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Send Us Your Comments

Oracle9i Recovery Manager Reference, Release 1 (9.0.1)
Part No.  A90136-02

Oracle Corporation welcomes your comments and suggestions on the quality and usefulness of this document. Your input is an important part of the information used for revision.

- Did you find any errors?
- Is the information clearly presented?
- Do you need more information? If so, where?
- Are the examples correct? Do you need more examples?
- What features did you like most?

If you find any errors or have any other suggestions for improvement, please indicate the document title and part number, and the chapter, section, and page number (if available). You can send comments to us in the following ways:

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  Server Technologies Documentation
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  Redwood Shores, CA  94065
  USA

If you would like a reply, please give your name, address, telephone number, and (optionally) electronic mail address.

If you have problems with the software, please contact your local Oracle Support Services.
This guide contains command syntax, recovery catalog views descriptions, and related reference information about the Recovery Manager utility.

This preface contains these topics:

- Audience
- Organization
- Related Documentation
- Conventions
- Documentation Accessibility
Audience

This manual is intended for database administrators who perform the following tasks:

- Back up, restore, and recover Oracle databases
- Perform maintenance on backups and copies of database files

To use this document, you need to know the following:

- Relational database concepts and basic database administration as described in Oracle9i Database Concepts and the Oracle9i Database Administrator's Guide
- Basic backup and recovery concepts and strategies as described in the Oracle9i Backup and Recovery Concepts
- Basic RMAN concepts and tasks as described in Oracle9i Recovery Manager User's Guide
- The operating system environment under which you are running Oracle

Organization

This document contains:

**Chapter 1, "About RMAN Commands"**
This chapter describes the basic conventions of RMAN syntax.

**Chapter 2, "RMAN Commands"**
This chapter displays the RMAN syntax diagrams, describes the elements of the syntax, and provides examples.

**Chapter 3, "Recovery Catalog Views"**
This chapter describes the recovery catalog views.

**Appendix A, " Deprecated RMAN Commands'"
This appendix describes RMAN syntax that is deprecated (that is, no longer supported) but still functional.

**Appendix B, "RMAN Compatibility"**
This appendix shows the compatible combinations of the RMAN executable, target database, recovery catalog database, and recovery catalog schema.
Related Documentation

For more information, see these Oracle resources:

- Oracle9i Recovery Manager User’s Guide
- Oracle9i Backup and Recovery Concepts
- Oracle9i User-Managed Backup and Recovery Guide
- Oracle9i Database Utilities
- http://www.oracle.com/database/recovery

You can access information about the Backup Solutions Program at


In North America, printed documentation is available for sale in the Oracle Store at

http://oraclestore.oracle.com/

Customers in Europe, the Middle East, and Africa (EMEA) can purchase documentation from

http://www.oraclebookshop.com/

Other customers can contact their Oracle representative to purchase printed documentation.

To download free release notes, installation documentation, white papers, or other collateral, please visit the Oracle Technology Network (OTN). You must register online before using OTN; registration is free and can be done at

http://technet.oracle.com/membership/index.htm

If you already have a username and password for OTN, then you can go directly to the documentation section of the OTN Web site at

http://technet.oracle.com/docs/index.htm

Conventions

This section describes the conventions used in the text and code examples of this documentation set. It describes:

- Conventions in Text
- Conventions in Code Examples
## Conventions in Text

We use various conventions in text to help you more quickly identify special terms. The following table describes those conventions and provides examples of their use.

<table>
<thead>
<tr>
<th>Convention</th>
<th>Meaning</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Bold</strong></td>
<td>Bold typeface indicates terms that are defined in the text or terms that appear in a glossary, or both.</td>
<td>When you specify this clause, you create an index-organized table.</td>
</tr>
<tr>
<td><em>Italics</em></td>
<td>Italic typeface indicates book titles or emphasis.</td>
<td>Oracle9i Database Concepts</td>
</tr>
<tr>
<td><strong>UPPERCASE monospace (fixed-width font)</strong></td>
<td>Uppercase monospace typeface indicates elements supplied by the system. Such elements include parameters, privileges, datatypes, RMAN keywords, SQL keywords, SQL*Plus or utility commands, packages and methods, as well as system-supplied column names, database objects and structures, usernames, and roles.</td>
<td>You can specify this clause only for a NUMBER column. You can back up the database by using the BACKUP command. Query the TABLE_NAME column in the USER_TABLES data dictionary view. Use the DBMS_STATS.GENERATE_STATS procedure.</td>
</tr>
<tr>
<td><strong>lowercase monospace (fixed-width font)</strong></td>
<td>Lowercase monospace typeface indicates executables, filenames, directory names, and sample user-supplied elements. Such elements include computer and database names, net service names, and connect identifiers, as well as user-supplied database objects and structures, column names, packages and classes, usernames and roles, program units, and parameter values. <strong>Note:</strong> Some programmatic elements use a mixture of UPPERCASE and lowercase. Enter these elements as shown.</td>
<td>Enter sqlplus to open SQL*Plus. The password is specified in the orapwd file. Back up the datafiles and control files in the /disk1/oracle/dbs directory. The department_id, department_name, and location_id columns are in the hr.departments table. Set the QUERY_REWRITE_ENABLED initialization parameter to true. Connect as oe user. The JRepUtil class implements these methods.</td>
</tr>
<tr>
<td><strong>lowercase monospace italic</strong></td>
<td>Lowercase monospace italic font represents placeholders or variables.</td>
<td>You can specify the parallel_clause. Run Uold_release.SQL where old_release refers to the release you installed prior to upgrading.</td>
</tr>
</tbody>
</table>
Conventions in Code Examples

Code examples illustrate SQL, PL/SQL, SQL*Plus, or other command-line statements. They are displayed in a monospace (fixed-width) font and separated from normal text as shown in this example:

```
SELECT username FROM dba_users WHERE username = 'MIGRATE';
```

The following table describes typographic conventions used in code examples and provides examples of their use.

<table>
<thead>
<tr>
<th>Convention</th>
<th>Meaning</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>[]</td>
<td>Brackets enclose one or more optional items. Do not enter the brackets.</td>
<td>DECIMAL (digits [ , precision ])</td>
</tr>
<tr>
<td>{}</td>
<td>Braces enclose two or more items, one of which is required. Do not enter the braces.</td>
<td>{ENABLE</td>
</tr>
<tr>
<td></td>
<td>A vertical bar represents a choice of two or more options within brackets or braces. Enter one of the options. Do not enter the vertical bar.</td>
<td>{ENABLE</td>
</tr>
<tr>
<td>...</td>
<td>Horizontal ellipses points indicate either:</td>
<td>CREATE TABLE ... AS subquery;</td>
</tr>
<tr>
<td></td>
<td>■ That we have omitted parts of the code that are not directly related to the example</td>
<td>SELECT col1, col2, ..., coln FROM employees;</td>
</tr>
<tr>
<td></td>
<td>■ That you can repeat a portion of the code</td>
<td></td>
</tr>
<tr>
<td>. . .</td>
<td>Vertical ellipsis points indicate that we have omitted several lines of code not directly related to the example.</td>
<td></td>
</tr>
<tr>
<td>Other notation</td>
<td>You must enter symbols other than brackets, braces, vertical bars, and ellipses points as shown.</td>
<td>acctbal NUMBER(11,2); acct CONSTANT NUMBER(4) := 3;</td>
</tr>
<tr>
<td>Italicized</td>
<td>Italicized text indicates placeholders or variables for which you must supply particular values.</td>
<td>CONNECT SYSTEM/system_password DB_NAME = database_name</td>
</tr>
</tbody>
</table>
Documentation Accessibility

Oracle’s goal is to make our products, services, and supporting documentation accessible to the disabled community with good usability. To that end, our documentation includes features that make information available to users of assistive technology. This documentation is available in HTML format, and contains markup to facilitate access by the disabled community. Standards will continue to evolve over time, and Oracle is actively engaged with other market-leading technology vendors to address technical obstacles so that our documentation can be accessible to all of our customers. For additional information, visit the Oracle Accessibility Program Web site at

http://www.oracle.com/accessibility/

JAWS, a Windows screen reader, may not always correctly read the code examples in this document. The conventions for writing code require that closing braces should appear on an otherwise empty line; however, JAWS may not always read a line of text that consists solely of a bracket or brace.

<table>
<thead>
<tr>
<th>Convention</th>
<th>Meaning</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>UPPERCASE</strong></td>
<td>Uppercase typeface indicates elements supplied by the system. We show these terms in uppercase in order to distinguish them from terms you define. Unless terms appear in brackets, enter them in the order and with the spelling shown. However, because these terms are not case sensitive, you can enter them in lowercase.</td>
<td>SELECT last_name, employee_id FROM employees; SELECT * FROM USER_TABLES; DROP TABLE hr.employees;</td>
</tr>
<tr>
<td><strong>lowercase</strong></td>
<td>Lowercase typeface indicates programmatic elements that you supply. For example, lowercase indicates names of tables, columns, or files. <strong>Note:</strong> Some programmatic elements use a mixture of <strong>UPPERCASE</strong> and lowercase. Enter these elements as shown.</td>
<td>SELECT last_name, employee_id FROM employees; sqlplus hr/hr CREATE USER mjones IDENTIFIED BY ty30J9;</td>
</tr>
</tbody>
</table>

**Convention**

**Meaning**

**Example**

<table>
<thead>
<tr>
<th>Convention</th>
<th>Meaning</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>UPPERCASE</strong></td>
<td>Uppercase typeface indicates elements supplied by the system. We show these terms in uppercase in order to distinguish them from terms you define. Unless terms appear in brackets, enter them in the order and with the spelling shown. However, because these terms are not case sensitive, you can enter them in lowercase.</td>
<td>SELECT last_name, employee_id FROM employees; SELECT * FROM USER_TABLES; DROP TABLE hr.employees;</td>
</tr>
<tr>
<td><strong>lowercase</strong></td>
<td>Lowercase typeface indicates programmatic elements that you supply. For example, lowercase indicates names of tables, columns, or files. <strong>Note:</strong> Some programmatic elements use a mixture of <strong>UPPERCASE</strong> and lowercase. Enter these elements as shown.</td>
<td>SELECT last_name, employee_id FROM employees; sqlplus hr/hr CREATE USER mjones IDENTIFIED BY ty30J9;</td>
</tr>
</tbody>
</table>
This chapter describes the basic elements of RMAN syntax. It includes the following sections:

- Conventions Used in this Reference
- Command Entries
Conventions Used in this Reference

This section explains the conventions used in this chapter including:

- **Text Conventions**
- **Syntax Diagrams and Notation**
- **RMAN Code Examples**

**Text Conventions**

The text in this reference adheres to the following conventions:

**UPPERCASE monospace**

Uppercase monospace text calls attention to RMAN keywords, SQL keywords, column headings in tables and views, and initialization parameters.

**lowercase monospace**

Lowercase monospace text calls attention to variable text in RMAN examples.

**italics**

Italicized monospace text calls attention to RMAN or SQL placeholders, that is, text that should not be entered as-is but represents a value to be entered by the user.

**Syntax Diagrams and Notation**

This section describes the conventions for RMAN command syntax.

**Syntax Diagrams**

This reference uses syntax diagrams to show Recovery Manager commands. These syntax diagrams use lines and arrows to show syntactic structure, as shown in Figure 1–1.
This section describes the components of syntax diagrams and gives examples of how to write RMAN commands. Syntax diagrams are made up of these items:

- **Keywords**
- **Placeholders**

**Keywords** Keywords have special meanings in Recovery Manager syntax. In the syntax diagrams, keywords appear in rectangular boxes and an uppercase font, like the word `CATALOG` in Figure 1–1. When used in text and code examples, RMAN keywords appear in uppercase, monospace font, for example, `CATALOG` `DATAFILECOPY`. You must use keywords in RMAN statements exactly as they appear in the syntax diagram, except that they can be either uppercase or lowercase.

The RMAN language is free-form. Keywords must be separated by at least one white space character, but otherwise there are no restrictions. A command can span multiple lines.

**Placeholders** Placeholders in syntax diagrams indicate non-keywords. In the syntax diagrams, they appear in ovals, as in the word `integer` in Figure 1–1. When described in text, RMAN placeholders appear in lowercase italic, for example, `'filename'`. Placeholders are usually:

- Names of database objects (`tablespace_name`)
- Oracle datatype names (`date_string`)
- subclauses (`datafileSpec`)

When you see a placeholder in a syntax diagram, substitute an object or expression of the appropriate type in the RMAN statement. For example, to write a `DUPLICATE TARGET DATABASE TO 'database_name'` command, use the name of the duplicate database you want to create, such as `dupdb`, in place of the `database_name` placeholder in the diagram.
Some placeholder values are enclosed in required or optional quotes. The syntax diagrams show single quotes, though in all cases double quotes are also legal in RMAN syntax. For example, you specify either 'filename' or "filename". For the SQL command, it is recommended that you use double quotes because the SQL statement itself may also contain a quote, and the most common type of quote in a SQL statement is a single quote. Single and double quotes do not mean the same in SQL as they do in RMAN.

The following table shows placeholders that appear in the syntax diagrams and provides examples of the values you might substitute for them in your statements.

<table>
<thead>
<tr>
<th>Placeholder</th>
<th>Description</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>quoted strings such as 'filename', 'tablespace_name', 'channel_name', 'channel_parms'</td>
<td>A string of characters contained in either single or double quotes. A quoted string may contain white space, punctuation, and RMAN and SQL keywords.</td>
<td>&quot;?/dbs/cf.f&quot; 'dev1'</td>
</tr>
<tr>
<td>nonquoted strings such as channel_id, tag_name, date_string</td>
<td>A sequence of characters containing no white space and no punctuation characters and starting with an alphabetic character.</td>
<td>ch1</td>
</tr>
<tr>
<td>integer</td>
<td>Any sequence of only number characters.</td>
<td>67843</td>
</tr>
</tbody>
</table>

Reserved Words

Table 1–1 is a list of RMAN reserved words. If you use one of these words by itself without surrounding it in quotes, then RMAN generates an error. These are examples of correct and incorrect entries:

```
ALLOCATE CHANNEL backup DEVICE TYPE DISK; # incorrect
ALLOCATE CHANNEL 'backup' DEVICE TYPE DISK; # correct
BACKUP DATABASE TAG full; # incorrect
BACKUP DATABASE TAG 'full'; # correct
```

<table>
<thead>
<tr>
<th>Table 1–1</th>
<th>RMAN Reserved Words</th>
<th>(Page 1 of 2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABORT</td>
<td>AFFINITY</td>
<td>AFTER</td>
</tr>
<tr>
<td>APPEND</td>
<td>ARCHIVELOG</td>
<td>AT</td>
</tr>
<tr>
<td>BACKUP</td>
<td>BACKUPPIECE</td>
<td>BACKUPSET</td>
</tr>
<tr>
<td>CATALOG</td>
<td>CHANGE</td>
<td>CHANNEL</td>
</tr>
</tbody>
</table>

1-4  Oracle9i Recovery Manager Reference
Table 1–1  RMAN Reserved Words  (Page 2 of 2)

<table>
<thead>
<tr>
<th>CLONENAME</th>
<th>CMDFILE</th>
<th>CHECK</th>
<th>CLONE</th>
<th>CLONE_CF</th>
<th>CLONENAME</th>
<th>CMDFILE</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMMAND</td>
<td>COMPLETED</td>
<td>CONNECT</td>
<td>CONTROLFILE</td>
<td>CONTROLFILECOPY</td>
<td>COPY</td>
<td>CREATE</td>
</tr>
<tr>
<td>CROSSCHECK</td>
<td>CUMULATIVE</td>
<td>CURRENT</td>
<td>DATABASE</td>
<td>DATAFILE</td>
<td>DATAFILECOPY</td>
<td>DAYS</td>
</tr>
<tr>
<td>DBA</td>
<td>DBID</td>
<td>DEBUG</td>
<td>DEFINE</td>
<td>DELETE</td>
<td>DESTINATION</td>
<td>DEVICE</td>
</tr>
<tr>
<td>DISK</td>
<td>DISKRATIO</td>
<td>DROP</td>
<td>DUMP</td>
<td>DUPLEX</td>
<td>DUPLICATE</td>
<td>ECHO</td>
</tr>
<tr>
<td>EQUAL</td>
<td>EXECUTE</td>
<td>EXIT</td>
<td>EXPIRED</td>
<td>FILESPESET</td>
<td>FOR</td>
<td>FORCE</td>
</tr>
<tr>
<td>FOREVER</td>
<td>FORMAT</td>
<td>FROM</td>
<td>FULL</td>
<td>GROUP</td>
<td>HIGH</td>
<td>HOST</td>
</tr>
<tr>
<td>ID</td>
<td>INACCESSIBLE</td>
<td>INCARNATION</td>
<td>INCLUDE</td>
<td>INCREMENTAL</td>
<td>INPUT</td>
<td>INTEGER</td>
</tr>
<tr>
<td>IMMEDIATE</td>
<td>JOB</td>
<td>K</td>
<td>KBYTES</td>
<td>LEVEL</td>
<td>LIBPARM</td>
<td>LIBRARY</td>
</tr>
<tr>
<td>LIKE</td>
<td>LIMIT</td>
<td>LIST</td>
<td>LOG</td>
<td>LOGFILE</td>
<td>LOGICAL</td>
<td>LOGSEQ</td>
</tr>
<tr>
<td>LOW</td>
<td>MAXCORRUPT</td>
<td>MAXOPENFILES</td>
<td>MSGLOG</td>
<td>MASK</td>
<td>MSGNO</td>
<td>MAINTENANCE</td>
</tr>
<tr>
<td>MOUNT</td>
<td>M</td>
<td>NAME</td>
<td>NEED</td>
<td>NEWNAME</td>
<td>NOCHECKSUM</td>
<td>NOCATALOG</td>
</tr>
<tr>
<td>NEWLINE</td>
<td>NOREDO</td>
<td>NORMAL</td>
<td>NOMOUNT</td>
<td>NOFILECHECK</td>
<td>NULL</td>
<td>OF</td>
</tr>
<tr>
<td>OFFLINE</td>
<td>ORPHAN</td>
<td>OBSOLETE</td>
<td>OPEN</td>
<td>ON</td>
<td>OFF</td>
<td>ONLY</td>
</tr>
<tr>
<td>PARMS</td>
<td>PLSQL</td>
<td>PRINT</td>
<td>PFILE</td>
<td>PROXY</td>
<td>POOL</td>
<td>PIPE</td>
</tr>
<tr>
<td>RCVCAT</td>
<td>RELEASE</td>
<td>RELOAD</td>
<td>REPLACE</td>
<td>REPlicate</td>
<td>REPORT</td>
<td>RECOVERABLE</td>
</tr>
<tr>
<td>RESET</td>
<td>RESTART</td>
<td>RESTORE</td>
<td>RESYNC</td>
<td>RMAN</td>
<td>RPTCETESTRUN</td>
<td>READONLY</td>
</tr>
<tr>
<td>READRATE</td>
<td>RECOVER</td>
<td>REDUNDANCY</td>
<td>REGISTER</td>
<td>REUSE</td>
<td>SCHEMA</td>
<td>SCN</td>
</tr>
<tr>
<td>SCRIPT</td>
<td>SEND</td>
<td>SET</td>
<td>SETLIMIT</td>
<td>SETSIZE</td>
<td>SHUTDOWN</td>
<td>SIZE</td>
</tr>
<tr>
<td>SKIP</td>
<td>SLAXDEBUG</td>
<td>SQL</td>
<td>STARTUP</td>
<td>STEP</td>
<td>TABLESPACE</td>
<td>TAG</td>
</tr>
<tr>
<td>TARGET</td>
<td>TEST</td>
<td>THREAD</td>
<td>TIME</td>
<td>TIMEOUT</td>
<td>TO</td>
<td>TRACE</td>
</tr>
<tr>
<td>TRANSACTIONAL</td>
<td>TYPE</td>
<td>UNAVAILABLE</td>
<td>UNCATALOG</td>
<td>UNDERSCORE</td>
<td>UNRECOVERABLE</td>
<td>UNTIL</td>
</tr>
<tr>
<td>UPGRADE</td>
<td>VALIDATE</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

RMAN Code Examples

This reference contains many examples of RMAN commands. These examples show you how to use elements of RMAN. This example shows the use of a BACKUP command:

RUN
{ALLOCATE CHANNEL ch1 DEVICE TYPE sbt;
Note that examples are set off from the text and appear in a monospace font.

**Command Entries**

The description of each command or subclause contains the following sections:

- **Syntax**
  Shows the keywords and parameters that make up the statement.
  
  **Note:** Not all keywords and parameters are valid in all circumstances. Be sure to refer to the "Keywords and Parameters" section of each statement to learn about any restrictions on the syntax.

- **Purpose**
  Describes the basic uses of the statement.

- **Restrictions and Usage Notes**
  Lists requirements, restrictions, and guidelines for proper use of the command.

- **Keywords and Parameters**
  Describes the purpose of each keyword and parameter. Restrictions and usage notes also appear in this section.

- **Examples**
  Shows how to use various clauses and options of the statement.

  **Note:** Optional sections following the examples provide more information on how and when to use the statement.
This chapter describes, in alphabetical order, Recovery Manager commands and subclauses. For a summary of the RMAN commands and command-line options, refer to "Summary of RMAN Commands" on page 2-2.
Table 2–1 provides a functional summary of RMAN commands that you can execute at the RMAN prompt, within a RUN command, or both. All commands from previous RMAN releases work with the current release. For RMAN options that you can specify on the operating system command line, refer to "cmdLine" on page 2-57.

### Table 2–1 Recovery Manager Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;@&quot; on page 2-6</td>
<td>Run a command file.</td>
</tr>
<tr>
<td>&quot;@@&quot; on page 2-7</td>
<td>Run a command file in the same directory as another command file that is currently running. The @@ command differs from the @ command only when run from within a command file.</td>
</tr>
<tr>
<td>&quot;ALLOCATE CHANNEL&quot; on page 2-9</td>
<td>Establish a channel, which is a connection between RMAN and a database instance.</td>
</tr>
<tr>
<td>&quot;ALLOCATE CHANNEL FOR MAINTENANCE&quot; on page 2-13</td>
<td>Allocate a channel in preparation for issuing maintenance commands such as DELETE.</td>
</tr>
<tr>
<td>&quot;allocOperandList&quot; on page 2-16</td>
<td>A subclause that specifies channel control options such as PARMS, FORMAT, and MAXOPENFILES.</td>
</tr>
<tr>
<td>&quot;ALTER DATABASE&quot; on page 2-20</td>
<td>Mount or open a database.</td>
</tr>
<tr>
<td>&quot;archivelogRecordSpecifier&quot; on page 2-22</td>
<td>Specify a range of archived redo logs files.</td>
</tr>
<tr>
<td>&quot;BACKUP&quot; on page 2-26</td>
<td>Back up a database, tablespace, datafile, archived log, or backup set.</td>
</tr>
<tr>
<td>&quot;BLOCKRECOVER&quot; on page 2-46</td>
<td>Recover an individual data block or set of data blocks within one or more datafiles.</td>
</tr>
<tr>
<td>&quot;CATALOG&quot; on page 2-50</td>
<td>Add information about a datafile copy, archived redo log, or control file copy to the repository.</td>
</tr>
<tr>
<td>&quot;CHANGE&quot; on page 2-53</td>
<td>Mark a backup piece, image copy, or archived redo log as having the status UNAVAILABLE or AVAILABLE; remove the repository record for a backup or copy; override the retention policy for a backup or copy.</td>
</tr>
<tr>
<td>&quot;completedTimeSpec&quot; on page 2-61</td>
<td>Specify a time range during which the backup or copy completed.</td>
</tr>
<tr>
<td>&quot;CONFIGURE&quot; on page 2-63</td>
<td>Configure persistent RMAN settings. These settings apply to all RMAN sessions until explicitly changed or disabled.</td>
</tr>
</tbody>
</table>
### Summary of RMAN Commands

#### Table 2–1 Recovery Manager Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;CONNECT&quot; on page 2-76</td>
<td>Establish a connection between RMAN and a target, auxiliary, or recovery catalog database.</td>
</tr>
<tr>
<td>&quot;connectStringSpec&quot; on page 2-79</td>
<td>Specify the username, password, and net service name for connecting to a target, recovery catalog, or auxiliary database. The connection is necessary to authenticate the user and identify the database.</td>
</tr>
<tr>
<td>&quot;COPY&quot; on page 2-81</td>
<td>Create an image copy of a datafile, control file, or archived redo log.</td>
</tr>
<tr>
<td>&quot;CREATE CATALOG&quot; on page 2-86</td>
<td>Create the schema for the recovery catalog.</td>
</tr>
<tr>
<td>&quot;CREATE SCRIPT&quot; on page 2-88</td>
<td>Create a stored script and store it in the recovery catalog.</td>
</tr>
<tr>
<td>&quot;CROSSCHECK&quot; on page 2-92</td>
<td>Determine whether files managed by RMAN, such as archived logs, datafile copies, and backup pieces, still exist on disk or tape.</td>
</tr>
<tr>
<td>&quot;datafileSpec&quot; on page 2-95</td>
<td>Specify a datafile by filename or absolute file number.</td>
</tr>
<tr>
<td>&quot;DELETE&quot; on page 2-96</td>
<td>Delete backups and copies, remove references to them from the recovery catalog, and update their control file records to status DELETED.</td>
</tr>
<tr>
<td>&quot;DELETE SCRIPT&quot; on page 2-100</td>
<td>Delete a stored script from the recovery catalog.</td>
</tr>
<tr>
<td>&quot;deviceSpecifier&quot; on page 2-101</td>
<td>Specify the type of storage device for a backup or copy.</td>
</tr>
<tr>
<td>&quot;DROP CATALOG&quot; on page 2-102</td>
<td>Remove the schema from the recovery catalog.</td>
</tr>
<tr>
<td>&quot;DUPLICATE&quot; on page 2-103</td>
<td>Use backups of the target database to create a duplicate database that you can use for testing purposes or to create a standby database.</td>
</tr>
<tr>
<td>&quot;EXECUTE SCRIPT&quot; on page 2-112</td>
<td>Run an RMAN stored script.</td>
</tr>
<tr>
<td>&quot;EXIT&quot; on page 2-113</td>
<td>Quit the RMAN executable.</td>
</tr>
<tr>
<td>&quot;HOST&quot; on page 2-114</td>
<td>Invoke an operating system command-line subshell from within RMAN or run a specific operating system command.</td>
</tr>
<tr>
<td>&quot;keepOption&quot; on page 2-116</td>
<td>Specify that a backup or copy should or should not be exempt from the current retention policy.</td>
</tr>
<tr>
<td>&quot;LIST&quot; on page 2-118</td>
<td>Produce a detailed listing of backup sets or copies.</td>
</tr>
<tr>
<td>&quot;listObjList&quot; on page 2-135</td>
<td>A subclause used to specify which items will be displayed by the LIST command.</td>
</tr>
<tr>
<td>&quot;maintQualifier&quot; on page 2-137</td>
<td>A subclause used to specify additional options for maintenance commands such as DELETE and CHANGE.</td>
</tr>
</tbody>
</table>
### Table 2–1    Recovery Manager Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;obsOperandList&quot; on page 2-139</td>
<td>A subclause used to determine which backups and copies are obsolete.</td>
</tr>
<tr>
<td>&quot;PRINT SCRIPT&quot; on page 2-141</td>
<td>Display a stored script.</td>
</tr>
<tr>
<td>&quot;QUIT&quot; on page 2-143</td>
<td>Exit the RMAN executable.</td>
</tr>
<tr>
<td>&quot;recordSpec&quot; on page 2-144</td>
<td>A subclause used to specify which objects the maintenance commands</td>
</tr>
<tr>
<td></td>
<td>should operate on.</td>
</tr>
<tr>
<td>&quot;RECOVER&quot; on page 2-146</td>
<td>Apply redo logs or incremental backups to a restored backup set or copy</td>
</tr>
<tr>
<td></td>
<td>in order to update it to a specified time.</td>
</tr>
<tr>
<td>&quot;REGISTER&quot; on page 2-152</td>
<td>Register the target database in the recovery catalog.</td>
</tr>
<tr>
<td>&quot;RELEASE CHANNEL&quot; on page 2-154</td>
<td>Release a channel that was allocated with an ALLOCATE CHANNEL command.</td>
</tr>
<tr>
<td>&quot;releaseForMaint&quot; on page 2-155</td>
<td>Release a channel allocated with an ALLOCATE CHANNEL FOR MAINTENANCE</td>
</tr>
<tr>
<td></td>
<td>command.</td>
</tr>
<tr>
<td>&quot;REPLACE SCRIPT&quot; on page 2-156</td>
<td>Replace an existing script stored in the recovery catalog. If the script</td>
</tr>
<tr>
<td></td>
<td>does not exist, then REPLACE SCRIPT creates it.</td>
</tr>
<tr>
<td>&quot;REPLICATE&quot; on page 2-160</td>
<td>Copy the control file to all the locations specified in the CONTROL_FILES</td>
</tr>
<tr>
<td></td>
<td>initialization parameter.</td>
</tr>
<tr>
<td>&quot;REPORT&quot; on page 2-162</td>
<td>Perform detailed analyses of the content of the recovery catalog.</td>
</tr>
<tr>
<td>&quot;RESET DATABASE&quot; on page 2-170</td>
<td>Inform RMAN that the SQL statement ALTER DATABASE OPEN RESETLOGS has</td>
</tr>
<tr>
<td></td>
<td>been executed and that a new incarnation of the target database has</td>
</tr>
<tr>
<td></td>
<td>been created, or reset the target database to a prior incarnation.</td>
</tr>
<tr>
<td>&quot;RESTORE&quot; on page 2-172</td>
<td>Restore files from backup sets or from disk copies to the default or a</td>
</tr>
<tr>
<td></td>
<td>new location.</td>
</tr>
<tr>
<td>&quot;RESYNC&quot; on page 2-182</td>
<td>Perform a full resynchronization, which creates a snapshot control file</td>
</tr>
<tr>
<td></td>
<td>and then copies any new or changed information from that snapshot control</td>
</tr>
<tr>
<td></td>
<td>file to the recovery catalog.</td>
</tr>
<tr>
<td>&quot;RUN&quot; on page 2-184</td>
<td>Execute a sequence of one or more RMAN commands, which are one or more</td>
</tr>
<tr>
<td></td>
<td>statements executed within the braces of RUN.</td>
</tr>
<tr>
<td>&quot;SEND&quot; on page 2-187</td>
<td>Send a vendor-specific quoted string to one or more specific channels.</td>
</tr>
</tbody>
</table>
### Summary of RMAN Commands

**Table 2–1  Recovery Manager Commands**

<table>
<thead>
<tr>
<th>Command</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;SET&quot; on page 2-189</td>
<td>Make the following session-level settings:</td>
</tr>
<tr>
<td></td>
<td>- Control whether RMAN commands are displayed in the message log</td>
</tr>
<tr>
<td></td>
<td>- Set the DBID when restoring a control file</td>
</tr>
<tr>
<td></td>
<td>- Specify new filenames for restored datafiles</td>
</tr>
<tr>
<td></td>
<td>- Specify a limit for the number of permissible block corruptions</td>
</tr>
<tr>
<td></td>
<td>- Override default archived redo log destinations</td>
</tr>
<tr>
<td></td>
<td>- Specify the number of copies of each backup piece</td>
</tr>
<tr>
<td></td>
<td>- Determine which server session corresponds to which channel</td>
</tr>
<tr>
<td></td>
<td>- Control where RMAN searches for backups when using an Oracle Real Application Clusters configuration</td>
</tr>
<tr>
<td></td>
<td>- Override the default format of the control file autobackup</td>
</tr>
<tr>
<td>&quot;SHOW&quot; on page 2-196</td>
<td>Displays the current CONFIGURE settings.</td>
</tr>
<tr>
<td>&quot;SHUTDOWN&quot; on page 2-199</td>
<td>Shut down the target database. This command is equivalent to the SQL*Plus SHUTDOWN command.</td>
</tr>
<tr>
<td>&quot;SPOOL&quot; on page 2-202</td>
<td>Write RMAN output to a log file.</td>
</tr>
<tr>
<td>&quot;SQL&quot; on page 2-204</td>
<td>Execute a SQL statement from within Recovery Manager.</td>
</tr>
<tr>
<td>&quot;STARTUP&quot; on page 2-206</td>
<td>Start up the target database. This command is equivalent to the SQL*Plus STARTUP command.</td>
</tr>
<tr>
<td>&quot;SWITCH&quot; on page 2-208</td>
<td>Specify that a datafile copy is now the current datafile, that is, the datafile pointed to by the control file. This command is equivalent to the SQL statement ALTER DATABASE RENAME FILE as it applies to datafiles.</td>
</tr>
<tr>
<td>&quot;untilClause&quot; on page 2-210</td>
<td>A subclause specifying an upper limit by time, SCN, or log sequence number. This clause is usually used to specify the desired point in time for an incomplete recovery.</td>
</tr>
<tr>
<td>&quot;UPGRADE CATALOG&quot; on page 2-212</td>
<td>Upgrade the recovery catalog schema from an older version to the version required by the RMAN executable.</td>
</tr>
<tr>
<td>&quot;VALIDATE&quot; on page 2-214</td>
<td>Examine a backup set and report whether its data is intact. RMAN scans all of the backup pieces in the specified backup sets and looks at the checksums to verify that the contents can be successfully restored.</td>
</tr>
</tbody>
</table>
Syntax

\[ \text{@ (filename)} \]

Purpose

To execute a series of RMAN commands stored in an operating system file with the specified full path name, for example, @\$ORACLE_HOME/dbs/cmd/cmd1.rman. If you do not specify the full path name, the current working directory is assumed, for example, @cmd1.rman. Do not use quotes around the string or leave whitespace between the @ and filename. RMAN processes the specified file as if its contents had appeared in place of the @ command.

