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Using the StorHouse/RFS Audit Log

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Welcome

Welcome to *Using the StorHouse/RFS Audit Log*. The StorHouse/RFS audit log contains records written to a file and/or the RFS audit log database whenever a specific system event occurs. Administrators can use report generation tools such as SAP Crystal Reports 2011 to query the audit log database and build detailed reports that track system usage.

Purpose of this Manual

This manual explains the parameters in the StorHouse/RFS configuration file that control RFS audit logging. It also explains how to query the audit log database to generate customized RFS usage reports. The examples in this manual use SAP Crystal Reports 2011 as the report generation tool of choice. However any similar reporting platform that permits connectivity via ODBC data sources is equally effective.

Audience

The audience of this manual consists of StorHouse/RFS system administrators who are responsible for installing, configuring, and maintaining StorHouse/RFS. It is also comprises database administrators or any persons in charge of using third-party

report generation tools at the customer site. It assumes readers are familiar with StorHouse/RFS operation and setup, including creating and updating StorHouse/RFS profiles in CCi, and the format of the audit log database. It also assumes readers know how to use the third-party report generation tool of choice.

Contents

This manual has three chapters:

- Chapter 1, "Configuring StorHouse/RFS to Enable Audit Logging," explains
 the format of the StorHouse/RFS audit log and database and describes how
 to set up the RFS configuration file parameters that enable audit logging.
- Chapter 2, "Generating Audit Log Reports using SAP Crystal Reports 2011," explains how to use SAP Crystal Reports 2011 to query the StorHouse/RFS audit log database to produce a report listing all files created in a StorHouse system grouped by RFS server and the user IDs that created the files.
- Chapter 3, "Sample Reports," contains three sample reports generated from the audit log database using SAP Crystal Reports 2001.

H A P T E R

Configuring StorHouse/RFS to Enable Audit Logging

This chapter defines the StorHouse/RFS audit log and database and describes their formats. It also explains the parameters in the StorHouse/RFS configuration file that control audit logging.

About the StorHouse/RFS Audit Log

The StorHouse/RFS audit log contains records written for a given file whenever a specific system event occurs. Administrators can configure the StorHouse/RFS software to generate the audit log as a text file or in database format. For the text file format, StorHouse/RFS writes a local log only and starts a new one every day.

For the database format, StorHouse/RFS initially writes log records to a text file and subsequently bulk loads them into a user table in the audit log database at a user-specified interval. Administrators can submit SQL queries to the audit log table using the SGI ODBC driver directly or by using any third-party report generation platform (for example, SAP Crystal Reports 2011) that permits connectivity via ODBC data sources.

Table 1-1 lists the valid audit log record types and explains the system events that trigger them.

Table 1-1: Audit Log Record Types

Record Type	Information Logged When
Create	StorHouse/RFS creates a file or directory.
Delete	StorHouse/RFS deletes a file or directory.
Rename	StorHouse/RFS renames a file or directory
Modify	A user or application changes file content or metadata for a file or directory.
Access	A user or application opens a file for reading.
Hash	StorHouse/RFS hashes a file on ingest to StorHouse. StorHouse/RFS writes a separate hash record for each specified hash type. For example, hashing a file according to MD5 and SHA1 protocols will create two audit log hash records.

Audit Log Format

Audit log records contain the following tab-separated fields.

- UTC Date in the format YYYY-MM-DD HH:MM:SS.NNNNNN
- Operational event that triggered the logging
- Name of the user who initiated the operation
- Complete path and file name separated by a common delimiter (\)
- Hash value of the path and file name
- Host name of the StorHouse/RFS server
- Complete path and file name of the rename destination (RENAME only)
- Collection name if the file has been collected

- Starting logical block number (LBN) in the collection if the file has been collected
- File size if the file has been collected
- Hash type (for hash entries only)
- Hash value (for hash entries only)

