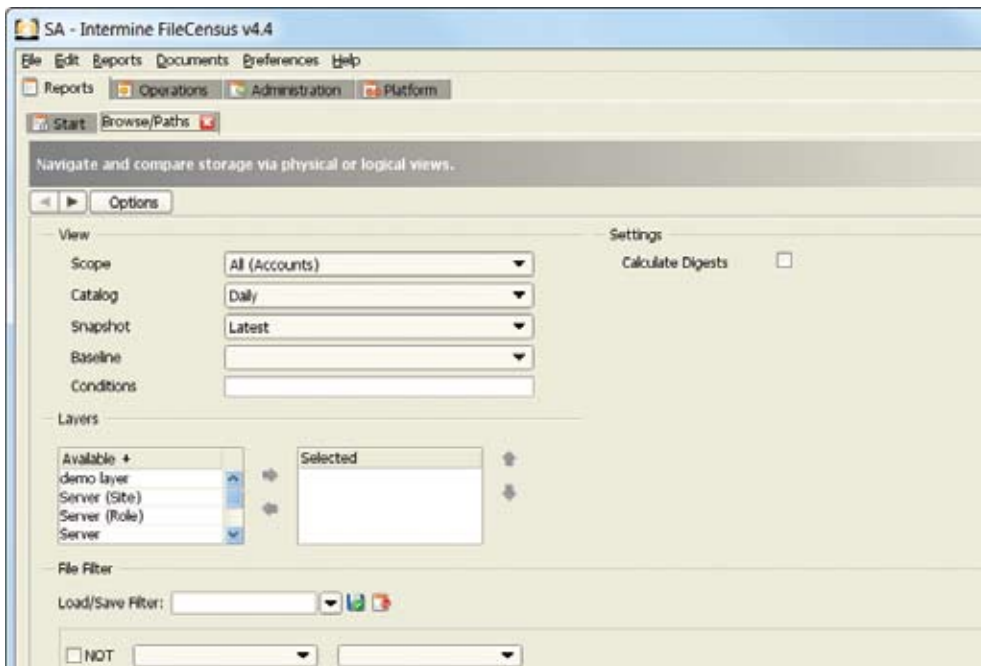
3.2.1. View

The View input criterion allows the user to specify certain parameters for a report before running it.



These parameters are:

1) Scope defines the set of all server/drive/directory file paths located within an organization's file storage network to be included in the report. There are several Scope values from which to choose under View, and they are all configured and defined on the Administration tab (Security sub-tab) of the Console. Users can and will create scopes to meet their specific requirements. FileCensus has a number of standard scopes configured as part of the initial installation.



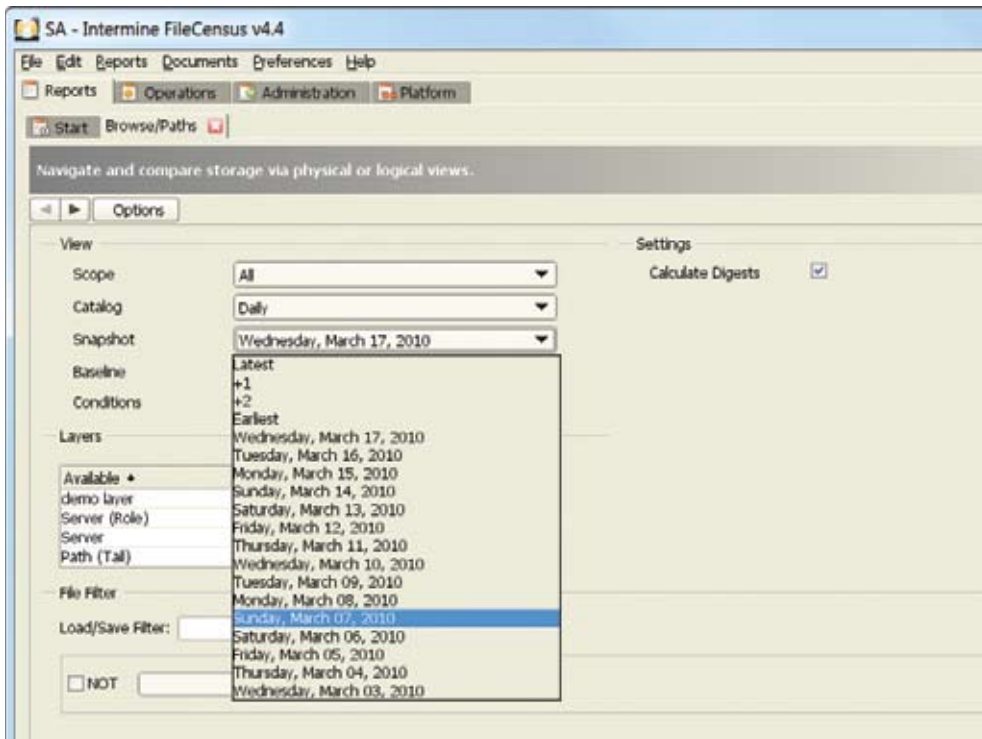
The available Scope values are:

- a. "All" – all drives and directories on the server
- b. "All (Accounts)"
- c. "All (Desktop)"
- d. "All (Music)"
- e. "All (My Documents)"
- f. "All (Profiles)"
- g. "All (Recycler)"
- h. "All (Temporary)" – all drives and directories on the server whose paths contain "temp," "tmp" or "temporary" (case insensitive)

2) Catalog defines the set of file system metadata (Libraries and *.fsi files) to be used by the report. There are several Catalog values from which to choose, and they are all configured and defined on the Administration tab (Catalogs sub-tab) of the Console. The Catalog values are:

- a. "Daily"
- b. "Monthly"
- c. "Weekly"
- d. "Yearly"

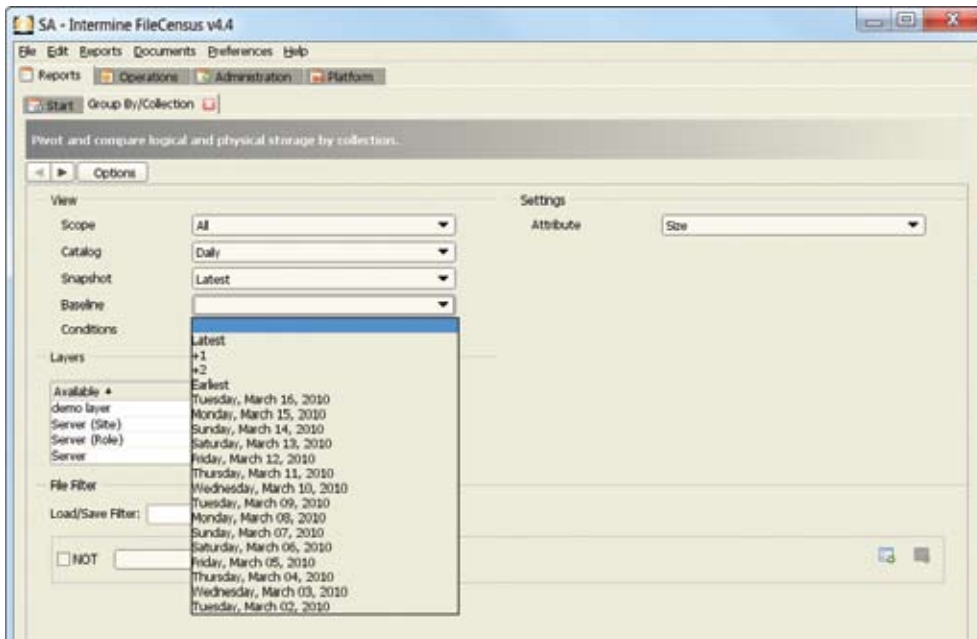
3) Snapshot defines the point in time (a specific date-time stamp) as of when the data to be used by the report was captured by FileCensus Agent scanning. For example, a "1/31/2010" snapshot yields report results valid as of 1/31/2010 (but not before or after that date).



The Snapshot values are:

- a. "Latest" – the most recent Snapshot
- b. "Earliest" – the least recent Snapshot
- c. [DATE-TIME1] through [DATE-TIME15] – 15 individual Snapshots most recently taken

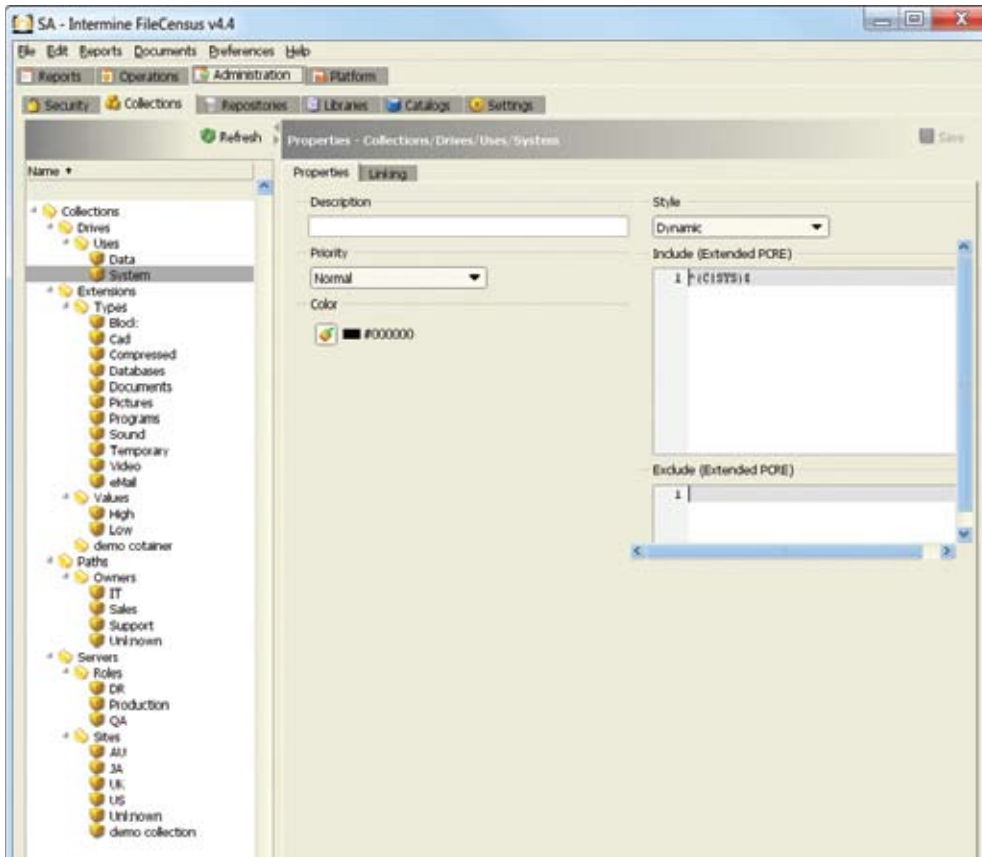
4) Baseline defines a previous point in time that can be used in a comparison with the selected Snapshot. By selecting a Baseline when running a report, the user can see data storage-related changes that have taken place between the Baseline and Snapshot points in time.



The Baseline values are:

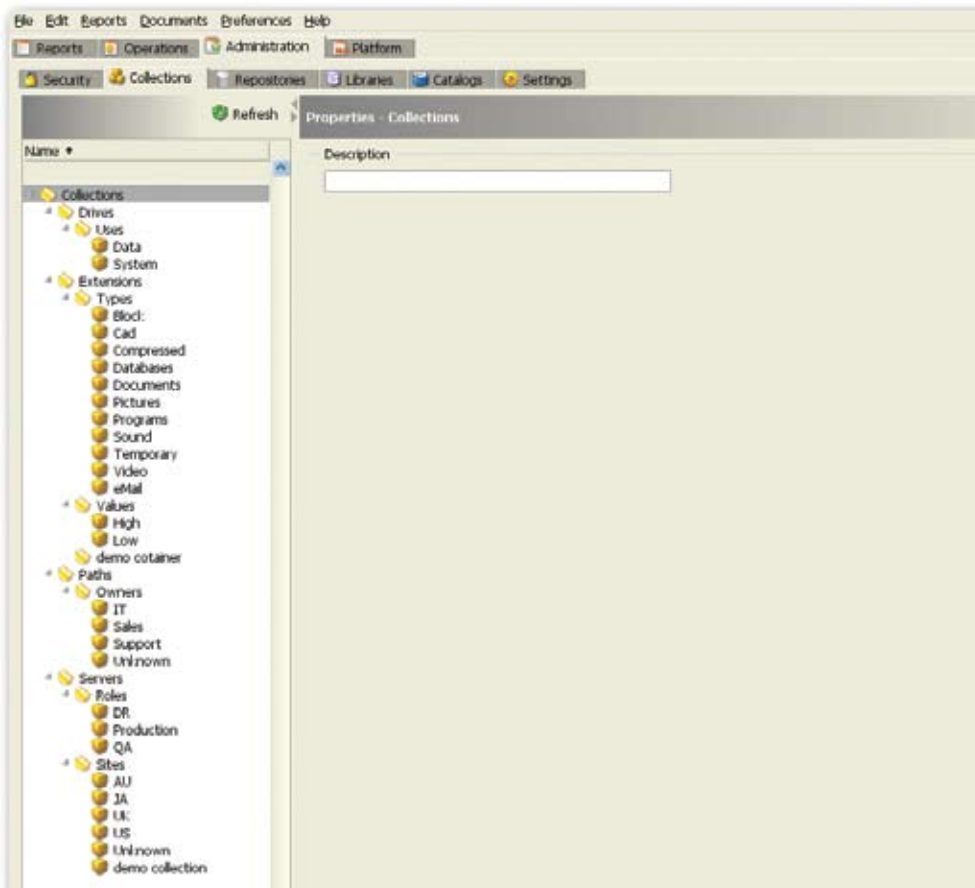
- a. "Latest" – the most recent Baseline taken
- b. "+1" – one (1) Baseline earlier than "Latest"
- c. "+2" – two (2) Baselines earlier than "Latest"
- d. "Earliest" – the least recent Baseline taken
- e. [SPECIFIC DATE]

5) Conditions define custom search criteria based on text the user types into the field. It is additional filtering the user can apply to a given report's results along with the other View input criteria.



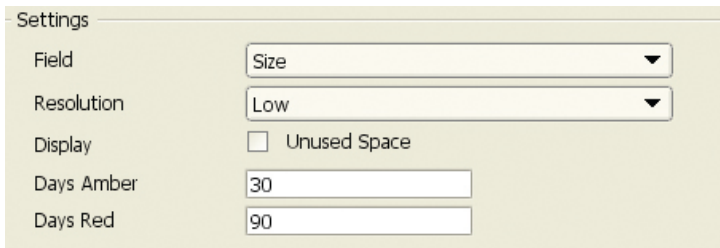
The Conditions syntax is:

- a. Entity (optional)
 - i. "s" for server
 - ii. "d" for drive
 - iii. "f" for file
- b. "~" for regular expression
- c. Entity Name – type in a string of characters representing all or a portion of the server name, drive name, file name



3.2.2. Settings

The Settings input criterion allows the user to specify unique parameters from report to report. Settings options are not present for every report, and they are different from one report to another depending on the type and characteristics of the report. See the individual reports in Section 5.3 below for instructions on different Settings input criteria where applicable.



3.2.3. Layers

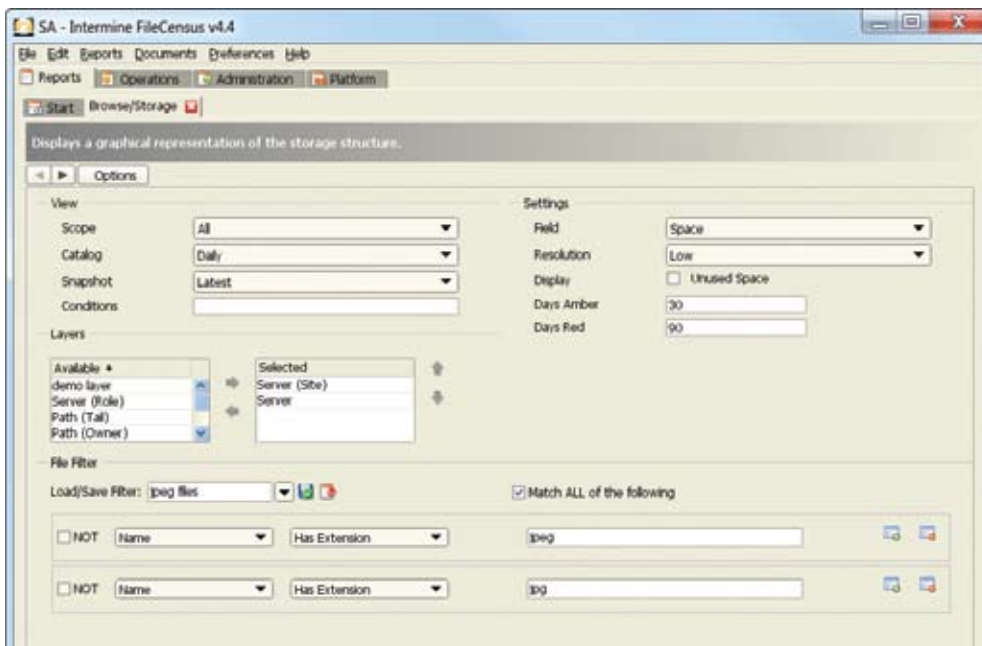
The Layers input criterion allows the user to group report results data into either standard or custom categorizations. Layers are created and/or configured on the Administration tab (Collections sub-tab) of the Console. The standard Layers

values are

- 1) "Server (Site)"
- 2) "Server (Role)"
- 3) "Server"
- 4) "Path (Tail)"
- 5) "Path (Owner)"
- 6) "Path (Head)"
- 7) "OS"
- 8) "Drive (Use)"
- 9) "Drive"
- 10) "Domain"

3.2.4. File Filter

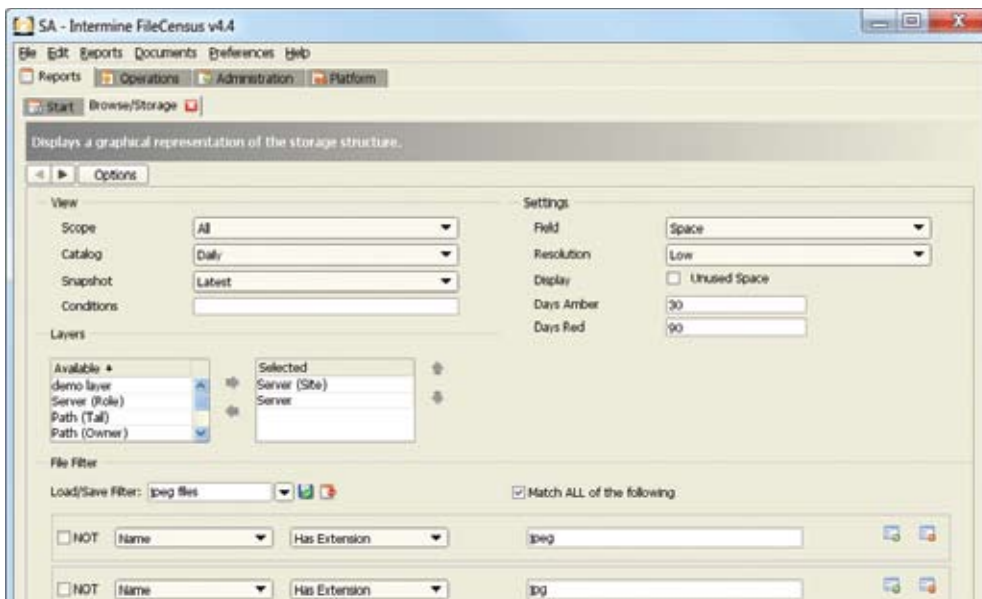
File Filter defines the way(s) in which the user chooses to further limit (filter) the report scope at the file level. It uses a combination of Boolean logic and text-based user input to perform the file filtering and produce results.