**Note:** The file must contain complete RMAN commands; partial commands generate syntax errors.

Restrictions and Usage Notes

Execute at the RMAN prompt or within the braces of a RUN command.

Example

**Running a Command File: Example**  
This example executes the command file \( \text{bkup\_db} \) two times:

\[
\text{@bkup\_db}
\text{RUN \{ @bkup\_db \}}
\]
Syntax

```
@@filename
```

Purpose

To execute a series of RMAN commands stored in an operating system file with the specified filename, for example, `@@cmd2.rman`. The `@@` command is identical to the `@` command unless it is used within a script. If contained in a script, then `@@filename` directs RMAN to look for the specified filename in the same directory as the command file from which it was called.

For example, assume that the working directory on UNIX is `$ORACLE_HOME`, and you invoke RMAN as follows:

```
% rman @$ORACLE_HOME/rdbms/admin/dba/scripts/cmd1.rman
```

Assume that the command `@@cmd2.rman` appears inside the `cmd1.rman` script. In this case, the `@@` command directs RMAN to look for the file `cmd2.rman` in the directory `$ORACLE_HOME/rdbms/admin/dba/scripts`.

---

**Note:** The file must contain complete RMAN commands; partial commands generate syntax errors.

Restrictions and Usage Notes

Execute at the RMAN prompt or within the braces of a `RUN` command.

Example

**Calling a Script Within a Script: Example**

Assume that the command file `bkup_db` contains the following two lines:

```
BACKUP DATABASE;
@@bkup_logs
```

---

RMAN Commands 2-7
The following example executes the command file `bkup_db` and specifies that it should look for the `bkup_logs` script in the `/scripts` directory.

```shell
@/scripts/bkup_db
```
ALLOCATE CHANNEL

Syntax

```
ALLOCATE AUXILIARY CHANNEL channel_id
DEVICE TYPE deviceSpecifier

allocOperandList
```

Purpose

To manually allocate a channel, which is a connection between RMAN and a database instance. Each connection initiates an Oracle server session on the target or auxiliary instance: this server session performs the work of backing up, restoring, or recovering backup sets and copies.

Manually allocated channels (allocated by using ALLOCATE) are mutually exclusive with automatically allocated channels (specified by using CONFIGURE). Manually allocated channels apply only to the RUN job in which you issue the command. Automatic channels apply to any RMAN job in which you do not manually allocate channels. You can always override automatic channel configurations by manually allocating channels within a RUN command.

Each channel operates on one backup set at a time (for BACKUP, RESTORE, or RECOVER) or one image copy at a time (for COPY). RMAN automatically releases the channel at the end of the job.

You can control the degree of parallelism within a job by the number of channels. You can allocate multiple channels simultaneously, thus allowing a single job to read or write multiple backup sets or copies in parallel. If you establish multiple connections, then each connection operates on a separate backup set or file copy.

Whether ALLOCATE CHANNEL causes operating system resources to be allocated depends on the operating system. On some platforms, operating system resources are allocated at the time the command is issued. On other platforms, operating system resources are not allocated until you open a file for reading or writing.
ALLOCATE CHANNEL

---

**Restrictions and Usage Notes**

- Execute `ALLOCATE` only within the braces of a `RUN` command.
- The target instance must be started.
- You cannot make a connection to a shared server session.
- You must allocate either a manually allocated or automatic channel when executing a `BACKUP`, `DUPLICATE`, `COPY`, `RESTORE`, `RECOVER`, or `VALIDATE` command.
- You cannot specify `BACKUP DEVICE TYPE` or `RESTORE DEVICE TYPE` after running `ALLOCATE CHANNEL`.
- You must use a recovery catalog when backing up a standby database.
- You cannot prefix `ORA_` to a channel name. RMAN reserves channel names beginning with the `ORA_` prefix for its own use.

---

**Keywords and Parameters**

<table>
<thead>
<tr>
<th>Keyword</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AUXILIARY</td>
<td>Specifies a connection between RMAN and an auxiliary database instance. An auxiliary instance is used when executing the <code>DUPLICATE</code> command or performing TSPITR. An auxiliary database can reside on the same host as its parent or on a different host. When specifying this option, the auxiliary database must be mounted but not open. See Also: &quot;DUPLICATE&quot; on page 2-103 to learn how to duplicate a database, and &quot;CONNECT&quot; on page 2-76 to learn how to connect to a duplicate database.</td>
</tr>
<tr>
<td>CHANNEL <code>channel_id</code></td>
<td>Specifies a connection between RMAN and the target database instance. Each connection initiates an Oracle server session on the database instance: this server session performs the work of backing up, restoring, and recovering backups and copies. Specify a channel id, which is the case-sensitive name of the channel, after the CHANNEL keyword. Oracle uses the to report I/O errors.</td>
</tr>
</tbody>
</table>

---

**Note:** When you specify `DEVICE TYPE DISK`, no operating system resources are allocated other than for the creation of the server session.
Examples

Allocating a Single Channel for a Backup: Example This command allocates a tape channel for a whole database backup:

```
RUN
{
  ALLOCATE CHANNEL dev1 DEVICE TYPE sbt;
  BACKUP DATABASE;
}
```

Spreading a Backup Set Across Multiple Disks: Example When backing up to disk, you can spread the backup across several disk drives. Allocate one DEVICE TYPE DISK channel for each disk drive and specify the format string so that the filenames are on different disks:

```
RUN
{
  ALLOCATE CHANNEL disk1 DEVICE TYPE DISK FORMAT '/disk1/%d_backups/%U';
  ALLOCATE CHANNEL disk2 DEVICE TYPE DISK FORMAT '/disk2/%d_backups/%U';
  ALLOCATE CHANNEL disk3 DEVICE TYPE DISK FORMAT '/disk3/%d_backups/%U';
  BACKUP DATABASE;
}
```

Creating Multiple Copies of a Backup Set: Example When creating multiple copies of a backup set, you can specify the SET BACKUP COPIES command. The
following example generates a single backup of the database, and then creates four identical backups of datafile 1 to four file systems:

```sql
RUN
|
ALLOCATE CHANNEL dev1 DEVICE TYPE DISK MAXPIECESIZE 2M;
BACKUP DATABASE;
SET BACKUP COPIES = 4;
BACKUP DATAFILE 1 FORMAT '/dsk1/bp/%U', '/dsk2/sv/%U', '/dsk3/bp/%U', '/dsk3/sv/%U';
}
```

Allocating an Auxiliary Channel for Database Duplication: Example  
When creating a duplicate database, allocate a channel by using the AUXILIARY option:

```sql
RUN
|
ALLOCATE AUXILIARY CHANNEL c1 DEVICE TYPE DISK;
ALLOCATE AUXILIARY CHANNEL c2 DEVICE TYPE DISK;
DUPLICATE TARGET DATABASE TO ndbnewh
LOGFILE
'/oracle/dbs/log_1.f' size 200K,
'/oracle/dbs/log_2.f' size 200K
SKIP READONLY
NOFILENAMECHECK;
}
```
**ALLOCATE CHANNEL FOR MAINTENANCE**

**Syntax**

```
ALLOCATE CHANNEL FOR MAINTENANCE DEVICE TYPE [deviceSpecifier] allocOperandList
```

**Purpose**

To manually allocate a channel in preparation for issuing a `CHANGE`, `DELETE`, or `CROSSCHECK` command. Note that if you use `CONFIGURE` to set up automatic channels, then RMAN can use these automatic channels for maintenance operations; you do not have to manually allocate them.

If RMAN allocates the automatic maintenance channel, then it uses the same naming convention as any other automatically allocated channel. If you manually run `ALLOCATE CHANNEL FOR MAINTENANCE`, then RMAN uses the following convention for channel naming: `ORA_MAINT_devicetype_n`, where `devicetype` refers to `DISK` or `sbt` and `n` refers to the channel number. For example, RMAN uses these names for two manually allocated disk channels:

```
ORA_MAINT_DISK_1
ORA_MAINT_DISK_2
```

You can allocate multiple maintenance channels for a single job, but you should only use this feature in these scenarios:

- To allow crosschecking or deletion of all backup pieces or proxy copies, both on disk and tape, with a single command
- To make crosschecking and deleting work correctly in an Oracle Real Application Clusters configuration in which each backup piece or proxy copy exists only on one node

**See Also:** *Oracle9i Recovery Manager User's Guide* to learn how to crosscheck and delete on multiple channels

**Restrictions and Usage Notes**

- Execute this command only at the RMAN prompt.
- The target instance must be started.
ALLOCATE CHANNEL FOR MAINTENANCE

- Do not specify a channel ID.
- You cannot allocate a maintenance channel to a shared session.
- You cannot prefix ORA_ to a channel name. RMAN reserves channel names beginning with the ORA_ prefix for its own use.

Keywords and Parameters

<table>
<thead>
<tr>
<th>DEVICE TYPE = deviceSpecifier</th>
<th>Specifies the type of storage device.</th>
</tr>
</thead>
<tbody>
<tr>
<td>allocOperandList</td>
<td>Specifies control options for the allocated channel.</td>
</tr>
</tbody>
</table>

Examples

Deleting a Backup Piece: Example  This example deletes a backup piece from the media management catalog:

```
ALLOCATE CHANNEL FOR MAINTENANCE DEVICE TYPE sbt;
DELETE BACKUPPIECE '/oracle/dbs/01aj3q5012';
```

Crosschecking a Backup Set: Example  This example crosschecks the backup set with primary key 828:

```
ALLOCATE CHANNEL FOR MAINTENANCE DEVICE TYPE DISK;
CROSSCHECK BACKUPSET 828;
```
Crosschecking on Multiple Nodes of an Oracle Real Application Clusters Configuration: Example  In this example, you perform a crosscheck of backups on two nodes of an Oracle Real Application Clusters configuration:

```
RUN
{
  SET AUTOLOCATE ON;
  ALLOCATE CHANNEL FOR MAINTENANCE DEVICE TYPE DISK CONNECT 'SYS/change_on_install@inst1';
  ALLOCATE CHANNEL FOR MAINTENANCE DEVICE TYPE DISK CONNECT 'SYS/change_on_install@inst2';
  CROSSCHECK BACKUP;
}
```

Deleting on Disk and sbt Channels with One Command: Example  In this example, you delete five backup sets from both disk and tape:

```
ALLOCATE CHANNEL FOR MAINTENANCE DEVICE TYPE DISK;
ALLOCATE CHANNEL FOR MAINTENANCE DEVICE TYPE sbt;
DELETE BACKUPSET 1,2,3,4,5;
```
Syntax

A subclause specifying control options on a channel, which is a connection between RMAN and a database instance. Specify this clause on the following commands:

- ALLOCATE CHANNEL
- ALLOCATE CHANNEL FOR MAINTENANCE
- CONFIGURE
Keywords and Parameters

<table>
<thead>
<tr>
<th>Keyword</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PARMS = 'channel_parms'</td>
<td>Specifies parameters for the device to allocate. Do not use this port-specific string if you have specified DEVICE TYPE DISK. If you use PARMS in conjunction with DEVICE TYPE sbt, then you can specify the following environment variables within a quoted string. The maximum length of the quoted string containing channel_parms is 1000 bytes. For example, you can specify:</td>
</tr>
<tr>
<td></td>
<td>PARM=&quot;BLKSIZE=16384,ENV=(NSR_SERVER=tape_server,NSR_CLIENT=oracleclnt,NSR_GROUP=oracle_tapes)&quot;</td>
</tr>
<tr>
<td></td>
<td>See Also: Oracle9i Recovery Manager User’s Guide to learn how Oracle links to media management libraries</td>
</tr>
<tr>
<td>'ENV=' (var1=val1,...)</td>
<td>Specifies one or more environment variables required by the media management vendor in the Oracle server session corresponding to this RMAN client. Because RMAN is a client program, the ENV parameter can be used to set server session specific variables that perform backup and restore operations on behalf of the RMAN client. For example:</td>
</tr>
<tr>
<td></td>
<td>PARM=&quot;ENV=(NSR_SERVER=srv1)&quot;</td>
</tr>
<tr>
<td>'BLKSIZE=integer'</td>
<td>Specifies the level of granularity for I/O on this channel. The value should be a multiple of the default device block factor. On Solaris, this value is 16 K. For example:</td>
</tr>
<tr>
<td></td>
<td>PARM=&quot;BLKSIZE=16384&quot;</td>
</tr>
<tr>
<td>'SBT_LIBRARY=lib_name'</td>
<td>Specifies which media library should be used on this sbt channel. The default library is operating system specific (for example, libobk.so on Solaris and ORASBT.DLL on Windows NT). For example:</td>
</tr>
<tr>
<td></td>
<td>PARM=&quot;SBT_LIBRARY=/oracle/lib/mmv.so&quot;</td>
</tr>
<tr>
<td>CONNECT = connectStringSpec</td>
<td>Specifies a connect string to the database instance where RMAN should conduct the backup or restore operations. Use this parameter to spread the work of backup or restore operations across different instances in an Oracle Real Application Clusters configuration. If you do not specify this parameter, and if you did not specify the AUXILIARY option, then RMAN conducts all operations on the target database instance specified by the command-line parameter or the instance connected to when you issued the CONNECT command. Typically, you should not use the CONNECT parameter in conjunction with the AUXILIARY option.</td>
</tr>
<tr>
<td></td>
<td>See Also: &quot;connectStringSpec&quot; on page 2-79 and &quot;cmdLine&quot; on page 2-57</td>
</tr>
</tbody>
</table>
Allocating Channels: Example

This example configures a persistent disk channel:

```
CONFIGURE CHANNEL DEVICE TYPE DISK RATE = 1500K FORMAT = '/backup/%U';
```

### Examples

**Configuring an Automatic Channel: Example**

This example configures a persistent disk channel:

```
CONFIGURE CHANNEL DEVICE TYPE DISK RATE = 1500K FORMAT = '/backup/%U';
```
Configuring a Channel for a Backup: Example  This example manually allocates an sbt channel and then runs a whole database backup:

RUN
{  
  ALLOCATE CHANNEL c1 DEVICE TYPE sbt MAXOPENFILES 20 RATE 2M MAXPIECESIZE 800M;
  BACKUP DATABASE;
}

Allocating a Channel for a Backup: Example  This example configures a default media management library, then makes a database backup by using this library. Then, the example backs up the database again using a different library, then finally makes a third backup using the default library:

CONFIGURE DEFAULT DEVICE TYPE TO sbt;
CONFIGURE CHANNEL DEVICE TYPE sbt PARMS="SBT_LIBRARY=/oracle/lib/mm_lib1.so";
BACKUP DATABASE;
RUN
{  
  ALLOCATE CHANNEL c1 DEVICE TYPE sbt PARMS="SBT_LIBRARY=/oracle/lib/mm_lib2.so";
  BACKUP DATABASE;
}
BACKUP ARCHIVELOG ALL;
ALTER DATABASE

Syntax

```sql
ALTER DATABASE {MOUNT | OPEN} [RESETLOGS]
```

Purpose

To mount or open a database.

See Also: *Oracle9i SQL Reference* for `ALTER DATABASE` syntax

Restrictions and Usage Notes

- Execute this command either within the braces of a `RUN` command or at the RMAN prompt.
- The target instance must be started.

Keywords and Parameters

<table>
<thead>
<tr>
<th>Keyword</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>MOUNT</td>
<td>Mounts the database without opening it. This option is equivalent to the SQL statement <code>ALTER DATABASE MOUNT</code>.</td>
</tr>
<tr>
<td>OPEN</td>
<td>Opens the database.</td>
</tr>
<tr>
<td>RESETLOGS</td>
<td>Resets the online redo logs to log sequence 1. The RMAN <code>RESETLOGS</code> option is equivalent to the SQL statement <code>ALTER DATABASE OPEN RESETLOGS</code>.</td>
</tr>
</tbody>
</table>

If you use a recovery catalog, then RMAN performs an implicit `RESET DATABASE` after the database is opened to make this new incarnation the current one in the catalog. If you execute the SQL statement `ALTER DATABASE OPEN RESETLOGS` (not the RMAN command of the same name), then you must manually run the `RESET DATABASE` command.
Examples

**Opening the Database after a Backup: Example**  This example mounts the database, takes a whole database backup, then opens the database. At the RMAN prompt enter:

```
STARTUP MOUNT;
BACKUP DATABASE;
# now that the backup is complete, open the database.
ALTER DATABASE OPEN;
```

**Mounting the Database after Restoring the Control File: Example**  To restore the control file to its default location enter the following:

```
STARTUP NOMOUNT;
RESTORE CONTROLFILE;
ALTER DATABASE MOUNT;
```

**Performing RESETLOGS after Incomplete Recovery: Example**  This example uses a manually allocated channel to perform incomplete recovery and then resets the online redo logs:

```
RUN 
{ 
   ALLOCATE CHANNEL ch1 DEVICE TYPE sbt;
   SET UNTIL SCN 1024;
   RESTORE DATABASE;
   RECOVER DATABASE;
   ALTER DATABASE OPEN RESETLOGS;
}
```
archivelogRecordSpecifier

Syntax

```
archlogRange ::=  

  ARCHIVELOG | archlogRange | ALL | LIKE 'string_pattern' | THREAD = integer  

  UNTIL TIME  
  FROM TIME = 'date_string'  
  FROM TIME = 'date_string'  
  FROM SEQUENCE = integer  
  FROM SCN = integer  
  UNTIL SEQUENCE = integer  
  UNTIL SCN = integer  
  UNTIL TIME = 'date_string'  
  FROM TIME = 'date_string'  

  TIME BETWEEN 'date_string' AND 'date_string'  
  THREAD = integer
```

Purpose

A subclause used to specify an archived log or range of archived redo logs files for use in backup, restore, and maintenance operations.

When backing up archived redo logs, RMAN can perform archived log failover automatically. RMAN backs up the log when at least one archived log corresponding to a given log sequence number and thread is available. Also, if the
copy that RMAN is backing up contains corrupt blocks, then it searches for good copies of these blocks in other copies of the same archived logs.

Specifying a range of archived redo logs does not guarantee that RMAN includes all redo data in the range: for example, the last available archived log file may end before the end of the range, or an archived log file in the range may be missing from all archiving destinations. RMAN includes the archived redo logs it finds and does not issue a warning for missing files.

---

**Note:** Query the V$ARCHIVED_LOG view or RC_ARCHIVED_LOG recovery catalog view to determine the time stamps, SCNs, and log sequence numbers for an archived log. For information on how to use the NLS_LANG and NLS_DATE_FORMAT environment variables to specify the format for the time, see Oracle9i Database Reference.

---

### Keywords and Parameters

<table>
<thead>
<tr>
<th>Keyword</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ALL</td>
<td>Specifies all available archived logs.</td>
</tr>
<tr>
<td>LIKE 'string_pattern'</td>
<td>Specifies all archived logs that match the specified <em>string_pattern</em>. The same pattern matching characters that are valid in the LIKE operator in the SQL language can be used to match multiple files.</td>
</tr>
<tr>
<td>UNTIL TIME = 'date_string'</td>
<td>Specifies the end date for a sequence of archived redo log files. The time specified in the string must be formatted according to the Globalization Technology date format specification currently in effect, but can also be any SQL expression with the same datatype, such as SYSDATE. The TO_DATE function can be used to specify hard-coded dates that work regardless of the current Globalization Technology settings. If you do not specify the FROM TIME parameter, then the beginning time for the sequence will be the earliest available archived redo log.</td>
</tr>
</tbody>
</table>

**See Also:** Oracle9i Recovery Manager User's Guide to learn how to make archived log backups in an Oracle Real Application Clusters configuration, and Oracle9i Real Application Clusters Administration for more information about the Oracle Real Application Clusters configuration.

**See Also:** Oracle9i Database Reference for information on how to use the NLS_LANG and NLS_DATE_FORMAT environment variables to specify the format for the time.
FROM TIME = 'date_string'

Specifies the beginning date for a sequence of archived redo log files. The time specified in the string must be formatted according to the Globalization Technology date format specification currently in effect, but can also be any SQL expression with the same datatype, such as SYSDATE. The TO_DATE function can be used to specify hard-coded dates that work regardless of the current Globalization Technology settings.

If you do not specify the UNTIL TIME parameter, RMAN will include all available log files beginning with the date specified in the FROM TIME parameter. Use the V$ARCHIVED_LOG data dictionary view to determine the time stamps for the first and last entries in a log file.

See Also: Oracle9i Database Reference for information on how to use the NLS_LANG and NLS_DATE_FORMAT environment variables to specify the format for the time

TIME BETWEEN 'date_string' AND 'date_string'

Specifies a range of times. Note that TIME BETWEEN 'date_string' AND 'date_string' is exactly equivalent to FROM TIME 'date_string' UNTIL TIME 'date_string'.

UNTIL SCN = integer

Specifies the ending SCN for a sequence of archived redo log files. If you do not specify the FROM SCN parameter, then RMAN will start with the earliest available archived log.

SCN BETWEEN integer AND integer

Specifies a range of SCNs. SCN BETWEEN integer1 AND integer2 is exactly equivalent to FROM SCN integer1 UNTIL SCN integer2.

FROM SCN = integer

Specifies the beginning SCN for a sequence of archived redo log files. If you do not specify the UNTIL SCN parameter, RMAN will include all available log files beginning with SCN specified in the FROM SCN parameter.

UNTIL SEQUENCE = integer

Specifies the terminating log sequence number for a sequence of archived redo log files. If you do not specify the FROM SEQUENCE parameter, RMAN uses the lowest available log sequence number to begin the sequence.

FROM SEQUENCE integer

Specifies the beginning log sequence number for a sequence of archived redo log files. If you do not specify the UNTIL SEQUENCE parameter, RMAN will include all available log files beginning with log sequence number specified in the FROM SEQUENCE parameter.

Note: You can specify all log sequence numbers in a thread by using the following syntax, where thread_number is an integer referring to the thread:

... ARCHIVELOG FROM SEQUENCE 0 THREAD thread_number

SEQUENCE

Specifies either a single log sequence number or a range of sequence numbers.

integer

Specifies a single log sequence number.

BETWEEN integer AND integer

Specifies a range of log sequence numbers. SEQUENCE BETWEEN integer1 AND integer2 is exactly equivalent to FROM SEQUENCE integer1 UNTIL SEQUENCE integer2.
**Examples**

**Specifying Records by Time: Example**  This example deletes all archived redo logs older than two weeks:

```
DELETE ARCHIVELOG ALL UNTIL TIME 'SYSDATE-14';
```

**Specifying Records by SCN: Example**  This example restores backup archived redo log files from tape that fall within a range of SCNs:

```
RESTORE ARCHIVELOG SCN BETWEEN 500 AND 700;
```

**Specifying a Single Log Sequence Number: Example**  This example backs up only archived log 1372 of thread 1 and then deletes it.

```
BACKUP ARCHIVELOG SEQUENCE 1372 DELETE INPUT;
```

**Specifying a Range of Records by Log Sequence Number: Example**  This example backs up all archived logs from sequence 288 to sequence 301 on thread 1 and deletes the archived logs after the backup is complete. If the backup fails, the logs are not deleted.

```
RUN
{
    ALLOCATE CHANNEL dev1 DEVICE TYPE sbt;
    BACKUP ARCHIVELOG
        SEQUENCE BETWEEN 288 AND 301 THREAD 1
    # delete original archived redo logs after backup completes
        DELETE INPUT;
}
```

**Specifying All Log Sequence Numbers in a Thread**  This example crosschecks all archived redo logs in thread 1:

```
CROSSCHECK ARCHIVELOG FROM SEQUENCE 0 THREAD 1;
```
BACKUP

Syntax

```
backupSpec ::= 

  BACKUP
  | INCREMENTAL LEVEL integer 
  | backupOperand
  | backupSpec

  PLUS ARCHIVELOG backupSpecOperand

backupSpec::= 

  BACKUPSET completedTimeSpec primary_key

  DATAFILE datafileSpec

  DATAFILECOPY filename

  DATAFILECOPY TAG tag_name

  TABLESPACE tablespace_name

  DATABASE archivelogRecordSpecifier

  CURRENT CONTROLFILE FOR STANDBY

  CONTROLFILECOPY filename

```
backupOperand:::=

FORMAT = "format_string",
CHANNEL = "channel_id",
CUMULATIVE,
MAXSETSIZE = integer K M G,
FILESPERSET = integer,
PARMS = "channel_parms",
POOL = integer,
TAG = "tag_name",
keepOption,
OFFLINE,
READONLY,
INACCESSIBLE,
NOEXCLUDE,
ONLY,
PROXY,
VALIDATE,
FORCE,
DISKRATIO = integer,
NOT BACKED UP SINCE TIME = "date_string",
NOCHECKSUM,
CHECK LOGICAL,
COPIES = integer,
DEVICE TYPE = "deviceSpecifier"
**Purpose**

To back up a database, tablespace, datafile (current or copy), control file (current or copy), archived log, or backup set. You can back up a target or standby database.

When performing a backup, specify the files that you want to back up. RMAN puts the input files into one or more **backup sets**, which are RMAN-specific logical
structures. The backup set is the smallest unit of a backup. RMAN only records backup sets in the repository that complete successfully.

Each backup set contains at least one backup piece, which is a physical file containing the backed up data. You can also use the BACKUP command to generate a proxy copy, which is a backup to a third-party medium in which the entire data transfer is conducted by a media manager.

You control the number of backup sets that Oracle produces as well as the number of input files that RMAN places into a single backup set. Any I/O errors when reading files or writing backup pieces cause Oracle to abort the job.

If CONFIGURE CONTROLFILE AUTOBACKUP is ON, then RMAN performs a control file autobackup in these circumstances:

- After every BACKUP or COPY command issued at the RMAN prompt.
- Whenever a BACKUP or COPY command within a RUN block is followed by a command that is neither BACKUP nor COPY.
- At the end of every RUN block if the last command in the block was either BACKUP or COPY.

The BACKUP command optimizes backups, that is, does not back up files that are identical to files that are already backed up, when the following conditions are met:

- The CONFIGURE BACKUP OPTIMIZATION command has been run.
- You run BACKUP DATABASE, BACKUP ARCHIVELOG with ALL or LIKE options, or BACKUP BACKUPSET ALL.
- You specify a channel of only one device type, that is, you do not mix channels that use different device types.

See Also: Oracle9i Recovery Manager User’s Guide for a conceptual overview of RMAN backup sets, and Oracle9i Recovery Manager User’s Guide to learn how to back up files

Restrictions and Usage Notes

When using the BACKUP command you must:

- Mount or open the target database. RMAN can make an inconsistent backup when the database is in ARCHIVELOG mode, but you must apply redo logs to make the backups consistent for use in restore operations.
- Use a current control file.
Manually allocate a channel for each execution of the BACKUP command if no automatic channel is configured for the specified device type. Note that RMAN comes with a preconfigured DISK channel.

Note: Backups that use the disk test API are not supported for production backups (refer to Oracle9i Recovery Manager User's Guide). Instead, use the preconfigured DISK channel or manually allocate a DISK channel.

Give each backup piece a unique name.

Back up files onto valid media. If you specify DEVICE TYPE DISK, then RMAN will back up to random access disks. You can make a backup on any device that can store an Oracle datafile: in other words, if the statement CREATE TABLESPACE tablespace_name DATAFILE 'filename' works, then 'filename' is a valid backup path name. If you specify DEVICE TYPE sbt, then you can back up to any media supported by the media management software.

Set the BACKUP_TAPE_IO_SLAVES initialization parameter to TRUE in order to perform duplexed backups. Otherwise, an error is signaled. RMAN configures as many spawned processes as needed for the number of backup copies you request.

When using the BACKUP command, you cannot do the following:

- Make a backup (either normal or incremental) in NOARCHIVELOG mode when the database is open or is closed after a crash or SHUTDOWN ABORT. You can only make a NOARCHIVELOG backup when the database after a consistent shutdown.
- Stripe a single backup set across multiple channels.
- Stripe a single input file across multiple backup sets.
- Combine archived redo log files and datafiles into a single backup.
- Back up files with different block sizes into the same backup set. RMAN can back up tablespaces with different block sizes, but puts each differently sized datafile into its own backup set.
- Back up temporary tablespaces
- Back up transportable tablespaces that were not made read/write after being transported.
- Use the `DELETE INPUT` option when backing up objects other than datafile copies, archived redo logs, or backup sets.
- Specify the number of backup pieces that should go in a backup set.
- Back up a backup set on tape to disk or on tape to tape.
- Specify the `PLUS ARCHIVELOG` clause on the `BACKUP ARCHIVELOG` command.
- Automate the creation of unique tag names for each backup. To create unique tag names every time, write a backup script and then edit it before execution by using an operating system utility, or use a shell script to generate the backup script.
- Open a `NOARCHIVELOG` mode database while it is being backed up. If you do, and some data blocks in the files being backed up are modified before being read by the backup session, then the backup is not usable after being restored because it requires recovery.
- Make the length of a backup piece filename longer than the port-specific length limit. If you use a media manager, then the limit is partially governed by the version of the media management API. Vendors that use:
  - SBT 1.1 must support filenames up to 14 characters, but may support longer filenames.
  - SBT 2.0 must support filenames up to 512 characters, but may support longer filenames.
- Specify the `DEVICE TYPE` option if you have not already configured a device type by using `CONFIGURE` (except for `DISK`, which is preconfigured).
- Manually allocate channels and run `BACKUP` with the `DEVICE TYPE` option.
- Validate the backup of backup sets.
- Use `CONFIGURE BACKUP COPIES` to duplex backup sets.