The following is a sample text audit log.

```
2012-06-18 20:12:55.155965
                                            \root\061812
6484964978907623608 LINXSTH.FILETEK.COM
2012-06-18 20:13:19.309951 C
                                            \root\061812\file.0
2063546621671238554 LINXSTH.FILETEK.COM
2012-06-18 20:13:19.321187 C 0
                                            \root\061812\file.1
2063546621671238555 LINXSTH.FILETEK.COM
2012-06-18 20:13:19.333209 C 0
                                            \root\061812\file.2
2063546621671238556 LINXSTH.FILETEK.COM
                                            \root\061812\file.3
2012-06-18 20:13:19.344526 C
                                   Ω
2063546621671238557 LINXSTH.FILETEK.COM
2012-06-18 20:13:19.357120
                                            \root\061812\file.4
                           C
2063546621671238558 LINXSTH.FILETEK.COM
                                            \root\061812\file.5
2012-06-18 20:13:19.367932 C
2063546621671238559 LINXSTH.FILETEK.COM
2012-06-18 20:13:19.379244 C 0
                                            \root\061812\file.6
2063546621671238560 LINXSTH.FILETEK.COM
2012-06-18 20:13:19.390375 C 0
                                            \root\061812\file.7
2063546621671238561 LINXSTH.FILETEK.COM
2012-06-18 20:13:19.402254 C 0
                                            \root\061812\file.8
2063546621671238562 LINXSTH.FILETEK.COM
2012-06-18 20:13:19.413201
                                            \root\061812\file.9
                            С
2063546621671238563 LINXSTH.FILETEK.COM
2012-06-18 20:16:00.248189 H
                                            \rfs0\Jun-18-12-
12_13_06\loop_10.all_sizes\all_sizes.105557
                                            -3432954264645978833
LINXSTH.FILETEK.COM
COLL120120618135548(C).LINXSTH.FILETEK.COM
                                                   105557 MD2
66CE0EE83C420C492098F1EEBB9735D0
                                            \rfs0\Jun-18-12-
2012-06-18 20:16:00.248300
12_13_06\loop_10.all_sizes\all_sizes.105557
                                            -3432954264645978833
LINXSTH.FILETEK.COM
COLL120120618135548(C).LINXSTH.FILETEK.COM
                                                   105557 MD4
952DCCC8B30744E43B43F80C7380D251
2012-06-18 20:16:00.248320
                                            \rfs0\Jun-18-12-
12_13_06\loop_10.all_sizes\all_sizes.105557
                                            -3432954264645978833
LINXSTH.FILETEK.COM
COLL120120618135548(C).LINXSTH.FILETEK.COM
                                                   105557 MD5
3C486C36C625675BC2E894080CDC4433
2012-06-18 20:16:00.248338
                                            \rfs0\Jun-18-12-
12_13_06\loop_10.all_sizes\all_sizes.105557
                                            -3432954264645978833
```

```
LINXSTH.FILETEK.COM
COLL120120618135548(C).LINXSTH.FILETEK.COM
                                               1 105557 SHA
78A6E86AE728BC9BE71D52B5473CD95227D9206F
2012-06-18 20:16:00.248356
                                               \rfs0\Jun-18-12-
                              Н
12 13 06\loop 10.all sizes\all sizes.105557
                                               -3432954264645978833
LINXSTH.FILETEK.COM
COLL120120618135548(C).LINXSTH.FILETEK.COM
                                                       105557
SHA1B86E09B62F62922EABDFF73C82DB620002F579C2
                                               \rfs0\Jun-18-12-
2012-06-18 20:16:00.248373
12_13_06\loop_10.all_sizes\all_sizes.105557
                                               -3432954264645978833
LINXSTH.FILETEK.COM
COLL120120618135548(C).LINXSTH.FILETEK.COM
                                               1
                                                       105557 SHA22
        8D51687914DBD978F1BD3919C33644B7D98BA68F6604B4C2436FD2D5
                                               \rfs0\Jun-18-12-
2012-06-18 20:16:00.248391
                              H
12 13 06\loop 10.all sizes\all sizes.105557
                                               -3432954264645978833
LINXSTH.FILETEK.COM
COLL120120618135548(C).LINXSTH.FILETEK.COM
                                                       105557 SHA25
07FC8D1F1DD74BDA83873BBC249677674E0204BDB0D5BEEAEABFA578BB99EA20
2012-06-18 20:16:00.248410
                                             \rfs0\Jun-18-12-
12_13_06\loop_10.all_sizes\all_sizes.105557
                                               -3432954264645978833
LINXSTH.FILETEK.COM
COLL120120618135548(C).LINXSTH.FILETEK.COM
                                                       105557 SHA38
2312237FB13EE7FA88259BAF2D9AAE3CEE9E54FA0C5CF89CF63E140C849CA43114156A
D5F75AEA8D49D8A1D658261B45
2012-06-18 20:16:00.248505
                                               \rfs0\Jun-18-12-
12_13_06\loop_10.all_sizes\all_sizes.105557
                                               -3432954264645978833
LINXSTH.FILETEK.COM
COLL120120618135548(C).LINXSTH.FILETEK.COM
                                                       105557 SHA51
7B20ED72CE21201ED4544E0FAD9D6F6FDA1C63F02F8A8513A8F9E43339ED0AACF51DE5
B4B973ED872F22489D291A84A8F5407FFB1E31986095053D891B32D172
2012-06-18 20:16:00.248525 H
                                               \rfs0\Jun-18-12-
12_13_06\loop_10.all_sizes\all_sizes.105557
                                               -3432954264645978833
LINXSTH.FILETEK.COM
COLL120120618135548(C).LINXSTH.FILETEK.COM
                                                      105557 RMD16
       3741734575AB3BA1422EFBB28F68C672F0BF064C
```