Create one or more File Filters for a report as follows:

- 1) Select the "NOT" checkbox to specify that certain files should not be included in the report results. Otherwise, leave the "NOT" checkbox unselected.
- 2) Choose one of the following file characteristics as the subject of the filter:
 - a. Accessed
 - b. Advanced
 - c. Attributes
 - d. Created
 - e. Modified
 - f. Name
 - g. Owner
 - h. Owner Type

- i. Path
 - j. Size
- 3) Choose one of the following Boolean expressions as the type of filter (not all expressions will be listed as the list is dependent upon the selected file characteristic):
- a. Contains
 - b. Equals
 - c. Has Extension
 - d. In Collection
 - e. Matches
 - f. Starts With
- 4) Enter the following information (depending on which file characteristic is chosen in Step 2 above):
- a. Attributes, Name, Owner or Path – enter text string
 - b. Accessed, Created or Modified – enter date
 - c. Advanced? -
 - d. Owner Type - dropdown menu
 - e. Size – number
- 5) Enter a name for the File Filter.
- 6) Click the “Save Filter Row” button (to the right of the Load/Save Filter row) to save the entered information for the filter.
- 7) Click the “Remove Filter Row” button (to the right of the “Load/Save Filter” button) to remove an already-saved row. If additional filter rows are added onscreen, selecting the “Match ALL of the following” checkbox forces the File Filter to meet all the conditions (exactly like the “AND” Boolean expression). Otherwise, leaving the “Match ALL of the following” checkbox unselected makes the File Filter conditions behave exactly like the “OR” Boolean expression.



- 8) Of note, users can also save a File Filter just created by clicking the “Save Filter” button (to the right of the Load/Save Filter field) after creating the filter. This saves the current File Filter for future use. Saved File Filters can be loaded by clicking the “down arrow” button to the right of the Load/Save Filter field and choosing the name of a previously-saved File Filter. This loads the filter row(s) on the screen for editing and inclusion in the report, or it can be removed by clicking the “Remove Filter” button to the right of the “Save Filter” button.

3.3. Report Viewers

3.3.1. Table

The Table report view presents report results in row-column format. When a report's results are shown in Table format, the following actions can be performed:

- 1) To sort the Table view by a specific column:
 - a. Click on the column header to sort the report results by that column's values
 - b. An arrow appears next to the column name indicating whether an ascendant (up arrow) or descendant (down arrow) sort has been applied to the column
 - c. Click on the column header again to shift from the ascendant to descendant sort (or vice versa)
- 2) To resize a column:
 - a. Hover the mouse (cursor) over the right-hand edge of the column header until the "Resize" icon appears
 - b. Click and drag the right-hand edge of the column header to resize the column (release the mouse when resized as desired)
- 3) To modify the columns that are visible in a given Table view:
 - a. Click on "Edit" in the FileCensus Console menu bar
 - b. Choose "Preferences"
 - c. Choose which columns to "Add/Remove"
 - d. Additionally, modify the column ordering from left to right using the "Move Up" and/or "Move Down" buttons
 - e. Use the "Make this configuration the default" checkbox to control whether or not the chosen column configuration is used every time the report is run
- 4) To filter the report results in a given Table view:
 - a. Type the filter string into the input field directly beneath the column header (if an invalid filter is typed, it is colored in red)
 - b. Previously-entered filter strings can be selected from a dropdown menu next to the input field
- 5) To restore default Table viewer settings:
 - a. Click on "Edit" in the FileCensus Console menu bar
 - b. Choose "Restore Defaults" to undo any changes made to the column configuration
- 6) To drill (or run another report using data contained in a row of a Table view) when in a Table view:
 - a. Double-click on any cell within a row to run the default report used for drilling (referred to as the "Default Drill") OR
 - b. Right-click on any cell within a row and choose a specific report to run from the context menu that appears
- 7) To save the results in a Table view:
 - a. Click on "File" in the FileCensus Console menu bar
 - b. Choose "Save As"
 - c. Save the report results in HTML or CSV file format

3.3.2. Tree Map

The Tree Map report view presents report results in a colored, two-dimensional graphical representation of file storage structures. Each sector displayed in a tree map view is drawn with a size relative to the amount of disk storage that sector represents. When a report's results are shown in Tree Map format, the following actions can be performed:

- 1) To drill (or get a more detailed view of a portion of a Tree Map) when in a Tree Map view:
 - a. Click on a sector of interest
 - b. Once done drilling, use the Navigator above the Tree Map view to return to the root view of the Tree Map
- 2) Right-click on any sector and choose a specific report to run from the context menu that appears

3.3.3. Pie Chart

The Pie Chart report view displays report results in one or more pie charts. When a report's results are shown in Pie Chart format, the following actions can be performed:

- 1) To save a Pie Chart view's contents to portable network graphic (PNG) format:
 - a. Click on "File" in the FileCensus Console menu bar
 - b. Choose "Save As" and save the Pie Chart view as a *.png file OR
 - c. Right-click anywhere on the Pie Chart view and choose "Save As" from the context menu that appears to save the Pie Chart view as a *.png file
- 2) To print a Pie Chart view's contents:
 - a. Click on "File" in the FileCensus Console menu bar
 - b. Choose "Print" OR
 - c. Right-click anywhere on the Pie Chart view and choose "Print" from the context menu that appears

3.3.4. Bar Chart

The Bar Chart report view displays report results in a bar chart. In some cases, Bar Chart views are shown with two (2) range axes so that series that are measured on different scales can be shown on the same chart. When a report's results are shown in Bar Chart format, the following actions can be performed:

- 1) To render a "tooltip," or descriptive information about the Bar Chart, hover the mouse (cursor) over a bar in the chart (the tooltip contains the name of the series, the bar's label and the bar's value)
- 2) To zoom in or out on specific sectors of the Bar Chart:
 - a. Right-click anywhere on the Bar Chart view
 - b. Choose "Zoom In > Range Axis" or "Zoom Out > Range Axis" from the context menu that appears to zoom in or out, respectively OR
 - c. Click and drag on the specific section of interest
 - d. To revert back to the entire Bar Chart view, right-click on the Bar Chart view and choose "Auto Range > Range Axis" from the context menu that appears
- 3) To save a Bar Chart view's contents to portable network graphic (PNG) format:
 - a. Click on "File" in the FileCensus Console menu bar
 - b. Choose "Save As" and save the Bar Chart view as a *.png file OR
 - c. Right-click anywhere on the Bar Chart view and choose "Save As" from the context menu that appears to save the Bar Chart view as a *.png file
- 4) To print a Bar Chart view's contents:
 - a. Click on "File" in the FileCensus Console menu bar
 - b. Choose "Print" OR
 - c. Right-click anywhere on the Bar Chart view and choose "Print" from the context menu that appears

3.3.5. Time Series

The Time Series report view displays one or more series of data points that have time as the x-axis. A series is displayed as bars (histogram), lines or scatter points. When a report's results are shown in Time Series format, the following actions

can be performed:

- 1) To zoom in or out on specific sectors of the Time Series view:
 - a. Right-click anywhere on the Time Series view
 - b. Choose "Zoom In" or "Zoom Out" from the context menu that appears to zoom in or out, respectively OR
 - c. Click and drag on the specific section of interest
 - d. To revert back to the entire Bar Chart view, right-click on the Bar Chart view and choose "Auto Range > Domain Axis," (entire domain) "Auto Range > Range Axis" (entire range) or "Both Axes" (entire chart) from the context menu that appears
- 2) To save a Time Series view's contents to portable network graphic (PNG) format:
 - a. Click on "File" in the FileCensus Console menu bar
 - b. Choose "Save As" and save the Time Series view as a *.png file OR
 - c. Right-click anywhere on the Time Series view and choose "Save As" from the context menu that appears to save the Time Series view as a *.png file
- 3) To print a Time Series view's contents:
 - a. Click on "File" in the FileCensus Console menu bar
 - b. Choose "Print" OR
 - c. Right-click anywhere on the Time Series view and choose "Print" from the context menu that appears

3.3.6. About

The About report view displays summary information about the data used to generate report results. It lists the following:

- 1) Name of the report that was run
- 2) Selected report options including the chosen Scope, Catalog and History
- 3) Images used
- 4) JDBC script (a SQL query that can be used to obtain the report's raw result set using the JDBC Driver)
- 5) Web interface data (data required when configuring the FileCensus Web Interface to display a tab containing the report results)

To print an About view's contents:

- 1) Click on "File" in the FileCensus Console menu bar
- 2) Choose "Print"

3.4. Reports

3.4.1. Browse Reports

The Browse reports allow a user to view a Snapshot of a system's file storage and navigate within the Snapshot to view additional details.

3.4.1.1. Browse Paths

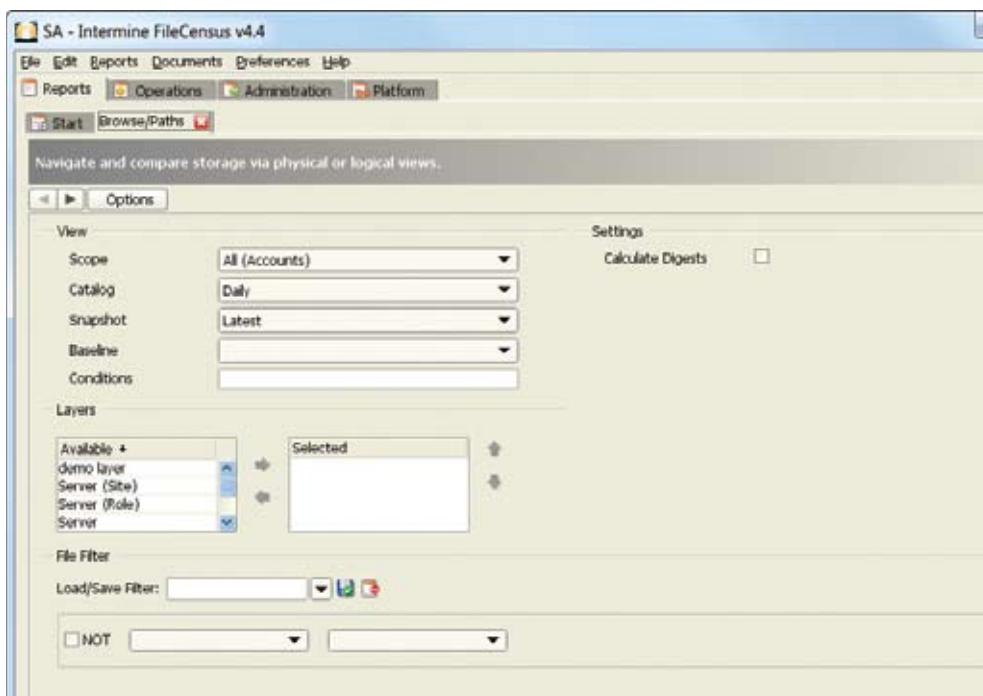
3.4.1.1.1. Purpose

The purpose of the Browse Paths report is to provide navigation through a snapshot of a server's file system (shown in LIST format) and learn about the location, size and number of files contained on the server at the time the snapshot was taken. Navigation through the report results is much like navigating through Microsoft Windows Explorer.

3.4.1.1.2. Running the Report

Click on the "Paths" link in the Browse section of the Reports (Start) tab. The Browse Paths screen appears. The following Input Criteria are available (from top to bottom, left to right):

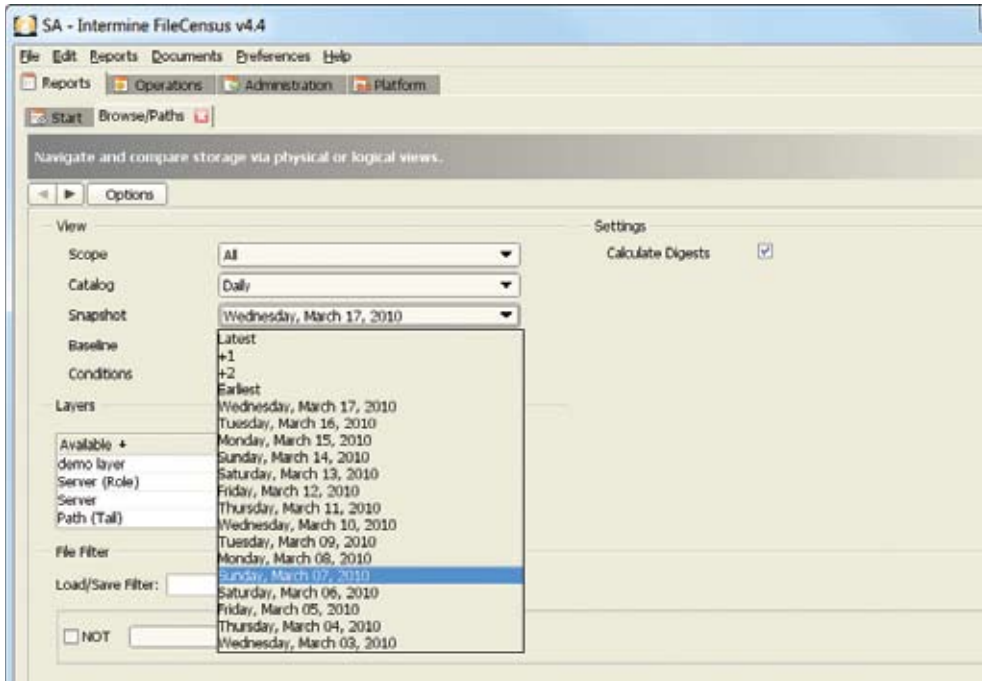
- 1) View
- 2) Settings
- 3) Layers
- 4) File Filter



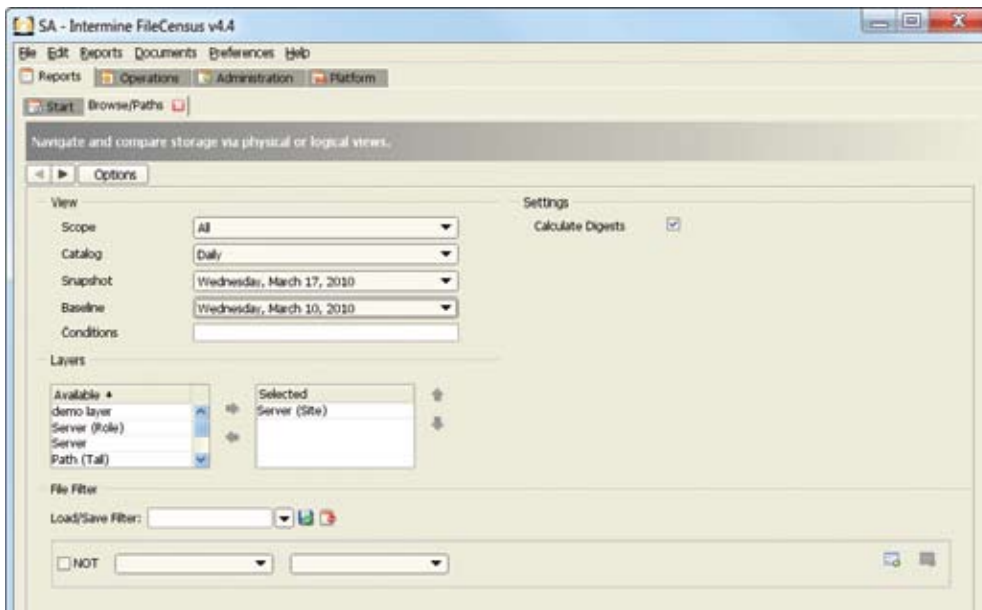
To run the report, here are the steps involved:

1) In the View section of the screen, as desired, choose or enter values for the following fields (see Section 5.2.1. above for a description of the "View" Input Criteria):

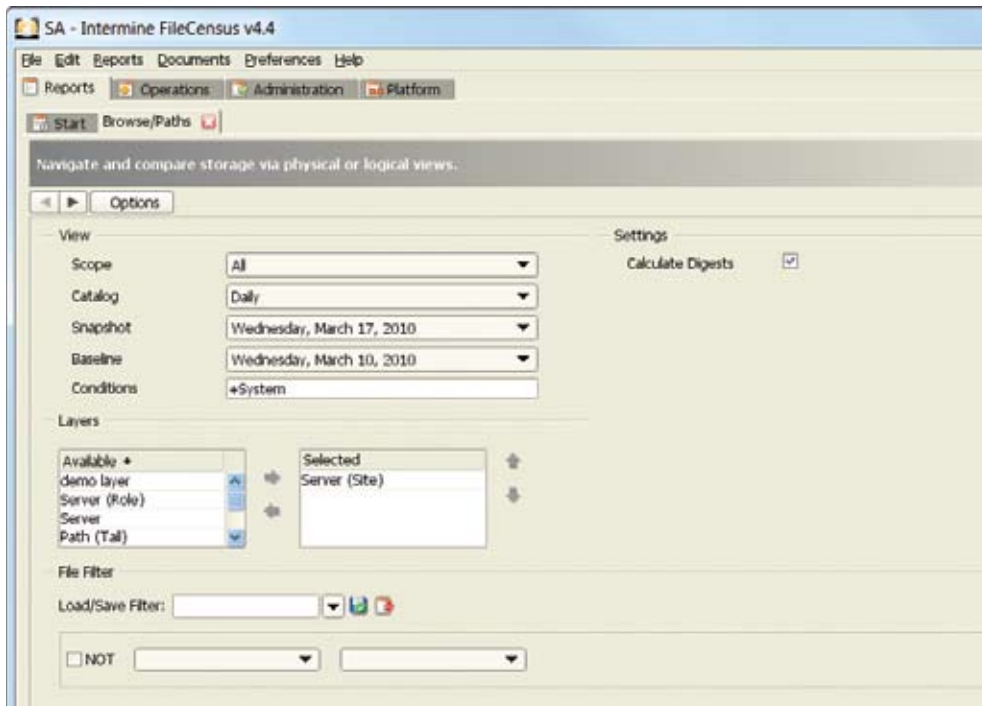
- a. Scope
- b. Catalog
- c. Snapshot



d. Baseline



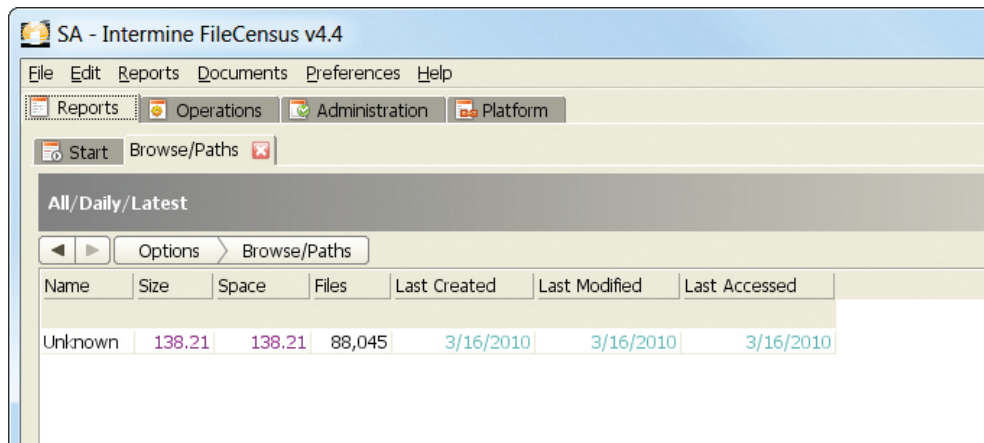
e. Conditions



- 2) In the Settings section of the screen, there is only one Setting available: "Calculate Digests." This setting calculates a digest (listing) of all the paths and files within the directory structure. The digest can be used to quickly determine if two (2) structures contain the same paths and files. The digest process requires significant additional disk space and processing and is therefore disabled by default. Care should be taken when enabling this setting in large storage networks so that digests are created only on the volumes of interest. The digest is the four (4) least-significant bytes of the "SHA1" hash.
- 3) In the Layers section of the screen, as desired (see Section 5.2.3. above for a description of the "Layers" Input Criteria):
 - a. Click on one or more Layers in the "Available" box.
 - b. Click the "right arrow" button to move the selected Layer(s) over to the "Selected" box (the Layer(s) will simultaneously disappear from the "Available" box). Conversely, click on one or more Layers in the "Selected" box and then click the "left arrow" button to move the selected Layer(s) over to the "Available" box (the Layer(s) will simultaneously disappear from the "Selected" box).
 - c. Use the "up arrow" and "down arrow" buttons to the right of the "Selected" box to prioritize the selected Layer(s).
- 4) In the File Filter section of the screen, as desired (see Section 5.2.4. above for a description of the "File Filter" Input Criteria):
 - a. Load a saved File Filter OR create a new File Filter using one or more rows (select or leave unselected the "Match ALL of the following" checkbox).
 - b. For each row in the filter, select or leave unselected the "NOT" checkbox to specify whether or not the condition described in the row should not be or needs to be met.
- 5) Click the "right arrow" button (in the upper left corner of the screen) to run the report (or click the "Next" button at the bottom right of the screen). The Browse Paths report results are displayed.