**Keywords and Parameters**

**FULL**

Copies all blocks into the backup set, skipping only datafile blocks that have never been used. RMAN makes full backups by default if neither `FULL` nor `INCREMENTAL` is specified. The server session does not skip blocks when backing up archived redo logs or control files. A full backup has no effect on subsequent incremental backups, so it is not considered a part of the incremental backup strategy.
INCREMENTAL LEVEL = integer

Copies only those data blocks that have changed since the last incremental integer backup, where integer is any integer from 1 to 4. For example, in a level 2 backup RMAN backs up all blocks used since the most recent level 2, level 1, or level 0 backup. This type of incremental backup is also called a differential backup to distinguish it from a cumulative backup.

A level 0 backup must exist as the base backup for an incremental strategy. An incremental backup at level 0 is identical in content to a full backup, but unlike a full backup the level 0 backup is considered a part of the incremental strategy. If no level 0 backup exists when you run a level 1 or higher backup, RMAN makes a level 0 backup automatically.

Oracle performs checks when attempting to create an incremental backup at a level greater than 0. These checks ensure that the incremental backup will be usable by a subsequent RECOVER command. Among the checks performed are:

- A level 0 backup set must exist, or level 0 datafile copies must exist for each datafile in the BACKUP command. These backup sets must not be marked UNAVAILABLE. If no level 0 backup exists, RMAN automatically makes one.
- Sufficient incremental backups taken since the level 0 must exist and be available such that the incremental backup to be created is usable.

If you specify INCREMENTAL, then in the backupSpec clause you must set one of the following parameters: DATAFILE, DATAFILECOPY, TABLESPACE, or DATABASE. RMAN does not support incremental backups of control files, archived redo logs, or backup sets.

Note that you cannot make inconsistent incremental backups when the database is in NOARCHIVELOG mode. Hence, you cannot generate incremental backups when a NOARCHIVELOG database is open and in use.

See Also: "CHANGE" on page 2-53

PLUS ARCHIVELOG

When you specify PLUS ARCHIVELOG, RMAN performs these steps:

1. Runs an ALTER SYSTEM ARCHIVE LOG CURRENT statement.
2. Runs the BACKUP ARCHIVELOG ALL command. Note that if backup optimization is enabled, then RMAN only backs up logs that have not yet been backed up.
3. Backs up the files specified in the BACKUP command.
4. Runs an ALTER SYSTEM ARCHIVE LOG CURRENT statement.
5. Backs up any remaining archived redo logs.

The backupSpecPlus clause includes the same options as the backupSpec clause.

backupSpec

A BACKUP specification list contains a list of one or more backupSpec clauses. A backupSpec clause minimally contains a list of one or more objects to be backed up. Each backupSpec clause generates one or more backup sets. A backupSpec clause generates multiple backup sets if the number of datafiles specified in or implied by its list of objects exceeds the FILESPERSET limit.
BACKUPSET

Backs up either ALL backup sets or backup sets specified by primary_key or completion time. Use this parameter in conjunction with the DEVICE TYPE sbt clause to back up all backups on disk to tape. You cannot back up from tape to tape or from tape to disk: only from disk to disk or disk to tape.

Note if you specify the DELETE INPUT option, then RMAN deletes all copies of the backup set that exist on disk. For example, if you duplexed a backup to 4 locations, then RMAN deletes all 4 backup sets. The ALL option is redundant, that is, it does not add any functionality.

RMAN performs backup set failover when backing up backup sets. RMAN searches for all available backup copies when the copy that it is trying to back up is corrupted or missing. This behavior is similar to RMAN's behavior when backing up archived logs that exist in multiple archiving destinations.

Note: You can duplex backups of backup sets by using BACKUP COPIES and SET BACKUP COPIES.

See Also: "completedTimeSpec" on page 2-61

DATAFILE

datafileSpec

Specifies a list of one or more datafiles.

Note: If you back up datafile 1, which is the first file of the SYSTEM tablespace, RMAN includes the control file in the backup set.

See Also: "datafileSpec" on page 2-95

DATAFILECOPY

'filename'

Specifies the filenames of one or more datafile image copies.

DATAFILECOPY TAG =
tag_name

Specifies a list of one or more datafile copies, identified by tag. If multiple datafile copies with this tag exist, then Oracle backs up only the most current datafile copy of any particular datafile.

TABLESPACE
tablespace_name

Specifies the names of one or more tablespaces. RMAN backs up all datafiles that are currently part of the tablespaces.

This keyword is provided merely as a convenience; Oracle translates the tablespace name internally into a list of datafiles.

DATABASE

Specifies datafiles in the database.

To include the current control file in the backup set, specify the INCLUDE CURRENT CONTROLFILE clause. You can include only datafiles and the standby control file in the backup set: you cannot include archived redo logs.
archivelogRecordSpecifier clause

Specifies a range of archived redo logs to be backed up. RMAN does not signal an error if the command finds no logs to back up, because this situation probably exists because no new logs were generated after the previous BACKUP ARCHIVELOG ALL DELETE INPUT command.

If you specify BACKUP ARCHIVELOG ALL, then RMAN backs up exactly one copy of each distinct log sequence number. For example, if you archive logs to multiple destinations, RMAN backs up one copy of each log sequence number—not each archived copy of each log sequence number. For other commands, such as DELETE, ALL does refer to every log, even duplicate log sequences.

See Also: “archivelogRecordSpecifier” on page 2-22 for syntax, and Oracle9i Recovery Manager User’s Guide for explanations of backup failover for logs and automatic log switching.

CURRENT CONTROLFILE

specifies the current control file.

If you specify FOR STANDBY, then RMAN generates a backup of the control file that is usable during creation of a standby database. The backup contains only the standby control file.

Note: You cannot assign a tag to a current control file.

CONTROLFILECOPY 'filename'

specifies the filename of a control file copy. The control file copy can be:

- A copy of a normal control file (that is, not a standby control file)
- A standby control file copy created using the COPY STANDBY CONTROLFILE command or the SQL statement ALTER DATABASE CREATE STANDBY CONTROLFILE

RMAN inspects the header of the control file copy to determine whether it is a standby or nonstandby control file.
**FORMAT = 'format_string'**

Specifies a filename to use for the backup piece. Any name that is legal as a sequential filename on the platform is allowed, if each backup piece has a unique name. If backing up to disk, then any legal disk filename is allowed, provided it is unique. If you do not specify the FORMAT parameter, RMAN stores the backup pieces in a port-specific directory ($ORACLE_HOME/dbs on UNIX).

You can specify up to four FORMAT strings. RMAN uses the second, third, and fourth values only when BACKUP COPIES, SET BACKUP COPIES, or CONFIGURE ... BACKUP COPIES is in effect. When choosing the format for each backup piece, RMAN uses the first format value for copy 1, the second format value for copy 2, and so on. If the number of format values exceeds the number of copies, then the extra formats are not used. If the number of format values is less than the number of copies, then RMAN reuses the format values, starting with the first one.

Specify FORMAT in any of these places, listed in order of precedence:

1. The backupSpec clause
2. The BACKUP command
3. The ALLOCATE CHANNEL command
4. The CONFIGURE CHANNEL command

If specified in more than one of these places, then RMAN searches for the FORMAT parameter in the order shown.

Note that the entire FORMAT string is processed in a port-specific manner by the target instance to derive the final backup piece name. The following substitution variables are available in FORMAT strings to aid in generating unique filenames. The formatting of this information varies by platform.

- **%c** Specifies the copy number of the backup piece within a set of duplexed backup pieces. If you did not duplex a backup, then this variable is 1 for backup sets and 0 for proxy copies. If one of these commands is enabled, then the variable shows the copy number. The maximum value for %c is 256.

- **%d** Specifies the name of the database.

- **%D** Specifies the current day of the month from the Gregorian calendar in format DD.

- **%F** Combines the DBID, day, month, year, and sequence into a unique and repeatable generated name.

- **%M** Specifies the month in the Gregorian calendar in format MM.

- **%n** Specifies the name of the database, padded on the right with x characters to a total length of eight characters. For example, if the prod1 is the database name, then the padded name is prod1xxx.
%p Specifies the piece number within the backup set. This value
starts at 1 for each backup set and is incremented by 1 as each
backup piece is created.

Note: If you specify PROXY, then the %p variable must be
included in the FORMAT string either explicitly or implicitly
within %U.

%s Specifies the backup set number. This number is a counter in
the control file that is incremented for each backup set. The
counter value starts at 1 and is unique for the lifetime of the
control file. If you restore a backup control file, then duplicate
values can result. Also, CREATE CONTROLFILE initializes the
counter back to 1.

%t Specifies the backup set time stamp, which is a 4-byte value
derived as the number of seconds elapsed since a fixed
reference time. The combination of %s and %t can be used to
form a unique name for the backup set.

%T Specifies the year, month, and day in this format: YYYYMMDD.

%u Specifies an 8-character name constituted by compressed
representations of the backup set number and the time the
backup set was created.

%U Specifies a convenient shorthand for %u_%p_%c that
guarantees uniqueness in generated backup filenames. If you
do not specify a format, RMAN uses %U by default.

%Y Specifies the year in this format: YYYY.

%% Specifies the '%' character. For example, %%Y translates to the
string %Y.

CHANNEL channel_id Specifies the case-sensitive name of a channel to use when creating backup sets. Use
any name that is meaningful, for example ch1 or dev1. Oracle uses the channel ID to
report I/O errors. If you do not specify this parameter, then RMAN dynamically
assigns the backup sets to any available channels during job execution.

Note: You can also specify this parameter in the backupSpec clause.

CUMULATIVE Copies the data blocks used since the most recent backup at level n-1 or lower, where n
is an integer from 1 to 4. For example, in a cumulative level 2 backup RMAN backs up
all blocks used since the most recent level 1 or level 0 backup.
**MAXSETSIZE** = integer

Specifies a maximum size for a backup set in bytes (default), kilobytes (K), megabytes (M), and gigabytes (G). Thus, to limit a backup set to 3 Mb, specify MAXSETSIZE = 3M. The default size is in bytes, rounded down from kilobytes. For example, MAXSETSIZE = 3000 is rounded down to 2 K (2048 bytes). The minimum value must be >= the database block size.

RMAN attempts to limit all backup sets to this size. Use MAXSETSIZE to configure backup sets so that each fits on one tape rather than spans multiple tapes. Otherwise, if one tape of a multivolume backup set fails, then you lose the data on all the tapes rather than just one.

When files are located on one disk and do not create an I/O distribution problem, the MAXSETSIZE parameter is easier to use than FILESPERSET. The FILESPERSET parameter is more useful for managing I/O distribution for backups of files on multiple disks.

**Note:** Because FILESPERSET has a default, both MAXSETSIZE and FILESPERSET take effect when MAXSETSIZE is set. RMAN attempts to limit the size in bytes of the backup sets according to the MAXSETSIZE parameter, treating FILESPERSET as an upper limit for the number of files to include in each set.

**FILESPERSET** = integer

Specifies the maximum number of input files in each backup set. If you set FILESPERSET = n, then RMAN never includes more than n files in a backup set. The default for FILESPERSET is the lesser of these two values: 64, number of input files divided by the number of channels. For example, if you back up 100 datafiles by using two channels, RMAN sets FILESPERSET to 50.

RMAN always attempts to create enough backup sets so that all allocated channels have work to do. An exception to the rule occurs when there are more channels than files to back up. For example, if RMAN backs up two datafiles when three channels are allocated and FILESPERSET = 1, then one channel is necessarily idle.

**See Also:** The MAXSETSIZE parameter, which limits backup sets by total bytes rather than number of files included

**PARMS** = 'channel_parms'

Specifies a quoted string containing operating system-specific information. RMAN passes the string to the operating system-dependent layer each time a backup piece is created. Currently, no PARMS settings are available when specified in the BACKUP command, although you can specify PARMS in the ALLOCATE CHANNEL or CONFIGURE CHANNEL command.

**POOL** = integer

Specifies the media pool in which the backup should be stored. Consult your media management documentation to see whether the POOL option is supported.

**TAG tag_name**

Creates a user-specified tag for the backup set. Typically, a tag is a meaningful name such as monday_evening_backup or weekly_full_backup. Tags must be 30 characters or less. Note that tags are reusable, so that backup set 100 can have the tag monday_evening_backup one week while backup set 105 has the same tag the next week.
You can also specify the tag at the backupSpec level. If you specify the tag at:

- The command level, then all backup sets created by this command are given this tag.
- The backupSpec level, then backup sets created as a result of different backup specifications can have different tags.
- Both levels, then the tag in the backupSpec takes precedence.

**Note:** You cannot automatically assign a different tag name to each backup. The easiest way to give each backup a new tag is to write a backup script and then edit it with an operating system utility before each execution.

`keepOption` overrides any configured retention policy for this backup so that the backup is not considered obsolete. You can use `CHANGE` to alter the keep status. Note that you must be connected to a recovery catalog when you specify `KEEP FOREVER`.

**See Also:** "`keepOption`" on page 2-116

**SKIP** excludes datafiles or archived redo logs from the backup set.

**Note:** You can also specify this option in the backupSpec clause.

- `OFFLINE` specifies that offline datafiles should be excluded from the backup set.
- `READONLY` specifies that read-only datafiles should be excluded from the backup set.
- `INACCESSIBLE` specifies that datafiles or archived redo logs that cannot be read due to I/O errors should be excluded from the backup set.
  A datafile is only considered inaccessible if it cannot be read. Some offline datafiles can still be read because they still exist on disk. Others have been deleted or moved and so cannot be read, making them inaccessible.

**NOEXCLUDE** When specified on `BACKUP DATABASE` command, RMAN backs up all tablespaces, including any for which a `CONFIGURE EXCLUDE` command has been entered. This option does not override `SKIP OFFLINE` or `SKIP READONLY`. 
<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
</table>
| PROXY   | Backs up the specified files by using the proxy copy functionality, which gives the media management software control over the data transfer between storage devices and the Oracle datafiles on disk. The media manager—not RMAN—decides how and when to move data. When you run BACKUP with the PROXY option, RMAN performs these steps:  
1. Searches for a channel of the specified device type that is proxy-capable. If no such channel is found, then RMAN issues an error message. RMAN attempts a conventional (that is, nonproxy) backup of the specified files unless the ONLY option is specified, in which case it does not attempt a conventional backup.  
2. If RMAN locates a proxy-capable channel, it calls the media manager to determine whether it can proxy copy the file. If the media manager cannot proxy copy the file, then RMAN uses conventional backup sets to back up the file.  
Note: If you specify PROXY, then the %p variable must be included in the FORMAT string either explicitly or implicitly within %U. |
| ONLY    | Causes Oracle to issue an error message when it cannot proxy copy rather than creating conventional backup sets. |
| VALIDATE| Causes RMAN to scan the specified files and verify their contents. RMAN creates no output files. Use this command periodically to check for physical and logical errors in database files.  
Note: You cannot validate backups of backup sets. |
| FORCE   | Causes RMAN to ignore backup optimization. In other words, even if CONFIGURE BACKUP OPTIMIZATION is set to ON, RMAN backs up all specified files.  
Note: You can also specify this option in the backupSpecOperand clause. |
DIRECTS RMAN TO ASSIGN DATAFILES TO EACH BACKUP SET AND SPREAD THEM ACROSS THE
SPECIFIED NUMBER OF DRIVES. FOR EXAMPLE, ASSUME THAT YOU USE 10 DISKS, THE DISKS
SUPPLY DATA AT 10 BYTES/SECOND, AND THE TAPE DRIVE REQUIRES 50 BYTES/SECOND TO KEEP
STREAMING. YOU CAN SET DISKRATIO = 5 TO SPREAD THE BACKUP LOAD ACROSS FIVE DISKS FOR
EACH BACKUP SET.

IF YOU SET FILESPERSET BUT NOT DISKRATIO, THEN DISKRATIO DEFAULTS TO THE SAME
VALUE AS FILESPERSET. IF YOU SPECIFY NEITHER PARAMETER, DISKRATIO DEFAULTS TO 4.
RMAN COMPARSES THE DISKRATIO VALUE TO THE ACTUAL NUMBER OF DEVICES INVOLVED IN
THE BACKUP AND USES THE LOWEST VALUE. FOR EXAMPLE, IF DISKRATIO = 4 AND THE DATAFILES
ARE ON THREE DISKS, THEN RMAN ATTEMPTS TO SPREAD THE BACKUP LOAD FOR EACH SET AMONG
THREE DISKS.

THE DISKRATIO PARAMETER IS EASIER FOR DATAFILE BACKUPS WHEN THE DATAFILES ARE STRIPED
OR RESIDE ON SEPARATE DISK SPINDLES AND YOU EITHER:

■ USE A HIGH-BANDWIDTH TAPE DRIVE THAT REQUIRES SEVERAL DATAFILES TO BE MULITPLEXED
  IN ORDER TO KEEP THE TAPE DRIVE STREAMING
■ MAKE BACKUPS WHILE THE DATABASE IS OPEN AND YOU NEED TO SPREAD THE I/O LOAD
  ACROSS SEVERAL DISK SPINDLES IN ORDER TO LEAVE BANDWIDTH FOR ONLINE OPERATIONS

NOTE: DO NOT SPREAD I/O OVER MORE THAN THE MINIMUM NUMBER OF DISKS TO KEEP THE
TAPE STREAMING. OTHERWISE, YOU INCREASE RESTORE TIME FOR A FILE WITHOUT INCREASING
PERFORMANCE.

NOT BACKED UP

BACKS UP ONLY THOSE FILES (OF THE FILES SPECIFIED ON THE COMMAND) THAT RMAN HAS NOT
BACKED UP SINCE THE SPECIFIED TIME. IF SINCE TIME IS NOT SPECIFIED, THEN ONLY THOSE FILES
THAT HAVE NEVER BEEN BACKED UP WILL BE BACKED UP. THIS OPTION IS A CONVENIENT WAY TO
BACK UP NEW FILES AFTER ADDING THEM TO THE DATABASE.

THIS CLAUSE IS A USEFUL WAY TO BACK UP FILES THAT WERE NOT BACKED UP DURING A PREVIOUS
ABORTED BACKUP. FOR EXAMPLE, YOU BACK UP THE DATABASE, BUT THE INSTANCE CRASHES
HALFWAY THROUGH. YOU CAN THEN RESTART THE BACKUP BY USING THE NOT BACKUP UP CLAUSE
AND AVOID BACKING UP THOSE FILES THAT YOU ALREADY BACKED UP. THIS FEATURE IS ONLY USEFUL
IF RMAN GENERATES MULTIPLE BACKUP SETS DURING THE BACKUP. CONSEQUENTLY, YOU MAY
WANT TO SET THE FILESPERSET PARAMETER TO A LOW VALUE SO THAT RMAN GENERATES
MULTIPLE BACKUP SETS.

SINCE TIME =

'SDATE_STRING'

SPECIFIES THE DATE AFTER WHICH RMAN SHOULD BACK UP FILES THAT
HAVE NO BACKUPS. THE DATE_STRING IS EITHER A DATE IN THE CURRENT NLS_DATE_FORMAT, OR A SQL DATE EXPRESSION SUCH AS
'SYSDATE-1'.

WHEN DETERMINING WHETHER A FILE HAS BEEN BACKED UP OR NOT, THE SINCE DATE THAT WAS ENTERED IS COMPARED WITH THE
COMPLETION TIME OF THE MOST RECENT BACKUP. THE COMPLETION TIME FOR A FILE IN A BACKUP SET IS THE COMPLETION TIME OF THE
ENTIRE BACKUP SET. IN OTHER WORDS, ALL FILES IN THE SAME BACKUP
SET HAVE THE SAME COMPLETION TIME.
### NOCHECKSUM
Suppresses block checksums. A checksum is a number that is computed from the contents of a data block. If the `DB_BLOCK_CHECKSUM` initialization parameter is `true`, then Oracle computes a checksum for each block and stores it in the block before writing the block to disk. When Oracle reads the block from disk later, it makes sure that the block generates the same checksum. If it does not, then the block is damaged.

Unless you specify the `NOCHECKSUM` option, Oracle computes a checksum for each block and stores it in the backup. The checksum is verified when restoring from the backup and written to the datafile when restored. If the database is already maintaining block checksums, then this flag has no effect. The checksum is always verified and stored in the backup in this case.

See Also: Oracle9i Database Reference for more information about the `DB_BLOCK_CHECKSUM` initialization parameter

### CHECK LOGICAL
Tests data and index blocks that pass physical corruption checks for logical corruption, for example, corruption of a row piece or index entry. If RMAN finds logical corruption, then it logs the block in the `alert.log` and server session trace file.

If the sum of physical and logical corruptions detected for a file remain below its `MAXCORRUPT` setting, then the RMAN command completes and Oracle populates `V$BACKUP_CORRUPTION` with corrupt block ranges. If `MAXCORRUPT` is exceeded, then the command terminates without populating the views.

Note: For `COPY` and `BACKUP` the `MAXCORRUPT` setting represents the total number of physical and logical corruptions permitted on a file.

### COPIES = integer
Specifies the number of identical backups (1 - 4) that RMAN should generate. The default value is 1. You can specify duplexing on more than one command. The order of precedence is as follows, with settings higher on the list overriding settings lower on the list:

- BACKUP COPIES
- SET BACKUP COPIES
- CONFIGURE ... BACKUP COPIES

### DEVICE TYPE `deviceSpecifier`
Allocates automatic channels for the specified device type only. This option is valid only if you have configured channels and have not manually allocated channels. For example, if you configure disk and tape channels, then configure `sbt` as the default device type, this command allocates disk channels only:

```
BACKUP DEVICE TYPE DISK DATABASE;
```

See Also: "`deviceSpecifier`" on page 2-101

### backupSpecOperand
Specifies a variety of options and parameters that affect the `backupSpec` clause. Most of the `backupSpecOperand` options are the same as the `backupOperand` options. Only the options unique to this clause are described below.
**Examples**

**Backing Up a Database: Example**  This command backs up the database to tape and then backs up the control file that contains the record of the database backup:

```
BACKUP DATABASE;
BACKUP CURRENT CONTROLFILE;
```

**Backing Up Tablespaces and Datafiles: Example**  This command uses two `backupSpec` clauses to back up tablespaces and datafiles and lets RMAN perform automatic parallelization of the backup:

```
RUN
{  
  ALLOCATE CHANNEL dev1 DEVICE TYPE DISK FORMAT '/fs1/%U';
  ALLOCATE CHANNEL dev2 DEVICE TYPE DISK FORMAT '/fs2/%U';
  BACKUP
      (TABLESPACE SYSTEM,sales1,sales2,sales3 FILESPERSET 20)
      (DATAFILE 12,14,15);
}
```
Backing Up Multiple Copies of Archived Redo Logs: Example  This example backs up the archived redo logs in `/oracle/arch/dest1` to one set of tapes and the logs from `/oracle/arch/dest2` to another set of tapes. This scenario assumes that you have two tape drives available.

```sql
# channel configuration
CONFIGURE DEVICE TYPE sbt PARALLELISM 2;
CONFIGURE CHANNEL 1 DEVICE TYPE sbt PARMS="ENV=(NSR_SERVER=tape_server_1)";
CONFIGURE CHANNEL 2 DEVICE TYPE sbt PARMS="ENV=(NSR_SERVER=tape_server_2)";

# backup
BACKUP
  FILESPERSET=20
  FORMAT='AL_%d/%t/%s/%p'
  (ARCHIVELOG LIKE '/oracle/arch/dest1/%' CHANNEL ORA_SBT_TAPE_1)
  (ARCHIVELOG LIKE '/oracle/arch/dest2/%' CHANNEL ORA_SBT_TAPE_2);
```

Backing Up Multiple Copies of Archived Logs and Deleting the Input: Example
This example assumes that you have two archive destinations set: `/arch/dest1` and `/arch/dest2`. The command backs up one log for each unique sequence number and then deletes all logs from both archiving directories.

```sql
BACKUP ARCHIVELOG LIKE '/arch/dest%' DELETE ALL INPUT;
```

Backing Up Backup Sets to Tape: Example  In this example, you want to keep recent backup sets on disk and older backup sets on tape. You do not want backup sets to exist on disk and tape simultaneously. Hence, you execute this command to back up older backups created more than two weeks ago to tape and then delete the input backup pieces:

```sql
BACKUP DEVICE TYPE sbt BACKUPSET CREATED BEFORE 'SYSDATE-14'
  DELETE INPUT;
```

Specifying DEVICE TYPE on the BACKUP Command: Example  This example configures DISK as the default device type, then backs up archived logs to tape:

```sql
CONFIGURE DEFAULT DEVICE TYPE TO DISK;
BACKUP DEVICE TYPE sbt ARCHIVELOG ALL;
```

Performing a Cumulative Incremental Backup: Example  This example backs up all blocks changed in the database since the most recent level 0 or level 1 backup:

```sql
BACKUP INCREMENTAL LEVEL 2 CUMULATIVE SKIP INACCESSIBLE DATABASE;
```
Duplexing a Backup Set: Example  This example duplexes a backup of datafile 1 to separate file systems:

BACKUP COPIES 2 DATAFILE 1 FORMAT '/fs1/df1_%U', '/fs2/df1_%U';

Specifying How Channels Divide a Workload: Example  This example parallelizes a backup operation by specifying which channels should back up which files and to which location:

RUN
|
ALLOCATE CHANNEL ch1 DEVICE TYPE sbt PARMS="ENV=(NSR_SERVER=tape_server_1)"
ALLOCATE CHANNEL ch2 DEVICE TYPE DISK RATE 1500K;
ALLOCATE CHANNEL ch3 DEVICE TYPE sbt PARMS="ENV=(NSR_SERVER=tape_server_2)"
BACKUP
  (DATAFILE 1,2,3,4  # channel ch1 backs up datafiles to tape drive #1
   CHANNEL ch1)
  (CONTROLFILECOPY '/oracle/copy/cf.f'
   CHANNEL ch2)    # channel ch2 backs up control file copy to disk
  (ARCHIVELOG FROM TIME 'SYSDATE-14'
   CHANNEL ch3));   # channel ch3 backs up archived redo logs to tape drive #2

Performing an Oracle Real Application Clusters Backup: Example  The following script distributes datafile and archived log backups across two nodes in an Oracle Real Application Clusters environment:

RUN
|
ALLOCATE CHANNEL node_1 DEVICE TYPE sbt
  CONNECT 'SYS/sys_pwd@node_1'
  PARMS 'ENV=(DSMO_NODE=KDFDWD01_ORACLE)
  FORMAT '%d_set%s_%t_piece%p';
SET LIMIT CHANNEL node_1 KBYTES=1000000;
SET COMMAND ID TO 'node_1';
ALLOCATE CHANNEL node_2 DEVICE TYPE sbt
  CONNECT 'SYS/sys_pwd@node_2'
  PARMS 'ENV=(DSMO_NODE=KDFDWD01_ORACLE)
  FORMAT '%d_set%s_%t_piece%p';
SET LIMIT CHANNEL node_2 KBYTES=1000000;
SET COMMAND ID TO 'node_2';
BACKUP FILESPERSET 1
  (TABLESPACE SYSTEM, rbs, data1, data2
   CHANNEL node_1)
  (TABLESPACE temp, reccat, data3, data4
   CHANNEL node_2);
BACKUP FILESPERSET 20
  (ARCHIVELOG UNTIL TIME 'SYSDATE' LIKE '/node1/arc/%'
   DELETE ALL INPUT  # deletes all logs that match LIKE criteria
Creating a Control File for a Standby Database: Example

This example creates a backup of the current control file that can be used to create a standby database:

```
BACKUP STANDBY CONTROLFILE;
```

Checking for Corruption: Example

This example backs up datafile 3 and specifies that no more than two blocks with corruption should be tolerated:

```
RUN {
   SET MAXCORRUPT FOR DATAFILE 3 TO 2;
   BACKUP CHECK LOGICAL
   DATAFILE 3;
}
```

Creating a Long-Term Backup: Example

This example creates a consistent backup of the database that is exempt from the retention policy and tells RMAN to keep the backup for the next year, but not to keep the archived logs necessary to recover it:

```
SHUTDOWN;
STARTUP MOUNT;
BACKUP DATABASE UNTIL 'SYSDATE+365' NOLOGS;
```

Backing Up Files with No Recent Backups: Example

This example backs up all database files and archived logs that have not been backed up in the last month:

```
BACKUP DATABASE, ARCHIVELOG ALL NOT BACKED UP SINCE TIME 'SYSDATE-31';
```

Using a UNIX Shell Script to Generate Unique Tag Names: Example

This sample UNIX shell script can generate RMAN backups with unique backup tag names:

```
#!/bin/sh
today=`date +%a`
rmancmd <<EOF
CONNECT TARGET /;
CONNECT CATALOG rman/rman@rcdb;
BACKUP DATABASE PLUS ARCHIVELOG TAG '$today';
ECF
```

RMAN Commands 2-45
Syntax

```
blockrecovery deviceSpecifier bmrBlockSpec bmrOption

bmrBlockSpec ::= DATAFILE datfileSpec BLOCK integer
              | TABLESPACE tablespace_name DBA integer

bmrOption ::= FROM BACKUPSET DATFILECOPY
             | FROM TAG tag_name
             | RESTORE untilClause
```

Purpose

Block media recovery recovers an individual data block or set of data blocks within a datafile. This type of recovery is useful if the data loss or corruption applies to a small number of blocks rather than to an entire datafile.

You can also use block media recovery to validate the integrity of redo generated after a backup. For example, you can do a trial-run block media recovery to detect problems in the archived redo stream.
Typically, block corruption is reported in Oracle error messages in trace files. Block-level data loss usually results from:

- I/O errors causing minor data loss
- Memory corruptions that get flushed to disk

You need to specify the datafile number and block number or the tablespace and data block address (DBA) when executing the BLOCKRECOVER command, or use the CORRUPTION LIST keyword to recover all blocks reported in the V$BACKUP_CORRUPTION and V$COPY_CORRUPTION views.

**See Also:** Oracle9i Recovery Manager User’s Guide for concepts and Oracle9i Recovery Manager User’s Guide for procedures

### Restrictions and Usage Notes

- This command is available only in the Enterprise Edition of Oracle9i.
- The target database must be mounted or open. Note that you do not have to take a datafile offline if you are performing block recovery on it.
- You can only perform complete recovery of individual blocks. Point-in-time recovery of individual data blocks is not supported.
- You can only perform block media recovery on corrupt blocks.
- Blocks marked media corrupt are not accessible until recovery completes.
- You cannot perform block media recovery by using a backup control file.
- You must have a full backup of the file containing the corrupt blocks: block media recovery cannot use incremental backups.
- Block media recovery cannot survive a missing or inaccessible archived log, although it can sometimes survive missing or inaccessible records (see Oracle9i Recovery Manager User’s Guide).
- The datafile header block (block 1) cannot be recovered.

### Keywords and Parameters

<table>
<thead>
<tr>
<th>DEVICE TYPE</th>
<th>Specifies the device type for the backup used in the block recovery.</th>
</tr>
</thead>
<tbody>
<tr>
<td>deviceSpecifier</td>
<td>See Also: &quot;deviceSpecifier&quot; on page 2-101</td>
</tr>
</tbody>
</table>

`bmrBlockSpec` Specifies the data blocks that require recovery.
### DATAFILE

**datafileSpec**

Specifies a list of one or more datafiles that contain blocks requiring media recovery.

See Also: "datafileSpec" on page 2-95

### BLOCK integer

Specifies the block number of the block requiring media recovery. Typically, the block number is obtained from error message output.

### TABLESPACE

**tablespace_name**

Specifies the tablespace name or number containing the corrupt blocks.

### DBA integer

Specifies the data block address (DBA) of the corrupt block.