Audit Log Database and User Table Format

Before you can store the audit log in database format, you must create an audit log database and the _AL table within that database. You create the audit log database with the setup_audit_db utility script. To create the _AL table, you must copy the setup_audit_db script to your StorHouse SM server system and then run the script as fltkoper. The full path to the setup_audit_db script is /opt/FLTKrfs/bin.

Table 1-2 defines the fields in the AL table.

Table 1-2: Fields in the _AL Table

Field	Definition	Format
TSTAMP	Date and time the logged event occurred.	TIMESTAMP NOT NULL DEFAULT SYSTIMESTAMP
RECORD_TYPE	Type of event. Valid values are: A – access for read C – create D – delete R – rename M – modify H – hash	CHAR(1) NOT NULL DEFAULT ' '
USERNAME	UNIX user ID of the user who performed the action.	VARCHAR(70) NOT NULL DEFAULT ' '
FILEPATH	Path of the file processed by the event.	VARCHAR (4096) NOT NULL DEFAULT ''
FILEPATH_HASH	Value used to identify the file in other tables (for example, the locator and security tables).	BIGINT NOT NULL DEFAULT 0
SYSTEMNAME	Name of the StorHouse/RFS server where the event took place.	VARCHAR(64) NOT NULL DEFAULT ' '
OLD_FILEPATH	In move operations, the source path of the file.	VARCHAR (4096) DEFAULT ' '
COLLECTION_NAME	Name of the StorHouse collection file that contains the user file.	VARCHAR (56)
LBN	Logical block number indicating the location of the user file within the collection file.	INTEGER
FILE_SIZE	Size of the user file in bytes.	BIGINT
HASH_TYPE	Type of hashing algorithm (for example, MD5) used for this record.	CHAR(6)
FILEDATA_HASH	Actual hash value of the file (i.e., the MD5 string)	VARBINARY (128)

RES1	Reserved for future use.	VARCHAR (256)
XML	Reserved for future use.	VARCHAR (20000))

The _AL table has two indexes:

- A range index on the TSTAMP field
- A value index on the FILEPATH_HASH field

RFS Configuration File Parameters that Control Audit Logging and Hashing

The parameters that control audit logging and hashing are located in the AUDITLOG section and COLLECTION definition of a StorHouse/RFS configuration file. Note the following:

- At minimum, you must provide values for the MaxLoadInterval and the Storage parameters in the AUDITLOG section to write data to the audit log database.
- You must configure the FileAudit setting for each Collection definition that you want to track in the audit log.