3.4.1.1.3. Report Results

Initially, the Browse Path report results are a single row of data in column format.



From left to right, the columns are shown as follows:

- 1) Name – the server name
- 2) Size – the total size (in byte denominations) of all files contained on the server
- 3) Space
- 4) Files – the total number of files contained on the server
- 5) Last Created – the last date a file on the server was created
- 6) Last Modified – the last date a file on the server was modified
- 7) Last Accessed – the last date a file on the server was opened

By double-clicking anywhere in the server data row, the user can navigate to a listing of the server's directories and associated file data. The same columns and data for the server's sub-directories are now shown. The list can be sorted by clicking on the column headers. The user can continue to double-click to view data down to the file level within the server's directory hierarchy.

Note the coloration of the Size, Space and all the date-based values in the report results. The colors represent ranges server/directory/file size (Size and Space) or age (Last Created, Last Modified and Last Accessed). These are configured on the Administration tab (Settings sub-tab) of the Console. See Section 3.3.2.3.6. above for instructions on configuring the coloration settings.

3.4.1.2. Browse Storage

3.4.1.2.1. Purpose

The purpose of the Browse Storage report is to provide navigation through a snapshot of a server's file system (shown in GRAPHICAL format) and learn about the location, size and number of files contained on the server at the time the snapshot was taken.

3.4.1.2.2. Running the Report

Click on the "Storage" link in the Browse section of the Reports (Start) tab. The Browse Storage screen appears. The following Input Criteria are available (from top to bottom, left to right):

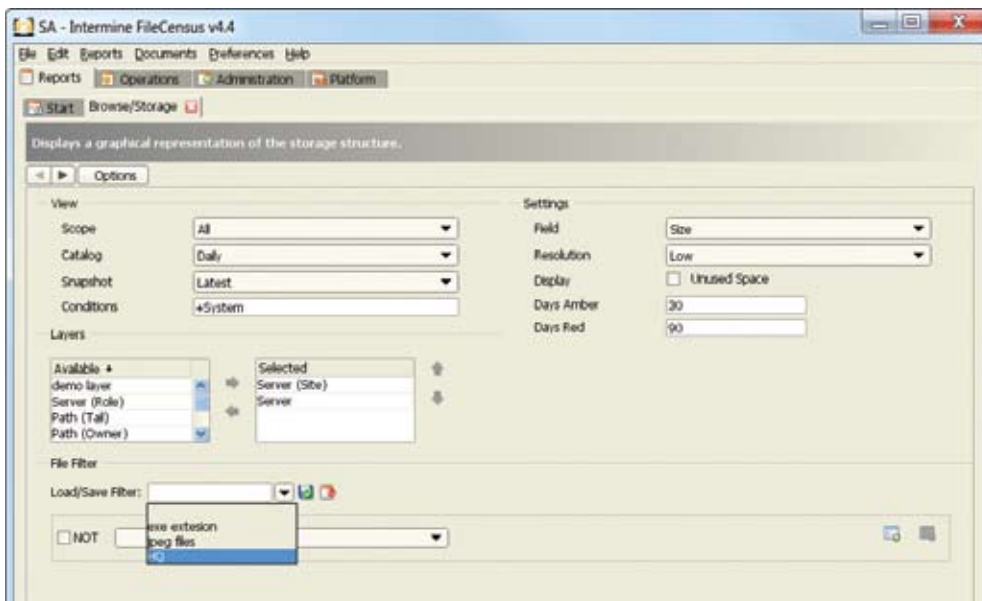
- 1) View
- 2) Settings
- 3) Layers
- 4) File Filter

To run the report, here are the steps involved:

- 2) In the Settings section of the screen, there are several Settings available:
 - a. Field – determines which report result data element is used when the report calculates the size of each file region; possible values are:
 - i. Space – the space (in bytes) that each file consumes on the disk
 - ii. Size – the size (in bytes) that each file consumes on the disk
 - iii. Files – the number of files in a folder determines the size of the folder region
 - b. Resolution – Low, Medium or High
 - c. Display (Unused Space) - If this checkbox is selected, then the report will draw a block representing the free space available on each block being displayed. Otherwise, no free space is represented in the report results.
 - d. Days Amber/Days Red – In the report results, the user can choose to color the blocks based on the represented directories'/files' Last Accessed (Date). A block's color is based on three categorizations:
 - i. Band 1 blocks are colored green (these are the directories/files accessed most recently).
 - ii. Band 2 blocks are colored yellow
 - iii. Band 3 blocks are colored red (these are the directories/files accessed least recently).

In the Days Amber field, enter the number of days that should be the upper limit of Band 1. In the Days Red field, enter the number of days that should be the upper limit of Band 2.

- 3) In the Layers section of the screen, as desired (see Section 5.2.3. above for a description of the “Layers” Input Criteria):
 - a. Click on one or more Layers in the “Available” box.
 - b. Click the “right arrow” button to move the selected Layer(s) over to the “Selected” box (the Layer(s) will simultaneously disappear from the “Available” box). Conversely, click on one or more Layers in the “Selected” box and then click the “left arrow” button to move the selected Layer(s) over to the “Available” box (the Layer(s) will simultaneously disappear from the “Selected” box).
 - c. Use the “up arrow” and “down arrow” buttons to the right of the “Selected” box to prioritize the selected Layer(s).
- 4) In the File Filter section of the screen, as desired (see Section 5.2.4. above for a description of the “File Filter” Input Criteria):
 - a. Load a saved File Filter OR create a new File Filter using one or more rows (select or leave unselected the “Match ALL of the following” checkbox).
 - b. For each row in the filter, select or leave unselected the “NOT” checkbox to specify whether or not the condition described in the row should not be or needs to be met.



- 5) Click the “right arrow” button (in the upper left corner of the screen) to run the report. The Browse Storage report results are displayed.

3.4.1.2.3. Report Results

The Browse Storage report results are shown as a tree map – a two-dimensional graphical representation of the directories and files in the system at the time of the Snapshot.

Note the “Color by” dropdown menu field at the top right of the report results. The user can choose to color the results by path depth (how “deep” the directory/file is compared to root), file type (i.e. documents, pictures, programs, etc.), Age Steps, Age Bands or Age Gradient .

Right-click on a block in the report results. The Context menu appears and the following choices are available:

- 1) Resolve – after right-clicking on a block of “unresolved space” (directories/files that the report was unable to analyze due to depth or lack of information), choose this option to try to resolve the space
- 2) Open in explorer – opens Microsoft Windows Explorer window at the selected directory (or the parent directory if the block selected is a file); this option works only when the server hosting the FileCensus Console has access to the selected directory or parent directory
- 3) File details – after right-clicking on a file block, choose this option to display its details
- 4) Browse path – displays a Browse Paths report view for the selected directory (or the parent directory if the block selected is a file)

3.4.2. Forecast Reports

The Forecast reports are predictive reports designed to show anticipated future system storage growth based on past and current trends.

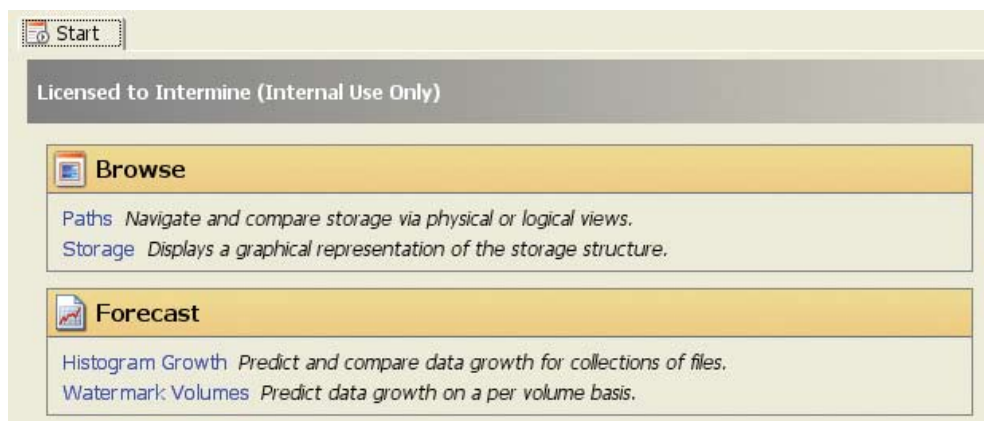
3.4.2.1. Forecast Histogram Growth

3.4.2.1.1. Purpose

The purpose of the Forecast Histogram Growth report is to look up the historical rate at which files in a specific location have been created and saved, and predict future storage growth for that same location.

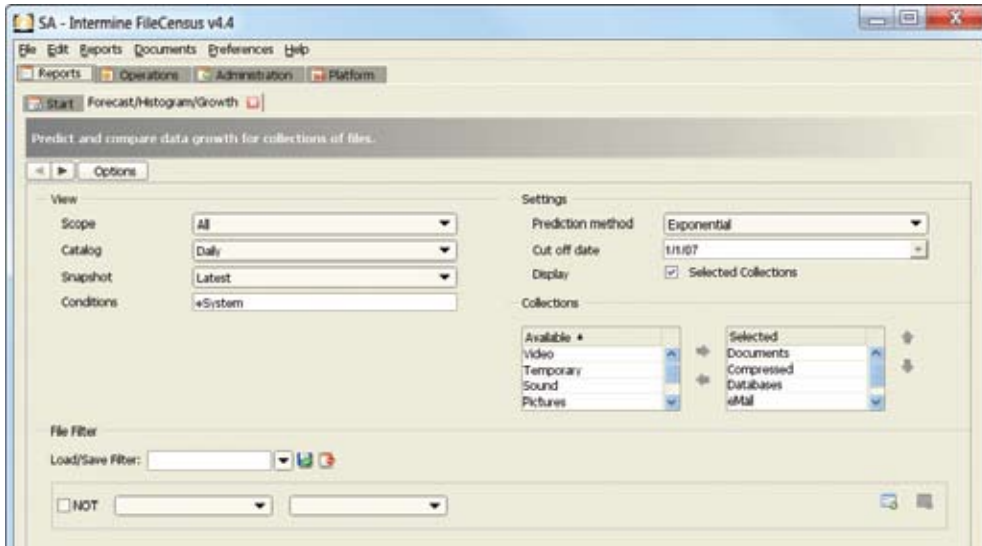
3.4.2.1.2. Running the Report

Click on the “Histogram Growth” link in the Forecast section of the Reports (Start) tab. The Forecast Histogram Growth screen appears.



The following Input Criteria are available (from top to bottom, left to right):

- 1) View
- 2) Settings
- 3) Collections
- 4) File Filter



To run the report, here are the steps involved:

- 1) In the View section of the screen, as desired, choose values for the following (see Section 5.2.1. above for a description of the “View” Input Criteria):
 - a. Scope
 - b. Catalog
 - c. Snapshot
 - d. Conditions
- 2) In the Settings section of the screen, there are several Settings available:
 - a. Prediction method – defines which algorithm (“Exponential” or “Linear”) to calculate and display the report results
 - b. Cut off date – the least recent date to use (as a starting point) in calculating and displaying the report results
 - c. Display (Selected Collections) - If this checkbox is selected, then the report will display not only the growth of “All Data,” but also the growth of Collections that are selected in Step 3 below. Otherwise, only “All Data” growth is shown.
- 3) In the Collections section of the screen, as desired:
 - a. Click on one or more Collections in the “Available” box.
 - b. Click the “right arrow” button to move the selected Collection(s) over to the “Selected” box (the Collection(s) will simultaneously disappear from the “Available” box). Conversely, click on one or more Collections in the “Selected” box and then click the “left arrow” button to move the selected Collection(s) over to the “Available” box (the Collection(s) will simultaneously disappear from the “Selected” box).
 - c. Use the “up arrow” and “down arrow” buttons to the right of the “Selected” box to prioritize the selected Collection(s).
- 4) In the File Filter section of the screen, as desired (see Section 5.2.4. above for a description of the “File Filter” Input Criteria):
 - a. Load a saved File Filter OR create a new File Filter using one or more rows (select or leave unselected the “Match ALL of the following” checkbox).
 - b. For each row in the filter, select or leave unselected the “NOT” checkbox to specify whether or not the condition described in the row should not be or needs to be met.
- 5) Click the “right arrow” button (in the upper left corner of the screen) to run the report. The Forecast Histogram Growth report results are displayed.

3.4.2.1.3. Report Results

The Forecast Histogram Growth report results are displayed as a bar chart. The Y-axis represents a total file size measurement and the X-axis displays historical, current and future dates as a function of time. So the report display is a comparison of file storage size over time (past, present and future). In addition to the bars, there are trend lines for "All Data" and any Collections that were selected and displayed. These trend lines attempt to predict future data growth based on past demonstrated growth and the current state of data.

[Chapter 52_Screenshot_C: Predicted Data Growth Chart] [predicted data growth chart.png]

3.4.2.2. Forecast Watermark Volumes

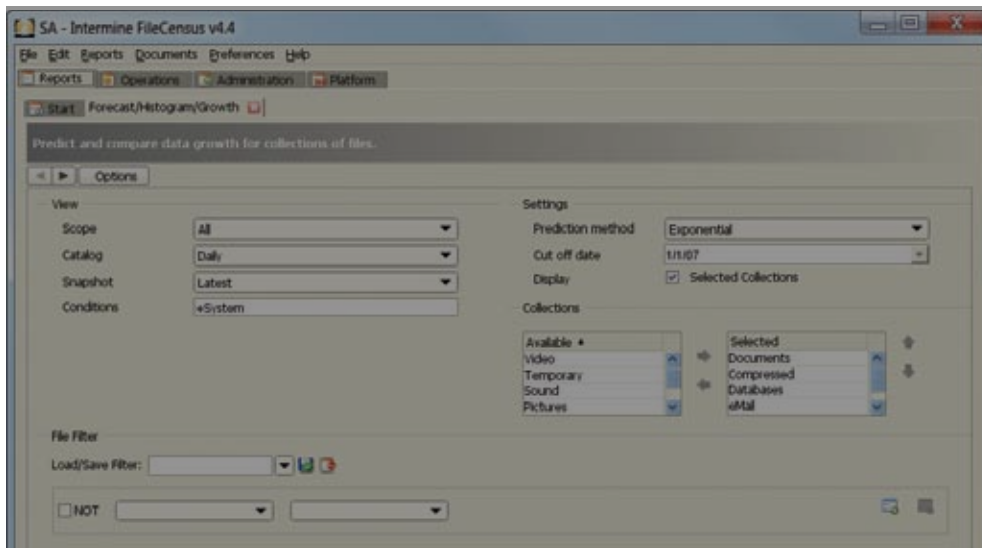
3.4.2.2.1. Purpose

The purpose of the Forecast Watermark Volumes report is to predict the growth of data on a per volume basis (within the selected Scope). It differs from the Forecast Histogram Growth report in that it uses multiple historical Snapshots to track the used space and total capacity of each volume over time. These Snapshots are then used to predict data growth in the future by calculating a linear trend line.

The Forecast Watermark Volumes report, as its name implies, samples the "high water mark" data as recorded by each historical Snapshot and attempts to predict when a volume's data will exceed its capacity based on a linear curve fit. Of note, because this report relies on actual historical data to make predictions, it will only yield sensible results if a reasonable number (at least two) historical data files exists in the Catalog to analyze. If there are only a few Snapshots for each volume, then the linear curve fitting becomes unreliable, and the report becomes less useful.

3.4.2.2.2. Running the Report

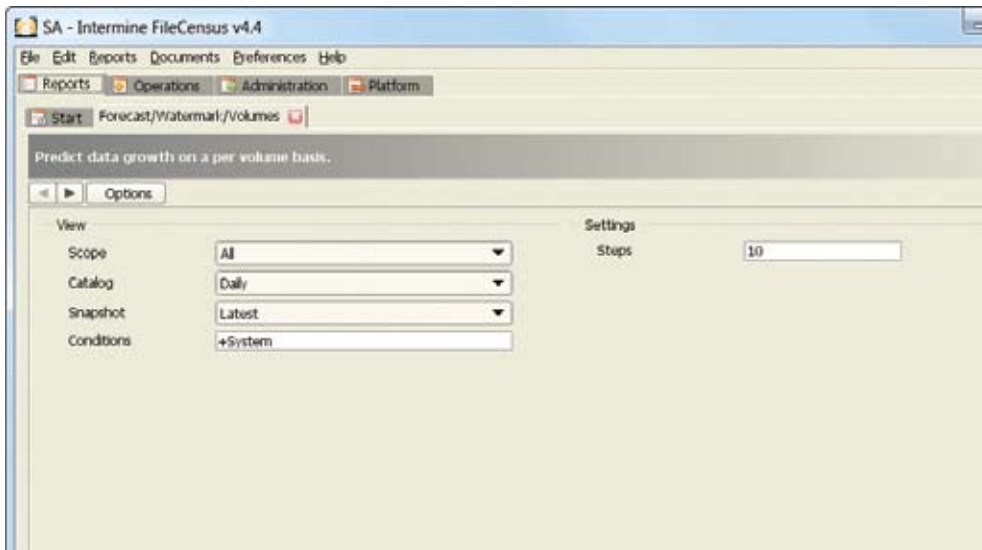
Click on the "Watermark Volumes" link in the Forecast section of the Reports (Start) tab. The Forecast Watermark Volumes screen appears.



[Chapter 53_Screenshot_A: Start, Zoom Forecast, Watermark Volumes] [start zoom forecast watermark volumes.png]

The following Input Criteria are available (from top to bottom, left to right):

- 1) View
- 2) Settings



To run the report, here are the steps involved:

- 1) In the View section of the screen, as desired, choose values for the following (see Section 5.2.1. above for a description of the “View” Input Criteria):
 - a. Scope
 - b. Catalog
 - c. Snapshot
 - d. Conditions
- 2) In the Settings section of the screen, there is only one Setting available: “Steps.” This setting allows the user to specify the maximum number of historical Snapshots the report should use for the analysis. Exactly how far back in time the report analyzes depends on the number entered for this setting plus the selected Catalog value. For example, if the “Monthly” Catalog is chosen, and “10” is specified as the “Steps” setting value, then only the last ten months’ worth of Snapshots are used as a basis for the report.
- 3) Click the “right arrow” button (in the upper left corner of the screen) to run the report. The Forecast Watermark Volumes report results are displayed.

3.4.2.2.3. Report Results

The Forecast Watermark Volumes report results are displayed as a table, one volume per row.

Path	Capacity	Used Space	Free Space	% Free	Date90	Days90	Date100	Days100	Fitness	Images	Prediction Points	Status
13PC/C/	465.76	134.77	300.98	71.06	7/29/2011	499	7/31/2011	501	0.00	8		4 Cycle

Data displayed (in column format from left to right) for each volume is as follows:

- 1) Path
- 2) Capacity
- 3) Used space
- 4) Free space (expressed as a percentage)
- 5) % free
- 6) Date upon which the report predicts the volume's data will reach 90% of capacity
- 7) Number of days remaining until the day the volume's data is predicted to reach 90% of capacity
- 8) Date upon which the report predicts the volume's data will reach 100% of capacity
- 9) Number of days remaining until the day the volume's data is predicted to reach 100% of capacity
- 10) Indication of the report's "fit wellness," or how well the prediction curve fits the observed data
- 11) Images
- 12) Prediction points
- 13) Status

By double-clicking on a volume (row) in the table, the user can view the actual Snapshots and prediction curve for that volume.

3.4.3. Group By Reports

The Group By reports are file-centric, analyzing, comparing and reporting on specific characteristics about files.

Group By

- Age* Groups the file population by created, modified and accessed dates.
- Collection* Pivot and compare logical and physical storage by collection.
- Date* Groups files into configurable bands based on ages.
- Extension* Analyse and compare all or selected files by their extension.
- Layer* Create pivot tables using layers to summarise path statistics.
- Owner* Group and compare storage using file ownership.
- Size* Groups the file population based on the current size bands.

3.4.3.1. Group By Age

3.4.3.1.1. Purpose

The purpose of the Group By Age report is to group and compare selected files by their age relative to the date of the last Agent scan.