### CORRUPTION LIST

Recovers all blocks listed in the V$BACKUP_CORRUPTION and V$COPY_CORRUPTION views. This view is populated by BACKUP (with or without the VALIDATE option), VALIDATE, and COPY. Two types of corruption result in rows added to these views:

- Physical corruption (sometimes called media corruption). Oracle does not recognize the block at all: the checksum is invalid, the block contains all zeros, or the header and footer of the block do not match. Physical corruption checking is on by default, and can be turned off with the NOCHECKSUM option.

- Logical corruption. The block has a valid checksum, the header and footer match, and so forth, but the contents are logically inconsistent. Logical corruption checking is off by default, and can be turned on with the CHECK LOGICAL option.

### bmrOption

Specifies various restore options relating to the block recovery.

- **FROM BACKUPSET**
  - Indicates that only backup set should be restored.

- **FROM DATAFILECOPY**
  - Indicates that only datafile image copies should be restored.

- **FROM TAG = 'tag_name'**
  - Indicates that only the backup set with the specified tag should be restored.

- **RESTORE untilClause**
  - Specifies that only backups and copies created before the specified time, SCN, or log sequence number should be restored.

See Also: "untilClause" on page 2-210
Examples

**Recovering a Group of Corrupt Blocks: Example**  This example recovers corrupt blocks in three datafiles:

```
BLOCKRECOVER DATAFILE 2 BLOCK 12, 13 DATAFILE 7 BLOCK 5, 98, 99 DATAFILE 9 BLOCK 19;
```

**Limiting Block Media Recovery by Type of Restore: Example**  The following example recovers a series of blocks and restores only from datafile copies:

```
RUN {
    BLOCKRECOVER
    DATAFILE 3 BLOCK 2,3,4,5
    TABLESPACE sales DBA 4194405, 4194409, 4194412
    FROM DATAFILECOPY;
}
```

**Limiting Block Media Recovery by Backup Tag: Example**  This example recovers blocks and restores only from the backup set with the tag `weekly_backup`:

```
BLOCKRECOVER TABLESPACE SYSTEM DBA 4194404, 4194405 FROM TAG "weekly_backup";
```

**Limiting Block Media Recovery by Time: Example**  The following example recovers two blocks in the `SYSTEM` tablespace and forces the blocks to be restored from backups created at least two days ago:

```
BLOCKRECOVER TABLESPACE SYSTEM DBA 4194404, 4194405 RESTORE UNTIL TIME 'SYSDATE-2';
```
CATALOG

Syntax

```
CATALOG [CONTROLFILECOPY | DATAFILECOPY | ARCHIVELOG] filename

CATALOG CONTROLFILECOPY [FILENAME = 'filename']

CATALOG DATAFILECOPY [FILENAME = 'filename']

CATALOG ARCHIVELOG [FILENAME = 'filename']
```

Purpose

Use the CATALOG command to:

- Add metadata about a user-managed datafile, control file, or archived log copy to the recovery catalog and control file.
- Record a datafile copy as a level 0 backup in the RMAN repository, which enables you to use it as part of an incremental backup strategy.
- Record the existence of user-managed copies of Oracle release 8.0 or later databases created before RMAN was installed.
- Record the existence of the last user-managed datafile copies made after the final shutdown in Oracle version 7 and before running the migration utility.

See Also: Oracle9i Recovery Manager User’s Guide to learn how to manage target database records stored in the catalog

Restrictions and Usage Notes

- Execute the CATALOG command within the braces of a RUN command or at the RMAN prompt.
- You must be connected to the target database, and the database must be mounted or open. If you use a recovery catalog, then the catalog must be open.
- For a user-managed backup to be cataloged, it must be:
  - Accessible on disk.
  - A complete image copy of a single file.
A datafile, control file, or archived log backup. If the datafile backup is inconsistent, then it must have been created with the `BEGIN BACKUP/END BACKUP` statements.

RMAN treats all user-managed backups as image copies. Note that during cataloging, RMAN does not check whether the file was correctly copied by the operating system utility: it just checks the header.

You **cannot** use `CATALOG` to perform the following operations:

- Catalog any datafile copies that were created in Oracle7 unless they were made after the final consistent shutdown in Oracle7 and before running the migration utility, or were made of a tablespace that was offline normal or read-only at the time of the migration. In other words, no Oracle7 redo must need to be applied to the backups to roll them forward.
- Recatalog backup pieces or backup sets. If you run `CHANGE ... UNCATALOG` against an RMAN backup, then it is permanently unusable by RMAN.
- Rename a backup piece or move a backup piece from one place to another.

**Keywords and Parameters**

<table>
<thead>
<tr>
<th>Syntax</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>CONTROLFILECOPY</code></td>
<td>Specifies the filename of a control file copy to be added to or updated in the recovery catalog and control file. The control file copy can be:</td>
</tr>
<tr>
<td><code>'filename'</code></td>
<td>- A copy of a normal control file (that is, not a standby control file) created with the RMAN command <code>COPY CURRENT CONTROLFILE</code> command or the SQL statement <code>ALTER DATABASE CREATE CONTROLFILE</code></td>
</tr>
<tr>
<td></td>
<td>- A standby control file copy created with the RMAN command <code>COPY STANDBY CONTROLFILE</code> or the SQL statement <code>ALTER DATABASE CREATE STANDBY CONTROLFILE</code></td>
</tr>
<tr>
<td><code>DATAFILECOPY</code></td>
<td>Specifies the filename of a datafile copy to be added to or updated in the recovery catalog and control file.</td>
</tr>
<tr>
<td><code>'filename'</code></td>
<td><code>ARCHIVELOG</code> Specifies the filename of an archived log to be added to or updated in the recovery catalog and control file.</td>
</tr>
<tr>
<td><code>'filename'</code></td>
<td><code>TAG = tag_name</code> Specifies the tag that will be assigned to this file in the control file and recovery catalog, for example, <code>Sunday_PM_Backup</code>.</td>
</tr>
<tr>
<td><code>LEVEL = integer</code></td>
<td>Indicates that the file copy should be recorded as an incremental backup at the specified level. Only level 0 is supported. You can perform incremental backups by using a datafile copy as the base level 0 backup.</td>
</tr>
</tbody>
</table>
Examples

Cataloging an Archived Redo Log: Example  This statement catalogs the archived redo logs /arc/log1, /arc/log2, and /arc/log3:

```
CATALOG ARCHIVELOG '/arc/log1', '/arc/log2', '/arc/log3';
```

Cataloging a File Copy as an Incremental Backup: Example  The following example catalogs datafile copy tbs_2.dbf as an incremental level 0 backup:

```
CATALOG DATAFILECOPY '/oracle/copy/tbs_2.dbf' LEVEL 0;
```

Note that the datafile copy could have been created with ALTER TABLESPACE BEGIN/END BACKUP.
To make the following changes:

- Change the status of backups, copies, and archived logs in the repository to **AVAILABLE** or **UNAVAILABLE**. This feature is useful when a previously unavailable file is made available again, or you do not want a specific backup or copy to be eligible to be restored but also do not want to delete it.

- Remove catalog records for backups and copies, and update the corresponding records in the target control file to status **DELETED**. This feature is useful when you remove a file by using an operating system command rather than the RMAN **CHANGE** command, and want to remove its repository record as well.

- Specify that a backup or copy should either abide by the currently configured retention policy or be exempt from it.

**See Also:** Oracle9i Recovery Manager User’s Guide to change the availability status of a backup or copy, and Oracle9i Recovery Manager User’s Guide to learn how to make a backup or copy exempt from the retention policy.
Restrictions and Usage Notes

- Execute the CHANGE command within the braces of a RUN command or at the RMAN prompt.
- The target instance must be started.
- Use CHANGE only on files that are recorded in the RMAN repository and belong to the current database incarnation.
- The KEEP FOREVER clause requires use of a recovery catalog.
- The only CHANGE command that requires either a manual or automatic maintenance channel is the CHANGE ... AVAILABLE command. However, a maintenance channel is not required when CHANGE ... AVAILABLE is used with a file that is disk only (that is, an ARCHIVELOG, DATAFILECOPY, or CONTROLFILECOPY).

If you use CHANGE ... AVAILABLE on files that are not disk-only, and have objects created on device types that are not configured for automatic channels, then issue manual maintenance commands on these channels. For example, if you created a backup on an sbt channel, but have only a DISK channel automatically configured, then you must manually allocate an sbt channel before CHANGE ... AVAILABLE can operate on the backup.

Keywords and Parameters

To obtain the primary keys of the records whose status you want to change, run a LIST command or query the recovery catalog views.

| BACKUP | Operates on the specified backups: backup sets, backup pieces, and proxy copies. If you do not specify an option for BACKUP, then CHANGE BACKUP operates on all backups recorded in the repository. |
| Note: Use the KEY column of the LIST output to obtain the primary key usable in the CHANGE command. |
| OF listObjList | Restricts the list of objects operated on to the object type specified in the listObjList clause. If you do not specify an object, then CHANGE defaults to all copies. |
| mantQualifier | restricts the command based on the specified options. |

See Also: "listObjList" on page 2-135

See Also: "mantQualifier" on page 2-137
| COPY                          | Operates on datafile copies, archived redo logs, and image copies of archived redo logs. If you do not specify an option for COPY, then CHANGE COPY operates on all copies recorded in the repository. |
|                              | OF listObjList restricts the list of objects operated on to the object type specified in the listObjList clause. If you do not specify an object, then CHANGE defaults to all copies. |
|                              | See Also: "listObjList" on page 2-135 |
| maintQualifier               | restricts the command based on the specified options. |
|                              | See Also: "maintQualifier" on page 2-137 |
| recordSpec                   | Specifies the object whose availability status you are changing. See "recordSpec" on page 2-144. |
| AVAILABLE                    | Changes the status of a backup or copy to AVAILABLE in the repository. View the status in the LIST output or recovery catalog views. |
| UNAVAILABLE                  | Changes the status of a backup or copy to UNAVAILABLE in the repository. View the status in the LIST output or recovery catalog views. This option is provided for cases when the file cannot be found or has migrated offsite. RMAN does not use a file that is marked UNAVAILABLE in a RESTORE or RECOVER command. If the file is later found or returns to the main site, then you can use the AVAILABLE option to reflect this change. |
| UNCATALOG                    | Removes references to a datafile copy or archived redo log (but not a backup piece or backup set) from the recovery catalog, and updates records in the target control file to status DELETED. The CHANGE ...UNCATALOG command does not touch physical backups and copies. Use this command to notify RMAN when a file is deleted by some means other than a DELETE command. |
|                              | Caution: If you resynchronize from a backup control file, or upgrade the recovery catalog, then uncataloged records can sometimes reappear in the catalog metadata. |
| DEVICE TYPE deviceSpecifier  | executes the CHANGE for the specified device type only (see "deviceSpecifier" on page 2-101). This option is valid only if you have configured automatic channels and have not manually allocated channels. For example, if you run CHANGE UNCATALOG ... DEVICE TYPE DISK, then RMAN only uncatalogs files on disk. |
| keepOption                   | Changes the exemption status of a backup or copy in relation to the configured retention policy. For example, specify CHANGE ... NOKEEP to make a backup that is currently exempt from the retention policy eligible for OBSOLETE status. |
|                              | Note: You can also specify KEEP in the backupSpec clause. |
|                              | See Also: "keepOption" on page 2-116 |
Examples

**Updating a Backup Set to Status UNAVAILABLE: Example**  This example changes the status of a backup set to UNAVAILABLE. You do not need to allocate a maintenance channel:

```
CHANGE BACKUPSET 100 UNAVAILABLE;
```

**Uncataloging a Datafile Copy: Example**  This example uncatalogs a datafile copy that was removed by an operating system utility:

```
% rm /dir1/df1_copy.f
% rman target / nocatalog
RMAN> CHANGE DATAFILECOPY '/dir1/df1_copy.f' UNCATALOG;
```

**Changing the Retention Status of a Backup Set: Example**  This example changes an ordinary backup into a long-term backup:

```
CHANGE BACKUPSET 231 KEEP FOREVER NOLOGS;
```
cmdLine

Syntax

![Syntax Diagram]

Purpose

To start RMAN from the operating system command line. Use these arguments to:

- Connect to the target, recovery catalog, or auxiliary database.

**Note:** On some platforms, you may not want to connect at the operating system command line because the password is visible to other users on the system. The `CONNECT` command is an alternative method that avoids this problem.

- Specify that you are using RMAN without a recovery catalog.
Run a command file, which is a user-defined file containing RMAN commands.

Specify the file in which RMAN records the results of processed commands.

Append output to the existing RMAN log file.

Send a command to the media manager.

Cause RMAN to print message numbers in the RMAN output.

If you start RMAN without specifying either `CATALOG` or `NOCATALOG` on the command line, then RMAN makes no connection to a repository. If you run a command that requires the repository, and if no `CONNECT CATALOG` command has been issued yet, then RMAN automatically connects in the default `NOCATALOG` mode. After that point, the `CONNECT CATALOG` command is not valid in the session.

**See Also**: *Oracle9i Recovery Manager User's Guide* to learn how to use RMAN to connect to databases

**Restrictions and Usage Notes**

Use these arguments at the operating system command line rather than at the RMAN prompt.

**Keywords and Parameters**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>See Also:</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>TARGET</code></td>
<td>Specifies a connect string to the target database, for example, <code>TARGET SYS/change_on_install@inst1</code></td>
<td>&quot;connectStringSpec&quot; on page 2-79</td>
</tr>
<tr>
<td><code>CATALOG</code></td>
<td>Specifies a connect string to the database containing the recovery catalog, for example, <code>CATALOG rman/rman@inst2</code></td>
<td>&quot;connectStringSpec&quot; on page 2-79</td>
</tr>
<tr>
<td><code>NOCATALOG</code></td>
<td>Indicates that you are using RMAN without a recovery catalog.</td>
<td></td>
</tr>
<tr>
<td><code>AUXILIARY</code></td>
<td>Specifies a connect string to an auxiliary database, for example, <code>AUXILIARY SYS/change_on_install@dupdb</code></td>
<td>&quot;connectStringSpec&quot; on page 2-79</td>
</tr>
</tbody>
</table>
## RMAN Commands

**LOG = 'filename'**  
Specifies the file where Recovery Manager will record RMAN output, that is, the commands that were processed and their results. If you do not specify this argument, then RMAN writes its message log file to standard output.

The **LOG** parameter does not cause RMAN to abort if the specified file cannot be opened. Instead, the output goes to standard output.

**APPEND**  
Causes new output to be appended to the end of the message log file. If you do not specify this parameter, and if a file with the same name as the message log file already exists, then RMAN overwrites it.

**CMDFILE = 'filename'**  
Runs a file containing a user-defined list of RMAN commands. If the first character of the filename is alphabetic, then you can omit the quotes around the filename.

The contents of the command file should be identical to commands entered at the RMAN prompt. For example, the following file contents will cause RMAN to connect to a target database and recovery catalog `rcat`, then back up the target:

```
CONNECT TARGET; CONNECT CATALOG rman/rman@rcat; BACKUP DATABASE PLUS ARCHIVELOG;
```

RMAN terminates after running the command file.

**@filename**  
Equivalent to **CMDFILE**.

**MSGNO**  
Causes RMAN to print message numbers, that is, **RMAN-xxxx**, for the output of all commands. By default, RMAN does not print the **RMAN-xxxx** prefix.

**SEND = 'command'**  
Sends a vendor-specific command string to all allocated channels.

*See Also:* Your media management documentation to determine whether this feature is supported, and "SEND" on page 2-187

**PIPE = 'pipe_name'**  
Invokes the RMAN pipe interface. RMAN uses two public pipes: one for receiving commands and the other for sending output. The names of the pipes are derived from the value of the **PIPE** parameter. For example, you can invoke the RMAN pipe interface with the following options: `PIPE rpi TARGET SYS/pwd@tdb`.

RMAN opens the following pipes in the target database:

- **ORA$RMAN_RPI_IN**, which RMAN uses to receive user commands
- **ORA$RMAN_RPI_OUT**, which RMAN uses to send all output

All messages on both the input and output pipes are of type **VARCHAR2**.

*See Also:* *Oracle9i Recovery Manager User’s Guide* to learn how to pass commands to RMAN through a pipe.

**TIMEOUT = integer**  
Causes RMAN to exit automatically if it does not receive input from an input pipe within `integer` seconds. The **PIPE** parameter must be specified when using **TIMEOUT**.

*See Also:* *Oracle9i Recovery Manager User’s Guide* to learn how to pass commands to RMAN through a pipe.
Examples

Connecting Without a Recovery Catalog: Example  This example connects to the target database prod1 without a recovery catalog:

```
% rman TARGET SYS/sys_pwd@prod1 NOCATALOG
```

Connecting in Default NOCATALOG mode: Example  This example connects to the target database prod1 without specifying catalog options. Because CONNECT CATALOG is not run at the RMAN prompt, RMAN connects in default NOCATALOG mode when the first command requiring a repository connection is run:

```
% rman
RMAN> CONNECT TARGET
RMAN> BACKUP DATABASE;
```

Connecting to an Auxiliary Instance: Example  This example connects to the target database prod1, the recovery catalog database rcat, and the auxiliary instance aux1:

```
% rman TARGET SYS/sys_pwd@prod1 CATALOG rman/rman@rcat AUXILIARY sys/aux_pwd@aux1
```

Specifying a Command File: Example  This example connects to the target database prod1 and the recovery catalog database rcat, and then runs the command file b_whole_10.rcv:

```
% rman TARGET SYS/sys_pwd@prod1 CATALOG rman/rman@rcat @'/oracle/dbs/b_whole_10.rcv'
```

Specifying a Message Log in Append Mode: Example  This example connects to the target database prod1 without a recovery catalog and then specifies that RMAN should append messages to the message log:

```
% rman TARGET / NOCATALOG LOG = $ORACLE_HOME/dbs/log/msglog.f APPEND
```

Invoking the RMAN Pipe Interface: Example  This example invokes the RMAN pipe newpipe with a 90 second timeout option:

```
% rman PIPE newpipe TARGET SYS/sys_pwd@prod1 TIMEOUT = 90
```
**completedTimeSpec**

**Syntax**

```plaintext
completedTimeSpec

AFTER | BETWEEN | BEFORE

[COMPLETED]

AFTER | BETWEEN | BEFORE

= | = | =

date_string | date_string | date_string
```

**Purpose**

A subclause that specifies when a backup or copy completed.

**Restrictions and Usage Notes**

All date strings must be either:

- Formatted according to the Global Technology date format specification currently in effect.
- Created by a SQL expression that returns a `DATE` value, as in the following examples:
  - `'SYSDATE-30'`
  - `TO_DATE('09/30/2000 08:00:00','MM/DD/DD HH24:MI:SS')`.

The `TO_DATE` technique specifies dates independently of the current Global Technology environment variable settings.

**Note:** In Oracle8i, the FROM/UNTIL ... TIME syntax in the LIST, CROSSCHECK, and DELETE commands was replaced with `completedTimeSpec`. If you are adapting an RMAN script from before Oracle8i for use in the current release, then you must update these commands for the script to work correctly.
Keywords and Parameters

<table>
<thead>
<tr>
<th>Keyword</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AFTER 'date_string'</td>
<td>Specifies the time after which the backup was completed.</td>
</tr>
<tr>
<td>BETWEEN 'date_string' AND 'date_string'</td>
<td>Specifies a time range during which the backup was completed. Note that BETWEEN 'date1' AND 'date2' is exactly equivalent to AFTER 'date1' BEFORE 'date2'.</td>
</tr>
<tr>
<td>BEFORE 'date_string'</td>
<td>Specifies the time before which the backup was completed.</td>
</tr>
</tbody>
</table>

Examples

**Crosschecking Backups Within a Time Range: Example**  
This example crosschecks the backup sets of the database made last month:

```
CROSSCHECK BACKUP OF DATABASE COMPLETED BETWEEN 'SYSDATE-62' AND 'SYSDATE-31';
```

**Deleting Expired Backups: Example**  
This example deletes expired backup sets of datafile 1 made in the last two weeks:

```
DELETE EXPIRED BACKUP OF DATAFILE 1 COMPLETED AFTER 'SYSDATE-14';
```

**Listing Copies: Example**  
This example lists image copies of datafile /oracle/dbs/tbs_22.f made before October 13, 2000:

```
```
Syntax

```
deviceConf::=
  \( \text{backupConf} \) \| \( \text{datafileSpec} \) \| \( \text{SNAPSHOT CONTROLFILE NAME TO 'filename'} \) \| \( \text{CLEAR} \) \| \( \text{deviceConf} \) \| \( \text{cfauConf} \) \;
```

```
deviceConf::=
  \( \text{deviceConf} \) \| \( \text{backupConf} \) \| \( \text{DEFAULT DEVICE TYPE TO deviceSpecifier} \) \| \( \text{CLEAR} \) \| \( \text{DEVICE TYPE deviceSpecifier PARALLELISM integer} \) \| \( \text{CLEAR} \) \| \( \text{AUXILIARY CHANNEL integer DEVICE TYPE deviceSpecifier} \) \| \( \text{CLEAR} \) \| \( \text{allocOperandList} \)
```
backupConf::=

- RETENTION POLICY
  - NONE
  - CLEAR
  - REDUNDANCY = integer
- MAXSETSIZE
  - TO integer
  - CLEAR
  - UNLIMITED
- ARCHIVELOG
- BACKUP OPTIMIZATION
  - ON
  - OFF
  - CLEAR
- DATAFILE
  - BACKUP COPIES FOR DEVICE TYPE deviceSpecifier
    - TO integer
    - CLEAR
- EXCLUDE FOR TABLESPACE tablespace_name
  - CLEAR
**Purpose**

To configure persistent settings affecting RMAN backup, restore, duplication, and maintenance jobs. These configurations are in effect for any RMAN session until the configuration is cleared or changed.

Use `CONFIGURE` to set the following:

- An ongoing retention policy that automatically determines which backups and copies are eligible for deletion because they are no longer needed
- The device type (for example, DISK or sbt) for RMAN jobs
- The default number of channels of each device type that RMAN should allocate for automated backup and restore jobs
- The settings for automatic channels for a specified device type
- The maximum size of backup pieces and sets created on automatic channels
- Backup optimization either ON or OFF
- The exclusion policy for tablespaces in whole database backups
- The filename of the snapshot control file
- Filenames for files in an auxiliary database
- The control file autobackup feature to ON or OFF
- The default format for the control file autobackup output files

RMAN uses default settings for `CONFIGURE` options. You can return to the default value for any `CONFIGURE` command by running the same command with the `CLEAR` option.

**See Also:** *Oracle9i Recovery Manager User’s Guide* to learn how to configure the RMAN environment
Restrictions and Usage Notes

- Execute this command at the RMAN prompt.
- The target database must be mounted or open.
- Channels allocated with `ALLOCATE CHANNEL` override any configured automatic channels.
- RMAN does not simultaneously allocate automatic channels for multiple device types in `BACKUP` and `COPY` jobs.
- To direct backups or restores to specific channels, use the RMAN-generated channel names. If you specify channel numbers in the `CONFIGURE CHANNEL` command, then RMAN uses the same numbers in the system-generated channel names.
- If you configure channels by using the nondefault `CONNECT` or `PARMS` options to create backups or copies, then you must either use the same configured channels or manually allocate channels with the same options to restore or crosscheck these backups.
- You cannot exclude the `SYSTEM` tablespace from whole database backups.
- The `REDUNDANCY` and `RECOVERY WINDOW` options are mutually exclusive. Only one type of retention policy can be in effect at any time.
- You cannot clear individual parameters when running `CONFIGURE ... CLEAR`. For example, you can run `CONFIGURE CHANNEL DEVICE TYPE sbt CLEAR` but not `CONFIGURE CHANNEL DEVICE TYPE sbt RATE 1000 CLEAR`.
- The channel number in a manually numbered channel must be less than 255.
- You must specify at least one channel option when running `CONFIGURE CHANNEL`. In other words, you cannot issue a command such as `CONFIGURE CHANNEL 2 DEVICE TYPE DISK`, but you can issue a command such as `CONFIGURE CHANNEL 2 DEVICE TYPE DISK MAXPIECESIZE 2500K`.
- The `CONFIGURE CONTROLFILE AUTOBACKUP FORMAT format string` must include the `%F` substitution variable.
Keywords and Parameters

<table>
<thead>
<tr>
<th>Keywords</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DEFAULT DEVICE TYPE TO</td>
<td>Specifies the default device type for automatic channels. By default, DISK is the default device type. The CLEAR option returns the default device type to DISK. By default, the BACKUP and COPY commands only allocate channels of the default device type. For example, if you configure automatic channels of type DISK and sbt, and set the default device type to DISK, then RMAN only allocates disk channels when you run the BACKUP DATABASE command. You can override this behavior either by manually allocating channels in a RUN command, or by specifying the DEVICE TYPE clause on the BACKUP command itself. The RESTORE command allocates automatic channels of all configured device types, regardless of the default device type. The RESTORE command obeys the PARALLELISM setting for each configured device type.</td>
</tr>
<tr>
<td>deviceSpecifier</td>
<td></td>
</tr>
<tr>
<td>DEVICE TYPE deviceSpecifier PARALLELISM integer</td>
<td>Configures the device types that are eligible for use in jobs that use automatic channels and sets the degree of parallelism. The DISK device type is the default. Specifying CLEAR for a device type resets its settings to the default values (PARALLELISM = 1). The PARALLELISM parameter specifies the number of automatic channels of the specified device type allocated for RMAN jobs. By default, PARALLELISM = 1. For example, you can set PARALLELISM for disk backups to 3. If you configure automatic channels of type disk and tape, and set the default device type as disk, then RMAN allocates three disk channels when you run BACKUP DATABASE at the RMAN prompt. To change the parallelism for a device type to n, run a new CONFIGURE DEVICE TYPE ... PARALLELISM n command. For example, you can change configure PARALLELISM to 3 for sbt and then change it to 2 as follows: CONFIGURE DEVICE TYPE sbt PARALLELISM 3; CONFIGURE DEVICE TYPE sbt PARALLELISM 2; Note: If you configure n manually numbered channels, the PARALLELISM setting can be greater than or less than n. For example, you can manually number ten automatic channels and configure parallelism to any value such as 2 or 12.</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>
CONFIGURE

<table>
<thead>
<tr>
<th>CHANNEL integer</th>
<th>DEVICE TYPE deviceSpecifier</th>
</tr>
</thead>
</table>
| Specifies the standard or AUXILIARY channel that you are configuring or clearing, as well as the device type (DISK or sbt) of the channel. You can either configure a generic channel or specify a channel by number, where integer is less than 255. If you configure a generic channel (that is, if you do not specify a channel number), then RMAN uses the generic settings for every parallelized channel except any channel number that you have explicitly configured. In other words, a generic channel setting specifies options for all channels not configured explicitly. For generic channels of a specified device type, a new command erases all the previous settings for this device type. Assume that you run these two commands:

```sql
CONFIGURE CHANNEL DEVICE TYPE sbt MAXPIECESIZE 1G;
CONFIGURE CHANNEL DEVICE TYPE sbt RATE 1700K;
```

The second command erases the MAXPIECESIZE setting of the first command.

If AUXILIARY is specified, then this configuration is used only for channels allocated at the auxiliary instance. If no auxiliary device configuration is specified, and if RMAN needs to automatically allocate auxiliary channels, then RMAN uses the target database device configuration. It is not necessary to specify configuration information for auxiliary channels unless they require different parameters from the target channels.

See Also: Oracle9i Recovery Manager User's Guide to learn how configure automatic channels specified by channel number

**allocOperandList**

Specifies control options for the allocated channel.

See Also: "allocOperandList" on page 2-16

**CLEAR**

Clears the specified channel. For example, configure CHANNEL 1 DEVICE TYPE DISK CLEAR returns only channel 1 to its default, whereas CONFIGURE CHANNEL DEVICE TYPE DISK CLEAR returns the generic disk channel to its default.

Note that you cannot specify any other channel options (for example, PARMS) when you specify CLEAR.

**RETENTION POLICY TO**

Specifies a persistent, ongoing policy for datafile and control file backups and copies that RMAN marks as obsolete, that is, not needed and eligible for deletion. As time passes, RMAN marks backups and copies as obsolete according to the criteria you specify in the retention policy. RMAN does not automatically delete any backups or copies: manually run the DELETE OBSOLETE command to remove obsolete files. By default, RETENTION POLICY is configured to REDUNDANCY 1.

For backups, the basic unit of the retention policy is a backup set, not a backup piece. For example, BACKUP COPIES 4 TABLESPACE users generates a single backup set that is duplexed into four identical backup pieces. The retention policy considers this as one backup, not four separate backups.
<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CONFIGURE RECOVERYWINDOWOF integer DAYS</td>
<td>Specifies a time window in which RMAN should be able to recover the database. The window stretches from the current time (SYSDATE) to the point of recoverability, which is the earliest date to which you want to recover. The point of recoverability is integer days in the past, that is, SYSDATE - integer.</td>
</tr>
<tr>
<td>REDUNDANCY integer</td>
<td>Specifies that RMAN should retain integer backups or copies of each datafile and control file. If more than integer backups or copies exist, RMAN marks these extra files as obsolete. Then, RMAN determines the oldest of the retained backups and copies, and marks all archived logs and log backups older than this backup or copy as obsolete. The DELETE OBSOLETE command removes obsolete backups and copies as well as archived log backups and copies.</td>
</tr>
<tr>
<td>NONE</td>
<td>Disables the retention policy feature. RMAN does not consider any backups or copies as obsolete.</td>
</tr>
<tr>
<td>CLEAR</td>
<td>Resets the retention policy to its default (REDUNDANCY = 1).</td>
</tr>
<tr>
<td>MAXSETSIZE</td>
<td>Specifies the maximum size of each backup set created on a channel. By default MAXSETSIZE is set to UNLIMITED, meaning that it is disabled.</td>
</tr>
<tr>
<td>TO integer</td>
<td>Specifies the maximum set size in bytes, kilobytes (k), megabytes (m), or gigabytes (G). The default setting is in bytes and is rounded down to kilobytes. For example, if you set MAXSETSIZE to 5000, RMAN sets the maximum set size at 4 kilobytes (that is, 4096 bytes), which is the lower kilobyte boundary of 5000. The minimum value must be greater than or equal to the database block size.</td>
</tr>
<tr>
<td>TO UNLIMITED</td>
<td>Specifies that there is no size limit for backup sets.</td>
</tr>
<tr>
<td>CLEAR</td>
<td>Resets the maximum set size to its default value (UNLIMITED).</td>
</tr>
<tr>
<td>(ARCHIVELOG</td>
<td>DATAFILE) BACKUP COPIES FOR DEVICE TYPE deviceSpecifier TO integer</td>
</tr>
</tbody>
</table>
### CONFIGURE

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>BACKUP OPTIMIZATION</strong></td>
<td>Toggles backup optimization ON or OFF (default). Specify CLEAR to return optimization to its default value of OFF.</td>
</tr>
<tr>
<td>Optimization does not back up a file to a device type if the identical file is already backed up on the device type. For two files to be identical, their content must be exactly the same. You can override backup optimization by using the FORCE option of the BACKUP command.</td>
<td></td>
</tr>
<tr>
<td>RMAN does not signal an error if optimization causes all files to be skipped during a backup. Note also that BACKUP ... DELETE INPUT deletes all specified files whether or not optimization would skip these files during a backup.</td>
<td></td>
</tr>
<tr>
<td>Backup optimization is enabled when all of the following conditions are satisfied:</td>
<td></td>
</tr>
<tr>
<td>- The CONFIGURE BACKUP OPTIMIZATION ON command has been run.</td>
<td></td>
</tr>
<tr>
<td>- You run BACKUP DATABASE, BACKUP ARCHIVELOG with ALL or LIKE options, or BACKUP BACKUPSET ALL.</td>
<td></td>
</tr>
<tr>
<td>- The RMAN job uses a channel of only one device type.</td>
<td></td>
</tr>
<tr>
<td>The retention policy has an effect on which files backup optimization skips.</td>
<td></td>
</tr>
<tr>
<td><strong>EXCLUDE FOR TABLESPACE</strong></td>
<td>Excludes the specified tablespace from BACKUP DATABASE commands. Note that you cannot exclude the SYSTEM tablespace. By default, each tablespace is not excluded, that is, the exclude functionality is disabled. The exclusion is stored as an attribute of the tablespace, not the individual datafiles, so the exclusion applies to any files that are added to this tablespace in the future. If you run CONFIGURE ... CLEAR on a tablespace after excluding it, then it returns to the default configuration of &quot;not excluded.&quot;</td>
</tr>
<tr>
<td>You can still back up the configured tablespace by explicitly specifying it in a BACKUP command or by specifying the NOEXCLUDE option on a BACKUP DATABASE command.</td>
<td></td>
</tr>
<tr>
<td><strong>See Also:</strong> Oracle9i Recovery Manager User’s Guide for more information about snapshot control files</td>
<td></td>
</tr>
</tbody>
</table>
AUXNAME FOR DATAFILE datafileSpec TO 'filename'

Configures the auxiliary filename for the specified target datafile to 'filename'. For example, you can set the auxiliary name for datafile 2 to /df2.f, and then unspecify this auxiliary name by running CONFIGURE AUXNAME FOR DATAFILE 2 NULL.