Table 1-3 describes the parameters that affect audit logging.

Table 1-3: Parameters That Control Audit Logging and Hashing

Configuration Parameter	Definition
AUDITLOG Section	Globally defines if and where RFS writes audit log data.
FileAuditPath	Fully qualified path where StorHouse/RFS will write the audit/hash records.
	Note: There is a parameter with the same name in the RFS section of the configuration file. This parameter will be deprecated in the near future. Therefore, always specify FileAuditPath in the AUDITLOG section to enable audit logging.
MaxLoadInterval	Amount of time in minutes between bulk loads of audit log records to the database.
Storage	Name of the StorHouse/RFS storage definition that will contain the audit log database. If blank, StorHouse/RFS will write the audit log in text file format only. You must specify Storage to enable use of the audit log database.
	You can create a new storage definition to contain the audit log database, or you can set up audit logging to utilize an existing storage definition. Moreover, one or more StorHouse/RFS servers can use the same storage definitions for audit logs, thereby enabling a comprehensive database of all hashes throughout an organization.
Collection Definition	Specifies which events to capture and the type of hashing method for files in this collection.
FileAudit	Types of file and directory actions to be logged for files in this collection. Valid values are:
	A (access)
	C (create)
	D (delete)
	R (rename)
	M (modify)
	You may specify one or more values (for example, CDR). Do not separate values with a delimiter.
	Note that if a value is specified for FileAuditHash, RFS automatically creates a corresponding hash record in the audit log.

FileAuditHash	Types of hashes to perform on files in this collection when they are written to StorHouse. Valid values are:
	■ MD5
	■ SHA
	■ SHA1
	■ SHA224
	■ SHA256
	■ SHA384
	■ SHA512
	■ RMD160
	You may specify one or more values (for example, SHA1,SHA224) separated by a comma or space.

You update the RFS configuration file by editing a StorHouse/RFS profile in StorHouse/CCi. A StorHouse/RFS profile is a tool for managing the properties, or operating parameters, of a StorHouse/RFS server. In other words, it is the graphical representation of the sections and definitions in the StorHouse/RFS configuration file. For detailed information about how to update a StorHouse/RFS profile, refer to the StorHouse/RFS Configuration File Reference Manual.

C H A P T E R

2

Generating Audit Log Reports using SAP Crystal Reports 2011

This chapter explains how to use SAP Crystal Reports 2011 to generate an audit log report that details all StorHouse files sorted by StorHouse/RFS server and user ID that created the file. Although this chapter specifically shows the procedure for creating reports using SAP Crystal Reports 2011, the same concepts can be applied to any reporting tool that can connect to StorHouse via an ODBC data source.

Prerequisites

To use SAP Crystal Reports 2011 to generate audit log reports, you need:

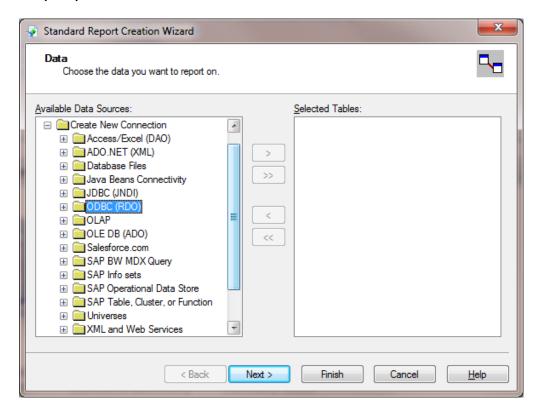
- A StorHouse/RFS server running StorHouse/RFS release v5 or higher
- The SGI ODBC Driver installed and operational on the machine where your reporting application is running
- A version of SAP Crystal Reports 2011

SAP Crystal Reports is available only as a 32-bit application. Therefore, you will need the 32-bit version of the StorHouse/RM ODBC driver.