3.4.3.1.2. Running the Report

Click on the "Age" link in the Group By section of the Reports (Start) tab. The Group By Age screen appears. The following Input Criteria are available (from top to bottom, left to right):

- 1) View
- 2) Settings
- 3) File Filter

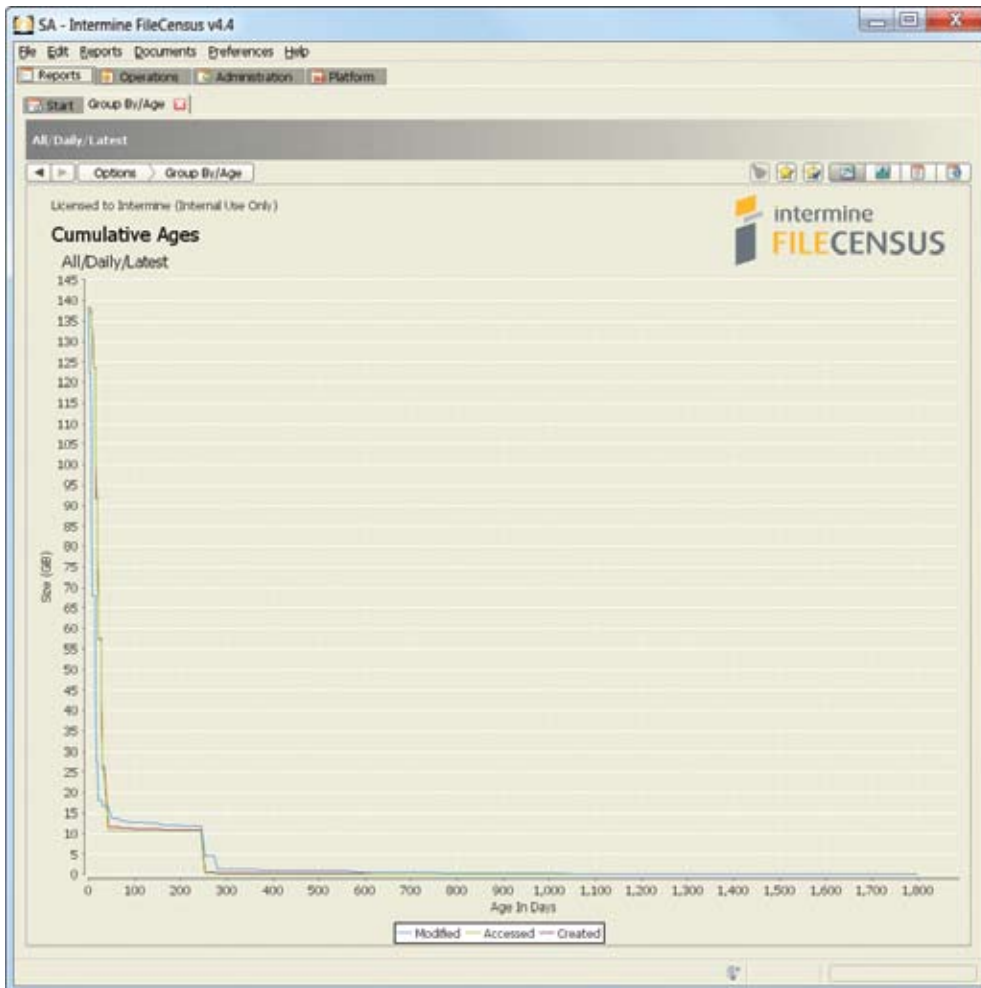
To run the report, here are the steps involved:

- 1) In the View section of the screen, as desired, choose values for the following (see Section 5.2.1. above for a description of the "View" Input Criteria):
 - a. Scope
 - b. Catalog
 - c. Snapshot
 - d. Conditions
- 2) In the Settings section of the screen, there is only one Setting available: "Attribute." This setting determines which file attribute is used to compare groups of files. It is a dropdown menu field with the following possible values:
 - a. Space – the space (in bytes) that the file group consumes on the disk
 - b. Size – the size (in bytes) that the file group consumes on the disk
 - c. Count – the number of files in a group
- 3) In the File Filter section of the screen, as desired (see Section 5.2.4. above for a description of the "File Filter" Input Criteria):
 - a. Load a saved File Filter OR create a new File Filter using one or more rows (select or leave unselected the "Match ALL of the following" checkbox).
 - b. For each row in the filter, select or leave unselected the "NOT" checkbox to specify whether or not the condition described in the row should not be or needs to be met.
- 4) Click the "right arrow" button (in the upper left corner of the screen) to run the report. The Group By Age report results are displayed.

3.4.3.1.3. Report Results

The Group By Age report results can be displayed in one of three different formats:

1) "Cumulative Ages" – a line chart that shows the cumulative size, space or count (depending on the user's selection in the "Attribute" Setting when running the report) of files for different file ages; because file age can be determined by Created Date, Modified Date or Accessed Date, all three date values are used and shown in the chart as separate lines



2) "Grouped Ages" – a bar chart showing the total size, space or count (depending on the user's selection in the "Attribute" Setting when running the report) of files for different file ages, as determined by Date Bands which are set up on the Administration tab (Settings sub-tab) of the Console (see Section 3.3.2.3.6. above for instructions on Date Bands); because file age can be determined by Created Date, Modified Date or Accessed Date, all three date values are used and shown in the chart as separate bars

3) "Tabulated Results" – a table is displayed with the following columns (and values for each row in the table, which depends on the Catalog selected when running the report):

- a. Age – count of days relative to when the files in the selected Scope were last scanned by the Agent; "0" is in the future, "1" is the scan date, "2" is the day before the scan date, etc.
- b. Created – total file size, space or count of files that were created on this day
- c. Accessed – total file size, space or count of files that were last accessed on this day
- d. Modified – total file size, space or count of files that were last modified on this day
- e. Band – Date Band to which the day belongs

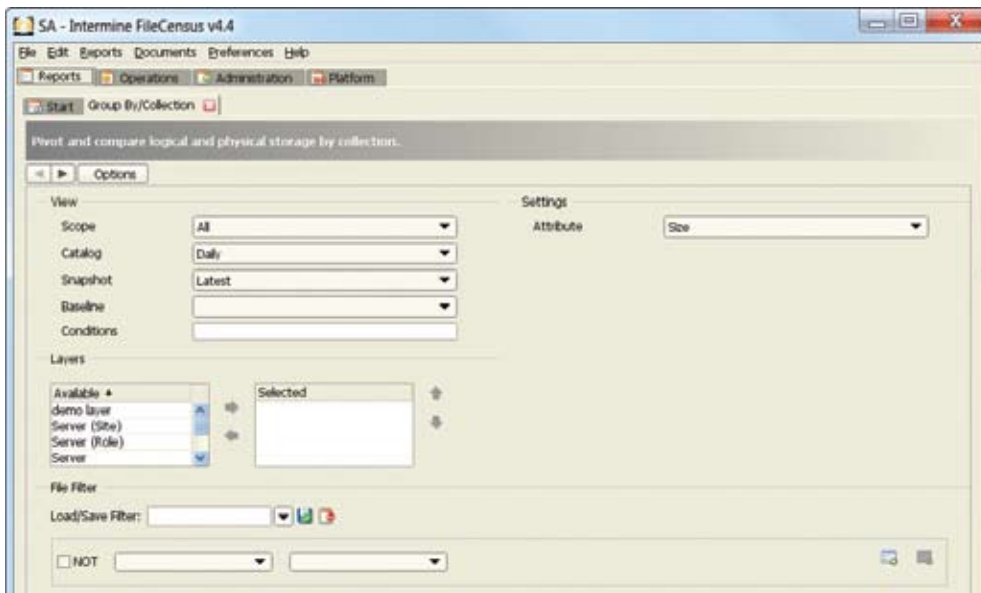
3.4.3.2. Group By Collection

3.4.3.2.1. Purpose

The purpose of the Group By Collection report is to group and compare selected files by their assigned Collections relative to the date of the last Agent scan.

3.4.3.2.2. Running the Report

Click on the "Collection" link in the Group By section of the Reports (Start) tab. The Group By Collection screen appears.

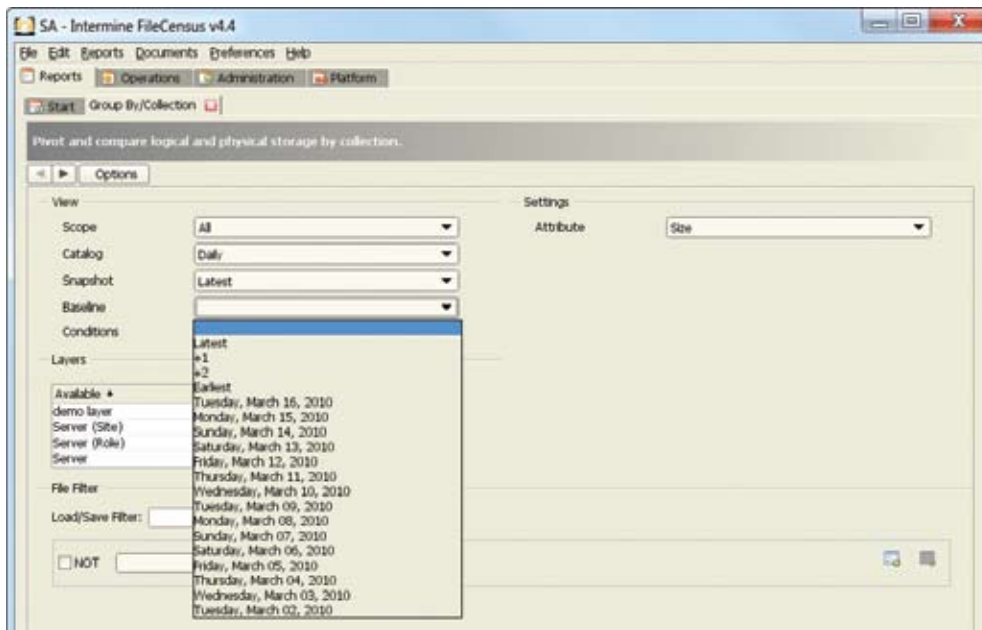


The following Input Criteria are available (from top to bottom, left to right):

- 1) View
- 2) Settings
- 3) Layers
- 4) File Filter

To run the report, here are the steps involved:

- 1) In the View section of the screen, as desired, choose values for the following (see Section 5.2.1. above for a description of the "View" Input Criteria):
 - a. Scope
 - b. Catalog
 - c. Snapshot
 - d. Baseline



e. Conditions

- 2) In the Settings section of the screen, there is only one Setting available: "Attribute." This setting determines which file attribute is used to compare groups of files. It is a dropdown menu dropdown menu field with the following possible values:
 - a. Space – the space (in bytes) that the file group consumes on the disk
 - b. Size – the size (in bytes) that the file group consumes on the disk
 - c. Count – the number of files in a group
- 3) In the Layers section of the screen, as desired (see Section 5.2.3. above for a description of the "Layers" Input Criteria):
 - a. Click on one or more Layers in the "Available" box.
 - b. Click the "right arrow" button to move the selected Layer(s) over to the "Selected" box (the Layer(s) will simultaneously disappear from the "Available" box). Conversely, click on one or more Layers in the "Selected" box and then click the "left arrow" button to move the selected Layer(s) over to the "Available" box (the Layer(s) will simultaneously disappear from the "Selected" box).
 - c. Use the "up arrow" and "down arrow" buttons to the right of the "Selected" box to prioritize the selected Layer(s).
- 4) In the File Filter section of the screen, as desired (see Section 5.2.4. above for a description of the "File Filter" Input Criteria):
 - a. Load a saved File Filter OR create a new File Filter using one or more rows (select or leave unselected the "Match ALL of the following" checkbox).
 - b. For each row in the filter, select or leave unselected the "NOT" checkbox to specify whether or not the condition described in the row should not be or needs to be met.
- 5) Click the "right arrow" button (in the upper left corner of the screen) to run the report. The Group By Collection report results are displayed.

3.4.3.2.3. Report Results

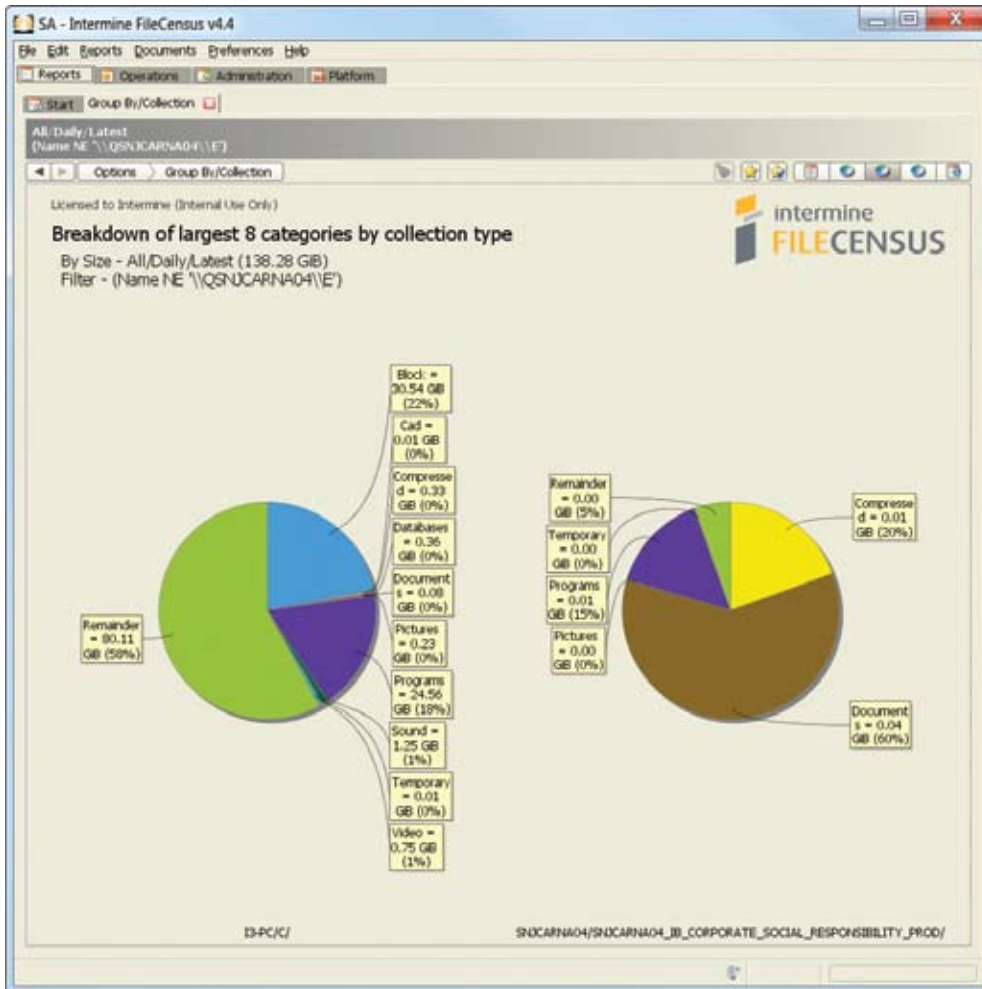
The Group By Collection report results can be displayed in several different formats:

- 1) "Tabulated Results" – a table is displayed with the following columns:
 - a. Name – path name
 - b. One column per collection – for each Collection defined in the file system (Collections > Extensions > Types) there is a single column containing the size of all the files of that Collection type
 - c. Remainder – size of all data that does not fall within any of the Collection types
 - d. Total – total amount of used space on the volume

Name	Block	Cad	Compressed	Databases	Documents	eMail	Pictures	Programs	Sound	Temporary	Video	Remainder	Total
I3-PC/C/	30.54	0.01	0.33	0.36	0.08	0.23	24.56	1.25	0.01	0.75	80.11	138.21	
SNOCARNA04/SNOCAR	*	*	0.01	*	0.04	0.00	0.01	*	0.00	*	0.00	0.06	

Double-click on a value in the "Name" column to run a detailed report on the subject volume. Double-click on any of the other column values to run a detailed report on the Collection type of the subject volume. The Largest Files report is the default view shown.

- 2) Pie charts
 - a. "Breakdown by Collection Type" – compares the size of each Collection type
 - b. "Breakdown of Largest Categories by Collection Type" – shows a pie chart for each of the eight (8) largest categories, with each chart showing the file size of each Collection type



c. "Breakdown of Collection Types by Largest Categories" – shows a pie chart for each of the eight (8) largest Collections, with each chart showing the file size of each category

3.4.3.3. Group By Date

3.4.3.3.1. Purpose

The purpose of the Group By Date report is to group and compare selected files by their different milestone dates.

3.4.3.3.2. Running the Report

Click on the “Date” link in the Group By section of the Reports (Start) tab. The Group By Date screen appears. The following Input Criteria are available (from top to bottom, left to right):

- 1) View
- 2) Settings

To run the report, here are the steps involved:

- 1) In the View section of the screen, as desired, choose values for the following (see Section 5.2.1. above for a description of the “View” Input Criteria):
 - a. Scope
 - b. Catalog
 - c. Snapshot
 - d. Baseline
 - e. Conditions
- 2) In the Settings section of the screen, there is only one Setting available: “Attribute.” This setting determines which file attribute is used to compare groups of files. It is a dropdown menu field with the following possible values:
 - a. Space – the space (in bytes) that the file group consumes on the disk
 - b. Size – the size (in bytes) that the file group consumes on the disk
 - c. Count – the number of files in a group
- 3) Click the “right arrow” button (in the upper left corner of the screen) to run the report. The Group By Date report results are displayed.

3.4.3.3.3. Report Results

The Group By Date report results can be displayed in two (2) different formats:

- 1) “Tabulated Results” – a table is displayed with the following columns:
 - a. Band – date band used to group the report data
 - b. Created – total size or count (depending on Setting chosen) of files created within each date band
 - c. Accessed – total size or count (depending on Setting chosen) of files last accessed within each date band
 - d. Modified – total size or count (depending on Setting chosen) of files last modified within each date band
- 2) “Files by Age” – a bar chart showing the cumulative size or space (depending on Setting chosen) per date band

3.4.3.4. Group By Extension

3.4.3.4.1. Purpose

The purpose of the Group By Extension report is to group and compare selected files by their extensions.

3.4.3.4.2. Running the Report

Click on the “Extension” link in the Group By section of the Reports (Start) tab. The Group By Extension screen appears. The following Input Criteria are available (from top to bottom, left to right):

- 1) View
- 2) File Filter

To run the report, here are the steps involved:

- 1) In the View section of the screen, as desired, choose values for the following (see Section 5.2.1. above for a description of the "View" Input Criteria):
 - a. Scope
 - b. Catalog
 - c. Snapshot
 - d. Baseline
 - e. Conditions
- 2) In the File Filter section of the screen, as desired (see Section 5.2.4. above for a description of the "File Filter" Input Criteria):
 - a. Load a saved File Filter OR create a new File Filter using one or more rows (select or leave unselected the "Match ALL of the following" checkbox).
 - b. For each row in the filter, select or leave unselected the "NOT" checkbox to specify whether or not the condition described in the row should not be or needs to be met.
- 3) Click the "right arrow" button (in the upper left corner of the screen) to run the report. The Group By Extension report results are displayed.

3.4.3.4.3. Report Results

The Group By Extension report results can be displayed in several different formats:

- 1) "Tabulated Results" – a table is displayed as follows:
 - a. Size and file count of all files having the extension (if no Baseline was selected when running the report)
 - b. Difference in size and file count between Baseline and Snapshot (if a Baseline was selected when running the report)

Extension	Size	Count
.manifest	0.13	14,476
.dll	7.26	13,547
.mui	0.16	6,791
.png	0.06	4,474
.	4.53	3,748
.xml	0.08	2,976
.ppd	0.07	2,736
.exe	1.89	2,468
.inf	0.08	1,807
.ini	0.07	1,633
.cat	0.05	1,350
.gif	0.01	1,209
.man	0.00	1,184
.cdf-ms	0.00	1,137
.prf	0.05	1,125
.py	0.01	1,032
.sys	14.29	911
.html	0.00	884
.ppd	0.07	810
.txt	0.04	794
.jpe	0.13	749
.inf_joc	0.00	742
.class	0.00	723
.wav	0.03	649
.jar	0.44	629
.mof	0.02	623
.ttf	0.42	586
.js	0.02	576
.java	0.00	478
.nls	0.05	473
.dat	0.20	433
.ps1	0.00	427
.fon	0.01	384
.lnk	0.00	356
.css	0.00	338
.ott	0.01	327
.cur	0.00	316
.bmp	0.02	311
.rtf	0.01	302
.adms	0.01	297
.adml	0.00	297
.mum	0.00	291
	138.28	88,352

Double-click on a value in the table to run a detailed report using the set of files (all with the same extension) represented by the row. The Largest Files report is the default view shown.