If you are performing TSPITR or running the DUPLICATE command, then by setting AUXNAME you can preconfigure the filenames for use on the auxiliary database without manually specifying the auxiliary filenames during the procedure.

For example, use this command during TSPITR if the datafiles are on raw disk and you need to restore auxiliary datafiles to raw disk for performance reasons. Typically, you set the AUXNAME parameter in TSPITR for the datafiles of the SYSTEM tablespace and the tablespaces containing rollback segments. Do not overlay files which are in use by the production database and can be discarded after TSPITR completes. In essence, the AUXNAME of a datafile is the location where TSPITR can create a temporary copy of it.

When renaming files with the DUPLICATE command, CONFIGURE AUXNAME is an alternative to SET NEWNAME. The difference is that after you set the AUXNAME the first time, you do not need to reset the filename when you issue another DUPLICATE command: the AUXNAME setting remains in effect until you issue CONFIGURE AUXNAME ... CLEAR. In contrast, you must reissue the SET NEWNAME command every time you rename files.

See Also: Oracle9i Recovery Manager User's Guide to learn how to perform RMAN TSPITR, and Oracle9i Recovery Manager User's Guide to learn how to duplicate a database

SNAPSHOT CONTROLFILE NAME TO 'filename'

Configures the snapshot control file filename to 'filename'. If you run CONFIGURE SNAPSHOT CONTROLFILE NAME CLEAR, then RMAN sets the snapshot control file name to its default.

The default value for the snapshot control file name is platform-specific and dependent on the Oracle home. For example, the default on some UNIX system is $ORACLE_HOME/dbs/snapcf_@.f. If you clear the control file name, and you change the Oracle home, then the default location of the snapshot control file changes as well.

See Also: Oracle9i Recovery Manager User's Guide for more information about snapshot control files

CONTROLFILE AUTOBACKUP

Controls the control file autobackup feature. By default, this feature is not enabled.
ON

Enables the control file autobackup feature. When ON, then RMAN automatically performs a control file autobackup in these situations:

- After every BACKUP or COPY command issued at the RMAN prompt
- Whenever a BACKUP or COPY command within a RUN block is followed by a command that is neither BACKUP nor COPY.
- At the end of every RUN block if the last command in the block was either BACKUP or COPY.

The control file autobackup occurs in addition to any backup or copy of the current control file that has been performed during these commands.

RMAN automatically backs up the current control file using the default format of %F (see entry for CONFIGURE CONTROLFILE AUTOBACKUP FORMAT for an explanation of this substitution variable). You can change this format using the CONFIGURE CONTROLFILE AUTOBACKUP FORMAT and SET CONTROLFILE AUTOBACKUP FORMAT commands.

OFF

Disables the autobackup feature.

CLEAR

Returns the feature to its default setting of OFF.

CONTROLFILE AUTOBACKUP FORMAT FOR DEVICE TYPE deviceSpecifier TO 'format_string'

Configures the default filename format for the control file autobackup on the specified device type. By default, the initial format is %F for all devices. Any default format string specified with CONFIGURE must include the %F substitution variable (see BACKUP). This variable translates into c-IIIIIIIIIII-YYYYMMDD-QQ, where:

- IIIIIIIIIII stands for the DBID. The DBID is printed in decimal so that it can be easily associated with the target database.
- YYYYMMDD is a time stamp in the Gregorian calendar of the day the backup is generated
- QQ is the sequence in hexadecimal number that starts with 00 and has a maximum of 'FF' (256)

Specify CLEAR to return the format to the default %F.
Examples

**Configuring Backup Optimization: Example**  This example configures RMAN so that the `BACKUP` command does not back up files to a device type if the identical file has already been backed up to the device type:

```
CONFIGURE BACKUP OPTIMIZATION ON;
```

**Configuring a Retention Policy: Example**  This example configures a retention policy with a recovery window of 2 weeks, and then resets the retention policy to `REDUNDANCY = 1`:

```
CONFIGURE RETENTION POLICY TO RECOVERY WINDOW OF 14 DAYS;
CONFIGURE RETENTION POLICY CLEAR;
```

**Configuring Automatic Disk and Tape Channels: Example**  This example configures generic `DISK` and `sbt` channels, sets the default device type to `sbt`, and sets `PARALLELISM` to 3:

```
CONFIGURE CHANNEL DEVICE TYPE DISK RATE 5M;
CONFIGURE CHANNEL DEVICE TYPE sbt PARMS 'ENV=(NSR_SERVER=bksrv1)';
CONFIGURE DEFAULT DEVICE TYPE TO sbt;
CONFIGURE DEVICE TYPE sbt PARALLELISM 3;
```

**Overriding the Default Device Type: Example**  This example configures the default device type to `sbt`, backs up the archived logs on the default `sbt` channel, and then backs up the database to disk on the default disk channel:

```
CONFIGURE CHANNEL DEVICE TYPE sbt PARMS 'ENV=(NSR_SERVER=bksrv1)';
CONFIGURE DEFAULT DEVICE TYPE TO sbt;
BACKUP ARCHIVELOG ALL;
BACKUP DEVICE TYPE DISK DATABASE;
```
Configuring Automatic Channels Across File Systems: Example  
This example configures automatic disk channels across three file systems:

```
CONFIGURE CHANNEL 1 DEVICE TYPE DISK FORMAT '/disk1/backup/%U';
CONFIGURE CHANNEL 2 DEVICE TYPE DISK FORMAT '/disk2/backup/%U';
CONFIGURE CHANNEL 3 DEVICE TYPE DISK FORMAT '/disk3/backup/%U';
```

Configuring Automatic Channels in an Oracle Real Application Clusters Configuration: Example 
This example allocates automatic sbt channels for two nodes of an Oracle Real Application Clusters database:

```
CONFIGURE DEVICE TYPE sbt PARALLELISM 2;
CONFIGURE DEFAULT DEVICE TYPE TO sbt;
CONFIGURE CHANNEL 1 DEVICE TYPE sbt CONNECT 'SYS/change_on_install@node1'
   PARMS 'ENV=(NSR_SERVER=bkserv1)';
CONFIGURE CHANNEL 2 DEVICE TYPE sbt CONNECT 'SYS/change_on_install@node2'
   PARMS 'ENV=(NSR_SERVER=bkserv2)';
```

Clearing Automatic Channels: Example 
This example clears manually numbered DISK channels 2 and 3 and the generic sbt channel:

```
CONFIGURE CHANNEL 2 DEVICE TYPE DISK CLEAR;
CONFIGURE CHANNEL 3 DEVICE TYPE DISK CLEAR;
CONFIGURE CHANNEL DEVICE TYPE sbt CLEAR;
```

Configuring and Clearing Parallelism: Example 
This example sets DISK parallelism to 2, then changes it to 3, then returns it to the default parallelism of 1:

```
CONFIGURE DEVICE TYPE DISK PARALLELISM 2;
CONFIGURE DEVICE TYPE DISK PARALLELISM 3;
CONFIGURE DEVICE TYPE DISK CLEAR;
```

Configuring Backup Copies: Example 
This example configures duplexing to 3 for DISK backups of datafiles and control files and then runs a database backup:

```
CONFIGURE DATAFILE BACKUP COPIES FOR DEVICE TYPE DISK TO 3;
BACKUP DATABASE FORMAT '/fs1/%U', '/fs2/%U', '/fs3/%U';
```

Configuring the Snapshot Control File Location: Example 
This example configures a new location for the snapshot control file and then resynchronizes the recovery catalog:

```
CONFIGURE SNAPSHOT CONTROLFILE NAME TO '/oracle/dbs/snap.cf';
```

Excluding a Tablespace from a Whole Database Backup: Example 
This example excludes the read-only reports tablespace from whole database backups, and then returns the reports tablespace to the default behavior of "not excluded":

```
```
CONFIGURE EXCLUDE FOR TABLESPACE reports;
CONFIGURE EXCLUDE FOR TABLESPACE reports CLEAR;

**Specifying Auxiliary Filenames: Example**  This example duplicates a database to a remote host with a different directory structure, by using `CONFIGURE AUXNAME` to specify new filenames for the datafiles:

```
# set auxiliary names for the datafiles
CONFIGURE AUXNAME FOR DATAFILE 1 TO '/oracle/auxfiles/aux_1.f';
CONFIGURE AUXNAME FOR DATAFILE 2 TO '/oracle/auxfiles/aux_2.f';
CONFIGURE AUXNAME FOR DATAFILE 3 TO '/oracle/auxfiles/aux_3.f';
CONFIGURE AUXNAME FOR DATAFILE 4 TO '/oracle/auxfiles/aux_4.f';

RUN
{
    ALLOCATE AUXILIARY CHANNEL dupdb1 TYPE DISK;
    DUPLICATE TARGET DATABASE TO dupdb
    LOGFILE
        GROUP 1 ('$ORACLE_HOME/dbs/dupdb_log_1_1.f',
            '$ORACLE_HOME/dbs/dupdb_log_1_2.f') SIZE 200K,
        GROUP 2 ('$ORACLE_HOME/dbs/dupdb_log_2_1.f',
            '$ORACLE_HOME/dbs/dupdb_log_2_2.f') SIZE 200K REUSE;
}

# Un-specify the auxiliary names for the datafiles so that they are not overwritten
# by mistake:
CONFIGURE AUXNAME FOR DATAFILE 1 CLEAR;
CONFIGURE AUXNAME FOR DATAFILE 2 CLEAR;
CONFIGURE AUXNAME FOR DATAFILE 3 CLEAR;
CONFIGURE AUXNAME FOR DATAFILE 4 CLEAR;
```

**Specifying the Default Format for the Control File Autobackup: Example**  This example turns on the autobackup feature, then changes the default format for the DISK and sbt devices, then clears the autobackup setting:

```
CONFIGURE CONTROLFILE AUTOBACKUP ON;
CONFIGURE CONTROLFILE AUTOBACKUP FORMAT FOR DEVICE TYPE DISK TO '/backup_dir/%F';
CONFIGURE CONTROLFILE AUTOBACKUP FORMAT FOR DEVICE TYPE sbt TO 'cf_auto_%F';
CONFIGURE CONTROLFILE AUTOBACKUP CLEAR;  # returns to default setting of OFF
```
CONNECT

Syntax

CONNECT

Purpose

To establish a connection between RMAN and a target, auxiliary, or recovery catalog database.

Note: When connecting from the command line, the password may be visible to other users on the system. The CONNECT command avoids this problem.

See Also: "cmdLine" on page 2-57 for command line connection options

Restrictions and Usage Notes

- You can only run the CONNECT TARGET, CONNECT CATALOG, and CONNECT AUXILIARY commands if you are at the RMAN prompt and if you are not already connected to the specified databases.
- After being connected to a target database, you must exit and restart RMAN to connect to a different target database.
- If you need to connect to a different target, catalog, or auxiliary database, then you should start a new RMAN session.
- You cannot specify the NOCATALOG option on the command line and then run CONNECT CATALOG at the RMAN prompt.
- You cannot run CONNECT CATALOG command when RMAN is in the default NOCATALOG mode, that is, when these conditions are met:
- You started RMAN at the command without specifying either CATALOG or NOCATALOG.
- You have already run a command such as BACKUP that requires a repository connection.

**Keywords and Parameters**

| CONNECT TARGET | connectStringSpec | Establishes a connection between RMAN and the target database. |
| CONNECT CATALOG | connectStringSpec | Establishes a connection between RMAN and the recovery catalog database. You must run this command before running any command that requires a repository. Otherwise, RMAN defaults to NOCATALOG mode and invalidates the use of CONNECT CATALOG in the session. |
| CONNECT AUXILIARY | connectStringSpec | Establishes a connection between RMAN and an auxiliary instance. An auxiliary instance can be used with the DUPLICATE command or used during TSPITR. |

**Examples**

**Connecting Without a Recovery Catalog: Example**  This example starts RMAN and then connects to the target database with an Oracle Net service name prod1:

```
% rman NOCATALOG
RMAN> CONNECT TARGET sys/change_on_install@prod1;
```

**Connecting in the Default NOCATALOG Mode: Example**  This example starts RMAN and then connects to the target database with an Oracle Net service name prod1. Because BACKUP is run and no CONNECT CATALOG has been run, RMAN defaults to NOCATALOG mode:

```
% rman
RMAN> CONNECT TARGET sys/change_on_install@prod1;
RMAN> BACKUP DATAFILE 7;
# You cannot run CONNECT CATALOG after this point because RMAN has defaulted to NOCATALOG
```

**Connecting with a Recovery Catalog: Example**  This example starts RMAN and then connects to the target database prod1 by using operating system authentication and the recovery catalog database rcat by using a password file:

```
% rman
RMAN> CONNECT TARGET /
RMAN> CONNECT CATALOG rman/rman@rcat
```
Connecting to Target, Recovery Catalog, and Duplicate Databases: Example

This example connects to three different databases specifying a username and password for each:

```
% rman
RMAN> CONNECT TARGET SYS/sysdba@prod1
RMAN> CONNECT CATALOG rman/rman@rcat
RMAN> CONNECT AUXILIARY SYS/sysdba@dupdb
```
connectStringSpec

Syntax

```
userid / password @ net_service_name
```

Purpose

A subclause specifying the username, password, and net service name for connecting to a target, recovery catalog, or auxiliary database. The connection is necessary to authenticate the user and identify the database.

Restrictions and Usage Notes

- You must have `SYSDBA` privileges on the target and auxiliary databases.
- Do not connect to the recovery catalog database as user `SYS`.

Keywords and Parameters

<table>
<thead>
<tr>
<th>Keyword</th>
<th>Description</th>
</tr>
</thead>
</table>
| `/`           | If you do not specify a user ID or password when connecting to the target database, then a forward slash establishes a connection as user `SYS` by using operating system authentication. For example, enter the following to connect to the target database: `% rman TARGET /`

  **Note:** The forward slash depends on platform-specific environment variables.

| `userid`      | Establishes a connection to the database for the specified user. If you do not specify a password, RMAN obtains the password interactively by displaying a prompt. The characters will not be echoed to the terminal.

  You must have `SYSDBA` authority when connecting to the target or auxiliary database, but must not connect as `SYS` to the recovery catalog database.

  **Note:** The connect string must not contain any white space, but it can contain punctuation characters such as a forward slash (`/`) and an at sign (`@`).

<table>
<thead>
<tr>
<th><code>/password</code></th>
<th>establishes a connection for the specified user by using a password. If the target database is not open, then a password file must exist.</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>@net_service_name</code></td>
<td>Establishes a connection to the database through an optional Oracle Net net service name.</td>
</tr>
</tbody>
</table>
Examples

**Connecting Without a Recovery Catalog: Example**  This example connects to the target database by using a password and the Oracle Net service name prod1 in the default NOCATALOG mode:

```bash
% rman TARGET SYS/change_on_install@prod1
```

**Entering the Password Interactively: Example**  This example connects to the target database as user SYS but without specifying a password at the command line:

```bash
% rman TARGET SYS
```

Recovery Manager: Release 9.0.1.0.0

target database Password:

**Connecting with Operating System Authentication: Example**  This example starts RMAN and then connects to the target database prod1 by using operating system authentication and the recovery catalog database rcat using a net service name:

```bash
% rman
RMAN> CONNECT TARGET /
RMAN> CONNECT CATALOG rman/rman@rcat
```

**Connecting to a Target Database, Recovery Catalog, and Auxiliary Instance: Example**  This example connects to three different databases from the command line, specifying a username, password, and net service name for each:

```bash
% rman TARGET SYS/pwd1@prod1 CATALOG rman/rman@rcat AUXILIARY SYS/pwd2@dupdb
```
COPY

Syntax

copy_option ::= 

TAG = tag_name

LEVEL = integer

NOCHECKSUM

CHECK LOGICAL

keepOption

copy_inputfile ::= 

DATAFILE datafileSpec

DATAFILECOPY

ARCHIVELOG

CURRENT CONTROLFILE

CONTROLFILECOPY
Purpose

Create an image copy of a file. The output file is always written to disk. You can copy the following types of files:
- Datafiles (current or copies)
- Archived redo logs
- Control files (current or copies)

In many cases, copying datafiles is more beneficial than backing them up, since the output is suitable for use without any additional processing. In contrast, you must process a backup set with a RESTORE command before it is usable. So, you can perform media recovery on a datafile copy, but not directly on a backup set, even if it backs up only one datafile and contains a single backup piece.

If CONFIGURE CONTROLFILE AUTOBACKUP is set to ON, then RMAN automatically performs a control file autobackup in these situations:
- After every BACKUP or COPY command issued at the RMAN prompt
- Whenever a BACKUP or COPY command within a RUN block is followed by a command that is neither BACKUP nor COPY.
- At the end of every RUN block if the last command in the block was either BACKUP or COPY.

See Also: Oracle9i Recovery Manager User’s Guide to learn how to copy files with RMAN

Restrictions and Usage Notes

- The target database must be mounted or open.
- You cannot make incremental copies.

Keywords and Parameters

<table>
<thead>
<tr>
<th>copy_option</th>
<th>Specifies optional parameters affecting either the input or output files or both.</th>
</tr>
</thead>
<tbody>
<tr>
<td>TAG = ‘tag_name’</td>
<td>Specifies the tag of the input file or output file copy. You cannot apply a tag to a copy of an archived log, current control file, or standby control file.</td>
</tr>
</tbody>
</table>
**LEVEL = integer**
Includes the input file or output file copy in the incremental backup strategy by making it serve as a basis for subsequent incremental backup sets. Typically, you specify LEVEL 0. If you do not use the LEVEL option, then the datafile copy has no impact on the incremental backup strategy.

**NOCHECKSUM**
Suppresses block checksums. Unless you specify this option, Oracle computes a checksum for each block. RMAN verifies the checksum when restoring the copy. If the database is already maintaining block checksums, then this flag has no effect.

**CHECK LOGICAL**
Tests data and index blocks that pass physical corruption checks for logical corruption, for example, corruption of a row piece or index entry. If RMAN finds logical corruption, then it logs the block in the alert.log and server session trace file.

Provided the sum of physical and logical corruptions detected for a file remain below its MAXCORRUPT setting, the RMAN command completes and Oracle populates V$BACKUP_CORRUPTION and V$COPY_CORRUPTION with corrupt block ranges. If MAXCORRUPT is exceeded, then the command terminates without populating the views.

**keepOption**
Overrides any configured retention policy for this copy so that the copy is not considered obsolete.

See Also: "keepOption" on page 2-116

**copy_inputfile**
specifies the type of input file, that is, the file that you want to copy.

**DATAFILE**

**datafileSpec**
Specifies a list of one or more datafiles as input.

See Also: "datafileSpec" on page 2-95

Note: If you specify a filename, then it must be the name of a current datafile as listed in the control file.

**DATAFILECOPY**

`'filename'`
Specifies a list of one or more datafile copies as input. Specify the datafile copies by `'filename` or `TAG = 'tag_name'`.
The filename must not be the name of a current datafile listed in the control file. The existing copy may have been created by either a previous `COPY` command or by an external operating system utility.

**ARCHIVELOG**

`'filename'`
Specifies the filename of an input archived redo log. The archived log may have been created by the Oracle archiving session or by a previous `copy` command. Specify the archived redo log by filename.
COPY

<table>
<thead>
<tr>
<th>CURRENT CONTROLFILE</th>
<th>Specifies the current control file. If you specify the FOR STANDBY option, RMAN makes a control file that can be used for creation of a standby database.</th>
</tr>
</thead>
<tbody>
<tr>
<td>CONTROLFILECOPY</td>
<td>Specifies the filename of a control file copy. You can also set TAG = 'tag_name' to specify a list of one or more control file copies. This command copies a control file copy. The copy can be:</td>
</tr>
<tr>
<td>'filename'</td>
<td>- A copy of a normal control file (that is, not a standby control file)</td>
</tr>
<tr>
<td></td>
<td>- A standby control file copy created by using the COPY STANDBY CONTROLFILE command or the SQL statement ALTER DATABASE CREATE STANDBY CONTROLFILE</td>
</tr>
<tr>
<td></td>
<td>RMAN inspects the header of the control file copy to determine whether it is a standby or nonstandby control file.</td>
</tr>
<tr>
<td></td>
<td>Note: The control file copy is marked as a backup control file, so media recovery will be necessary if you mount the control file copy. This command is equivalent to the ALTER DATABASE BACKUP CONTROLFILE TO '...' statement.</td>
</tr>
<tr>
<td>TO AUXNAME</td>
<td>Specifies that Oracle should copy the input datafile to the filename specified in an earlier SET AUXNAME command for the input datafile.</td>
</tr>
<tr>
<td>TO 'filename'</td>
<td>Specifies the filename of the output file copy.</td>
</tr>
</tbody>
</table>

**Examples**

**Copying a Datafile: Example**  This example copies the datafile tbs_01.f with the NOCHECKSUM option to the output file temp3.f, marking it as a level 0 backup:

COPY
    NOCHECKSUM
    DATAFILE '$ORACLE_HOME/dbs/tbs_01.f' TO '$ORACLE_HOME/copy/temp3.f'
    LEVEL 0;

**Copying the Control File: Example**  This example copies the current control file and gives the copy the tag weekly_cf_copy:

COPY
    CURRENT CONTROLFILE TO '$ORACLE_HOME/copy/cf1.f'
    TAG = weekly_cf_copy;

**Creating a Long-Term Database Copy: Example**  This example copies the database and exempts it from the current retention policy:
COPY
  KEEP FOREVER NOLOGS
  CURRENT CONTROLFILE TO '/archive/cf1.f',
  DATAFILE 1 TO '/archive/df1.copy',
  DATAFILE 2 TO '/archive/df2.copy';

Creating a Standby Control File: Example  This example uses the preconfigured
DISK channel to create a copy of the current target control file that can be used as a
standby control file:

COPY CURRENT CONTROLFILE FOR STANDBY TO '/cf_standby.f';
CREATE CATALOG

Syntax

```
CREATE CATALOG TABLESPACE 'tablespace_name';
```

Purpose

To create a schema for the recovery catalog. Typically, you create this schema in a separate recovery catalog database.

Note: In releases prior to 8.1.5, you created the recovery catalog schema by connecting to the recovery catalog database and executing the `catrman.sql` script.

See Also: `Oracle9i Recovery Manager User’s Guide` to learn how to create the recovery catalog.

Restrictions and Usage Notes

- Execute this command only at the RMAN prompt.
- RMAN must be connected to the recovery catalog either through the `CATALOG` command-line option or the `CONNECT CATALOG` command, and the catalog database must be open. A connection to the target database is not required.
- The recovery catalog owner must be granted the `RECOVERY_CATALOG_OWNER` role, and also be granted space privileges in the tablespace where the recovery catalog tables will reside.
- Do not create the recovery catalog in the `SYS` schema.

See Also:

- `Oracle9i Database Administrator’s Guide` for more information about the `RECOVERY_CATALOG_OWNER` role
- "cmdLine" on page 2-57 for information about RMAN command-line options
Keywords and Parameters

| TABLESPACE 'tablespace_name' | Specifies the tablespace in which to store the recovery catalog schema. The catalog owner must be granted quota privileges. If you do not specify a tablespace, RMAN stores the recovery catalog in the default tablespace of the catalog owner. |

Example

**Creating a Catalog Schema: Example**  This example creates a user `rman`, grants `rman` the RECOVERY_CATALOG_OWNER role, then creates the recovery catalog in the schema `rman.cattbs` of the database `rcat`:

```sql
% sqlplus sys/change_on_install@rcat;

SQL> CREATE USER rman IDENTIFIED BY rman
2> DEFAULT TABLESPACE cattbs QUOTA UNLIMITED ON cattbs;
SQL> GRANT recovery_catalog_owner TO rman;
SQL> exit

% rman CATALOG rman/rman@rcat;
RMAN> CREATE CATALOG;
```
CREATE SCRIPT

Syntax

backupCommands ::= 

backup

copy

restoreCommands ::= 

replicate

restore

recover

blockrecover

duplicate

switch
maintenanceCommands::=

allocate
alterDatabase
beginLine
executeScript
host
release
resync
send
set
shutdown
sql
startup

miscellaneousCommands::=

**Purpose**

To create a script and store it in the recovery catalog for future reference. Stored scripts provide a common repository for frequently executed collections of RMAN commands. Any command that is legal within a `RUN` command is permitted in the stored script. The script is not executed immediately; run the script with `@`.  

**Restrictions and Usage Notes**

Note the following restrictions:

- Execute `CREATE SCRIPT` only at the RMAN prompt.
- RMAN must be connected to the recovery catalog either through the `CATALOG` command-line option or the `CONNECT CATALOG` command, and the catalog database must be open. A connection to the target database is not required.
- You cannot execute a `RUN` command within a stored script.
- The `@` and `@@` commands do not work within `CREATE SCRIPT`.
- Quotes must be used around the script name when the name contains either spaces or reserved words.

**Keywords and Parameters**

For descriptions of the individual commands that you can use in a stored script, refer to the appropriate entry, for example, "BACKUP" on page 2-26.

`'script_name'`  

Creates a stored script with the specified name. The statements allowable within the brackets of the `CREATE SCRIPT 'script_name' ( ... )` command are the same allowable within the `RUN` command. The statements within the braces constitute the `job_command_list`.  

**Note:** To run the stored script, specify `EXECUTE SCRIPT` within the braces of the `RUN` command.
Example

Creating a Script: Example  This example creates a script called b_whole_10 that backs up the database and archived redo logs, then executes it:

```sql
CREATE script b_whole_10
{
    ALLOCATE CHANNEL d1 DEVICE TYPE sbt;
    BACKUP INCREMENTAL LEVEL 0 TAG b_whole_10 DATABASE PLUS ARCHIVELOG;
}

RUN { EXECUTE script b_whole_10; }
```
CROSSCHECK

Syntax

Purpose

To verify the existence of backups (backup sets or media-managed proxy copies) and copies (both archived logs and image copies) stored on disk or tape.

The CROSSCHECK command checks only objects marked AVAILABLE or EXPIRED, either by examining the files on disk for DISK channels or by querying the media manager for sbt channels. The CROSSCHECK command only processes files created on the same device type as the channels running the crosscheck.

RMAN does not delete any files that it is unable to find, but updates their repository records to EXPIRED. You can determine which files are marked EXPIRED by issuing a LIST EXPIRED command. Then, you can run DELETE EXPIRED to remove the repository records for all expired files.

If some backup pieces or copies were erroneously marked as EXPIRED, for example, because the media manager was misconfigured, then after ensuring that the files really do exist in the media manager, run the CROSSCHECK BACKUP command again to restore those files to AVAILABLE status. Note that the DELETE EXPIRED command removes both the repository records as well as any existing physical files whose records show the status EXPIRED.

See Also: Oracle9i Recovery Manager User’s Guide to learn how to manage target database records in the catalog

Restrictions and Usage Notes

- The target instance must be started.
- A maintenance channel is not required when CROSSCHECK is used with a file that is on disk. If you use CROSSCHECK on nondisk files, and have objects
created on device types that are not configured for automatic channels, then you must manually allocate maintenance channels for these objects. For example, if you created a backup on an `sbt` channel, but have only a `DISK` channel automatically configured, then you must manually allocate an `sbt` channel before the `CROSSCHECK` command can check the backup.

### Keywords and Parameters

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>BACKUP</strong></td>
<td>Crosschecks backup sets, backup pieces, and proxy copies. By default, RMAN crosschecks backups of the whole database. Both usable and unusable backups are included in the output, even those that cannot be restored, are expired or unavailable, or are incremental backups that cannot be restored because their parent full backup or copy no longer exists. <strong>See Also:</strong> The tables describing columns in the <code>LIST</code> output. Use the <code>KEY</code> column of the output to obtain the primary key usable in the <code>CHANGE</code> and <code>DELETE</code> commands.</td>
</tr>
<tr>
<td><strong>COPY</strong></td>
<td>Crosschecks datafile copies, control file copies, archived redo logs, and image copies of archived redo logs. By default, <code>CROSSCHECK</code> checks copies of all files in the database with status <code>AVAILABLE</code> or <code>EXPIRED</code>. <strong>OF listObjList</strong> Restricts the list of objects operated on to the object type specified in the <code>listObjList</code> clause. If you do not specify an object, <code>CROSSCHECK</code> defaults to all copies. <strong>See Also:</strong> &quot;listObjList&quot; on page 2-135</td>
</tr>
<tr>
<td></td>
<td><strong>maintQualifier</strong> Restricts the command based on the specified options. <strong>See Also:</strong> &quot;maintQualifier&quot; on page 2-137</td>
</tr>
<tr>
<td></td>
<td><strong>Note:</strong> <code>listObjList</code> and <code>maintQualifier</code> are valid options on both the <code>BACKUP</code> and <code>COPY</code> commands. <strong>recordSpec</strong> Specifies the object whose availability status you are changing. See &quot;recordSpec&quot; on page 2-144.</td>
</tr>
<tr>
<td></td>
<td><strong>DEVICE TYPE deviceSpecifier</strong> Allocates automatic channels for the specified device type only. This option is valid only if you have configured automatic channels and have not manually allocated channels. For example, if you configure automatic disk and tape channels and run <code>CROSSCHECK ... DEVICE TYPE DISK</code>, then RMAN allocates only disk channels. <strong>See Also:</strong> &quot;deviceSpecifier&quot; on page 2-101</td>
</tr>
</tbody>
</table>
Examples

**Crosschecking All Backups: Example**  The following example queries the status of all backups and copies on tape and disk (note that because RMAN preconfigures a disk channel, you do not need to manually allocate a disk channel):

```sql
ALLOCATE CHANNEL FOR MAINTENANCE DEVICE TYPE sbt;
CROSSCHECK BACKUP;
CROSSCHECK COPY;
```

**Crosschecking Within a Range of Dates: Example**  The following example queries the media manager for the status of the backup sets in a given six month range. Note that RMAN uses the date format specified in the `NLS_DATE_FORMAT` parameter, which is 'DD-MON-YY' in this example:

```sql
ALLOCATE CHANNEL FOR MAINTENANCE DEVICE TYPE sbt;
CROSSCHECK BACKUP DEVICE TYPE sbt COMPLETED BETWEEN '01-JAN-00' AND '01-JUL-00';
```
datafileSpec

Syntax

```
{ filename | integer }
```

Purpose

A subclause that specifies a datafile by filename or absolute file number.