Creating the Sample Report

Use the following procedure to create the sample audit log report with SAP Crystal Reports 2011.

- ▼ To create a report that details all StorHouse files sorted by RFS server and user ID that created the file
 - 1. In Crystal Reports, click Report Wizard.
 - In the Data Source dialog box, under Create New Connection, select ODBC (RDO).



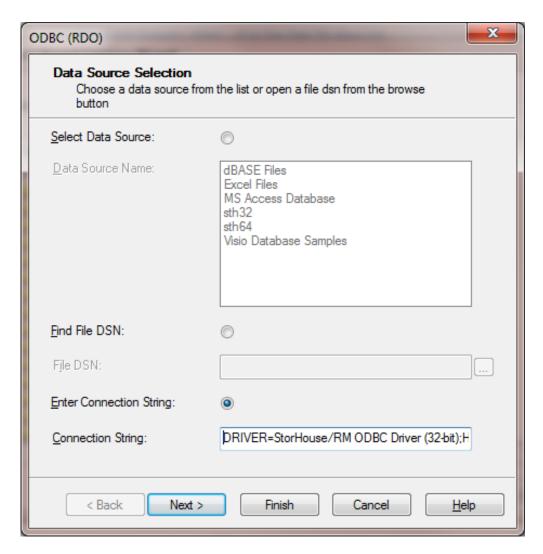
3. When the Data Source Selection dialog opens, SGI provides the connection details. In this example, it is the following connection string:

DRIVER=StorHouse/RM ODBC Driver (32-bit); HOST=192.168.10.102[1990]; UID=SYSADM; PWD=SYSADM; DATABAS E=ARCHIVE; CALLER=

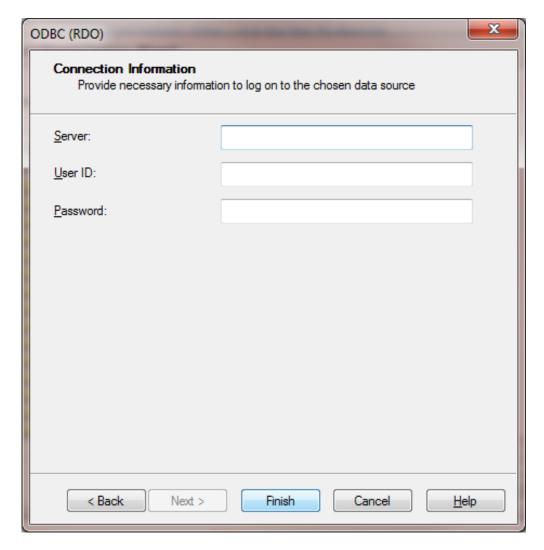
where:

- HOST is the hostname or IP address of your StorHouse server
- UID is the StorHouse account ID used to connect to the database
- PWD is the password for the specified UID
- DATABASE is the name of the database you are connecting to

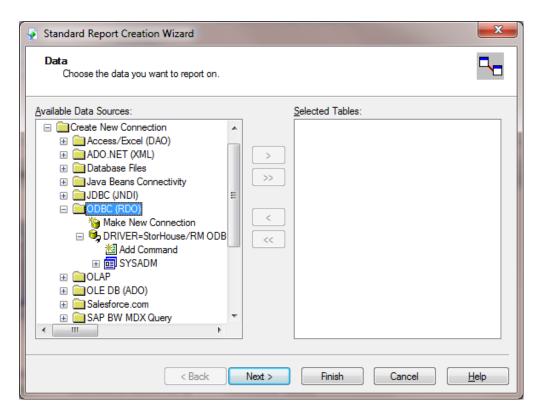
Note that instead of using a connection string, you could supply a DSN.