2) Pie charts

a. "Top 25 Extensions (By Size)" – displayed as follows:

- i. Top 25 extensions by size (if no Baseline was selected when running the report)
- ii. Top 25 extensions by increase in size between Baseline and Snapshot (if a Baseline was selected when running the report)

b. "Top 25 Extensions (By Count)"

- i. Top 25 extensions by number of files (if no Baseline was selected when running the report)
- ii. Top 25 extensions by increase in number of files between Baseline and Snapshot (if a Baseline was selected when running the report)

c. "Top 25 Extensions (By Space)"

- i. Top 25 extensions by space on disk (if no Baseline was selected when running the report)
- ii. Top 25 extensions by increase in disk space between Baseline and Snapshot (if a Baseline was selected when running the report)

- 3) "Top 25 Extensions" – a bar chart displayed as follows:
 - a. Top 25 extensions by size, number of files and space on disk (if no Baseline was selected when running the report)
 - b. Top 25 extensions by increases in size, number of files and disk space between Baseline and Snapshot (if a Baseline was selected when running the report)

[Chapter 56_Screenshot_A: Group By / Extension Graph] [group by extension graph.png]

3.4.3.5. Group By Layer

3.4.3.5.1. Purpose

The purpose of the Group By Layer report is to group and compare selected files by their assigned Layers.

3.4.3.5.2. Running the Report

Click on the "Layer" link in the Group By section of the Reports (Start) tab. The Group By Layer screen appears.

[Chapter 57_Screenshot_A: Group By / Layer Report Help] [group by layer report help.png]

The following Input Criteria are available (from top to bottom, left to right):

- 1) View
- 2) Settings
- 3) Layers
- 4) File Filter

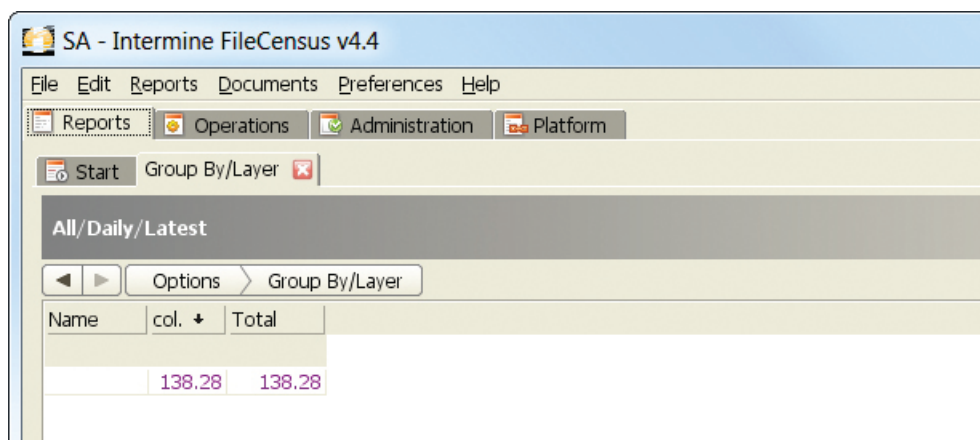
To run the report, here are the steps involved:

- 1) In the View section of the screen, as desired, choose values for the following (see Section 5.2.1. above for a description of the "View" Input Criteria):
 - a. Scope
 - b. Catalog
 - c. Snapshot
 - d. Baseline
 - e. Conditions
- 2) In the Settings section of the screen, there are two (2) Settings available:
 - a. "Attribute" - this setting is used in the pivot table calculations and determines which file attribute is used to compare groups of files. It is a dropdown menu field with the following possible values:
 - i. Space – the space (in bytes) that the file group consumes on the disk
 - ii. Size – the size (in bytes) that the file group consumes on the disk
 - iii. Files – the number of files in a group
 - b. "Operation" – the calculation to be used on the chosen Attribute, either:
 - i. Sum
 - ii. Min
 - iii. Max
 - iv. Ave

- 3) In the Layers section of the screen, as desired (see Section 5.2.3. above for a description of the “Layers” Input Criteria):
 - a. Click on one or more Layers in the “Available” box.
 - b. Click the “right arrow” button to move the selected Layer(s) over to the “Selected” box (the Layer(s) will simultaneously disappear from the “Available” box). Conversely, click on one or more Layers in the “Selected” box and then click the “left arrow” button to move the selected Layer(s) over to the “Available” box (the Layer(s) will simultaneously disappear from the “Selected” box).
 - c. Use the “up arrow” and “down arrow” buttons to the right of the “Selected” box to prioritize the selected Layer(s).
- 4) In the File Filter section of the screen, as desired (see Section 5.2.4. above for a description of the “File Filter” Input Criteria):
 - a. Load a saved File Filter OR create a new File Filter using one or more rows (select or leave unselected the “Match ALL of the following” checkbox).
 - b. For each row in the filter, select or leave unselected the “NOT” checkbox to specify whether or not the condition described in the row should not be or needs to be met.
- 5) Click the “right arrow” button (in the upper left corner of the screen) to run the report. The Group By Layer report results are displayed.

3.4.3.5.3. Report Results

The Group By Layer report results are displayed in a pivot table that allows comparison of all Layers with one another.



The rows in the pivot table represent instances of one Layer and the columns represent instances of another Layer. Each row-column intersection is the result of performing the calculation chosen in the “Operation” Setting against the chosen “Attribute” Setting for each file within both the row Layer and column Layer.

This report allows multi-dimensional pivot tables via double-clicking. When the user double-clicks on a Layer name, the Group By Layer report runs for that Layer. When the user double clicks on any other cell in the table, the Group By Layer report runs for the two Layers used to create that cell. In both of these situations, the subsequent results are organized as a pivot table of the next two Layers entered when running the report. If the user double-clicks multiple times in different areas of the pivot table, there will come a point where all the Layers entered when running the report have been used. When this occurs, the Browse Paths report is run, listing the top level paths of each volume in the current Scope that matches all of the Layers that were selected through double-clicking.

The screenshot shows the 'SA - Intermine FileCensus v4.4' application window. The interface includes a menu bar (File, Edit, Reports, Documents, Preferences, Help) and a toolbar with tabs for Reports, Operations, Administration, and Platform. The 'Reports' tab is active, and the 'Group By/Layer' report is selected. The main area displays a table with columns: Name, Size, Space, Files, Last Created, Last Modified, and Last Accessed. The table lists various system and application folders and files, such as \$AVG, \$Recycle.Bin, Boot, Documents and Settings, Intermine, NVIDIA, PerfLogs, Program Files, Program Files (x86), ProgramData, putty, Python31, Recovery, sqltebrowser_200_b1_win, System Volume Information, Users, Windows, Windows.old, Wtouch, xplorer_full, ~snapshot, and corporate_social_responsibility.

Name	Size	Space	Files	Last Created	Last Modified	Last Accessed
\$AVG	0.01	0.01	4	3/16/2010	3/16/2010	3/16/2010
\$Recycle.Bin	0.04	0.04	7	3/15/2010	3/15/2010	3/15/2010
Boot	0.01	0.01	35	2/10/2010	3/16/2010	3/15/2010
Documents and Settings	0.00	0.00	0			
Intermine	3.40	3.40	1,392	3/15/2010	3/15/2010	3/15/2010
NVIDIA	0.14	0.14	49	2/15/2010	1/17/2010	2/15/2010
PerfLogs	0.00	0.00	0			
Program Files	0.96	0.96	6,517	3/11/2010	3/16/2010	3/11/2010
Program Files (x86)	1.28	1.28	8,644	3/16/2010	3/16/2010	3/16/2010
ProgramData	0.30	0.30	2,877	3/16/2010	3/16/2010	3/16/2010
putty	0.00	0.00	10	2/26/2010	2/26/2010	2/26/2010
Python31	0.00	0.00	1	3/12/2010	3/12/2010	3/12/2010
Recovery	0.16	0.16	2	2/9/2010	7/14/2009	2/9/2010
sqltebrowser_200_b1_win	0.02	0.02	9	3/3/2010	12/10/2009	3/3/2010
System Volume Information	4.45	4.45	20	3/12/2010	3/16/2010	3/15/2010
Users	102.33	102.33	6,380	3/16/2010	3/16/2010	3/16/2010
Windows	11.11	11.11	62,063	3/16/2010	3/16/2010	3/16/2010
Windows.old	0.00	0.00	1	2/2/2010	2/2/2010	2/2/2010
Wtouch	0.00	0.00	3	12/23/2009	12/23/2009	12/23/2009
xplorer_full	0.00	0.00	2	3/4/2010	2/10/2010	3/4/2010
~snapshot	0.00	0.00	0			
corporate_social_responsibility	0.06	0.06	307	1/6/2010	3/10/2010	3/11/2010

Using the right-click context menu to drill on a layer name will run the selected report for all paths that match the selected layer.

Using the right-click context menu to drill on any other cell will run the selected report for all paths that match the two layers used to create that cell.

3.4.3.6. Group By Owner

3.4.3.6.1. Purpose

The purpose of the Group By Owner report is to group and compare selected files by their assigned owners.

3.4.3.6.2. Running the Report

Click on the "Owner" link in the Browse section of the Reports (Start) tab. The Group By Owner screen appears. The following Input Criteria are available (from top to bottom, left to right):

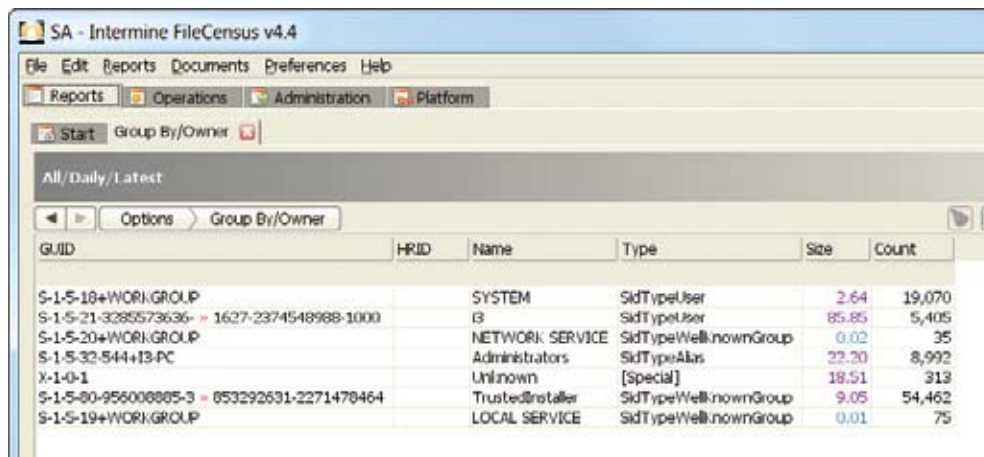
- 1) View
- 2) Filters

To run the report, here are the steps involved:

- 1) In the View section of the screen, as desired, choose values for the following (see Section 5.2.1. above for a description of the “View” Input Criteria):
 - a. Scope
 - b. Catalog
 - c. Snapshot
 - d. Baseline
 - e. Conditions
- 2) In the Filters section of the screen, unlike any of the other FileCensus reports, there are actually two (2) different filters, File Filter and User Filter. The additional User Filter supports filtering of file owner metadata. As desired (see Section 5.2.4. above for a description of the “File Filter” Input Criteria), for each filter type:
 - a. Load a saved File Filter OR create a new File Filter using one or more rows (select or leave unselected the “Match ALL of the following” checkbox).
 - b. For each row in the filter, select or leave unselected the “NOT” checkbox to specify whether or not the condition described in the row should not be or needs to be met.
- 3) Click the “right arrow” button (in the upper left corner of the screen) to run the report. The Group By Owner report results are displayed.

3.4.3.6.3. Report Results

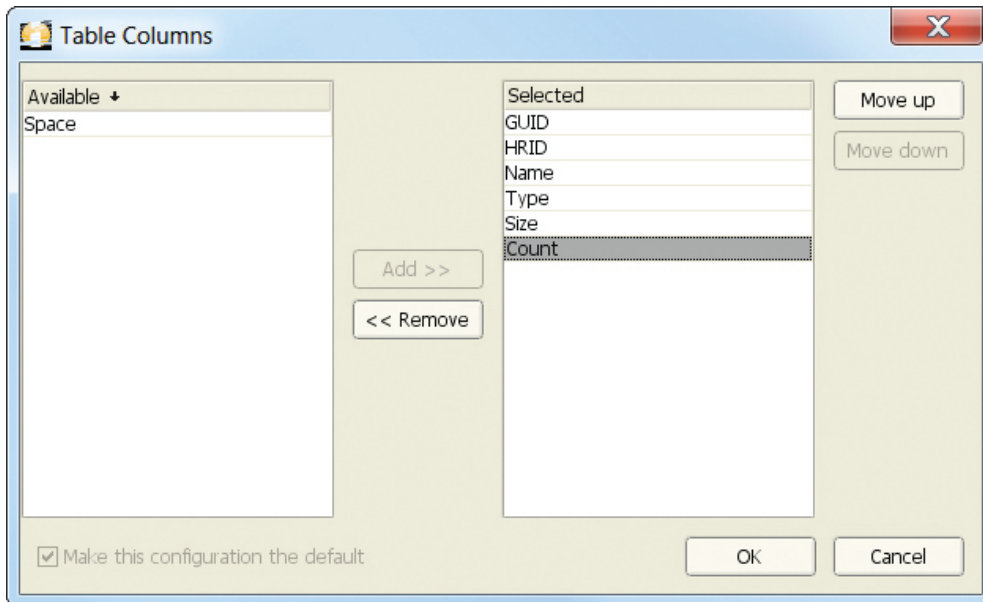
The Group By Owner report results can be displayed in two (2) different formats:



The screenshot shows the SA - Intermine FileCensus v4.4 application interface. The main window displays the 'Group By/Owner' report results in a tabular format. The table has columns for GUID, HRID, Name, Type, Size, and Count. The data is as follows:

GUID	HRID	Name	Type	Size	Count
S-1-5-18+WORKGROUP		SYSTEM	SidTypeUser	2.64	19,070
S-1-5-21-328573636-1627-2374548988-1000		IS	SidTypeUser	85.85	5,405
S-1-5-20+WORKGROUP		NETWORK SERVICE	SidTypeWellknownGroup	0.02	35
S-1-5-32-544+13-PC		Administrators	SidTypeAlias	22.20	8,992
X-1-0-1		Unknown	[Special]	18.51	313
S-1-5-80-956008805-3-853292631-2271478464		TrustedInstaller	SidTypeWellknownGroup	9.05	54,462
S-1-5-19+WORKGROUP		LOCAL SERVICE	SidTypeWellknownGroup	0.01	75

- 1) Tabular view – a table with the following columns:
 - a. Name – the login name of the user (although the values in the Name column are short-form login names (i.e. “User”), to filter the values of the name column the user must supply fully-qualified names (i.e. “Security/WinNT/Server/User”)
 - b. GUID – globally-unique user identifier
 - c. HRCN – Human Resources common name of the user
 - d. HRCX – Human Resources context of the user
 - e. HRID – Human Resources identifier of the user
 - f. Type – type of user account
 - g. Size – total amount of disk space currently consumed by the user’s files
 - h. Count – total number of files owned by the user



Double-click on any row in the table to view additional details about the user contained in that row (this is disabled if any User Filter was set when running the report). The Largest Files report is the default view.

2) Pie charts:

- a. "Top 25 Users by Size" – compares file ownership of the 25 users whose files take up the most disk space
- b. "Top 25 Users by Count" – compares file ownership of the 25 users who own the greatest number of files

3.4.3.7. Group By Size

3.4.3.7.1. Purpose

The purpose of the Group By Size report is to group and compare selected files by their sizes.

3.4.3.7.2. Running the Report

Click on the "Size" link in the Group By section of the Reports (Start) tab. The Group By Size screen appears. The following Input Criteria are available (from top to bottom, left to right):

- 1) View
- 2) File Filter

To run the report, here are the steps involved:

- 1) In the View section of the screen, as desired, choose values for the following (see Section 5.2.1. above for a description of the “View” Input Criteria):
 - a. Scope
 - b. Catalog
 - c. Snapshot
 - d. Conditions
- 2) In the File Filter section of the screen, as desired (see Section 5.2.4. above for a description of the “File Filter” Input Criteria):
 - a. Load a saved File Filter OR create a new File Filter using one or more rows (select or leave unselected the “Match ALL of the following” checkbox).
 - b. For each row in the filter, select or leave unselected the “NOT” checkbox to specify whether or not the condition described in the row should not be or needs to be met.
- 3) Click the “right arrow” button (in the upper left corner of the screen) to run the report. The Group By Size report results are displayed.

3.4.3.7.3. Report Results

The Group By Size report results are displayed in a table with the following columns:

- 1) Band – size band (from among those currently configured)
- 2) Size – total size of all files within the size band
- 3) Count – number of files within the size band

3.4.4. Largest Reports

The Largest reports find the largest of certain entities within a file system.

3.4.4.1. Largest Duplicates

3.4.4.1.1. Purpose

The purpose of the Largest Duplicates report is to find the largest duplicated files within the file system.

3.4.4.1.2. Running the Report

Click on the "Duplicates" link in the Largest section of the Reports (Start) tab. The Largest Duplicates screen appears.

Name	Size	Modified	Count	Required	Wasted	Cluster
mmincho.ttc	10057108	2009-06-11 06:43:49	2	0.01	0.01	93
mscorwks.dll	10059072	2009-06-11 06:39:59	2	0.01	0.01	14
Clip_1080_Ssec_VC1_15mbps.wmv	10069125	2009-06-11 07:09:49	2	0.01	0.01	111
NsData000a.dll	10240512	2009-07-14 11:16:06	3	0.01	0.02	6
smfang.ttf	10576012	2009-06-11 06:43:16	2	0.01	0.01	44
IMPNNM.DIC	10779504	2009-06-11 07:03:39	2	0.01	0.01	83
iefame.dll	10976768	2009-12-19 19:02:38	3	0.01	0.02	51
wmp.dll	11406396	2009-08-29 16:59:32	3	0.01	0.02	23
nviddmim.sys	11572512	2009-06-11 06:37:25	2	0.01	0.01	73
nvcompier.dll	11639400	2010-01-12 14:03:33	2	0.01	0.01	115
bdigRes.dll	11644928	2009-07-14 11:40:10	2	0.01	0.01	76
NsLexicons0001.dll	11722752	2009-07-14 11:08:28	3	0.01	0.02	39
smkal.ttf	11785184	2009-06-11 06:43:17	2	0.01	0.01	12
lonwbrlr.lex	11967524	2009-06-11 07:29:29	3	0.01	0.02	1
NsLexicons0007.dll	12038656	2009-07-14 11:08:30	3	0.01	0.02	69
wmploc.DLL	12625408	2009-08-29 16:54:52	3	0.01	0.02	71
shw32.dll	12868560	2009-07-14 11:16:14	3	0.01	0.02	60
quim.ttc	13524972	2009-06-11 06:43:52	2	0.01	0.01	2
Mahjong.dll	13713920	2009-07-14 11:28:46	2	0.01	0.01	20
msghbd.ttf	14512072	2009-06-11 06:43:24	2	0.01	0.01	91
msyhbd.ttf	14602860	2009-06-11 06:43:16	2	0.01	0.01	65
nvogl32.dll	14924392	2010-01-12 14:03:33	3	0.01	0.03	47
OmdBase.dll	14967808	2009-07-14 11:41:53	2	0.01	0.01	26
IMPST.DIC	15095656	2009-06-11 07:03:40	2	0.01	0.01	105
smsun.ttc	15323200	2009-06-11 06:43:18	2	0.01	0.01	68
smsunb.ttf	15406288	2009-06-11 06:43:19	2	0.01	0.01	17
SBEserver.exe	15697920	2009-07-14 11:39:35	2	0.01	0.01	3
IMTCS.IMD	15815555	2009-06-11 07:02:20	2	0.01	0.01	46
LWS64.msl	15893504	2009-10-15 06:50:48	2	0.01	0.01	118
batang.ttc	16264732	2009-06-11 06:43:51	2	0.02	0.02	27
Slape.msl	16803200	2010-02-15 14:24:05	2	0.02	0.02	95
NvCplSetupEngine.exe	18913528	2010-01-12 14:03:33	2	0.02	0.02	96
imageres.dll	20268032	2009-07-14 11:06:03	3	0.02	0.04	104
msjh.ttf	21663376	2009-06-11 06:43:24	2	0.02	0.02	37
msyh.ttf	21767952	2009-06-11 06:43:15	2	0.02	0.02	5
ehres.dll	22177792	2009-07-14 11:26:52	2	0.02	0.02	50
t1033.ngr	23407328	2009-06-11 07:52:10	2	0.02	0.02	64
l1033.ngr	25501860	2009-06-11 07:52:06	2	0.03	0.03	29
PurplePlace.dll	26665856	2009-07-14 11:32:20	2	0.03	0.03	114
Chess.dll	29001216	2009-07-14 11:25:47	2	0.03	0.03	79
M1033DSK.CSD	29798100	2009-06-11 07:36:17	2	0.03	0.03	62
mindlu.ttc	32217124	2009-06-11 06:43:23	2	0.03	0.03	40
			279	1.29	1.60	

The following Input Criteria are available (from top to bottom, left to right):

- 1) View
- 2) Settings
- 3) Layers
- 4) File Filter

To run the report, here are the steps involved:

4) In the View section of the screen, as desired, choose values for the following (see Section 5.2.1. above for a description of the “View” Input Criteria):

- a. Scope
- b. Catalog
- c. Snapshot
- d. Conditions

5) In the Settings section of the screen, there is only one Setting available: “Fields to use for duplicate detection.” If desired:

- a. Click on one or more fields in the “Available” box.
- b. Click the “right arrow” button to move the selected field(s) over to the “Selected” box (the field(s) will simultaneously disappear from the “Available” box). Conversely, click on one or more fields in the “Selected” box and then click the “left arrow” button to move the selected field(s) over to the “Available” box (the field(s) will simultaneously disappear from the “Selected” box).
- c. Of note, if no fields are selected, then the report uses certain fields – Name, Size and Modified Date – as defaults for duplicate detection.
- d. Use the “up arrow” and “down arrow” buttons to the right of the “Selected” box to prioritize the selected field(s).