Restrictions and Usage Notes

You cannot use environment variables such as $ORACLE_HOME in filenames. You must specify the relative or absolute path name.

Keywords and Parameters

- `filename`
  Specifies the datafile by using either the full path or a relative filename. If you specify a relative filename, the filename is qualified in a port-specific manner by the target database.

- `integer`
  Specifies the datafile by using its absolute file number. Obtain the file number from the V$DATAFILE, V$DATAFILE_COPY, or V$DATAFILE_HEADER views or REPORT SCHEMA command output.

Examples

**Specifying a Datafile by Filename: Example**  This example copies datafile `/oracle/dbs/tbs_12.f` to disk, specifying it by filename:

```
COPY DATAFILE '/oracle/dbs/tbs_12.f' TO '/oracle/copy/tbs_1.copy';
```

**Specifying a Datafile by Absolute File Number: Example**  This example copies datafile `/oracle/dbs/tbs_31.f` to disk, specifying it by file number:

```
RUN
{
   ALLOCATE CHANNEL ch1 DEVICE TYPE DISK;
   COPY DATAFILE 10 TO '/oracle/copy/tbs_31.copy';
}
```
DELETE

Syntax

```plaintext
DELETE [NOPROMPT] [EXPIRED] [OBsolete] OF listObjList maintQualifier
```  

Purpose

To delete physical backups and copies as well as do the following:

- Update their records in the target control file to status `DELETED`
- Remove their records from the recovery catalog (if you use a catalog)

By default, `DELETE` displays a list of the files and prompts you for confirmation before deleting any file in the list, unless you are running a command file.

If you specify the `EXPIRED` option, then `DELETE` only removes files marked `EXPIRED`, that is, "not found," by the `CROSSCHECK` command. Use the `LIST` command or query the recovery catalog views to determine which backups or copies are expired.

**Caution:** If for some reason a backup or copy marked `EXPIRED` exists when you run the `DELETE EXPIRED` command, then RMAN deletes the physical files.

If you specify the `OBsolete` option, then `DELETE` removes files considered `OBsolete`, that is, "not needed," by the retention policy or because it is orphaned. You can specify a retention policy by using `CONFIGURE RETENTION POLICY`, or specify the `REDUNDANCY` and `RECOVERY WINDOW` options on the `DELETE` command.
See Also: "BACKUP" on page 2-26 to learn about the BACKUP DELETE INPUT command

Restrictions and Usage Notes

- The target instance must be started.
- A maintenance channel is not required when DELETE is used with a file that is disk-only (that is, an ARCHIVELOG, DATAFILECOPY, CONTROLFILECOPY). Otherwise, you must use a manual or automatic maintenance channel.

If you use DELETE on files that are not disk-only, and if you have objects created on device types that are not configured for automatic channels, then run manual maintenance commands on these channels. For example, if you created a backup using an sbt channel, but have only a DISK channel automatically configured, you must manually allocate an sbt channel for DELETE.

Keywords and Parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>NOPROMPT</td>
<td>Deletes specified files without first listing the files or prompting for confirmation. The DELETE NOPROMPT command still displays each item as it is deleted. By default, DELETE displays files and then prompts for confirmation. If the user confirms, then RMAN shows each item as it is deleted. If you are running commands from a command file, then NOPROMPT is the default.</td>
</tr>
<tr>
<td>EXPIRED</td>
<td>Removes only files whose status in the repository is EXPIRED. RMAN marks backups and copies as expired when you run a CROSSCHECK command and the files are absent or inaccessible. To determine which files are expired, run a LIST EXPIRED command. Note: Beginning in Oracle9i, RMAN’s default behavior is to prompt for confirmation when you run DELETE EXPIRED. In releases previous to Oracle9i, RMAN did not prompt.</td>
</tr>
<tr>
<td>OBSOLETE</td>
<td>Deletes backups and datafile copies recorded in the RMAN repository that are obsolete, that is, no longer needed. In addition to obsolete datafile backups, RMAN deletes obsolete archived logs and archived log backups. RMAN determines which backups and copies of datafiles are no longer needed, which in turn determines when logs (and backups of logs) are no longer needed. RMAN considers the creation of a datafile as a backup when deciding which logs to keep. RMAN first uses the options that you specify with obsOperandList to determine what is obsolete. If you do not specify options in obsOperandList, then RMAN uses the options specified in CONFIGURE RETENTION POLICY.</td>
</tr>
</tbody>
</table>

obsOperandList  Specifies the criteria for determining which backups and copies are obsolete. See Also: "obsOperandList" on page 2-139
### DELETE

<table>
<thead>
<tr>
<th>DEVICE TYPE</th>
<th>deviceSpecifier</th>
<th>Restrictions the deletion to obsolete backups and copies created on the specified device type only.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>See Also</strong></td>
<td>&quot;deviceSpecifier&quot; on page 2-101</td>
<td></td>
</tr>
</tbody>
</table>

**BACKUP**

Deletes backup sets, backup pieces, and proxy copies. By default, RMAN deletes backups of the whole database. Specify the `EXPIRED` option to remove only backups that are marked `EXPIRED` in the repository. The KEY column of the `LIST` output indicates the primary key usable in the `CHANGE` and `DELETE` commands.

**COPY**

Deletes datafile copies, archived redo logs, and image copies of archived redo logs. By default, `DELETE ... COPY` removes copies of all files in the database. Specify the `EXPIRED` option to remove only copies that are marked `EXPIRED` in the repository.

- **OF listObjList** restricts the list of objects operated on to the object type specified in the `listObjList` clause. See "listObjList" on page 2-135. If you do not specify an object, `CHANGE` defaults to all copies.

- **maintQualifier** restricts the command based on the specified options (see "maintQualifier" on page 2-137).

**Note:** `listObjList` and `maintQualifier` are valid options on both the `BACKUP` and `COPY` commands.

- **recordSpec** Specifies the object that you are deleting.

  **See Also:** "recordSpec" on page 2-144

- **DEVICE TYPE deviceSpecifier** allocates automatic channels for the specified device type only (see "deviceSpecifier" on page 2-101). This option is valid only if you have configured channels and have not manually allocated channels. For example, if you configure disk and tape channels, and run `DELETE ... DEVICE TYPE DISK`, then RMAN allocates only disk channels.

#### Examples

**Deleting Expired Backups: Example** The following example uses a configured `sbt` channel to check the media manager for expired backups of the tablespace `user_data` that are more than one month old and removes their catalog records:

```sql
CONFIGURE CHANNEL DEVICE TYPE sbt;
CROSSCHECK BACKUP OF TABLESPACE user_data COMPLETED BEFORE 'SYSDATE-31';
DELETE NOPROMPT EXPIRED BACKUP OF TABLESPACE user_data COMPLETED BEFORE 'SYSDATE-31';
```
Deleting Obsolete Backups: Example The following example deletes backups and copies that are not needed to recover the database to a random point within the last week. RMAN also deletes archived redo logs that are no longer needed:

DELETE NOPROMPT OBsolete RECOVERY WINDOW OF 7 DAYS;

Deleting a Backup Set Specified by Primary Key: Example The following example deletes backup set 503 from disk:

DELETE BACKUPSET 503;
DELETE SCRIPT

Syntax

```
DELETE SCRIPT 'script_name'
```

Purpose

To delete a stored script from the recovery catalog.

Restrictions and Usage Notes

- Execute `DELETE SCRIPT` only at the RMAN prompt.
- RMAN must be connected to the recovery catalog either through the `CATALOG` command-line option or the `CONNECT CATALOG` command, and the catalog database must be open. A connection to the target database is not required.
- Quotes must be used around the script name when the name contains either spaces or reserved words.

Keywords and Parameters

<table>
<thead>
<tr>
<th><code>script_name</code></th>
<th>Deletes the specified script. The script name must be a name used in a previous <code>CREATE SCRIPT</code> or <code>REPLACE SCRIPT</code> command.</th>
</tr>
</thead>
</table>

See Also: "CREATE SCRIPT" on page 2-88

Example

Deleting a Script: Example

This example deletes the script `b_whole_10`:

```
DELETE SCRIPT b_whole_10;
```
deviceSpecifier

Syntax

Syntax

```
DISK

'media_device'
```

Purpose

A subclause specifying the type of storage for a backup or copy.

Keywords and Parameters

<table>
<thead>
<tr>
<th>DISK</th>
<th>Specifies disk storage.</th>
</tr>
</thead>
<tbody>
<tr>
<td>'media_device'</td>
<td>Specifies a sequential I/O device or access method for storage. The syntax and semantics of sequential I/O device types are platform-specific. Example values are sbt and sbt_tape (with or without quotes). These values are synonymous. The media_ device variable specifies a media management device such as a third-party tape subsystem interface. Note that media device names are not case sensitive. The sbt variable is legal as input, but RMAN output always displays its synonym sbt_tape. It is stored in the catalog as sbt_tape for backwards compatibility.</td>
</tr>
</tbody>
</table>

Examples

Allocating a Tape Channel: Example

This example allocates a maintenance channel for a media management device:

```
ALLOCATE CHANNEL FOR MAINTENANCE DEVICE TYPE sbt;
```

Backing Up to Disk: Example

This example backs up the database to disk:

```
BACKUP DEVICE TYPE DISK DATABASE;
```

Restoring from Disk and Tape: Example

This example restores the database:

```
RUN
{
   ALLOCATE CHANNEL t1 DEVICE TYPE 'sbt_tape';
   RESTORE DATABASE;
}
```
DROP CATALOG

Syntax

```
DROP CATALOG
```

Purpose

To remove the schema from the recovery catalog.

**Caution:** This command deletes all metadata from the recovery catalog. If you have no backups of the catalog, then all backups of all databases managed by this recovery catalog become unusable.

**See Also:** *Oracle9i Recovery Manager User’s Guide* to learn how to drop the recovery catalog schema

Restrictions and Usage Notes

- Execute this command only at the RMAN prompt.
- You must be connected to the recovery catalog database through the `CATALOG` command-line option or the `CONNECT CATALOG` command. The catalog database must be open. You do not have to be connected to the target database.
- Enter the command twice to confirm that you want to drop the schema.

Example

**Deleting the Catalog: Example**  This example drops the schema from the recovery catalog (you must enter the command twice to confirm):

```
RMAN> DROP CATALOG

recovery catalog owner is rman
enter DROP CATALOG command again to confirm catalog removal

RMAN> DROP CATALOG
```
DUPLICATE

Syntax

\[\text{dupOptionList ::=}
\]

\[\text{logSpec ::=}
\]

\[\text{GROUP} \text{integer} \text{filename}
\]

\[\text{DEVICE TYPE deviceSpecifier}
\]

\[\text{PFILE filename}
\]

\[\text{LOGFILE logSpec}
\]

\[\text{NOFILENAMECHECK}
\]

\[\text{SKIP READONLY}
\]

\[\text{REUSE}
\]

\[\text{SIZE integer K M}
\]

\[\text{REUSE}
\]
dupsbyOptionList ::= 

- DORECOVER
- NOMOUNT
- NOFILENAMECHECK

**Purpose**

To use backups of the target database to create either of the following:

- A **duplicate database**, which is a copy of the target database with a unique DBID. Because a duplicate database has a unique DBID, it is entirely independent of the primary database and can be registered in the same recovery catalog as the primary database. Typically, duplicate databases are used for testing.

- A **standby database**, which is a special copy of the primary database that is updated by applying archived redo logs from the primary database. A standby database does not get a new DBID.

To create a standby database with the `DUPLICATE` command you must specify the `FOR STANDBY` option. The `DUPLICATE ... FOR STANDBY` command creates the standby database by restoring a standby control file, mounting the standby control file, and then restoring and recovering backups of the target datafiles. The standby database is left mounted after duplication is complete. Note that backups of the standby database are interchangeable with backups of the primary database.

When duplicating a database that is currently in `NOARCHIVELOG` mode, recovery occurs with the `NOREDO` option. Hence, if incremental backups exist, RMAN applies only these backups to the restored files during recovery. For databases in `ARCHIVELOG` mode, `DUPLICATE` recovers by default up to the last archived redo log generated at the time the command was executed—unless the `SET UNTIL` clause is specified, in which case recovery is bounded by the parameter setting.

**See Also:**

- *Oracle9i Recovery Manager User’s Guide* to learn how to create a duplicate database with the `DUPLICATE` command
- *Oracle9i Recovery Manager User’s Guide* to learn how to create a standby database with the `DUPLICATE ... FOR STANDBY` command
- *Oracle9i Data Guard Concepts and Administration* to learn how to create and manage standby database
Restrictions and Usage Notes

These restrictions apply to all uses of the DUPLICATE command (both for creation of a standby database and creation of a nonstandby duplicate database):

- Issue one or more ALLOCATE AUXILIARY CHANNEL commands before executing the DUPLICATE command, or CONFIGURE automatic auxiliary channels. RMAN uses the automatic target channel configuration for auxiliary channels in the following circumstances:
  - You have not manually allocated auxiliary channels.
  - You have not configured automatic auxiliary channels.
  - The automatic target channels do not have CONNECT strings.

Note that the DUPLICATE command does not require non-AUXILIARY channels (that is, normal target database channels).

- You must be connected to both the target database and auxiliary instance. The auxiliary instance must be started with the NOMOUNT option, and the target database must be mounted or open.

- You cannot duplicate a database when some backups of the target database do not exist. RMAN attempts to duplicate the following:
  - All datafiles in online tablespaces, whether or not the datafiles are online.
  - All tablespaces taken offline with an option other than NORMAL. For example, RMAN attempts to duplicate tablespaces taken offline with the IMMEDIATE option. You cannot duplicate OFFLINE NORMAL tablespaces, although you can add these tablespaces manually after duplication.

If no valid backups exist of any tablespace or datafile, then the DUPLICATE command fails.

- If the target and duplicate databases reside on the same host, set the CONTROL_FILES parameter appropriately so that the DUPLICATE command does not generate an error because the target control file is in use.

- If the target and duplicate databases share the same host, set all *_PATH and *_DEST initialization parameters appropriately so that the target database files are not overwritten by the duplicate database files.

- You cannot set the DB_NAME parameter in the duplicate parameter file to a value different from the database name specified in the DUPLICATE command.

- You cannot use the same database name for the target and duplicate databases when the duplicate database resides in the same Oracle home as the target.
Note that if the duplicate database resides in a different Oracle home from the target, then its database name just has to differ from other database names in that same Oracle home.

- If the target and duplicate databases reside on different hosts, then you must do one of the following for duplication to be successful:
  - Move backups and disk copies from the target host to the duplicate host and \texttt{CATALOG} the image copies.
  - Make sure that all backups and copies (disk or \texttt{sbt}) on the target host are remotely accessible from the duplicate host. Make sure that the archived redo logs are available in the expected location in the new host.

- If you can make an operating system copy of a database file on one platform and then restore it to another platform, then it is also possible to duplicate a database from one platform to another. Otherwise, duplication is not possible.

- You cannot recover the duplicate database to the current point in time, that is, the most recent SCN. RMAN recovers the duplicate database up to or before the most recent available archived redo log.

- Specify new filenames or convert target filenames for the datafiles and online redo logs when the duplicate filenames must be different from the target filenames (as when duplicating to the same host as the primary). If you do not specify filenames for duplicate online redo logs and datafiles, then RMAN reuses the target datafile names.

- If you want the duplicate filenames to be the same as the target filenames, and if the databases are in different hosts, then you must specify \texttt{NOFILENAMECHECK}.

- If duplicating a database on the same host as the target database, do not specify the \texttt{NOFILENAMECHECK} option. Otherwise, RMAN may signal this error:

  RMAN-10035: exception raised in RPC: ORA-19504: failed to create file 
  
  "/oracle/dbs/tbs_01.f"

  ORA-27086: skgflk: unable to lock file - already in use

  SVR4 Error: 11: Resource temporarily unavailable

  Additional Information: 8

  RMAN-10031: ORA-19624 occurred during call to

  DBMS_BACKUP_RESTORE.RESTOREBACKUPPIECE

The following restrictions apply when you use the \texttt{DUPLICATE} command with the \texttt{FOR STANDBY} option:

- All backups and copies located on disk must be available at the standby host with the same path names as in the target host.
Backups on tape must be accessible from the standby host.

If archived logs have not been backed up, then archived logs must be available at the standby host with the same path names as in the target host.

If RMAN recovers the standby database, then the checkpoint SCN of the control file must be included in an archived redo log that is either available at the standby site or included in an RMAN backup. For example, assume that you create the standby control file and then immediately afterward archive the current log, which has a sequence of 100. You must recover the standby database up to at least log sequence 100, or Oracle signals an ORA-1152 error message because the standby control file backup or copy was taken after the point in time.

You cannot use SET NEWNAME or CONFIGURE AUXNAME to transform the filenames for the online redo logs on the standby database.

You cannot use the DUPLICATE command to activate a standby database.

You cannot connect to the standby database and then DUPLICATE ... FOR STANDBY to create an additional standby database. To create additional standby databases, connect to the original primary database and run DUPLICATE ... FOR STANDBY.

Do not attempt to register the standby database in the primary database repository.

Keywords and Parameters

<table>
<thead>
<tr>
<th>TO 'database_name'</th>
<th>Specifies the name of the duplicate database. The name should match the name in the initialization parameter file of the duplicate database or Oracle signals an error when creating the control file.</th>
</tr>
</thead>
<tbody>
<tr>
<td>dupOptionList</td>
<td>Specifies options that apply when creating a nonstandby duplicate database.</td>
</tr>
<tr>
<td>LOGFILE logSpec</td>
<td>Specifies the online redo logs when creating a nonstandby duplicate database. The syntax is the same used in the LOGFILE option of the CREATE DATABASE statement. Refer to the description of logSpec for the legal options.</td>
</tr>
</tbody>
</table>
## DUPPLICATE

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>NOFILENAMECHECK</td>
<td>Prevents RMAN from checking whether target datafiles sharing the same names as the duplicated files are in use. The user is responsible for determining that the duplicate operation will not overwrite useful data.</td>
</tr>
<tr>
<td></td>
<td>This option is necessary when you are creating a duplicate database in a different host that has the same disk configuration, directory structure, and filenames as the host of the target database. For example, assume that you have a small database located in the /dbs directory of host1:</td>
</tr>
</tbody>
</table>
|                      | `/oracle/dbs/system_prod1.dbf`  
|                      | `/oracle/dbs/users_prod1.dbf`  
|                      | `/oracle/dbs/tools_prod1.dbf`  
|                      | `/oracle/dbs/rbs_prod1.dbf`  |
|                      | Assume that you want to duplicate the database in machine host2, which has the same file system `/oracle/dbs/*`, and you want to use the same filenames in the duplicate database as in the primary. In this case, specify the NOFILENAMECHECK option to avoid an error message. Because RMAN is not aware of the different hosts, RMAN cannot determine automatically that it should not check the filenames. |
| SKIP READONLY        | Excludes datafiles in read-only tablespaces from the duplicate database.                                                                                                                                 |
|                      | **Note**: A record for the skipped read-only tablespace still appears in DBA_TABLESPACES. By using this feature, you can activate the read-only tablespace later. For example, you can store the read-only tablespace data on a CD-ROM, then mount the CD-ROM later and view the data. |
| DEVICE TYPE deviceSpecifier | Allocates automatic channels for the specific deviceSpecifier only (for example, DISK or sbt). This option is valid only if you have configured automatic channels and have not manually allocated channels. For example, if you configure automatic disk and tape channels, and if you run DUPLICATE ..., DEVICE TYPE DISK, then RMAN allocates only disk channels. |
|                      | **See Also**: "deviceSpecifier" on page 2-101                                                                                                                                                               |
| PFILE = 'filename'   | Specifies a client-side initialization parameter used by the auxiliary instance. RMAN automatically shuts down and restarts the auxiliary instance during duplication. If the auxiliary does not use a server-side parameter file in the default location, you must specify the client-side parameter file that RMAN should use when starting the auxiliary instance. Otherwise, you do not need to specify PFILE. |
**logSpec**

Specifies the online redo logs when creating a nonstandby duplicate database. If you do not specify LOGFILE, then RMAN uses LOG_FILE_NAME_CONVERT if it is set. If neither LOGFILE nor LOG_FILE_NAME_CONVERT is set, then RMAN uses the original target log filenames for the duplicate files. You must specify the NOFILENAMECHECK option in this case.

**See Also:** Oracle9i SQL Reference for CREATE DATABASE syntax

<table>
<thead>
<tr>
<th>'filename'</th>
<th>Specifies the filename of the online redo log member.</th>
</tr>
</thead>
<tbody>
<tr>
<td>SIZE integer</td>
<td>Specifies the size of the file in kilobytes (K) or megabytes (M). The default is in bytes. If you omit this parameter, then the file must already exist.</td>
</tr>
<tr>
<td>REUSE</td>
<td>Allows Oracle to reuse an existing file. If the file already exists, then Oracle verifies that its size matches the value of the SIZE parameter. If the file does not exist, then Oracle creates it. If you omit the SIZE parameter, then the file must already exist. The REUSE option is significant only when used in conjunction with the SIZE parameter. If you omit the SIZE parameter, then Oracle expects the file to exist already.</td>
</tr>
<tr>
<td>GROUP integer</td>
<td>Specifies the group containing the online redo log members.</td>
</tr>
</tbody>
</table>

FOR STANDBY

Specifies that database being duplicated is to be used as a standby database. RMAN restores the most recent files (unless SET UNTIL is specified). If DORECOVER is specified, then RMAN also recovers database. RMAN always leaves standby database in mounted state after executing DUPLICATE command.

**dupbyOptionList**

Specifies options that only apply when creating a standby database.

| DORECOVER | Specifies that RMAN should recover the database after creating it. If you specify an untilClause, then RMAN recovers to the specified point and leaves the database mounted. |
| NOFILENAMECHECK | Prevents RMAN from checking whether target datafiles sharing the same names as the duplicated files are in use. Note that the NOFILENAMECHECK option is required when the standby and primary datafiles and logs have identical filenames. |

**See Also:** The description in dupOptionList

## Examples

**Setting New Filenames Manually: Example**

This example assumes that the target database is on host1 and you wish to duplicate the database to newdb on host2 with the file structure `/oracle/dbs/*`. Because the filenames in host1 are
irregularly named and located in various subdirectories, you use SET NEWNAME commands to rename the files consistently. The DUPLICATE command uses backup sets stored on tape to duplicate the target database to database newdb:

```
RUN
{}
ALLOCATE AUXILIARY CHANNEL newdb1 DEVICE TYPE sbt;
SET NEWNAME FOR DATAFILE 1 TO '$ORACLE_HOME/dbs/newdb_data_01.f';
SET NEWNAME FOR DATAFILE 2 TO '$ORACLE_HOME/dbs/newdb_data_02.f';
SET NEWNAME FOR DATAFILE 3 TO '$ORACLE_HOME/dbs/newdb_data_11.f';
SET NEWNAME FOR DATAFILE 4 TO '$ORACLE_HOME/dbs/newdb_data_12.f';
SET NEWNAME FOR DATAFILE 5 TO '$ORACLE_HOME/dbs/newdb_data_21.f';
SET NEWNAME FOR DATAFILE 6 TO '$ORACLE_HOME/dbs/newdb_data_22.f';
DUPLICATE TARGET DATABASE TO newdb
  PFILE = /oracle/dbs/initNEWDB.ora
  LOGFILE
     GROUP 1 ('$ORACLE_HOME/dbs/newdb_log_1_1.f',
              '$ORACLE_HOME/dbs/newdb_log_1_2.f') SIZE 200K,
     GROUP 2 ('$ORACLE_HOME/dbs/newdb_log_2_1.f',
              '$ORACLE_HOME/dbs/newdb_log_2_2.f') SIZE 200K REUSE;
}
```

**Reusing the Target Filenames: Example**  This example assumes the following:

- You are restoring to a new host without a catalog.
- You have configured automatic channels.
- The target host and duplicate host have the same file structure.
- You wish to name the duplicate files exactly like the target database files.
- You do not want to duplicate read-only tablespaces.
- You want to prevent RMAN from checking whether files on the target database that have the same names as the duplicated files are in use.

```
CONNECT TARGET
CONNECT AUXILIARY sys/aux_pwd@newdb
DUPLICATE TARGET DATABASE TO ndbnewh
  LOGFILE
     '$ORACLE_HOME/dbs/log_1.f' size 200K,
     '$ORACLE_HOME/dbs/log_2.f' size 200K
  SKIP READONLY
  NOFILENAMECHECK;
}
```

**Creating a Standby Database: Example**  This example creates a standby database on a remote host with the same directory structure as the primary host. In this example, the NOFILENAMECHECK option is specified because the standby and
primary datafiles and logs have the same names. Note that an automatic auxiliary channel is already configured, so you do not need to manually allocate a channel:

DUPLICATE TARGET DATABASE FOR STANDBY
   NOFILENAMECHECK;
EXECUTE SCRIPT

Syntax

```
EXECUTE SCRIPT 'script_name';
```

Purpose

To run an RMAN script stored in the recovery catalog. Use the `CREATE SCRIPT` command to generate stored scripts.

When you run an `EXECUTE SCRIPT` command within a `RUN` command, RMAN places the contents of the script between the braces of `RUN`. For this reason, you should not allocate a channel at the `RUN` command level if you already allocated it in the script.

See Also: Oracle9i Recovery Manager User’s Guide, and "CREATE SCRIPT" on page 2-88

Restrictions and Usage Notes

Execute this command only within the braces of a `RUN` command.

Keywords and Parameters

`'script_name'` Runs the specified stored script. To obtain a listing of all stored scripts, use SQL*Plus to connect to the recovery catalog database as the catalog owner and run the following query:

```
SQL> SELECT * FROM RC_STORED_SCRIPT;
```

See Also: “RC_STORED_SCRIPT” on page 3-27 for more information about `RC_STORED_SCRIPT`, and "CREATE SCRIPT" on page 2-88 for information about creating scripts

Example

 Executing a Script: Example This example runs a stored script:

```
RUN { EXECUTE script b_whole_10; }
```
EXIT

Syntax

EXIT

Purpose
To shut down the Recovery Manager utility.

Restrictions and Usage Notes
Execute only at the RMAN prompt.

Example

Exiting RMAN: Example  This example starts RMAN and then shuts it down:

% rman
RMAN> EXIT
HOST

Syntax

```
HOST [command]
```

Purpose

To invoke an operating system command-line sub-shell from within RMAN.

Restrictions and Usage Notes

Execute this command at the RMAN prompt or within the braces of a `RUN` command.

Keywords and Parameters

<table>
<thead>
<tr>
<th>HOST</th>
<th>Enables you to execute an operating system command. Use this parameter:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>■ With a <code>command'</code>, in which case RMAN runs the command in the specified</td>
</tr>
<tr>
<td></td>
<td>string and then continues.</td>
</tr>
<tr>
<td></td>
<td>■ Without a <code>command'</code>, in which case RMAN displays a command prompt and</td>
</tr>
<tr>
<td></td>
<td>resumes after you exit the subshell.</td>
</tr>
</tbody>
</table>

Examples

**Executing an Operating System Copy Within RMAN: Example**  This example shuts down the database, makes a backup of datafile `tbs_01.f` by using a media manager, then makes an image copy of the same file on disk by using a UNIX command. The database needs to be shut down cleanly to prevent fractured blocks:

```sql
SHUTDOWN IMMEDIATE;
STARTUP MOUNT;
BACKUP DATAFILE '$ORACLE_HOME/dbs/tbs_01.f';
HOST 'cp $ORACLE_HOME/dbs/tbs_01.f $ORACLE_HOME/dbs/copy/tbs_01.f';
ALTER DATABASE OPEN;
```

**Hosting to the Operating System Within a Copy Job: Example**  This example makes an image copy of `datafile 3`, hosts out to the UNIX prompt to check that
the copy is in the directory (the UNIX session output is indented and displayed in bold), then resumes the RMAN session:

COPY DATAFILE 3 TO 'df.3';
HOST;
  % ls df.3
  df.3
  % exit
LIST COPY;
A subclause specifying the status of a backup or copy in relation to a retention policy. The KEEP option marks the backup or copy as exempt from the retention policy (that is, not obsolete), and the NOKEEP option undoes any existing exemptions.

**Keywords and Parameters**

- **KEEP**: Overrides any configured retention policy for this backup or copy so that the backup is not obsolete. The BACKUP ... KEEP command or COPY ... KEEP specifies a new retention time for this backup or copy. Use this option to create a long-term backup, that is, a backup that want you to archive.

  - **UNTIL TIME = 'date_string'**: Specifies the date until which the backup or copy must be kept. You can either specify a specific time by using the current NLS_DATE_FORMAT, or a SQL date expression, such as ‘SYSDATE+365’.

- **FOREVER**: Specifies that the backup or copy never expires. You must use a recovery catalog when FOREVER is specified, because the backup records eventually age out of the control file.

- **LOGS**: Specifies that all of the archived logs required to recover this backup or copy must remain available as long as this backup or copy is available.

- **NOLOGS**: Specifies that this backup or copy cannot be recovered because the archived logs needed to recover this backup will not be kept. The only use for this backup or copy is to restore the database to the point in time that the backup or copy was taken. This is the only valid recoverability option when the database operates in NOARCHIVELOG mode. This option is not valid if the backup or copy is inconsistent.
Examples

Making a Long-Term Backup: Example  This example makes a long-term backup of the database and specifies that it should never become obsolete and that the logs required to recover it should not be retained:

```
BACKUP DATABASE KEEP FOREVER NOLOGS;
```

Changing the Status of a Copy: Example  This example specifies that any long-term copies of datafiles 1, 2, 3, 4, and 5 should lose their exempt status and so become eligible to be obsolete according to the existing retention policy:

```
CHANGE COPY OF DATAFILE 1,2,3,4,5 NOKEEP;
```
LIST

Syntax

```
listObjectSpec ::= listBackupOption |
listBackupOption ::= BACKUP OF listObjList listBackupOption |
listBackupOption ::= COPY OF listObjList |
```

Purpose

To display information about backup sets, proxy copies, and image copies recorded in the repository. The **LIST** command displays the files against which you can run **CROSSCHECK** and **DELETE** commands.

Use this command to list:

- Backups and copies marked as **EXPIRED** in the RMAN repository
Backups and copies of datafiles that are available and can possibly be used in a restore operation

Specified archived logs, backup sets, backup pieces, control file copies, datafile copies, and proxy copies

Backups and copies restricted by tag, completion time, recoverability, or device type

Incarnations of a specified database or of all databases known to the catalog

RMAN records the output to either standard output or the message log, but not to both at the same time. You can control how the output is organized (BY BACKUP or BY FILE) as well as the level of detail in the output (VERBOSE or SUMMARY).

See Also: Oracle9i Recovery Manager User’s Guide to learn how to make lists and reports, and "cmdLine" on page 2-57

Restrictions and Usage Notes

- Execute LIST only at the RMAN prompt.
- The INCARNATION option requires the use of a recovery catalog.
- You must be connected to the target database. If you are connected in NOCATALOG mode, then the database must be mounted. If you connect to a recovery catalog, then the target instance must be started (but it does not need to be mounted).