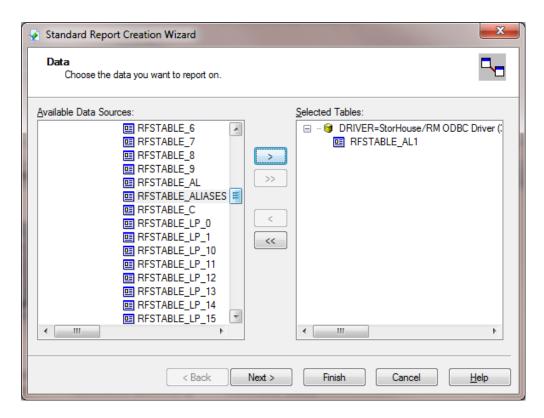
- 4. Click Next.
- 5. Leave the Connection Information dialog box text boxes blank as the supplied connection string already contains server, user ID, and password information.



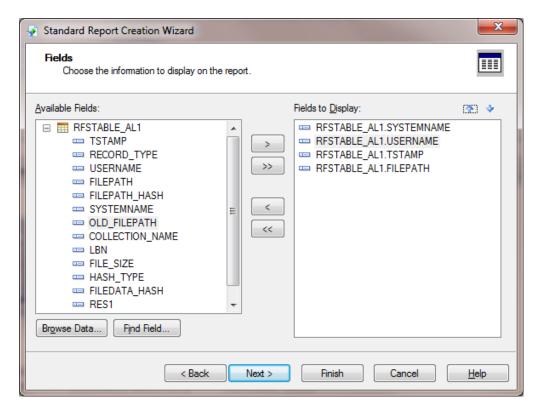
- 6. Click Finish.
- 7. On the **Data** dialog box, expand **SYSADM**.



8. Under **Available Data Sources**, Select **TABLENAME_AL**, and then click the arrow to move it to the **Selected Tables** column on the right.

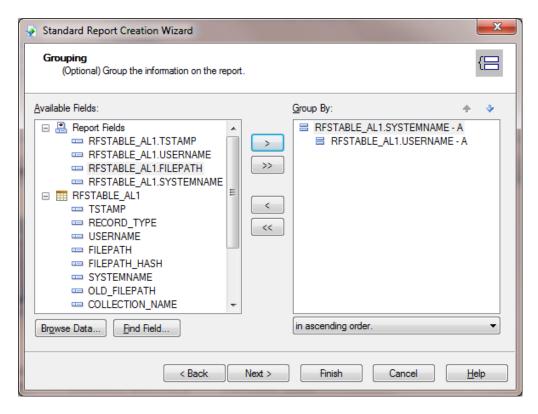


- 9. Click Next.
- 10. Under Available Fields, select SYSTEMNAME, USERNAME, TSTAMP, and FILEPATH, and then click the arrow to move each selected field to the Fields to Display column on the right.



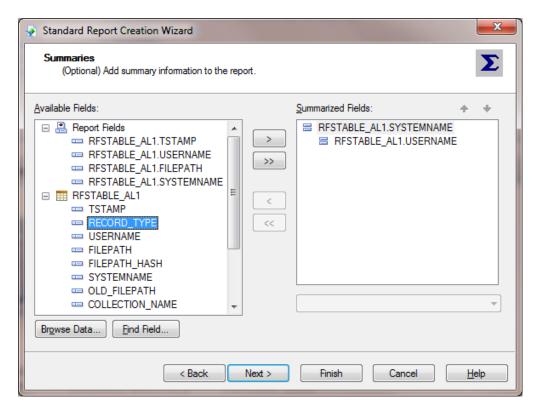
11. Click Next.

12. On the **Grouping** dialog box, under **Available Fields**, select **SYSTEMNAME** and **USERNAME**. Then click the arrow to move these fields to the **Group By** column on the right.