6) In the Layers section of the screen, as desired (see Section 5.2.3. above for a description of the “Layers” Input Criteria):

- a. Click on one or more Layers in the “Available” box.
- b. Click the “right arrow” button to move the selected Layer(s) over to the “Selected” box (the Layer(s) will simultaneously disappear from the “Available” box). Conversely, click on one or more Layers in the “Selected” box and then click the “left arrow” button to move the selected Layer(s) over to the “Available” box (the Layer(s) will simultaneously disappear from the “Selected” box).
- c. Use the “up arrow” and “down arrow” buttons to the right of the “Selected” box to prioritize the selected Layer(s).

7) In the File Filter section of the screen, as desired (see Section 5.2.4. above for a description of the “File Filter” Input Criteria):

- a. Load a saved File Filter OR create a new File Filter using one or more rows (select or leave unselected the “Match ALL of the following” checkbox).
- b. For each row in the filter, select or leave unselected the “NOT” checkbox to specify whether or not the condition described in the row should not be or needs to be met.

8) Click the “right arrow” button (in the upper left corner of the screen) to run the report. The Largest Duplicates report results are displayed.

3.4.4.1.3. Report Results

The Largest Duplicates report results can be displayed in one of several formats:

1) Table views:

- a. Summary Tabulated View – this table shows a row for every “cluster” (group of files having the same Name, Size and Modified Date) of duplicate files, with the following columns (the columns displayed are determined by Catalog setup):
 - i. Count – number of distinct files belonging to the cluster
 - ii. Required – amount of storage still required once de-duplication (see Section 5.3.4.1.4. below) is performed
 - iii. Wasted – amount of storage currently being wasted by the cluster
 - iv. Cluster – auto-generated ID for this cluster

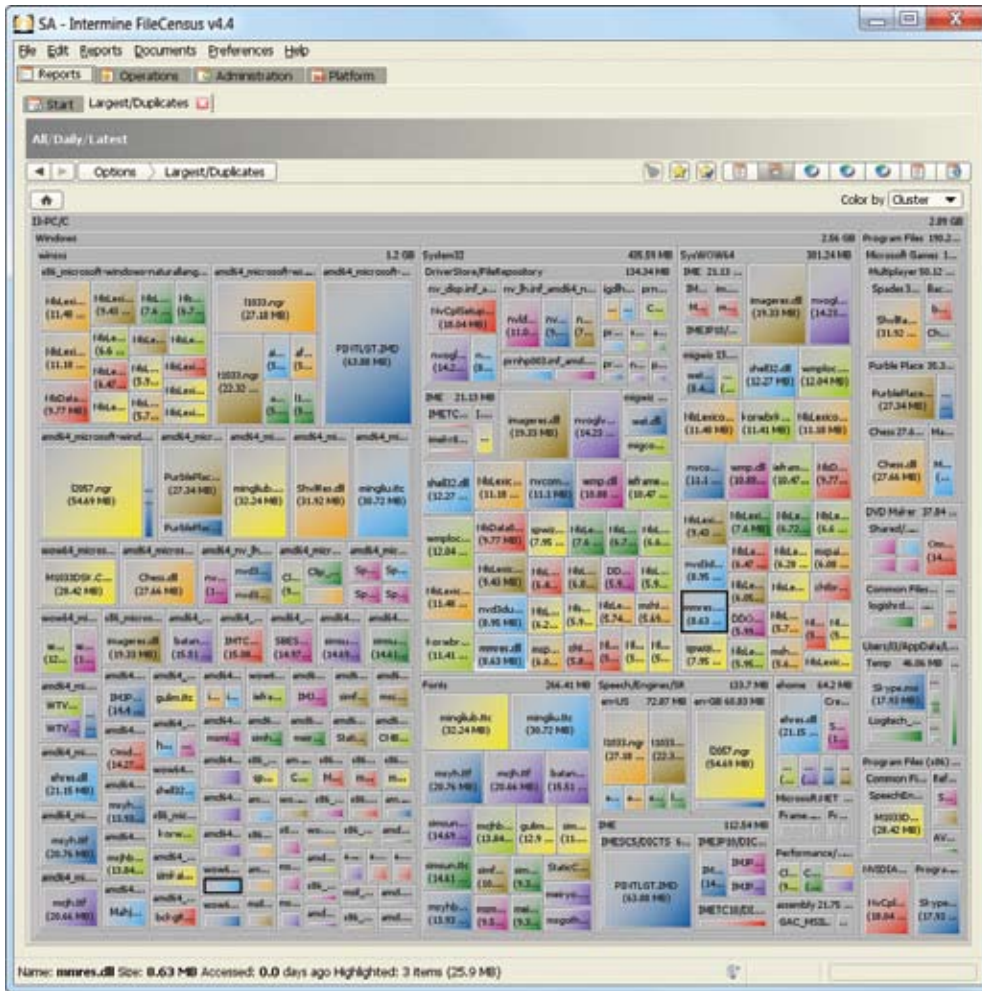
Name	Size	Modified	Count	Required	Wasted	Cluster
mamincho.ttc	10057108	2009-06-11 06:43:49	2	0.01	0.01	93
msscowlis.dll	10059072	2009-06-11 06:39:59	2	0.01	0.01	14
Clip_1000_5sec_VC1_15mbps.wmv	10069125	2009-06-11 07:09:49	2	0.01	0.01	111
NisData000a.dll	10240512	2009-07-14 11:16:06	3	0.01	0.02	6
simfang.ttf	10576012	2009-06-11 06:43:16	2	0.01	0.01	44
IMJPM.DIC	10779504	2009-06-11 07:03:39	2	0.01	0.01	83
wframe.dll	10976768	2009-12-19 19:02:38	3	0.01	0.02	51
wmp.dll	11406336	2009-08-29 16:59:32	3	0.01	0.02	23
nvddmlm.sys	11572512	2009-06-11 06:37:25	2	0.01	0.01	73
nvcomplex.dll	11639400	2010-01-12 14:03:39	2	0.01	0.01	115
bdgRes.dll	11644928	2009-07-14 11:40:10	2	0.01	0.01	76
NisLexicons0001.dll	11722752	2009-07-14 11:08:28	3	0.01	0.02	39
simlai.ttf	11785184	2009-06-11 06:43:17	2	0.01	0.01	12
lorwbrlr.lex	11967524	2009-06-11 07:29:29	3	0.01	0.02	1
NisLexicons0007.dll	12038656	2009-07-14 11:08:30	3	0.01	0.02	69
wmploc.DLL	12625408	2009-08-29 16:54:52	3	0.01	0.02	71
shell32.dll	12866560	2009-07-14 11:16:14	3	0.01	0.02	60
gulm.ttc	13524972	2009-06-11 06:43:52	2	0.01	0.01	2
Mahjong.dll	13713920	2009-07-14 11:28:46	2	0.01	0.01	20
msjhd.ttf	14512072	2009-06-11 06:43:24	2	0.01	0.01	91
msyhbd.ttf	14602860	2009-06-11 06:43:16	2	0.01	0.01	65
nvoglv32.dll	14924392	2010-01-12 14:03:33	3	0.01	0.03	47
CmdBase.dll	14967808	2009-07-14 11:41:53	2	0.01	0.01	26
IMJST.DIC	15095656	2009-06-11 07:03:40	2	0.01	0.01	105
simun.ttc	15222200	2009-06-11 06:43:18	2	0.01	0.01	68
simunb.ttf	15406288	2009-06-11 06:43:19	2	0.01	0.01	17
SBEServer.exe	15697920	2009-07-14 11:39:35	2	0.01	0.01	3
IMTCS.IMD	15815555	2009-06-11 07:02:20	2	0.01	0.01	46
LWS64.msi	15892504	2009-10-15 06:50:48	2	0.01	0.01	118
batang.ttc	16264732	2009-06-11 06:43:51	2	0.02	0.02	27
Skype.msi	18803200	2010-02-15 14:24:05	2	0.02	0.02	95
NvCpSetupEng.exe	18913528	2010-01-12 14:03:33	2	0.02	0.02	96
imageres.dll	20268032	2009-07-14 11:06:03	3	0.02	0.04	104
msjh.ttf	21663376	2009-06-11 06:43:24	2	0.02	0.02	37
msyh.ttf	21767952	2009-06-11 06:43:15	2	0.02	0.02	5
ehres.dll	22177792	2009-07-14 11:26:52	2	0.02	0.02	50
t1033.ngr	23407328	2009-06-11 07:52:10	2	0.02	0.02	64
l1033.ngr	28501860	2009-06-11 07:52:06	2	0.03	0.03	29
PublPlace.dll	28665856	2009-07-14 11:32:20	2	0.03	0.03	114
Chess.dll	29001216	2009-07-14 11:25:47	2	0.03	0.03	79
M1033DSK_CSD	29798100	2009-06-11 07:36:17	2	0.03	0.03	62
minaku.ttc	32217124	2009-06-11 06:43:23	2	0.03	0.03	40
			279	1.29	1.60	

b. Full Tabulated View - this table shows a row for every individual file contained in a duplicate file cluster, with the following columns (the columns displayed are determined by Catalog setup):

- i. Cluster - auto-generated ID of the cluster to which this file belongs
- ii. Name – file name
- iii. Size – file size
- iv. Modified – file’s modified date
- v. Count – number of times the file is duplicated
- vi. Path – file location (directory/sub-directory)
- vii. Wasted – amount of storage currently being wasted by the file’s duplicates

Double-click on any row in the Full Tabulated View to see detailed information about the subject file.

2) Tree Map view – this shows a two-dimensional graphical representation of the duplicate files present within the storage system. Move the mouse over any file shown. This visibly highlights the file and all of its duplicates that are visible on the currently displayed Tree Map view (i.e. the other duplicates may be in different servers, volumes or directories not currently displayed on the visible area, especially if the user has drilled down into sub-directories).



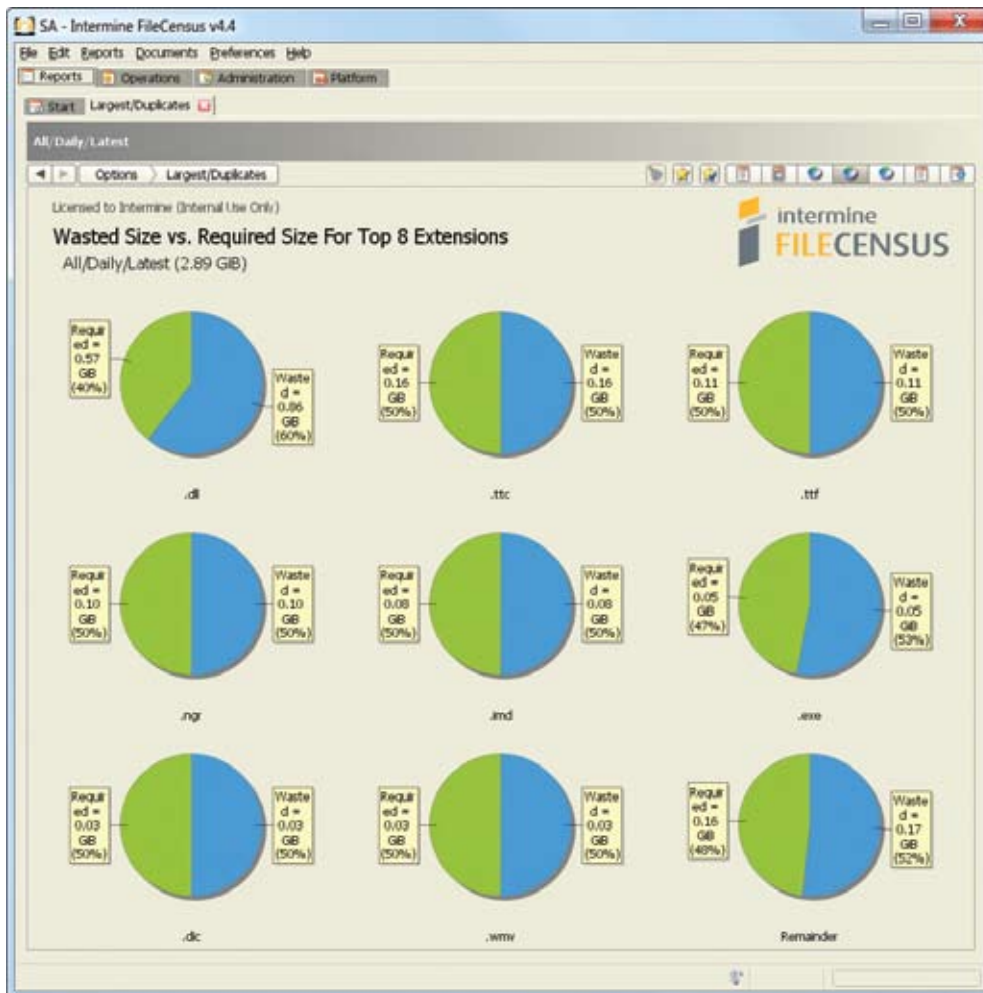
Note the “Color by” dropdown menu field at the top right of the report results. The user can choose to color the results by File Type (i.e. documents, pictures, programs, etc.) or Cluster.

Right-click on a block in the report results. The Context menu appears and the following choices are available:

- Open in explorer – opens Microsoft Windows Explorer window at the selected directory (or the parent directory if the block selected is a file); this option works only when the server hosting the FileCensus Console has access to the selected directory or parent directory
- File details – after right-clicking on a file block, choose this option to display its details
- Browse path – displays a Browse Paths report view for the selected directory (or the parent directory if the block selected is a file)

3) Pie chart views:

- a. "Breakdown of Wasted Size by Top 8 Extensions" – this shows the eight (8) types of file extensions which currently use up the largest amount of wasted storage space
- b. "Wasted Size vs. Required Size for Top 8 Extensions" – this shows two (2) separate pie charts: "Breakdown of Wasted Size by Top 8 Extensions" (similar to the pie chart shown in 3a above) and "Remainder" (shows a breakdown of all other types of file extensions that currently exist on the storage system); each file type shown in these pie charts is divided into two (2) sectors:
 - i. "Wasted" – represents the amount of wasted storage having that extension
 - ii. "Required" – represents the amount of storage having that extension that will still be required once de-duplication (see Section 5.3.4.1.4. below) is performed
- c. "Duplicated Size vs. Unique Size vs. Remainder for Top 8 Extensions" – this shows the same two pie charts described in 3b above, but each file type shown in these pie charts is divided into three (3) sectors:
 - i. "Wasted"
 - ii. "Required"
 - iii. "Remainder"

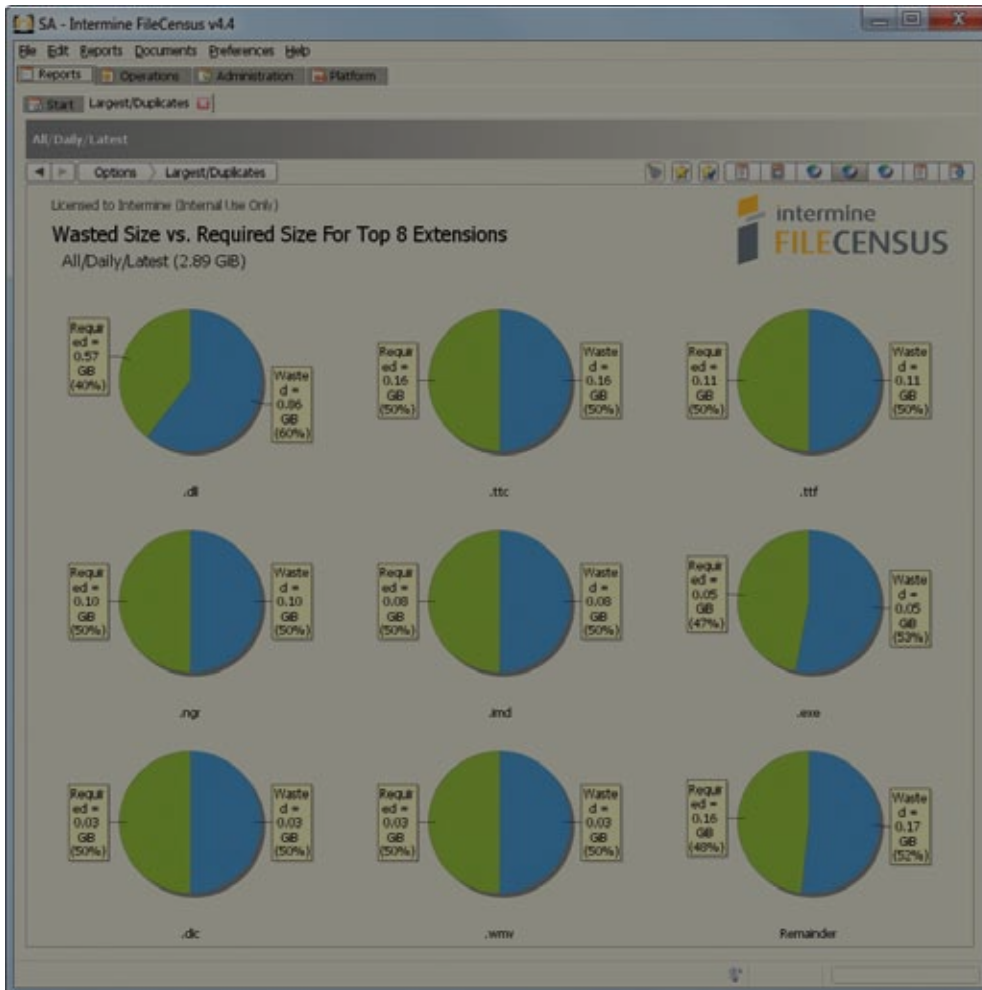


3.4.4.1.4. De-duplication

1) Configuration – FileCensus needs to be configured for de-duplication before users can remove duplicate files from the storage system. Here are the steps involved with de-duplication configuration:

- a. Create a Repository via the Administration tab of the Console.
- b. Click on the Security sub-tab of the Administration tab. The Security sub-tab screen appears. Select the Scope to be used when applying de-duplication to files and then select the “Allow De-duplication” checkbox.
- c. Click on the Collections sub-tab of the Administration tab. The Collections sub-tab screen appears. Configure the linking and authentication on Collections to support de-duplication (several different ways to do this depending on which file types need to be de-duplicated in which locations)