Keywords and Parameters

<table>
<thead>
<tr>
<th>INCARNATION</th>
<th>Displays information about the incarnations of a database.</th>
</tr>
</thead>
<tbody>
<tr>
<td>The LIST output includes the primary keys of all database incarnation records for the specified database name. Use the key in a RESET DATABASE command to change the incarnation that RMAN considers to be current to a previous incarnation.</td>
<td></td>
</tr>
<tr>
<td>See Also: Table 2-15 on page 2-131 for an explanation of the column headings of the LIST INCARNATION output table</td>
<td></td>
</tr>
</tbody>
</table>

| OF DATABASE | Specifies the name of the database. If you do not specify the OF DATABASE option, then the command lists all databases registered in the recovery catalog. |
| 'database_name' | |

See Also: Oracle9i Recovery Manager User’s Guide to learn how to make lists and reports, and "cmdLine" on page 2-57
EXPIRED

Displays backup sets, proxy copies, and image copies marked in the repository as EXPIRED, that is, "not found."

To ensure that LIST EXPIRED shows up-to-date output, issue a CROSSCHECK command periodically. When you issue a CROSSCHECK command, RMAN searches on disk and tape for the backups and copies recorded in the repository. If it does not find them, then it updates their repository records to status EXPIRED.

listObjectSpec

Specifies the type of object or objects that you are listing.

See Also: "recordSpec" on page 2-144

BACKUP

Displays information about backups: backup sets, backup pieces, and proxy copies. The output displays a unique key for each. The LIST BACKUP command defaults to BY BACKUP.

Unless you specify the RECOVERABLE option, RMAN lists both usable and unusable backups, even those that cannot be restored, are expired or unavailable, or are incrementals that cannot be restored because their parent full backup or copy no longer exists.

See Also: "LIST Output" on page 2-121 for an explanation of the column headings of the LIST output tables. Use the KEY column of the output to obtain the primary key usable in the CHANGE and DELETE commands.

COPY

Displays information about datafile copies, archived redo logs, and image copies of archived redo logs. By default, LIST COPY displays copies of all database files and archived redo logs. Both usable and unusable image copies are included in the output, even those that cannot be restored or are expired or unavailable.

See Also: Table 2–12 on page 2-129 and Table 2–14 on page 2-130 for an explanation of the column headings of the LIST COPY output tables.

OF listObjList

Restricts the list of objects operated on to the object type specified in the listObjList clause. If you do not specify an object, then LIST defaults to OF DATABASE CONTROLFILE ARCHIVELOG ALL.

Note: The LIST BACKUP ... LIKE command is not valid. The only valid exception is LIST BACKUP OF ARCHIVELOG LIKE.

See Also: "listObjList" on page 2-135

listBackupOption

Specifies the type of object or objects that you are listing.

See Also: "recordSpec" on page 2-144
LIST Output

The information that appears in the output is shown in the following tables:

- Table 2–2, "List of Backup Sets (when in verbose mode)"
- Table 2–3, "List of Backup Pieces (LIST BACKUP ... VERBOSE)"
- Table 2–4, "List of Datafiles in backup set ..."
- Table 2–5, "List of Archived Logs in backup set ..."
- Table 2–6, "List of Proxy Copies"
- Table 2–7, "List of Backup Sets (LIST BACKUP ... SUMMARY)"
- Table 2–8, "List of Backup Pieces (LIST BACKUPPIECE ...)"
Table 2–9, "List of Datafile Backups (LIST BACKUP ... BY FILE)"
Table 2–10, "List of Archived Log Backups (LIST BACKUP ... BY FILE)"
Table 2–11, "List of Controlfile Backups (LIST BACKUP ... BY FILE)"
Table 2–12, "List of Datafile Copies"
Table 2–13, "List of Controlfile Copies"
Table 2–14, "List of Archived Log Copies"
Table 2–15, "List of Database Incarnations"

**Table 2–2  List of Backup Sets (when in verbose mode)**

<table>
<thead>
<tr>
<th>Column</th>
<th>Indicates</th>
</tr>
</thead>
<tbody>
<tr>
<td>BS Key</td>
<td>A unique key identifying this backup set.</td>
</tr>
<tr>
<td></td>
<td>If you are connected to a recovery catalog, then BS Key is the primary key of the backup set in the catalog. It corresponds to BS_ KEY in the RC_BACKUP_SET view. If you are connected in NOCATALOG mode, then BS Key displays the RECID from V$BACKUP_SET.</td>
</tr>
<tr>
<td>Type</td>
<td>The type of backup: Full or Incr (incremental).</td>
</tr>
<tr>
<td>LV</td>
<td>The level of the backup: NULL for nonincrementals, level 0-4 for incrementals.</td>
</tr>
<tr>
<td>Size</td>
<td>The size of the backup in bytes.</td>
</tr>
<tr>
<td>Device Type</td>
<td>The type of device on which the backup was made, for example, DISK or sbt.</td>
</tr>
<tr>
<td>Elapsed Time</td>
<td>The duration of the backup.</td>
</tr>
<tr>
<td>Completion Time</td>
<td>The date and time that the backup set completed. Note that the format of this field depends on the NLS_LANG and NLS_DATE_ FORMAT environment settings.</td>
</tr>
</tbody>
</table>
Table 2–3  List of Backup Pieces (LIST BACKUP ... VERBOSE)

<table>
<thead>
<tr>
<th>Column</th>
<th>Indicates</th>
</tr>
</thead>
<tbody>
<tr>
<td>BP Key</td>
<td>A unique identifier for this backup piece in the recovery catalog or target database control file.</td>
</tr>
<tr>
<td></td>
<td>If you are connected to a recovery catalog, then BP Key is the primary key of the backup piece in the catalog. It corresponds to BP_KEY in the RC_BACKUP_PIECE view. If you are connected in NOCATALOG mode, then BP Key displays the RECID from V$BACKUP_PIECE.</td>
</tr>
<tr>
<td></td>
<td><strong>Note:</strong> The values for KEY in the recovery catalog and the control file are different.</td>
</tr>
<tr>
<td>Status</td>
<td>The backup piece status: AVAILABLE, UNAVAILABLE, or EXPIRED (refer to the CHANGE, CROSSCHECK, and DELETE commands for an explanation of each status).</td>
</tr>
<tr>
<td>Tag</td>
<td>The tag applied to the backup set; NULL if none.</td>
</tr>
<tr>
<td>Piece Name</td>
<td>The filename or handle of the backup piece.</td>
</tr>
<tr>
<td>Controlfile Included</td>
<td>This row appears only if the current control file is included in the backup.</td>
</tr>
<tr>
<td>Ckp SCN</td>
<td>The SCN of the backup control file checkpoint. All database changes recorded in the redo records before the specified SCN are reflected in this control file.</td>
</tr>
<tr>
<td>Ckp time</td>
<td>The time of the backup control file checkpoint. All database changes recorded in the redo records before the specified time are reflected in this control file.</td>
</tr>
</tbody>
</table>

Table 2–4  List of Datafiles in backup set ...  (Page 1 of 2)

<table>
<thead>
<tr>
<th>Column</th>
<th>Indicates</th>
</tr>
</thead>
<tbody>
<tr>
<td>File</td>
<td>The number of the file that was backed up.</td>
</tr>
<tr>
<td>LV</td>
<td>The level of the backup: NULL for nonincrementals, level 0-4 for incrementals.</td>
</tr>
<tr>
<td>Type</td>
<td>The type of backup: Full or Incr (incremental).</td>
</tr>
<tr>
<td>Ckp SCN</td>
<td>The checkpoint of the datafile at the time it was backed up. All database changes prior to the SCN have been written to the file; changes after the specified SCN have not been written to the file.</td>
</tr>
</tbody>
</table>
**Table 2–4  List of Datafiles in backup set ...**

<table>
<thead>
<tr>
<th>Column</th>
<th>Indicates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ckp Time</td>
<td>The checkpoint of the datafile at the time it was backed up. All database changes prior to the time have been written to the file; changes after the specified time have not been written to the file.</td>
</tr>
<tr>
<td>Name</td>
<td>The location where this file would be restored now if it were restored from this backup set and no SET NEWNAME command was entered. See Also: &quot;SET&quot; on page 2-189</td>
</tr>
</tbody>
</table>

**Table 2–5  List of Archived Logs in backup set ...

<table>
<thead>
<tr>
<th>Column</th>
<th>Indicates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thrd</td>
<td>The thread number of the redo log.</td>
</tr>
<tr>
<td>Seq</td>
<td>The log sequence number of the archived log.</td>
</tr>
<tr>
<td>Low SCN</td>
<td>The lowest SCN in the archived log.</td>
</tr>
<tr>
<td>Low Time</td>
<td>The time when Oracle switched into the redo log having this sequence number.</td>
</tr>
<tr>
<td>Next SCN</td>
<td>The low SCN of the next archived log sequence.</td>
</tr>
<tr>
<td>Next Time</td>
<td>The low time of the next archived log sequence.</td>
</tr>
</tbody>
</table>

**Table 2–6  List of Proxy Copies**

<table>
<thead>
<tr>
<th>Column</th>
<th>Indicates</th>
</tr>
</thead>
<tbody>
<tr>
<td>PC Key</td>
<td>A unique key identifying this proxy copy. If you are connected to a catalog, then PC Key is the primary key of the proxy copy in the catalog. It corresponds to XDF_KEY in the RC_PROXY_DATAFILE view or XCF_KEY in the RC_PROXY_CONTROLFILE view. If you are connected in NOCATALOG mode, then PC Key displays the RECID from V$PROXY_DATAFILE.</td>
</tr>
<tr>
<td>File</td>
<td>The absolute datafile number of the file that was copied.</td>
</tr>
<tr>
<td>Status</td>
<td>The proxy copy status: AVAILABLE, UNAVAILABLE, or EXPIRED (see the CHANGE, CROSSCHECK, and DELETE commands for an explanation of each status).</td>
</tr>
<tr>
<td>Completion Time</td>
<td>The date and time that the backup set completed. Note that the format of this field depends on the NLS_LANG and NLS_DATE_FORMAT environment settings.</td>
</tr>
</tbody>
</table>
Ckp SCN
The SCN of the proxy copy control file checkpoint. All database changes recorded in the redo records before the specified SCN are reflected in this control file.

Ckp time
The time of the proxy copy control file checkpoint. All database changes recorded in the redo records before the specified time are reflected in this control file.

Datafile name
The location where this file would be restored now if it were restored from this backup set and no SET NEWNAME command was entered.
See Also: "SET" on page 2-189

Handle
The media manager’s handle for the proxy copy.

Tag
The tag applied to the proxy copy; NULL if none.

Table 2–7  List of Backup Sets (LIST BACKUP ... SUMMARY) (Page 1 of 2)

<table>
<thead>
<tr>
<th>Column</th>
<th>Indicates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Key</td>
<td>A unique key identifying this backup set. If you are connected to a recovery catalog, then BS Key is the primary key of the backup set in the catalog. It corresponds to BS_KEY in the RC_BACKUP_SET view. If you are connected in NOCATALOG mode, then BS Key displays the RECID from V$BACKUP_SET.</td>
</tr>
<tr>
<td>TY</td>
<td>The type of backup: backup set (B) or proxy copy (P).</td>
</tr>
<tr>
<td>LV</td>
<td>The level of the backup: NULL for nonincrementals, level 0-4 for incrementals.</td>
</tr>
<tr>
<td>S</td>
<td>The backup set status: available (A), unavailable (U), or expired (X) (refer to the CHANGE, CROSSCHECK, and DELETE commands for an explanation of each status).</td>
</tr>
<tr>
<td>Device Type</td>
<td>The type of device on which the backup was made, for example, DISK or sbt.</td>
</tr>
<tr>
<td>Completion Time</td>
<td>The date and time that the backup set completed. Note that the format of this field depends on the NLS_LANG and NLS_DATE_ FORMAT environment settings.</td>
</tr>
<tr>
<td>#Pieces</td>
<td>The number of backup pieces in the backup set.</td>
</tr>
<tr>
<td>#Copies</td>
<td>The number of copies made of each backup piece in the set. The number is 1 if no duplexing was performed. Otherwise, the value ranges from 2 to 4.</td>
</tr>
</tbody>
</table>
### Table 2–7  List of Backup Sets (LIST BACKUP ... SUMMARY) (Page 2 of 2)

| Tag | The tag applied to the backup set; NULL if none. An asterisk (*) indicates multiple copies with different tags. |

### Table 2–8  List of Backup Pieces (LIST BACKUPPIECE ...)

<table>
<thead>
<tr>
<th>Column</th>
<th>Indicates</th>
</tr>
</thead>
<tbody>
<tr>
<td>BP Key</td>
<td>A unique identifier for this backup piece in the recovery catalog or target database control file. If you are connected to a catalog, then BP Key is the primary key of the backup piece in the catalog. It corresponds to BP_KEY in the RC_BACKUP_PIECE view. If you are connected in NOCATALOG mode, then BP Key displays the RECID from V$BACKUP_PIECE. <strong>Note:</strong> The values for KEY in the recovery catalog and the control file are different.</td>
</tr>
<tr>
<td>BS Key</td>
<td>A unique key identifying this backup set. If you are connected to a recovery catalog, then BS Key is the primary key of the backup set in the catalog. It corresponds to BS_KEY in the RC_BACKUP_SET view. If you are connected in NOCATALOG mode, then BS Key displays the RECID from V$BACKUP_SET.</td>
</tr>
<tr>
<td>Pc#</td>
<td>The number of the backup piece in the backup set.</td>
</tr>
<tr>
<td>Cp#</td>
<td>The copy number of this backup piece in the backup set. The number is 1 if no duplexing was performed. Otherwise, the value ranges from 2 to 4.</td>
</tr>
<tr>
<td>Status</td>
<td>The backup piece status: AVAILABLE, UNAVAILABLE, or EXPIRED (see the CHANGE, CROSSCHECK, and DELETE commands for an explanation of each status).</td>
</tr>
<tr>
<td>Device Type</td>
<td>The type of device on which the backup was made, for example, DISK or sbt.</td>
</tr>
<tr>
<td>Piece Name</td>
<td>The filename or handle of the backup piece.</td>
</tr>
</tbody>
</table>
### Table 2–9  List of Datafile Backups (LIST BACKUP ... BY FILE)

<table>
<thead>
<tr>
<th>Column</th>
<th>Indicates</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>File</strong></td>
<td>The absolute datafile number.</td>
</tr>
<tr>
<td><strong>Key</strong></td>
<td>A unique key identifying this backup set.</td>
</tr>
<tr>
<td></td>
<td>If you are connected to a recovery catalog, then Key is the primary key of the backup set in the catalog. It corresponds to BS_KEY in the RC_BACKUP_SET view. If you are connected in NOCATALOG mode, then Key displays the RECID from V$BACKUP_SET.</td>
</tr>
<tr>
<td><strong>TY</strong></td>
<td>The type of backup: backup set (B) or proxy copy (P).</td>
</tr>
<tr>
<td><strong>LV</strong></td>
<td>The backup level: F for nonincrementals, level 0-4 for incrementals.</td>
</tr>
<tr>
<td><strong>S</strong></td>
<td>The backup set status: available (A), unavailable (U), or expired (X) (refer to the CHANGE, CROSSCHECK, and DELETE commands for an explanation of each status).</td>
</tr>
<tr>
<td><strong>Ckp SCN</strong></td>
<td>The checkpoint of the datafile at the time it was backed up. All database changes prior to the SCN have been written to the file; changes after the specified SCN have not been written to the file.</td>
</tr>
<tr>
<td><strong>Ckp Time</strong></td>
<td>The checkpoint of the datafile at the time it was backed up. All database changes prior to the time have been written to the file; changes after the specified time have not been written to the file.</td>
</tr>
<tr>
<td><strong>#Pieces</strong></td>
<td>The number of backup pieces in the backup set.</td>
</tr>
<tr>
<td><strong>#Copies</strong></td>
<td>The number of copies made of each backup piece in the set. The number is 1 if no duplexing was performed. Otherwise, the value ranges from 2 to 4.</td>
</tr>
<tr>
<td><strong>Tag</strong></td>
<td>The tag applied to the backup set; NULL if none.</td>
</tr>
</tbody>
</table>
### Table 2–10  List of Archived Log Backups (LIST BACKUP ... BY FILE)

<table>
<thead>
<tr>
<th>Column</th>
<th>Indicates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thrd</td>
<td>The thread number of the redo log.</td>
</tr>
<tr>
<td>Seq</td>
<td>The log sequence number of the archived log.</td>
</tr>
<tr>
<td>Low SCN</td>
<td>The lowest SCN in the archived log.</td>
</tr>
<tr>
<td>Low Time</td>
<td>The time when Oracle switched into the redo log having this sequence number.</td>
</tr>
<tr>
<td>BS Key</td>
<td>A unique key identifying this backup set.</td>
</tr>
<tr>
<td></td>
<td>If you are connected to a recovery catalog, then BS Key is the primary key of the backup set in the catalog. It corresponds to BS_KEY in the RC_BACKUP_SET view. If you are connected in NOCATALOG mode, then BS Key displays the RECID from V$BACKUP_SET.</td>
</tr>
<tr>
<td>S</td>
<td>The backup set status: available (A), unavailable (U), or expired (X) (refer to the CHANGE, CROSSCHECK, and DELETE commands for an explanation of each status).</td>
</tr>
<tr>
<td>#Pieces</td>
<td>The number of backup pieces in the backup set.</td>
</tr>
<tr>
<td>#Copies</td>
<td>The number of copies made of each backup piece in the set. The number is 1 if no duplexing was performed. Otherwise, the value ranges from 2 to 4.</td>
</tr>
<tr>
<td>Tag</td>
<td>The tag applied to the backup set; NULL if none.</td>
</tr>
</tbody>
</table>

### Table 2–11  List of Controlfile Backups (LIST BACKUP ... BY FILE) (Page 1 of 2)

<table>
<thead>
<tr>
<th>Column</th>
<th>Indicates</th>
</tr>
</thead>
<tbody>
<tr>
<td>CF Ckp SCN</td>
<td>Checkpoint SCN of the control file.</td>
</tr>
<tr>
<td>Ckp Time</td>
<td>The log sequence number of the archived log.</td>
</tr>
<tr>
<td>BS Key</td>
<td>A unique key identifying this backup set.</td>
</tr>
<tr>
<td></td>
<td>If you are connected to a recovery catalog, then BS Key is the primary key of the backup set in the catalog. It corresponds to BS_KEY in the RC_BACKUP_SET view. If you are connected in NOCATALOG mode, then BS Key displays the RECID from V$BACKUP_SET.</td>
</tr>
<tr>
<td>S</td>
<td>The backup set status: available (A), unavailable (U), or expired (X) (refer to the CHANGE, CROSSCHECK, and DELETE commands for an explanation of each status).</td>
</tr>
</tbody>
</table>
**RMAN Commands**

**Table 2–11  List of Controlfile Backups (LIST BACKUP ... BY FILE) (Page 2 of 2)**

<table>
<thead>
<tr>
<th>Column</th>
<th>Indicates</th>
</tr>
</thead>
<tbody>
<tr>
<td>#Pieces</td>
<td>The number of backup pieces in the backup set.</td>
</tr>
<tr>
<td>#Copies</td>
<td>The number of copies made of each backup piece in the set. The number is 1 if no duplexing was performed. Otherwise, the value ranges from 2 to 4.</td>
</tr>
<tr>
<td>Tag</td>
<td>The tag applied to the backup set; NULL if none.</td>
</tr>
</tbody>
</table>

**Table 2–12  List of Datafile Copies**

<table>
<thead>
<tr>
<th>Column</th>
<th>Indicates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Key</td>
<td>The unique identifier for the datafile copy. Use this value in a CHANGE command to alter the status of the datafile copy. If you are connected to a recovery catalog, then Key is the primary key of the datafile copy in the catalog. It corresponds to CDF_KEY in the RC_DATAFILE_COPY view. If you are connected in NOCATALOG mode, then Key displays the RECID from V$DATAFILE_COPY. Note: The values for KEY in the recovery catalog and the control file are different.</td>
</tr>
<tr>
<td>File</td>
<td>The file number of the datafile from which this copy was made.</td>
</tr>
<tr>
<td>S</td>
<td>The status of the datafile copy: available (A), unavailable (U), or expired (E). (Refer to the CHANGE, CROSSCHECK, and DELETE commands for an explanation of each status).</td>
</tr>
<tr>
<td>Completion Time</td>
<td>The date and time that the copy completed. Note that the value of this field is sensitive to the NLS_LANG and NLS_DATE_FORMAT environment variables.</td>
</tr>
<tr>
<td>Ckp SCN</td>
<td>The checkpoint of this datafile when it was copied. All database changes prior to this SCN have been written to this datafile.</td>
</tr>
<tr>
<td>Ckp TIME</td>
<td>The checkpoint of this datafile when it was copied. All database changes prior to this time have been written to this datafile.</td>
</tr>
<tr>
<td>Name</td>
<td>The filename of the datafile copy.</td>
</tr>
</tbody>
</table>
### Table 2–13  List of Controlfile Copies

<table>
<thead>
<tr>
<th>Column</th>
<th>Indicates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Key</td>
<td>The unique identifier for the control file copy. Use this value in a CHANGE command to alter the status of the copy. If you are connected to a recovery catalog, then Key is the primary key of the control file copy in the catalog. It corresponds to CCF_KEY in the RC_CONTROLFILE_COPY view. If you are connected in NOCATALOG mode, then Key displays the RECID from V$DATAFILE_COPY. <strong>Note:</strong> The values for Key in the recovery catalog and the control file are different.</td>
</tr>
<tr>
<td>S</td>
<td>The status of the control file copy: available (A), unavailable (U), or expired (E). (Refer to the CHANGE, CROSSCHECK, and DELETE commands for an explanation of each status).</td>
</tr>
<tr>
<td>Completion Time</td>
<td>The date and time that the copy completed. Note that the value of this field is sensitive to the NLS_LANG and NLS_DATE_FORMAT environment variables.</td>
</tr>
<tr>
<td>Ckp SCN</td>
<td>The checkpoint of this control file when it was copied.</td>
</tr>
<tr>
<td>Ckp TIME</td>
<td>The checkpoint of this control file when it was copied.</td>
</tr>
<tr>
<td>Name</td>
<td>The filename of the control file copy.</td>
</tr>
</tbody>
</table>

### Table 2–14  List of Archived Log Copies  (Page 1 of 2)

<table>
<thead>
<tr>
<th>Column</th>
<th>Indicates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Key</td>
<td>The unique identifier for this archived redo log copy. Use this value in a CHANGE command to alter the status of the copy. If you are connected to a recovery catalog, then Key is the primary key of the backup set in the catalog. It corresponds to AL_KEY in the RC_ARCHIVED_LOG view. If you are connected in NOCATALOG mode, then Key displays the RECID from V$ARCHIVED_LOG. <strong>Note:</strong> The values for Key in the recovery catalog and the control file are different.</td>
</tr>
<tr>
<td>Thrd</td>
<td>The redo log thread number.</td>
</tr>
<tr>
<td>Seq</td>
<td>The log sequence number.</td>
</tr>
<tr>
<td>S</td>
<td>The status of the archived log: available (A), unavailable (U), or expired (E) (refer to the CHANGE, CROSSCHECK, and DELETE commands for an explanation of each status).</td>
</tr>
</tbody>
</table>
Examples

Listing Backups: Example  This example lists all backups in default verbose mode:

LIST BACKUP;

List of Backup Sets

<table>
<thead>
<tr>
<th>BS Key</th>
<th>Device Type</th>
<th>Elapse Time</th>
<th>Completion Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>236</td>
<td>DISK</td>
<td>00:00:08</td>
<td>21-SEP-00</td>
</tr>
</tbody>
</table>

BP Key: 237  Status: AVAILABLE  Tag:
Piece Name: /oracle/dbs/09c5unih_1_1

List of Archived Logs in backup set 236

<table>
<thead>
<tr>
<th>Thrd Seq</th>
<th>Low SCN</th>
<th>Low Time</th>
<th>Next SCN</th>
<th>Next Time</th>
</tr>
</thead>
</table>

Table 2–14  List of Archived Log Copies  (Page 2 of 2)

<table>
<thead>
<tr>
<th>Column</th>
<th>Indications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time</td>
<td>The time when Oracle switched into the redo log having this sequence number.</td>
</tr>
<tr>
<td>Name</td>
<td>The filename of the archived redo log copy.</td>
</tr>
</tbody>
</table>

Table 2–15  List of Database Incarnations

<table>
<thead>
<tr>
<th>Column</th>
<th>Indicates</th>
</tr>
</thead>
<tbody>
<tr>
<td>DB Key</td>
<td>When combined with the Inc Key, the unique key by which RMAN identifies the database incarnation in the recovery catalog. Use this key to unregister a database, that is, delete all the rows associated with that database from the recovery catalog.</td>
</tr>
<tr>
<td>Inc Key</td>
<td>When combined with DB Key, the unique key by which RMAN identifies the database incarnation in the recovery catalog. Use this key in \texttt{RESET DATABASE ... TO INCARNATION} when recovering the database to a time before the most recent \texttt{RESETLOGS}.</td>
</tr>
<tr>
<td>DB Name</td>
<td>The database name as listed in the DB_NAME parameter.</td>
</tr>
<tr>
<td>DB ID</td>
<td>The database identification number, which Oracle generates automatically at database creation.</td>
</tr>
<tr>
<td>CUR</td>
<td>Whether the incarnation is the current incarnation of the database.</td>
</tr>
<tr>
<td>Reset SCN</td>
<td>The SCN at which the incarnation was created.</td>
</tr>
<tr>
<td>Reset Time</td>
<td>the time at which the incarnation was created.</td>
</tr>
</tbody>
</table>
LIST

1 141 49173 21-SEP-00 49784 21-SEP-00
1 142 49784 21-SEP-00 50331 21-SEP-00

BS Key  Type LV Size       Device Type     Elapse Time   Completion Time
------- ---- -- ---------- ----------- ----------- ---------------
244     Full  61M        DISK          00:00:18   21-SEP-00

BP Key: 245   Status: AVAILABLE   Tag:
Piece Name: /oracle/dbs/0acSunj5_1_1

Controlfile Included: Ckp SCN: 51554       Ckp time: 21-SEP-00

List of Datafiles in backup set 244
File LV Type  Ckp SCN   Ckp Time   Name
--- ---- ---- --------- -------- ----
1     Full  51555      21-SEP-00 /oracle/dbs/tbs_01.f
2     Full  51555      21-SEP-00 /oracle/dbs/tbs_02.f

List of Proxy Copies

List of Datafiles in backup set 244
File LV Type  Ckp SCN   Ckp Time   Name
--- ---- ---- --------- -------- ----
1     Full  51555      21-SEP-00 /oracle/dbs/tbs_01.f
2     Full  51555      21-SEP-00 /oracle/dbs/tbs_02.f

Listing a Summary of Backups: Example  The following example lists a
summarized version of all RMAN backups:

LIST BACKUP SUMMARY;

List of Backups

Key  Ty LV S Device Type Completion Time #Pieces #Copies Tag
--- --- ---- ------ --------- -------------- ------- ------- ---
164  B   A DISK  14-SEP-00   1 1
170  B   A DISK  14-SEP-00   1 1

Listing Backups by File: Example  This example groups all backups by file:

LIST BACKUP BY FILE;

List of Datafile Backups
RMAN Commands

---

**File Key** | **TY** | **LV** | **S** | **Ckp SCN** | **Ckp Time** | #Pieces | #Copies | Tag
---|---|---|---|---|---|---|---|---
1 | 502 | B | 0 | A | 37973 | 09/28/99 19:28:36 | 1 | 2 |
552 | P | F | X | 78022 | 10/07/99 03:05:10 | 1 |
561 | P | 0 | A | 78025 | 10/07/99 03:38:09 | 1 | DF_1_2 |
2 | 502 | B | 0 | A | 37973 | 09/28/99 19:28:36 | 1 | 2 |
562 | P | 0 | U | 78027 | 10/07/99 03:38:22 | 1 | DF_1_2 |

**List of Archived Log Backups**

---

**Thrd Seq** | **Low SCN** | **Low Time** | **BS Key** | #Pieces | #Copies | Tag
---|---|---|---|---|---|---
1 | 141 | 49463 | A | 1 | 1 |

**List of Controlfile Backups**

---

**CF** | **Ckp SCN** | **Ckp Time** | **BS Key** | #Pieces | #Copies | Tag
---|---|---|---|---|---|---
51593 | 14-SEP-00 | 14-SEP-00 | 222 | A | 1 | 1 |

---

**Listing Archived Redo Logs: Example**  The following example lists archived logs and copies of logs:

```
LIST COPY OF DATABASE ARCHIVELOG ALL;
```

**List of Archived Log Copies**

---

**Key** | **Thrd Seq** | **S Low Time** | **Name**
---|---|---|---
153 | 1 | 141 | A 14-SEP-00 /oracle/work/arc_dest/arcr_1_141.arc
154 | 1 | 142 | A 14-SEP-00 /oracle/work/arc_dest/arcr_1_142.arc

---

**Listing Backups of Specific Datafiles: Example**  The following example lists backups of datafile 11 in summary mode:

```
LIST BACKUP OF DATAFILE 11 SUMMARY;
```

**List of Backups**

---

**Key** | **TY** | **LV** | **S Device** | **Type** | **Completion Time** | #Pieces | #Copies | Tag
---|---|---|---|---|---|---|---|---
180 | B | 0 | A DISK | | 14-SEP-00 | 1 | 2 |
**Listing Database Incarnations: Example**  
This example lists all database incarnations:

```
LIST INCARNATION;
```

<table>
<thead>
<tr>
<th>DB Key</th>
<th>Inc Key</th>
<th>DB Name</th>
<th>DB ID</th>
<th>CUR Reset SCN</th>
<th>Reset Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>RDBMS</td>
<td>674879952</td>
<td>YES 1</td>
<td>14-SEP-00</td>
</tr>
</tbody>
</table>
listObjList

Syntax

A subclause used to specify database files and archived redo logs.

Restrictions and Usage Notes

Use this clause in the following commands:

- LIST
- CROSSCHECK
- DELETE

Keywords and Parameters

<table>
<thead>
<tr>
<th>Keyword</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DATAFILE</td>
<td>Specifies datafiles by filename or file number. The clause specifies datafile image copies or backup sets that contain at least one of the datafiles.</td>
</tr>
<tr>
<td>datafileSpec</td>
<td>See Also: &quot;datafileSpec&quot; on page 2-95</td>
</tr>
<tr>
<td>TABLESPACE</td>
<td>Specifies tablespace names. The clause specifies datafile image copies or backup sets that contain at least one of the datafile from the specified tablespace.</td>
</tr>
<tr>
<td>'tablespace_name'</td>
<td></td>
</tr>
</tbody>
</table>
Examples

**Listing Datafile Copies: Example**  The following command lists image copies of all the files in the database, skipping the temp tablespace:

```
LIST COPY OF DATABASE SKIP TABLESPACE temp;
```

**Crosschecking Archived Redo Logs: Example**  The following example queries the media manager for the status of archived redo log backup sets created in the last 90 days:

```
ALLOCATE CHANNEL FOR MAINTENANCE DEVICE TYPE sbt;
CROSSCHECK BACKUP OF ARCHIVELOG FROM TIME 'SYSDATE-90';
```

**Deleting Expired Control File Backup Sets: Example**  The following command deletes expired backups of the control file:

```
DELETE EXPIRED BACKUP OF CONTROLFILE;
```
maintQualifier

Syntax

```
TAG = 'tag_name'
completedTimeSpec
LIKE 'string_pattern'
DEVICE TYPE = deviceSpecifier
```

Purpose

A subclause used to specify database files and archived redo logs.