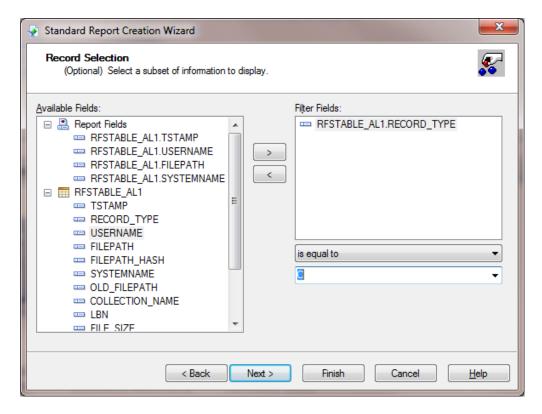


13. Click Next.

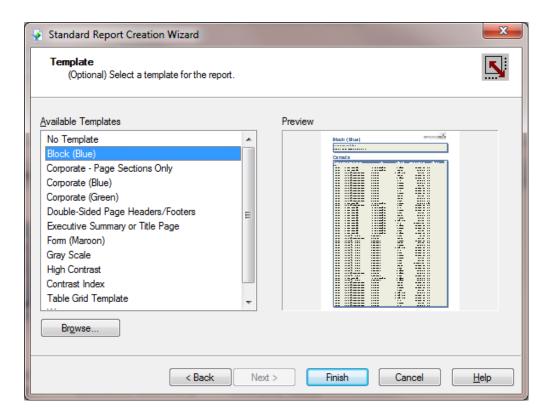
14. Review the Summaries dialog box, and leave it as is.



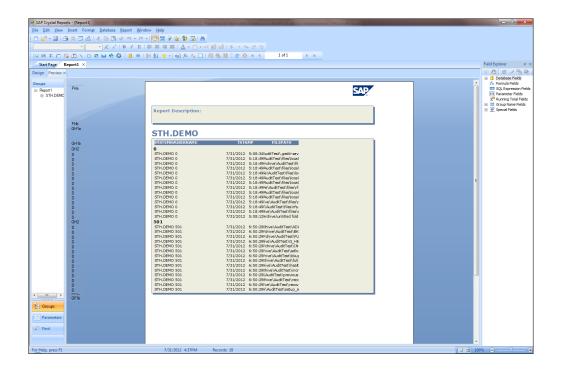
- 15. Click Next.
- 16. On the **Record Selection** dialog box, select **RECORD_TYPE**. Then click the arrow to move it to the **Filter Fields** column on the right.
- 17. In the **Filter Fields** column, click the arrow next to the **is equal to** drop-down list, and select **C** to display records only for a "Create" event.



- 18. Click Next.
- 19. On the **Template** dialog box, under **Available Templates**, select a template (in this example, **Block (Blue)**).



You have now created a basic report that shows all files created in your system. The report groups files by RFS server and the user ID that created them.



■■■ Using the StorHouse/RFS Audit Log

C H A P T E R

Sample Audit Log Reports Created Using SAP Crystal Reports 2011

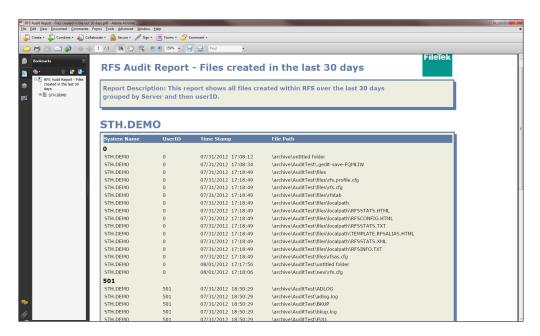
This chapter contains the following sample audit log reports generated with SAP Crystal Reports 2011:

- Files created in the last 30 days
- File hashes for files created on the current day
- File actions by user ID for the last 30 days

SGI distributes these reports in PDF and .rpt formats in a file called Sample Reports.zip.

RFS Audit Report - Files Created in the Last 30 Days

This report shows all files created on the system for the last 30 days grouped by server and user.



RFS Audit Report - File Hashes for Files Created on the Current Day

This report shows the MD5 hashes (assuming this feature has been enabled in the configuration) for all files created on the current day.



RFS Audit Report - File Actions by User ID for the Last 30 Days

This report shows file actions by user ID for the last 30 days in a graphical rather than a list format.