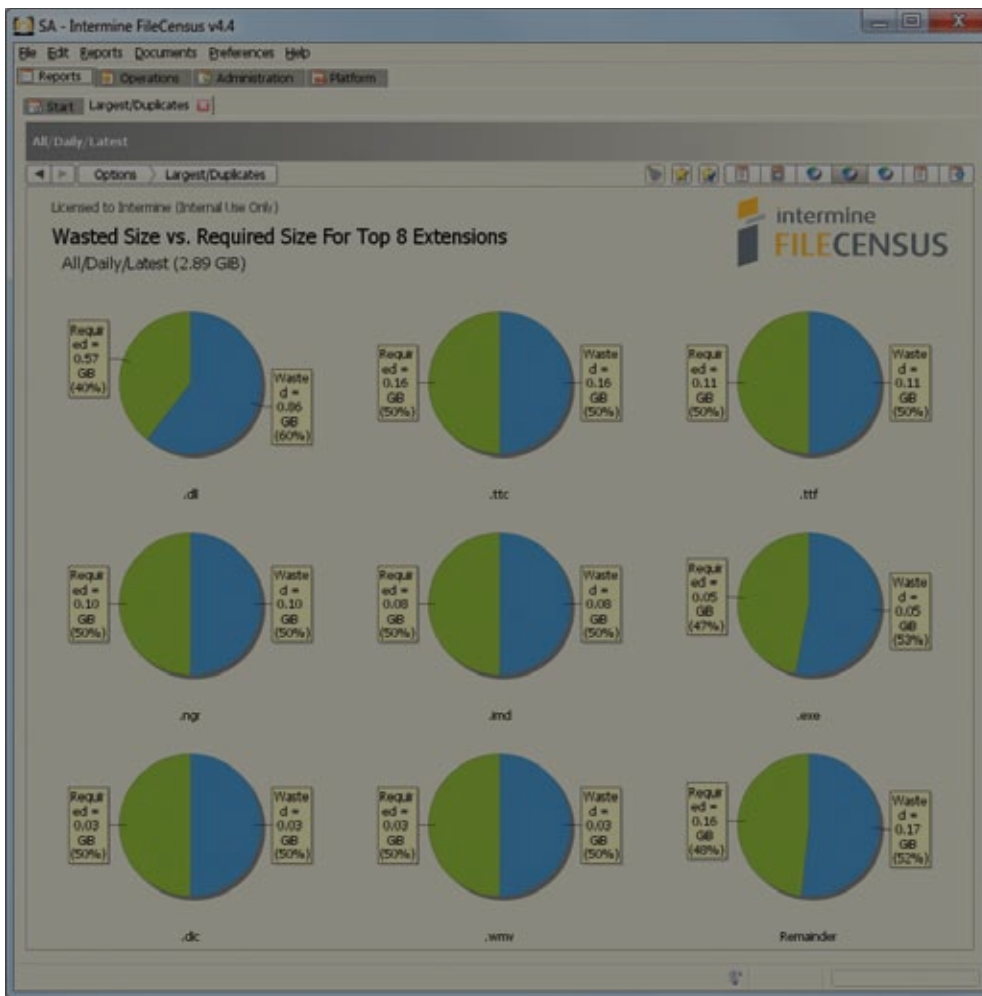
2) De-duplicating Files – De-duplication moves files to Repositories and replaces them with Microsoft Windows shortcut (*.lnk) files.



[Chapter 70_Screenshot_A: Data Deduplication]

Here are the steps involved with de-duplication:

- a. Run the Largest Duplicates report.
- b. Ensure the report results view is set to either the Summary Tabulated View or Full Tabulated View.
- c. Right-click on a row in the report results.
- d. In the Context menu that appears, choose to compare the files in the subject Cluster, or compare all files across all Clusters. The byte-by-byte comparisons will be performed.
- e. A new tabulated view will appear. Right-click on a row in the new tabulated view.
- f. In the Context menu that appears, choose the appropriate de-duplication method. De-duplication will be performed.
- g. A new tabulated view will appear showing the level of success with de-duplication.



3.4.4.2. Largest Files

3.4.4.2.1. Purpose

The purpose of the Largest Files report is to determine which files within the file storage system present the best opportunity for storage management improvement.

3.4.4.2.2. Running the Report

Click on the “Files” link in the Largest section of the Reports (Start) tab. The Largest Files screen appears. The following Input Criteria are available (from top to bottom, left to right):

- 1) View
- 2) Settings
- 3) Layers
- 4) File Filter

To run the report, here are the steps involved:

- 1) In the View section of the screen, as desired, choose values for the following (see Section 5.2.1. above for a description of the “View” Input Criteria):
 - a. Scope
 - b. Catalog
 - c. Snapshot
 - d. Baseline
 - e. Conditions
- 2) In the Settings section of the screen, there are two (2) Settings available:
 - a. “Attribute” - determines which file attribute is used to compare groups of files; it is a dropdown menudropdown menu field with the following possible values:
 - i. Space – the space (in bytes) that the file group consumes on the disk
 - ii. Size – the size (in bytes) that the file group consumes on the disk
 - b. “Count” – the number of files in a group
- 3) In the Layers section of the screen, as desired (see Section 5.2.3. above for a description of the “Layers” Input Criteria):
 - a. Click on one or more Layers in the “Available” box.
 - b. Click the “right arrow” button to move the selected Layer(s) over to the “Selected” box (the Layer(s) will simultaneously disappear from the “Available” box). Conversely, click on one or more Layers in the “Selected” box and then click the “left arrow” button to move the selected Layer(s) over to the “Available” box (the Layer(s) will simultaneously disappear from the “Selected” box).
 - c. Use the “up arrow” and “down arrow” buttons to the right of the “Selected” box to prioritize the selected Layer(s).
- 4) In the File Filter section of the screen, as desired (see Section 5.2.4. above for a description of the “File Filter” Input Criteria):
 - a. Load a saved File Filter OR create a new File Filter using one or more rows (select or leave unselected the “Match ALL of the following” checkbox).
 - b. For each row in the filter, select or leave unselected the “NOT” checkbox to specify whether or not the condition described in the row should not be or needs to be met.
- 5) Click the “right arrow” button (in the upper left corner of the screen) to run the report. The Largest Files report results are displayed.

3.4.4.2.3. Report Results

The Largest Files report results can be displayed in two (2) different formats:

1) Tabular view – a table with the following columns:

Name	Size	Modified	Attributes	Path
D:\PC\Users\G3\VirtualBox\HardDisks\{79d8b236-938f-4c43-...}1.vmd	21.83	3/11/2010	A,HH	
D:\PC\Users\G3\VirtualBox\HardDisks\{3-DEV}.vdi	15.55	3/2/2010	A,HH	
D:\PC\Users\G3\VirtualBox\HardDisks\{3-HG-SHS}.vdi	15.03	3/1/2010	A	
D:\PC\Users\G3\VirtualBox\HardDisks\FileCensus V4.3.vdi	9.85	3/12/2010	A,HH	
D:\PC\Users\G3\VirtualBox\HardDisks\FileCensus V4.5.vdi	9.85	3/10/2010	A,HH	
D:\PC\Users\G3\VirtualBox\HardDisks\FileCensus V4.2.vdi	9.77	3/10/2010	A,HH	
D:\PC\Users\G3\VirtualBox\HardDisks\FileCensus V4.4.vdi	9.37	3/25/2010	A,HH	
D:\PC\Users\G3\VirtualBox\HardDisks\{79d8b236-938f-4c43-...}0-127186e7d778}.vmd	8.68	3/1/2010	A,HH	
D:\PC\C\pagefile.sys	8.00	3/16/2010	S,HA	
D:\PC\C\pagefile.sys	6.00	3/16/2010	S,HA,HH	
D:\PC\C\System Volume Information\{ee0a27f2-c089-11df-...}	2.57	3/12/2010	S,HA	
D:\PC\C\System Volume Information\{99aad5-2d4d-11df-...}	1.50	3/15/2010	S,HA	
D:\PC\C\System Volume Information\{99aad49-2d4d-11df-...}	0.38	3/12/2010	S,HA	
D:\PC\C\Intermin\Recordings\TME2-6.avi	0.30	10/19/2009	A	
D:\PC\C\Intermin\Recordings\{31-jan-2010 David Baird visit\capture-13.camrec	0.27	1/31/2010	A	
D:\PC\C\Intermin\Recordings\{31-jan-2010 David Baird visit\capture-1.camrec	0.27	1/31/2010	A	
D:\PC\C\Intermin\Recordings\{31-jan-2010 David Baird visit\capture-4.camrec	0.22	1/31/2010	A	
D:\PC\C\Intermin\Recordings\{31-jan-2010 David Baird visit\capture-8.camrec	0.21	1/30/2010	A	
D:\PC\C\Intermin\Recordings\{31-jan-2010 David Baird visit\capture-10.camrec	0.20	1/30/2010	A	
D:\PC\C\Intermin\Recordings\{31-jan-2010 David Baird visit\capture-6.camrec	0.18	1/31/2010	A	
D:\PC\C\Recovery\ba6b995-15d1-11df-9a7d-a45b31297f3\Winre.win	0.16	7/14/2009	S,HH	
D:\PC\C\Intermin\Downloads\{000_3.1.1_Win32\Intel = stat_w3E_ens15.exe	0.15	1/25/2010	A	
D:\PC\C\Intermin\Downloads\{000_3.2.0_Win32\Intel = l_w3E_ens15(2).exe	0.15	3/3/2010	A	
D:\PC\C\Intermin\Recordings\{31-jan-2010 David Baird visit\capture-5.camrec	0.12	1/31/2010	A	
D:\PC\C\Intermin\Downloads\{96_21_desktop_win7 = bit_english_whql.exe	0.12	2/15/2010	A	
D:\PC\C\Intermin\Recordings\{Munging hi images 2010-02-17.wmv	0.11	2/17/2010	A	
D:\PC\C\Intermin\Recordings\{31-jan-2010 David Baird visit\capture-3.camrec	0.11	2/8/2010	A	
D:\PC\C\Program Files (x86)\Adobe\Reader 9.0\ - {AC76BA86-7AD7-1033-7B44-A9000000001}	0.10	1/9/2010	A	
D:\PC\C\Intermin\Recordings\{31-jan-2010 David Baird visit\capture-12.camrec	0.09	1/30/2010	A	
D:\PC\C\Intermin\Recordings\{31-jan-2010 David Baird visit\capture-7.camrec	0.07	1/30/2010	A	
D:\PC\C\Intermin\Downloads\VirtualBox-3.1.2-56127-Win.exe	0.07	1/27/2010	A	
D:\PC\C\Users\G3\Downloads\{3-6u18-windows-v64.exe	0.07	3/9/2010	A	
D:\PC\C\Windows\winsx\amd64_microsoft-wind - one_12deb2e3587e9b12\PIINTLGT.IMD	0.06	6/11/2009	A	
D:\PC\C\Windows\IME\THESCS\DIRECT\PIINTLGT.IMD	0.06	6/11/2009	A	
D:\PC\C\Intermin\Recordings\{31-jan-2010 David Baird visit\capture-2.camrec	0.06	3/5/2010	A	
D:\PC\C\Intermin\Recordings\{31-jan-2010 David Baird visit\capture-11.camrec	0.06	1/30/2010	A	
D:\PC\C\Windows\winsx\amd64_microsoft-wind - -gb_a3a447542a2c5da\{2057.ng	0.05	6/11/2009	A	
D:\PC\C\Windows\Speedy\Engines\SR\en-GB\{2057.ng	0.05	6/11/2009	A	
D:\PC\C\ProgramData\avg\update\backup\incv1.iam	0.05	3/18/2010	A,HH	
D:\PC\C\Users\G3\AppData\Local\Temp\ - jpadpages\{Jan2588tw.be	0.05	2/15/2010	A,HH	
D:\PC\C\Users\G3\AppData\Local\Temp\ - H1\incv1.iam	0.05	2/15/2010	A,HH	
D:\PC\C\Intermin\Downloads\{w1110_x64.exe	0.05	1/30/2010	A	
	123.70			

- a. Name – filename
- b. Modified – file's last modified date
- c. Size – file size
- d. Attributes
- e. Path – file location

Double-click on any row in the table to view additional details about the file contained in that row.

- 2) "Top 10 Extensions of 200 Largest Files" Pie chart – a pie chart view containing two (2) distinct pie charts:
 - a. "Breakdown of Top 10 Extensions" – shows the top ten (10) extensions from the files in the report results and compares the sizes of the files having these extensions
 - b. "Comparison with Remainder" – compares the size of all files in the report results having one of the top ten (10) extensions with size of all files not having one of these extensions

3.4.4.3. Largest Paths

3.4.4.3.1. Purpose

The purpose of the Largest Paths report is to determine which paths within the file storage system present the best opportunity for storage management improvement.

3.4.4.3.2. Running the Report

Click on the "Paths" link in the Largest section of the Reports (Start) tab. The Largest Paths screen appears. The following Input Criteria are available (from top to bottom, left to right):

- 1) View
- 2) Settings
- 3) Layers
- 4) File Filter

To run the report, here are the steps involved:

- 1) In the View section of the screen, as desired, choose values for the following (see Section 5.2.1. above for a description of the "View" Input Criteria):
 - a. Scope
 - b. Catalog
 - c. Snapshot
 - d. Conditions
- 2) In the Settings section of the screen, there are two (2) Settings available:
 - a. "Attribute" - determines which file attribute is used to compare groups of files. It is a dropdown menudropdown menu field with the following possible values:
 - i. Space – the space (in bytes) that the file group consumes on the disk
 - ii. Size – the size (in bytes) that the file group consumes on the disk
 - b. "Count" – the number of files in a group
- 3) In the Layers section of the screen, as desired (see Section 5.2.3. above for a description of the "Layers" Input Criteria):
 - a. Click on one or more Layers in the "Available" box.
 - b. Click the "right arrow" button to move the selected Layer(s) over to the "Selected" box (the Layer(s) will simultaneously disappear from the "Available" box). Conversely, click on one or more Layers in the "Selected" box and then click the "left arrow" button to move the selected Layer(s) over to the "Available" box (the Layer(s) will simultaneously disappear from the "Selected" box).
 - c. Use the "up arrow" and "down arrow" buttons to the right of the "Selected" box to prioritize the selected Layer(s).
- 4) In the File Filter section of the screen, as desired (see Section 5.2.4. above for a description of the "File Filter" Input Criteria):
 - a. Load a saved File Filter OR create a new File Filter using one or more rows (select or leave unselected the "Match ALL of the following" checkbox).
 - b. For each row in the filter, select or leave unselected the "NOT" checkbox to specify whether or not the condition described in the row should not be or needs to be met.
- 5) Click the "right arrow" button (in the upper left corner of the screen) to run the report. The Largest Paths report results are displayed.

3.4.4.3.3. Report Results

The Largest Paths report results are displayed in a table. The following columns are included:

Path	Size	Files	Owner	Last Accessed	Length	Levels	Mode
/HardDisks/	99.93	12	G	3/10/2010	32	4	-----
omation/	14.00	29	None	3/16/2010	1	0	-----
gs/31-Jan-2010 David Baird vist/	4.45	9	Administrators	3/15/2010	27	1	-----
z/	1.91	14	G	2/15/2010	52	3	-----
z/	0.87	2,172	TrustedInstaller	3/16/2010	18	2	-----
z/	0.87	2,172	TrustedInstaller	3/11/2010	18	2	-----
z/	0.76	43	G	3/4/2010	21	2	-----
z/	0.53	3,254	TrustedInstaller	2/15/2010	23	3	-----
z/	0.50	4	G	3/5/2010	22	2	-----
z/	0.35	493	TrustedInstaller	3/3/2010	15	2	-----
nd64_microsoft-wind - one_9c1c5e1446c0bd4/	0.29	81	TrustedInstaller	7/14/2009	111	3	-----
nd64_microsoft-wind - one_9db12a5d3c0f6a9e/	0.28	81	TrustedInstaller	7/14/2009	109	3	-----
z/ - /program/	0.18	332	SYSTEM	3/3/2010	46	3	-----
z/	0.18	6	G		31	2	-----
z/	0.16	26	Administrators	3/11/2010	19	2	-----
z/	0.16	2	SYSTEM	3/9/2010	47	2	-----
z/	0.15	33	SYSTEM	2/15/2010	88	5	-----
z/	0.14	49	Administrators	2/15/2010	54	5	-----
z/	0.12	174	Administrators	2/15/2010	60	8	-----
z/	0.11	13,239	TrustedInstaller	3/11/2010	26	3	-----
z/	0.11	8	G	3/16/2010	20	3	-----
z/	0.11	5	SYSTEM	2/17/2010	89	5	-----
z/	0.09	22	Administrators	2/15/2010	57	7	-----
z/	0.09	24	SYSTEM	7/14/2009	118	3	-----
z/	0.08	20	SYSTEM	7/14/2009	118	3	-----
z/	0.08	22	TrustedInstaller	7/14/2009	33	5	-----
z/	0.08	46	SYSTEM	2/15/2010	30	3	-----
z/	0.08	104	G	3/16/2010	29	5	-----
z/	0.08	112	TrustedInstaller	2/24/2010	15	2	-----
z/	0.08	18	TrustedInstaller	7/14/2009	33	5	-----
z/	0.08	102	Administrators	3/16/2010	30	3	-----
z/	0.07	17	G	2/15/2010	44	4	-----
z/	0.07	17	TrustedInstaller	7/14/2009	26	4	-----
z/	0.07	16	G	2/15/2010	61	5	-----
z/	0.07	29	G	2/15/2010	74	5	-----
z/	0.07	9	Administrators	3/3/2010	52	7	-----
z/	0.07	182	TrustedInstaller	7/14/2009	46	4	-----
z/	0.06	19	G	2/15/2010	27	4	-----
z/	0.06	1	TrustedInstaller	7/14/2009	117	3	-----
z/	0.06	70	Administrators	3/11/2010	25	2	-----
z/	0.06	24	G	2/15/2010	82	5	-----
z/	0.06	9	Administrators	2/16/2010	32	4	-----
Total	130.14	26,920					

- 1) Files – number of files directly under the path
- 2) Owner – user who owns the path
- 3) Last Accessed – path’s last accessed date
- 4) Length – number of characters in the path name
- 5) Levels – number of levels deep the path is in the file system
- 6) Size – total size of the files directly under the path
- 7) Path – file location
- 8) Mode

Double-click on any row in the table to view additional details about the file contained in that row. If a filter was supplied, then the Largest Paths (default) or Search Paths report view is displayed. If no filter was supplied, then the Largest Files report view is displayed.

3.4.5. Search Reports

The Search reports analyze different aspects of the storage system.

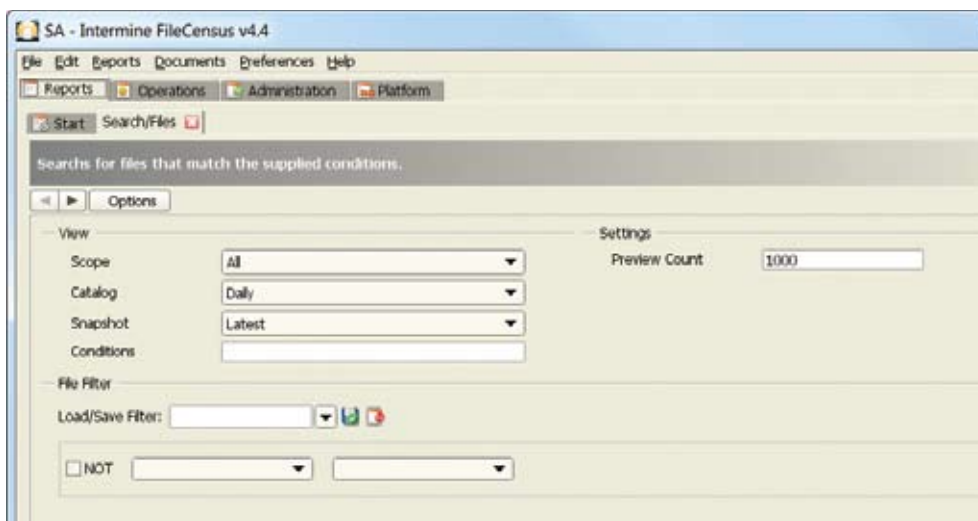
3.4.5.1. Search Files

3.4.5.1.1. Purpose

The purpose of the Search Files report is to analyze server files based on specific characteristics.

3.4.5.1.2. Running the Report

Click on the "Files" link in the Search section of the Reports (Start) tab. The Search Files screen appears.



The following Input Criteria are available (from top to bottom, left to right):

- 1) View
- 2) Settings
- 3) File Filter

To run the report, here are the steps involved:

- 1) In the View section of the screen, as desired, choose values for the following (see Section 5.2.1. above for a description of the "View" Input Criteria):
 - a. Scope
 - b. Catalog
 - c. Snapshot
 - d. Conditions
- 2) In the Settings section of the screen, there is only one Setting available: "Preview Count." This report sometimes yields very large sets of results data. Because of this, the amount of data displayed on the Console screen is purposely limited. The user can specify in the "Preview Count" Setting how many rows to display in the report results view. From there, the user can use an Export feature to view the entire set of report results and export them to disk.

-
- 3) In the File Filter section of the screen, as desired (see Section 5.2.4. above for a description of the “File Filter” Input Criteria):
 - a. Load a saved File Filter OR create a new File Filter using one or more rows (select or leave unselected the “Match ALL of the following” checkbox).
 - b. For each row in the filter, select or leave unselected the “NOT” checkbox to specify whether or not the condition described in the row should not be or needs to be met.
 - 4) Click the “right arrow” button (in the upper left corner of the screen) to run the report. The Search Files report results are displayed.

3.4.5.1.3. Report Results

The Search Files report results are displayed in a table. The following columns are included:

- 1) Name – file name
- 2) Size – combined size of all files in the volume
- 3) Modified
- 4) Accessed
- 5) Attributes
- 6) Created
- 7) Owner
- 8) Owner Type
- 9) Path – volume’s path

Name	Size	Modified	Accessed	Attributes	Created	Owner	Owner Type	Path
D:\FC\bootmg	0.00	7/14/2009	2/10/2010	R,S,H,A	2/10/2010	TrustedInstaller	SdTypeWellKnownGroup	
D:\FC\BOOTSECT.BAK	0.00	2/10/2010	2/10/2010	R,S,H,A	2/10/2010	SYSTEM	SdTypeUser	
D:\FC\win1028.txt	0.00	11/7/2007	3/3/2010	A	11/7/2007	SYSTEM	SdTypeUser	
D:\FC\win1031.txt	0.00	11/7/2007	3/3/2010	A	11/7/2007	SYSTEM	SdTypeUser	
D:\FC\win1033.txt	0.00	11/7/2007	3/3/2010	A	11/7/2007	SYSTEM	SdTypeUser	
D:\FC\win1036.txt	0.00	11/7/2007	3/3/2010	A	11/7/2007	SYSTEM	SdTypeUser	
D:\FC\win1040.txt	0.00	11/7/2007	3/3/2010	A	11/7/2007	SYSTEM	SdTypeUser	
D:\FC\win1041.txt	0.00	11/7/2007	3/3/2010	A	11/7/2007	SYSTEM	SdTypeUser	
D:\FC\win1042.txt	0.00	11/7/2007	3/3/2010	A	11/7/2007	SYSTEM	SdTypeUser	
D:\FC\win1052.txt	0.00	11/7/2007	3/3/2010	A	11/7/2007	SYSTEM	SdTypeUser	
D:\FC\win1092.txt	0.00	11/7/2007	3/3/2010	A	11/7/2007	SYSTEM	SdTypeUser	
D:\FC\globdata.ini	0.00	11/7/2007	3/3/2010	A	11/7/2007	SYSTEM	SdTypeUser	
D:\FC\hiberfil.sys	6.00	3/16/2010	2/10/2010	S,H,A,N	2/10/2010	Unknown	[Special]	
D:\FC\install.exe	0.00	11/7/2007	3/3/2010	A	11/7/2007	SYSTEM	SdTypeUser	
D:\FC\install.ini	0.00	11/7/2007	3/3/2010	A	11/7/2007	SYSTEM	SdTypeUser	
D:\FC\installwin1028.dll	0.00	11/7/2007	3/3/2010	A	11/7/2007	SYSTEM	SdTypeUser	
D:\FC\installwin1031.dll	0.00	11/7/2007	3/3/2010	A	11/7/2007	SYSTEM	SdTypeUser	
D:\FC\installwin1033.dll	0.00	11/7/2007	3/3/2010	A	11/7/2007	SYSTEM	SdTypeUser	
D:\FC\installwin1036.dll	0.00	11/7/2007	3/3/2010	A	11/7/2007	SYSTEM	SdTypeUser	
D:\FC\installwin1040.dll	0.00	11/7/2007	3/3/2010	A	11/7/2007	SYSTEM	SdTypeUser	
D:\FC\installwin1041.dll	0.00	11/7/2007	3/3/2010	A	11/7/2007	SYSTEM	SdTypeUser	
D:\FC\installwin1042.dll	0.00	11/7/2007	3/3/2010	A	11/7/2007	SYSTEM	SdTypeUser	
D:\FC\installwin1052.dll	0.00	11/7/2007	3/3/2010	A	11/7/2007	SYSTEM	SdTypeUser	
D:\FC\installwin1092.dll	0.00	11/7/2007	3/3/2010	A	11/7/2007	SYSTEM	SdTypeUser	
D:\FC\mediatool.dll	0.00	12/1/2006	2/10/2010	A	12/1/2006	SYSTEM	SdTypeUser	
D:\FC\setupfile.sys	8.00	3/16/2010	2/10/2010	S,H,A	2/10/2010	Unknown	[Special]	
D:\FC\setupdet.bmp	0.00	11/7/2007	3/3/2010	A	11/7/2007	SYSTEM	SdTypeUser	
D:\FC\VC_FED.cab	0.00	11/7/2007	3/3/2010	A	11/7/2007	SYSTEM	SdTypeUser	
D:\FC\VC_FED.msi	0.00	11/7/2007	3/3/2010	A	11/7/2007	SYSTEM	SdTypeUser	
D:\FC\FAVG\BROW\avgchff.dat	0.00	3/16/2010	3/16/2010	A	3/16/2010	Administrators	SdTypeAlias	
D:\FC\FAVG\BROW\avgchk.dat	0.00	3/15/2010	3/15/2010	A	3/15/2010	Administrators	SdTypeAlias	
D:\FC\FAVG\BROW\avgchmf.dat	0.00	3/16/2010	3/16/2010	A	3/16/2010	Administrators	SdTypeAlias	
D:\FC\FAVG\BROW\avgchms.dat	0.00	3/15/2010	3/15/2010	A	3/15/2010	Administrators	SdTypeAlias	
D:\FC\Recycle Bin\1-5-21-3285573636	0.00	3/12/2010	3/12/2010	A	3/12/2010	B	SdTypeUser	
D:\FC\Recycle Bin\1-5-21-3285573636	0.00	3/15/2010	3/15/2010	A	3/15/2010	B	SdTypeUser	
D:\FC\Recycle Bin\1-5-21-3285573636	0.00	3/12/2010	3/12/2010	A	3/12/2010	B	SdTypeUser	
D:\FC\Recycle Bin\1-5-21-3285573636	0.00	3/8/2010	3/8/2010	A	3/8/2010	B	SdTypeUser	
D:\FC\Recycle Bin\1-5-21-3285573636	0.00	3/15/2010	3/15/2010	A	3/15/2010	B	SdTypeUser	
D:\FC\Recycle Bin\1-5-21-3285573636	0.04	3/5/2010	3/5/2010	A	3/5/2010	B	SdTypeUser	
D:\FC\Recycle Bin\1-5-21-3285573636	0.00	2/9/2010	2/9/2010	S,H,A	2/9/2010	B	SdTypeUser	
D:\FC\Boot\BCD	0.00	3/16/2010	3/15/2010	A	2/10/2010	SYSTEM	SdTypeUser	
D:\FC\Boot\BCD.LOG	0.00	3/16/2010	2/10/2010	S,H,A	2/10/2010	SYSTEM	SdTypeUser	

Rows: 1,000 = Total: 88,352 = This preview does not contain all matching results. Use the exporter view to download all results.

Double-click on any row in the table to view additional details about the file contained in that row.

3.4.5.2. Search Paths

3.4.5.2.1. Purpose

The purpose of the Search Paths report is to analyze server paths based on specific characteristics.

3.4.5.2.2. Running the Report

Click on the "Paths" link in the Search section of the Reports (Start) tab. The Search Paths screen appears. The following Input Criteria are available (from top to bottom, left to right):

- 1) View
- 2) Path Filter

To run the report, here are the steps involved:

- 1) In the View section of the screen, as desired, choose values for the following (see Section 5.2.1. above for a description of the “View” Input Criteria):
 - a. Scope
 - b. Catalog
 - c. Snapshot
 - d. Conditions
- 2) In the Path Filter section of the screen, as desired (see Section 5.2.4. above for a description of the “Path Filter” Input Criteria):
 - a. Load a saved Path Filter OR create a new Path Filter using one or more rows (select or leave unselected the “Match ALL of the following” checkbox).
 - b. For each row in the filter, select or leave unselected the “NOT” checkbox to specify whether or not the condition described in the row should not be or needs to be met.
- 3) Click the “right arrow” button (in the upper left corner of the screen) to run the report. The Search Paths report results are displayed.

3.4.5.2.3. Report Results

The Search Paths report results are displayed in a table. The following columns are included:

- 1) Path – volume’s path
 - 2) Total Count – total number of files in the volume
 - 3) Filtered Count – total number of files that match the supplied filter (equals Total Count value if no filter supplied)
- Double-click on any row in the table to view additional details about the file contained in that row. If a filter was supplied, then the Largest Paths report view is displayed. If no filter was supplied, then the Largest Files report view is displayed.

3.4.5.3. Search Volumes

3.4.5.3.1. Purpose

The purpose of the Search Volumes report is to analyze server volumes based on specific characteristics.

3.4.5.3.2. Running the Report

Click on the “Volumes” link in the Search section of the Reports (Start) tab. The Search Volumes screen appears. The following Input Criteria are available (from top to bottom, left to right):

- 1) View

To run the report, here are the steps involved:

- 1) In the View section of the screen, as desired, choose values for the following (see Section 5.2.1. above for a description of the “View” Input Criteria):
 - a. Scope
 - b. Catalog
 - c. Snapshot
 - d. Baseline
 - e. Conditions

2) Click the "right arrow" button (in the upper left corner of the screen) to run the report. The Search Volumes report results are displayed.

3.4.5.3.3. Report Results

The Search Volumes report results can be displayed in a few different formats:

- 1) Tabular view – a table with the following columns:
 - a. Path – path name of the volume
 - b. Size – storage capacity of the volume
 - c. Free – amount of free space on the volume
 - d. % Free – percentage of the volume's capacity representing free space
 - e. Captured

Double-click on any row in the table to view additional details about the file contained in that row. The Largest Files report view is the default.

- 2) Tree map (Size) – a two (2)-dimensional graphical representation of the disk sizes of each volume
- 3) Tree map (Free Space) – a two (2)-dimensional graphical representation of the free space available on each volume

3.4.6. Security Path Rights Reports

The Security Path Rights reports are designed to show where security rights differ from path to path throughout the file system.

3.4.6.1. Security Path Rights Netware

3.4.6.1.1. Purpose

The purpose of the Security Path Rights Netware report is to show Netware-based differentiation in security rights among path levels within the file system.

3) Click the “right arrow” button (in the upper left corner of the screen) to run the report. The Security Path Rights Netware report results are displayed.

3.4.6.1.3. Report Results

The Security Path Rights Netware report results are shown in a table. The following columns are displayed:

- 1) Path – name of the path from where rights differ from parent directory path
- 2) Name – fully-qualified name of the security entity
- 3) Type – type of security entity (i.e. user, group, etc.)
- 4) Rights – rights mask of the entity at this path

Of note, there may be multiple rows per path, and one row per security entity and rights mask pair.

3.4.6.2. Security Path Rights UNIX

3.4.6.2.1. Purpose

The purpose of the Security Path Rights UNIX report is to show UNIX-based differentiation in security rights among path levels within the file system.

3.4.6.2.2. Running the Report

Click on the “Path Rights UNIX” link in the Security section of the Reports (Start) tab. The Security Path Rights UNIX screen appears. The following Input Criteria are available (from top to bottom, left to right):

- 1) View

To run the report, here are the steps involved:

- 1) In the View section of the screen, as desired, choose values for the following (see Section 5.2.1. above for a description of the “View” Input Criteria):
 - a. Scope
 - b. Catalog
 - c. Snapshot
 - d. Conditions
- 2) Click the “right arrow” button (in the upper left corner of the screen) to run the report. The Security Path Rights UNIX report results are displayed.

3.4.6.2.3. Report Results

The Security Path Rights UNIX report results are shown in a table. The following columns are displayed:

- 1) Path – name of the path from where rights differ from parent directory path
- 2) Owner – fully-qualified name of the directory-owning user
- 3) Group – fully-qualified name of the directory group
- 4) Mode – decimal-based representation of the directory mode

3.4.6.3. Security Path Rights Windows

3.4.6.3.1. Purpose

The purpose of the Security Path Rights Windows report is to show Microsoft Windows-based differentiation in security rights among path levels within the file system.

3.4.6.3.2. Running the Report

Click on the “Path Rights Windows” link in the Security section of the Reports (Start) tab. The Security Path Rights Windows screen appears. The following Input Criteria are available (from top to bottom, left to right):

- 1) View
- 2) Settings

To run the report, here are the steps involved:

- 1) In the View section of the screen, as desired, choose values for the following (see Section 5.2.1. above for a description of the “View” Input Criteria):
 - a. Scope
 - b. Catalog
 - c. Snapshot
 - d. Conditions
- 2) In the Settings section of the screen, there is only one Setting available: “Preview Count.” This report sometimes yields very large sets of results data. Because of this, the amount of data displayed on the Console screen is purposely limited. The user can specify in the “Preview Count” Setting how many rows to display in the report results view. From there, the user can use an Export feature to view the entire set of report results and export them to disk.
- 3) Click the “right arrow” button (in the upper left corner of the screen) to run the report. The Security Path Rights Windows report results are displayed.

3.4.6.3.3. Report Results

The Security Path Rights Windows report results are shown in a table. The following columns are displayed:

- 1) Path – name of the path from where rights differ from parent directory path
- 2) Name – either the resolved name of the security entity OR its SID if the SID could not be resolved
- 3) Ace Control – “Inherited,” “Protected” or both
- 4) ACE Flags – description of the ACE flags
- 5) ACE Mask – description of the ACE mask
- 6) ACE Type – “Allow” or “Deny”

Of note, there may be multiple rows per path and one row per security entity.

3.5. Saving Reports

3.5.1. Creating/Running Saved Reports

Saving reports allows users to preserve the setting of specific report options such as Scope, Catalog, Baseline, Filters and Layers so that these report configurations can be shared for future use with other access-permitted users.

When a report is saved, all of its options, table filters, sort orders and chosen results viewers are saved along with it. This means that these configurations need to be intuitive for the saved report to be relevant and useful to users in the future.

When a saved report is run, it attempts to present itself exactly as it was when it was originally saved. A saved report cannot run if any of its options no longer exists in FileCensus. For example, if a Catalog that no longer exists is referenced in a saved report, then the saved report will not run successfully. Furthermore, if a fixed Baseline date is used in a saved report (as opposed to a relative Baseline date like "Latest" or "Earliest"), then there will come a time when that date will no longer exist in the FileCensus instance and the saved report will not run successfully.

"My Saved Reports" and "Shared Reports" are the two (2) types of saved reports in FileCensus:

- 1) My Saved Reports can be created by any user and can be run only by the user who created them. To add a new report to My Saved Reports after running a report:
 - a. Click the "Add To My Saved Reports" button to display the "My Saved Reports" window
 - b. The user's current list of saved reports is shown along with a suggested name for the new saved report (of note, if a report name that already exists is entered, then the old report is overwritten by the new report)
 - c. Edit the report name as desired and click "OK" to save the report
- 2) Shared Reports are created under the Scope in which the report has been run. Only users who have sufficient privileges to modify a Scope can create a shared report under that Scope. All users with read access to a Scope can run a shared report that has been saved under that Scope. To add a new saved report to Shared Reports:
 - a. Click the "Add To Shared Reports" button to display the "Shared Reports" window
 - b. The Scope's current list of shared reports is shown along with a suggested name for the new shared report (of note, if a report name that already exists is entered, then the old report is overwritten by the new report)
 - c. Edit the report name as desired and click "OK" to save the report

Saved and shared reports can be renamed and deleted (with proper user access) via the "Manage" option under "Reports" from FileCensus Console menu bar.

3.5.2. Notifications

Notifications are essentially user subscriptions for saved reports. They are used when there is a requirement to publish a saved report's results to one or more users on a regular basis based upon a set of criteria.

When triggered, a Notification runs its associated saved report and interrogates the results to ensure that the specified criteria have been met. Notifications associated with a saved report are run using the account of the user who created it, and Notifications associated with a shared report are run using the account of each subscriber.

To add a Notification to a saved report:

- 1) Run the saved or shared report
- 2) From the report results, click on the "Add Notification" button to display the "Manage Notifications" window, which allows users to create, rename and delete Notifications
- 3) The list of Notifications currently attached to the saved report is displayed on the left-hand side of the window and the selected Notification's properties on the right-hand side; the following properties can be defined (re-defined) for a new (existing) Notification:
 - a. "Description" – a short text comment for the Notification
 - b. "Subscribers" – the users who will be notified if the Notification meets its criteria (can only be users for Notifications associated with shared reports; can be users or groups for Notifications associated with users)
 - c. "Priority" – the Notification's level of importance (affects which subscribers will be advised of the Notification if its criteria is met); available values are:
 - i. "Highest"
 - ii. "Higher"
 - iii. "Normal"
 - iv. "Lower"
 - v. "Lowest"
 - d. "Frequency" – the rate at which a Notification tests if its criteria has been met; available values are:
 - i. "Custom Daily"
 - ii. "Custom Weekly"
 - iii. "Custom Monthly"
 - iv. "Start Of The Day"
 - v. "Start Of The Week"
 - vi. "Start Of The Month"
 - vii. "End Of The Day"
 - viii. "End Of The Week"
 - ix. "End Of The Month"
 - x. "Update Catalogs"
 - xi. "Update Libraries"

- e. "Notification Style" – determines the above-mentioned criteria that must be met in order for the Notification to be triggered; available values are:
- i. "Notify Always" – Notification's criteria is always met
 - ii. "Notify On Any Change" – Notification's criteria is met if the results obtained by running its associated saved report differ in any way from those that were saved along with the Notification when it was created
 - iii. "Notify On Numerical Change" – Notification's criteria is met if any of the numerical cells (i.e. space, size, count, etc.) in the results obtained by running its associated saved report differ in any way from those that were saved along with the Notification when it was created
 - iv. "Notify On Row Count Change" – Notification's criteria is met if the number of rows in the results obtained by running its associated saved report differ from the number of rows in the results that were saved along with the Notification when it was created

3.5.3. Documents

Documents are collections of saved reports collated and viewed together. This allows for the contents of a series of saved reports to be visually compared. To create a Document:

- 1) Click on "Documents" in the FileCensus Console menu bar
- 2) Choose "Manage" to display the "Manage Documents" window
- 3) Create a new Document
- 4) Choose the saved reports that should appear within the new Document and the order in which they should appear
- 5) Specify a Description for the new Document (optional)

To view an existing Document, select it from the "Documents" FileCensus Console menu bar or from the Reports Start tab ("My Documents"). Of note, the Reports Start tab will need to be refreshed before a new Document will appear. Documents are presented as a single page containing the content of each of the Document's associated saved reports. A hyperlink to each saved report appears at the top of the page.

To export a Document to PDF format, click "Save As" under "File" in the FileCensus Console menu bar.

4. Glossary

4.1. Agent

Agents are FileCensus programs responsible for conducting scheduled and ad hoc scans of servers, volumes, paths and files, collecting information (metadata) for storage management analysis and reporting purposes.

4.2. "*.fsi" File

"*.fsi" files are metadata files associated with a file storage system.

4.3. Library

Libraries are sets of "*.fsi" files.

4.4. Catalog

Catalogs are groups of Libraries.

4.5. Scope

Scopes are lists of locations that exist in a storage infrastructure.

4.6. Collection

Collections are specific categorizations of files within the storage system.

4.7. Container

Containers are groups of Collections.