Restrictions and Usage Notes

Use this clause in the following commands:
- LIST
- CROSSCHECK
- DELETE

Keywords and Parameters

- **TAG = 'tag_name'** Specifies the datafile copies and backups by tag.
- **completedTimeSpec** Specifies a range of time for completion of the backup or copy. See Also: "completedTimeSpec" on page 2-61
- **LIKE 'string_pattern'** Restricts datafile copies by specifying a filename pattern. The pattern can contain Oracle pattern matching characters % and _ . RMAN only operates on those files whose name matches the pattern.
  - **Note:** You cannot use the LIKE option with the LIST ... ARCHIVELOG command.
Example

**Listing Backups on a Specific Device: Example**  The following command lists all backups located on tape:

```
LIST BACKUP DEVICE TYPE sbt;
```
obsOperandList

Syntax

```
REDUNDANCY = integer
RECOVERY WINDOW OF integer DAYS
ORPHAN
```

Purpose

A subclause used to specify which criteria are used to mark backups and copies as obsolete.

Restrictions and Usage Notes

Use this clause in the following commands:

- DELETE
- REPORT

Keywords and Parameters

<table>
<thead>
<tr>
<th>Keyword</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>REDUNDANCY</td>
<td>Specifies the minimum level of redundancy considered necessary for a backup or copy to be obsolete. A datafile copy is obsolete if there are at least <code>integer</code> more recent backups or image copies of this file; a datafile backup set is obsolete if there are at least <code>integer</code> more recent backups or image copies of each file contained in the backup set. For example, REDUNDANCY 2 means that there must be at least two more recent backups or copies of a datafile for any other backup or copy to be obsolete.</td>
</tr>
<tr>
<td>RECOVERY WINDOW OF integer DAYS</td>
<td>Specifies that RMAN should report as obsolete those backups and copies that are not needed to recover the database to any point within the last <code>integer</code> days. See Also: &quot;CONFIGURE&quot; on page 2-63 for an explanation of the recovery window</td>
</tr>
<tr>
<td>ORPHAN</td>
<td>Specifies as obsolete those backups and copies that are unusable because they belong to incarnations of the database that are not direct ancestors of the current incarnation. Note that RMAN displays orphaned backups in addition to the normal display of obsolete backups. See Also: Oracle9i Recovery Manager User’s Guide for an explanation of orphaned backups</td>
</tr>
</tbody>
</table>
Example

Deleting Obsolete Backups: Example  The following command deletes all backups and copies not needed to recover the database to a random point within the last 30 days:

DELETE OBSOLETE RECOVERY WINDOW OF 30 DAYS;
PRINT SCRIPT

Syntax

```
PRINT SCRIPT script_name
```

Purpose

To print a stored script to standard output or the RMAN message log. To print to a message log, specify the log filename with the \texttt{LOG} argument at the command line. If you do not specify this argument, Recovery Manager writes message output to standard output.

\textbf{Note:} You can also display the individual lines of the stored scripts by querying the \texttt{RC\_STORED\_SCRIPT\_LINE} recovery catalog view.

Restrictions and Usage Notes

- Use this command only at the RMAN prompt.
- You must be connected to a recovery catalog.

Keywords and Parameters

\textbf{\textit{script_name}}

Prints a stored script with the specified name to standard output or a message log. To obtain a listing of all stored scripts, use SQL\textsuperscript{\textregistered}Plus connect to the recovery catalog as the catalog owner and issue the following query:

\begin{verbatim}
SQL> SELECT * FROM RC_STORED_SCRIPT;
\end{verbatim}

\textbf{Note:} To run the script, use \texttt{EXECUTE SCRIPT} within the braces of the \texttt{RUN} command.

\textbf{See Also:} "\texttt{RC\_STORED\_SCRIPT}" on page 3-27
Examples

**Printing a Script to the Message Log: Example**  This example creates the `backup_db` script and prints it to `rman_log`. Finally, it executes the script:

```sql%
% rman TARGET / CATALOG rman/rman@rcatdb LOG = rman_log

CREATE SCRIPT backup_db {
    ALLOCATE CHANNEL d1 DEVICE TYPE sbt;
    BACKUP DATABASE;
}
PRINT SCRIPT backup_db;

RUN
|
  EXECUTE SCRIPT backup_db;
|;
```

**Printing a Script to the Screen: Example**  This example prints a stored script to the screen:

```sql
PRINT SCRIPT tbs1_b;

printing stored script: tbs1_b
|
allocate channel ch1 type disk;
backup tablespace tbs1;
|
QUIT

Syntax

QUIT

Purpose

To shut down the Recovery Manager utility.

Restrictions and Usage Notes

Execute only at the RMAN prompt.

Example

QUITting RMAN: Example

This example starts RMAN and then shuts it down:

% rman
RMAN> QUIT
recordSpec

Syntax

A subclause that specifies which objects the CHANGE, CROSSCHECK, DELETE, and LIST commands should operate on. Most recordSpec options allow you to specify a primary key. Run the LIST command to obtain the key.

Keywords and Parameters

<table>
<thead>
<tr>
<th>Keyword</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>BACKUPPIECE</td>
<td>Specifies a backup piece by 'media_handle', primary_key, or tag_name.</td>
</tr>
<tr>
<td>PROXY</td>
<td>Specifies a proxy copy by 'media_handle', primary_key, or tag_name.</td>
</tr>
</tbody>
</table>

2-144 Oracle9i Recovery Manager Reference
Examples

**Crosschecking Backups: Example**  This example crosschecks a set of backup sets specified by primary key:

```
CROSSCHECK BACKUPPIECE 507, 508, 509;
```

**Deleting Datafile Copies: Example**  This example deletes a specified datafile copy:

```
DELETE DATAFILECOPY "df1_copy.f";
```

**Listing Expired Archived Logs: Example**  This example lists all expired archived redo logs:

```
LIST EXPIRED ARCHIVELOG ALL;
```
RECOVER

Syntax

```
RECOVER deviceSpecifier recoverObject recoverOptionList;
```

```
recoveryObject ::= [untilClause [skip | FOREVER] TABLESPACE 'tablespace_name', DATAFILE datafileSpec, DATABASE untilClause, TABLESPACE 'tablespace_name', DATAFILE datafileSpec, DATABASE untilClause];
```

```
recoverOptionList ::= [DELETE ARCHIVELOG, CHECK READONLY, NOREDO, CHECK LOGICAL, FROM TAG 'tag_name', ARCHIVELOG TAG 'tag_name'];
```

Purpose

To apply redo logs or incremental backups to one or more restored datafiles in order to update them to a specified time.
RMAN uses online redo records and restores backup sets of archived redo logs as needed to perform the media recovery. RMAN first looks for the original archived logs or image copies, and if none are available, then it restores backups.

If RMAN has a choice between applying an incremental backup or applying redo, then it always chooses the incremental backup. If overlapping levels of incremental backup are available, then RMAN automatically chooses the one covering the longest period of time. Note that RMAN can apply incremental backups to restored files that were not created as part of an incremental backup.

**Note:** When RMAN applies incremental backups, it recovers changes to objects created with the **NOLOGGING** option. Applying archived redo logs to datafiles does not recover these changes.

**See Also:** *Oracle9i Recovery Manager User’s Guide* to learn how to recover datafiles

## Restrictions and Usage Notes

- Recovery is possible with a backup control file and no recovery catalog, but requires manual intervention if you added files to the database after the backup control file was created.

- If you have not configured channels, then at least one **ALLOCATE CHANNEL** command must precede **RECOVER** unless you do not need to restore archived redo log or incremental backups.

- You do not have to allocate a channel for archived log recovery because RMAN uses the preconfigured **DISK** channel. If incremental backups need to be restored during recovery, however, then you must either use configured channels or manually allocate channels of the same type that created these backups.

- For datafile and tablespace recovery, the target database must be mounted. If it is open, then the datafiles or tablespaces to be recovered must be offline. For database recovery, the database must be mounted but not open.

- Only the current datafiles may be recovered or have incremental backups applied to them.

- If you want to perform incomplete recovery, the best practice is to enter a **SET UNTIL** command before both the **RESTORE** and **RECOVER** command. If you specify a **SET UNTIL** command after a **RESTORE** and before a **RECOVER**, then
you may not be able to perform media recovery on the database to the time required because the restored files may have time stamps later than the specified time.

- The RECOVER DATABASE command does not recover any files that are offline normal or read-only at the point in time to which the files are being recovered. RMAN omits offline normal files with no further checking. If CHECK READONLY is specified, then RMAN checks each read-only file on disk to ensure that it is already current at the desired point in time. If CHECK READONLY is not specified, then RMAN omits read-only files.

- Open with the RESETLOGS option after incomplete recovery or recovery with a backup control file.

- You cannot recover temporary tablespaces. You can only re-create them.

- You must have already configured a device type with the CONFIGURE DEVICE TYPE command (except for DISK, which is preconfigured) before specifying the DEVICE TYPE option.

- You cannot manually allocate channels and then run RECOVER with the DEVICE TYPE option.

### Keywords and Parameters

<table>
<thead>
<tr>
<th><strong>DEVICE TYPE</strong></th>
<th><code>deviceSpecifier</code></th>
</tr>
</thead>
<tbody>
<tr>
<td>Allocates automatic channels for the specified device type only. For example, if you configure automatic disk and tape channels, and issue RECOVER ... DEVICE TYPE DISK, then RMAN allocates only disk channels.</td>
<td><strong>See Also:</strong> &quot;deviceSpecifier&quot; on page 2-101</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>DATABASE</strong></th>
<th>Specifies that the entire database is to be recovered. Unless you specify an <code>untilClause</code>, RMAN performs complete recovery.</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>untilClause</code></td>
<td>Specifies a noncurrent time, SCN, or log sequence number for termination of the RECOVER command. You must open the database with the RESETLOGS option after incomplete recovery.</td>
</tr>
</tbody>
</table>
### SKIP [FOREVER] TABLESPACE

Lists tablespaces that should not be recovered, which is useful for avoiding recovery of tablespaces containing only temporary data or for postponing recovery of some tablespaces. The `SKIP` clause takes the datafiles in the specified tablespaces offline before starting media recovery. These files are left offline after the media recovery is complete.

If you perform incomplete recovery, then `SKIP` is not allowed. Instead, use `SKIP FOREVER`, with the intention of dropping the skipped tablespaces after opening the database with the `RESETLOGS` option. The `SKIP FOREVER` clause causes RMAN to take the datafiles offline with the `DROP` option. Only use `SKIP FOREVER` when the specified tablespaces will be dropped after opening the database.

#### TABLESPACE 'tablespace_name'

Specifies tablespaces by tablespace name.

#### DATAFILE datafileSpec

Specifies a list of one or more datafiles to recover. Specify datafiles by either filename (by using a quoted string) or absolute datafile number (by using an integer).

If you are using the control file as the exclusive repository for RMAN metadata, then the filename must be the name of the datafile as known in the control file.

If you are using a recovery catalog, then the filename of the datafile must be the most recent name recorded in the catalog. For example, assume that a datafile was renamed in the control file. The database then crashes before you can resynchronize the catalog. Specify the old name of the datafile in the `RECOVER` command, because this is the name recorded in the catalog.

See Also: "datafileSpec" on page 2-95

#### recoverOptionList

Specifies various recovery options.

- **DELETE ARCHIVELOG** Deletes archived logs restored from backups or copies that are no longer needed. RMAN does not delete archived logs that were already on disk before the `RESTORE` command started.

- **CHECK READONLY** Checks the headers of read-only files to ensure that they are current before omitting them from the recovery.

- **NOREDO** Suppresses the application of redo logs—only incremental backups are applied. This option is intended for recovery of `NOARCHIVELOG` databases by using incremental backups. If you do not specify `NOREDO` when recovering a `NOARCHIVELOG` database, then Oracle aborts a recovery and issues an error.

  Note: Incremental backups of `NOARCHIVELOG` databases must be taken after a consistent shutdown.
Examples

Recovering a Tablespace in an Open Database: Example  The following example takes tablespace tbs_1 offline, uses automatic channels to restore and recover it (deleting the logs that it restored from tape), then brings it back online:

```sql
SQL "ALTER TABLESPACE tbs_1 OFFLINE IMMEDIATE";
RESTORE TABLESPACE tbs_1;
RECOVER TABLESPACE tbs_1 DELETE ARCHIVELOG;
SQL "ALTER TABLESPACE tbs_1 ONLINE";
```

Recovering Datafiles Restored to New Locations: Example  The following example uses the preconfigured disk channel and manually allocates one media management channel to use datafile copies on disk and backups on tape, and restores one of the datafiles in tablespace tbs_1 to a different location:

```sql
RUN
{
ALLOCATE CHANNEL dev2 DEVICE TYPE sbt;
SQL "ALTER TABLESPACE tbs_1 OFFLINE IMMEDIATE";
SET NEWNAME FOR DATAFILE 'disk?/oracle/tbs11.f'
TO 'disk9/oracle/tbs11.f';
RESTORE TABLESPACE tbs_1;
```
Performing Incomplete Recovery by Using a Backup Control File: Example

Assume that both the database and archived redo log 1234 were lost due to a disk crash. Because you do not have incremental backups, you need to recover the database by using available archived redo logs. You do not need to restore tablespace readonly1 because it has not changed since log 1234.

```sql
RUN
{
    SET UNTIL SEQUENCE 1234 THREAD 1;  # Recover database until log sequence 1234
    RESTORE CONTROLFILE TO '/vobs/oracle/dbs/cf1.f';
    # Because you specified a restore destination, manually replicate the control file.
    # RMAN replicates automatically when no destination is specified.
    REPLICATE CONTROLFILE FROM '/vobs/oracle/dbs/cf1.f';
    ALTER DATABASE MOUNT;
    RESTORE DATABASE SKIP TABLESPACE temp1, readonly1;
    RECOVER DATABASE SKIP FOREVER TABLESPACE temp1;
    ALTER DATABASE OPEN RESETLOGS;
    SQL "DROP TABLESPACE temp1";
    SQL "CREATE TABLESPACE temp1 DATAFILE '/vobs/oracle/dbs/temp1.f' SIZE 10M TEMPORARY";
}
Syntax

`REGISTER DATABASE`;

Purpose

To register the target database in the recovery catalog so that RMAN can access it. RMAN obtains all information it needs to register the target database from the target database itself.

**Note:** If you perform a `RESETLOGS` operation on a database and later register it in the recovery catalog, the catalog records the `DB_NAME` for the old incarnations as `UNKNOWN` because the old incarnations were not previously registered. You should not try to remove these records.

**See Also:** Oracle9i Recovery Manager User’s Guide, “CREATE CATALOG” on page 2-86

Restrictions and Usage Notes

- Execute this command only at the RMAN prompt.
- You must be connected to the target database and recovery catalog database.
- You can register multiple databases in the same recovery catalog, but the database identifiers of the databases must be unique.
- You can only register a database once in a given recovery catalog.
- The target database must be mounted or open.
- You should not register a standby database.
- The `REGISTER DATABASE` command fails when RMAN detects duplicate DBIDs. This situation can arise when databases are created by copying files from an existing database rather than by using the `DUPLICATE` command.
If this failure occurs, then you can create a second recovery catalog in the same database but in another user’s schema by executing `CREATE CATALOG` and using a different user ID. Then, register the database with the duplicate database identifier into the newly created recovery catalog in the new schema.

**Note:** If you are using RMAN with different target databases that have the same database name and DBID, be careful to always specify the correct recovery catalog schema when invoking RMAN.

### Example

**Registering a Database: Example**  This example registers a new target database, catalogs an existing datafile copy, then opens the database for use:

```
% rman TARGET / CATALOG rman/rman@rcat
STARTUP MOUNT;
REGISTER DATABASE;
CATALOG DATAFILECOPY '/oracle/dbs/tbs_11.f';
ALTER DATABASE OPEN;
```
RELEASE CHANNEL

Syntax

```
RELEASE CHANNEL channel_id;
```

Purpose

To release a channel while maintaining the connection to the target database instance. Specify the channel name with the same identifier used in the ALLOCATE CHANNEL command. This command is optional because RMAN automatically releases all channels allocated when the RUN command terminates.

Requirements

Execute this command only within a RUN command.

Keywords and Parameters

- `channel_id` specifies the case-sensitive channel ID used in the ALLOCATE CHANNEL command.

Examples

**Releasing a Channel: Example**  This example makes three identical backup sets of datafiles 1 through 4 to tape with channel ch1, then releases it. RMAN then makes three identical backups of datafiles 5 and 6 to tape with channel ch2 and then releases it:

```
RUN {
    SET BACKUP COPIES = 3;
    ALLOCATE CHANNEL ch1 DEVICE TYPE sbt FILESPERSET = 2 RATE = 1000;
    ALLOCATE CHANNEL ch2 DEVICE TYPE sbt MAXPIECESIZE = 3000;
    BACKUP CHANNEL ch1 DATAFILE 1,2,3,4;
    RELEASE CHANNEL ch1;
    BACKUP DATAFILE 5,6;
    RELEASE CHANNEL ch2;
}
```
releaseForMaint

Syntax

```
RELEASE CHANNEL
```

Purpose

To release a sequential I/O device specified in an ALLOCATE CHANNEL FOR MAINTENANCE command. Note that maintenance channels are unaffected by ALLOCATE CHANNEL and RELEASE CHANNEL command issued within a RUN command.

Requirements

- Execute this command only at the RMAN prompt.
- You must have a maintenance channel allocated in order to release it.

Examples

**Releasing a Maintenance Channel After a Delete Operation: Example**

This example allocates and then releases a maintenance channel to the media manager:

```
ALLOCATE CHANNEL FOR MAINTENANCE DEVICE TYPE sbt;
DELETE BACKUPPIECE 100;
RUN
{
    ALLOCATE CHANNEL ch1 DEVICE TYPE DISK;
    BACKUP DATAFILE 1;
    RELEASE CHANNEL ch1; # releases RUN channel but not maintenance channel
}
RELEASE CHANNEL; # releases maintenance channel
```
Syntax

```
backupCommands ::= 
  backup
  copy

restoreCommands ::= 
  replicate
  restore
  recover
  blockrecover
  duplicate
  switch
```
maintenanceCommands: ::= 

- catalog
- change
- configure
- crosscheck
- delete
- validate
- report
- delete
- show

miscellaneousCommands: ::= 

- allocate
- alterDatabase
- beginLine
- executeScript
- host
- release
- resync
- send
- set
- shutdown
- sql
- startup
REPLACE SCRIPT

Purpose

To replace an existing script stored in the recovery catalog. If the script does not exist, then REPLACE SCRIPT creates it.

The stored script feature is provided primarily to provide a common repository for frequently executed collections of RMAN commands: use any command legal within a **RUN** command in the script. The script is not executed immediately; use the **EXECUTE SCRIPT** command to run it.

See Also:

- For descriptions of the individual commands that you can use in a stored script, see the appropriate entry, for example, "BACKUP" on page 2-26
- For information about the @ and @@ arguments, see "CREATE SCRIPT" on page 2-88
- For information about the EXECUTE SCRIPT command, see "EXECUTE SCRIPT" on page 2-112

Restrictions and Usage Notes

- Execute REPLACE SCRIPT only at the RMAN prompt.
- You must be connected to a recovery catalog.
- The @ and @@ commands do not work within REPLACE SCRIPT.

Keywords and Parameters

For descriptions of the individual commands that you can use in a stored script, refer to the appropriate entry, for example, "BACKUP" on page 2-26.

<table>
<thead>
<tr>
<th>REPLACE SCRIPT 'script_name'</th>
<th>Replaces the specified stored script with the new commands. The statements allowable within the parentheses of the REPLACE SCRIPT 'script_name' ( ... ) command are the same allowable within the RUN command.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>To obtain a listing of all stored scripts, use SQL*Plus to connect to the recovery catalog database as the catalog owner and issue the following query:</td>
</tr>
<tr>
<td></td>
<td>SQL&gt; SELECT * FROM RC_STORED_SCRIPT;</td>
</tr>
<tr>
<td></td>
<td><strong>Note:</strong> To run the script, issue EXECUTE SCRIPT within the braces of the RUN command.</td>
</tr>
<tr>
<td></td>
<td><strong>See Also:</strong> &quot;RC_STORED_SCRIPT&quot; on page 3-27 for more information about RC_STORED_SCRIPT</td>
</tr>
</tbody>
</table>

| 2-158 Oracle9i Recovery Manager Reference |
Example

Replacing an RMAN Script: Example  This example creates a script called backup_full, replaces it with a different script, and then executes it:

CREATE SCRIPT backup_full {
    # manually allocates disk channels, specifying 3 different directories
    ALLOCATE CHANNEL ch1 DEVICE TYPE DISK FORMAT '/disk1/%U';
    ALLOCATE CHANNEL ch2 DEVICE TYPE DISK FORMAT '/disk2/%U';
    ALLOCATE CHANNEL ch3 DEVICE TYPE DISK FORMAT '/disk3/%U';
    BACKUP DATABASE;
}

REPLACE SCRIPT backup_full {
    # uses configured channel for default device type
    BACKUP DATABASE;
}

RUN { EXECUTE SCRIPT backup_full; }
REPLICATE

Syntax

```
REPLICATE CONTROLFILE FROM '{filename}'
```

Purpose

To copy a control file to the locations specified in the CONTROL_FILES initialization parameter of the target database.

After restoring the control file, you can use the `REPLICATE CONTROLFILE` statement to prepare the database for mounting. This operation is equivalent to executing multiple `COPY CONTROLFILE` statements.

**Note:** The `RESTORE` command will automatically replicate the control file to all CONTROL_FILES locations if no restore destination is specified.

Restrictions and Usage Notes

- Execute `REPLICATE CONTROLFILE` only within the braces of a `RUN` command.
- The target instance must be started.

Keywords and Parameters

| `filename` | Specifies the location of the control file to be replicated. For example, if you restore a control file backup to `/oracle/temp/cf.bak`, then you would also specify this `filename` in the `REPLICATE` command. |

2-160  | Oracle9i Recovery Manager Reference |
Example

**Replicating a Restored Control File: Example**  This example restores a control file to a temporary location and then replicates it manually:

```
STARTUP NOMOUNT;
RUN
{
  SET UNTIL TIME 'Jun 18 2000 16:32:36';
  # restore a backup controlfile to a temporary location.
  RESTORE CONTROLFILE TO '/tmp/cf.tmp';
  REPLICATE CONTROLFILE FROM '/tmp/cf.tmp';
  STARTUP FORCE MOUNT;
}
```
Syntax

\[
\text{reportObject} ::= \\
\text{REPORT} \text{NEED BACKUP} \text{INCREMENTAL} \text{DAYS} = \text{integer} \text{REDUNDANCY} = \text{integer} \text{RECOVERY WINDOW OF} \text{integer} \text{DAYS} \\
\text{SCHEMA} \text{atClause} \text{UNRECOVERABLE} \text{.obsOperandList} \\
\text{DEVICE TYPE} \text{deviceSpecifier} \\
\text{DATAFILE} \text{datafileSpec} \\
\text{TABLESPACE} \text{tablespace_name} \\
\text{DATABASE} \text{SKIP TABLESPACE} \text{tablespace_name}
\]
atClause::=

AT TIME = date_string

AT SCN = integer

AT SEQUENCE = integer THREAD = integer

Purpose

To perform detailed analyses of the RMAN repository. Oracle writes the output from the REPORT command to standard output or the message log file.

Use the REPORT command to answer questions such as the following:

- Which files need a backup?
- Which files have not had a backup for some time?
- Which files are not recoverable due to unrecoverable operations?
- Which backup files can be deleted?
- What was the physical schema of the database at a previous time?

See Also: Oracle9i Recovery Manager User’s Guide to learn how to use RMAN’s reporting functionality

Restrictions and Usage Notes

- Execute this command only at the RMAN prompt.
- You must connect to a recovery catalog when issuing a REPORT SCHEMA command with the AT TIME, AT SCN, or AT SEQUENCE options. Otherwise, a recovery catalog is not required for the REPORT command.
Keywords and Parameters

<table>
<thead>
<tr>
<th>Keyword</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>NEED BACKUP</td>
<td>Lists all datafiles in need of a new backup. The report assumes that you will use the most recent backup for restore operations. If you do not specify any option, then RMAN uses the current retention policy configuration. If the retention policy is disabled (CONFIGURE RETENTION POLICY TO NONE), RMAN generates an error.</td>
</tr>
<tr>
<td>INCREMENTAL = integer</td>
<td>Specifies a threshold number of incremental backups required for recovery. If complete recovery of a datafile requires more than integer incremental backups, then the datafile requires a new full backup. The REPORT command, like the RECOVER command, uses the lowest level of incremental backup whenever there is a choice. This is the same strategy that RMAN would use if the file were actually being recovered by the RECOVER command.</td>
</tr>
<tr>
<td>DAYS = integer</td>
<td>Specifies a threshold number of days worth of logs needed to recover the file. For example, REPORT NEED BACKUP DAYS 7 DATABASE shows the datafiles whose recovery requires more than one week’s worth of archived redo logs.</td>
</tr>
<tr>
<td>RECOVERY WINDOW</td>
<td>Specifies a time window in which RMAN should be able to recover the database. The window stretches from the current time (SYSDATE) to the point of recoverability, which is the earliest date to which you want to recover. The point of recoverability is integer days in the past, that is, SYSDATE – integer.</td>
</tr>
<tr>
<td>REDUNDANCY = integer</td>
<td>Specifies the minimum number of backups or copies that must exist for a datafile to be considered not in need of a backup. In other words, a datafile needs a backup if there are fewer than integer backups or copies of this file. For example, REDUNDANCY 2 means that if there are fewer than two copies or backups of a datafile, then it needs a new backup.</td>
</tr>
<tr>
<td></td>
<td>Note: Files for which no backups exist will not appear in this list: issue the REPORT NEED BACKUP REDUNDANCY command to display them.</td>
</tr>
</tbody>
</table>

If the target database control file is mounted and current, then RMAN makes the following optimizations to this report:

- Files that are offline and whose most recent backup contains all changes to the file are not included.
- Files that were offline and are now online, and whose most recent backup contains all changes up to the offline time, are only reported if they have been online for more than the specified number of days.
UNRECOVERABLE

Lists all unrecoverable datafiles. A datafile is considered unrecoverable if an unrecoverable operation has been performed against an object residing in the datafile since the last backup of the datafile.

Note: The nonexistence of any backup of a datafile is not sufficient reason to consider it unrecoverable. Such datafiles can be recovered through the use of the CREATE DATAFILE command, if redo logs starting from when the file was created still exist.

`reportObject`

Specifies the datafiles to be included in the report. The report can include the entire database (optionally skipping certain tablespaces), a list of tablespaces, or a list of datafiles.

- **DATAFILE**
  - `datafileSpec`
    - Lists the specified datafiles. RMAN reports on backups or datafile copies that contain at least one of the specified datafiles.

- **TABLESPACE**
  - `’tablespace_name’`
    - Lists datafiles in the specified tablespace. RMAN reports on backups or datafile copies that include at least one datafile from a specified tablespace.

- **DATABASE**
  - Lists backups or datafile copies of all files in the current database. Specify `SKIP TABLESPACE tablespace_name` to exclude the specified tablespace from the DATABASE specification.

SCHEMA

Lists the names of all datafiles and tablespaces at the specified point in time.

`atClause`

Specifies a point in time as a time, an SCN, or a log sequence number.

- **AT TIME =**
  - `’date_string’`
    - Specifies a date. The NLS_LANG and NLS_DATE_FORMAT environment variables specify the format for the time.

- **AT SCN =**
  - `integer`
    - Specifies an SCN.

- **AT SEQUENCE =**
  - `integer`
  - **THREAD =**
  - `integer`
    - Specifies a log sequence number for a specified redo THREAD number. The integer indicates the time when the specified log and thread were first opened.

OBSOLETE

`obsOperandList`

Lists full backups and datafile copies recorded in the RMAN repository that can be deleted because they are no longer needed. The subclause `obsOperandList` describes the criteria that RMAN uses to determine what is obsolete. If you do not specify parameters in `obsOperandList`, then RMAN uses the options specified in `CONFIGURE RETENTION POLICY`. If you use this option in conjunction with `DEVICE TYPE`, then RMAN only considers backups and copies created on the specified device.

DEVICE TYPE

`deviceSpecifier`

Specifies the type of storage device. RMAN only considers backups and copies available on the specified device for its report.

Report Output

The information that appears in the output is shown in the following tables:
Table 2–16, "Report of Database Schema"

<table>
<thead>
<tr>
<th>Column</th>
<th>Indicates</th>
</tr>
</thead>
<tbody>
<tr>
<td>File</td>
<td>The absolute datafile number.</td>
</tr>
<tr>
<td>K-bytes</td>
<td>The size of the file in kilobytes.</td>
</tr>
<tr>
<td>Tablespace</td>
<td>The tablespace name.</td>
</tr>
<tr>
<td>RB segs</td>
<td>YES if rollback segments exist in the tablespace and NO if they do not (only if connected to the recovery catalog). If RMAN is not connected to the catalog, then *** is displayed.</td>
</tr>
<tr>
<td>Datafile Name</td>
<td>The filename of the datafile.</td>
</tr>
</tbody>
</table>

Table 2–17 Report of Obsolete Backups and Copies

<table>
<thead>
<tr>
<th>Column</th>
<th>Indicates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type</td>
<td>Whether the object is a backup set, backup piece, proxy copy, or datafile copy.</td>
</tr>
<tr>
<td>Key</td>
<td>A unique key that identifies this backup in the target database control file.</td>
</tr>
<tr>
<td>Completion Time</td>
<td>The time that the backup or copy completed.</td>
</tr>
<tr>
<td>Filename/handle</td>
<td>The filename or media handle of the backup or datafile copy.</td>
</tr>
</tbody>
</table>
### Table 2–18  Report of Files that Need Backup Due to Unrecoverable Operations

<table>
<thead>
<tr>
<th>Column</th>
<th>Indicates</th>
</tr>
</thead>
<tbody>
<tr>
<td>File</td>
<td>The absolute number of the datafile that needs a new backup due to unrecoverable operations.</td>
</tr>
<tr>
<td>Type Of Backup Required</td>
<td>FULL or INCREMENTAL, depending on which type of backup is necessary to ensure the recoverability of all of the data in this file. If FULL, then create a full backup, level 0 backup, or a datafile copy. If INCREMENTAL, then a full or incremental backup will also suffice.</td>
</tr>
<tr>
<td>Name</td>
<td>The name of the datafile.</td>
</tr>
</tbody>
</table>

### Table 2–19  Report of Files with Less Than n Redundant Backups

<table>
<thead>
<tr>
<th>Column</th>
<th>Indicates</th>
</tr>
</thead>
<tbody>
<tr>
<td>File</td>
<td>The absolute datafile number of a datafile with less than $n$ redundant backups.</td>
</tr>
<tr>
<td>#bkps</td>
<td>The number of backups that exist for this file.</td>
</tr>
<tr>
<td>Name</td>
<td>The name of the file.</td>
</tr>
</tbody>
</table>

### Table 2–20  Report of Files Whose Recovery Needs More Than n Days of Archived Logs

<table>
<thead>
<tr>
<th>Column</th>
<th>Indicates</th>
</tr>
</thead>
<tbody>
<tr>
<td>File</td>
<td>The absolute file number of a datafile that requires more than $n$ days of archived redo logs for recovery.</td>
</tr>
<tr>
<td>Days</td>
<td>The number of days of archived redo data required for recovery.</td>
</tr>
<tr>
<td>Name</td>
<td>The name of the datafile.</td>
</tr>
</tbody>
</table>

### Table 2–21  Report of Files That Need More than n Incrementals During Recovery

<table>
<thead>
<tr>
<th>Column</th>
<th>Indicates</th>
</tr>
</thead>
<tbody>
<tr>
<td>File</td>
<td>The absolute file number of a datafile that requires more than $n$ incrementals for complete recovery.</td>
</tr>
<tr>
<td>Incrementals</td>
<td>The number of incremental backups required for complete recovery.</td>
</tr>
<tr>
<td>Name</td>
<td>The name of the datafile.</td>
</tr>
</tbody>
</table>
Examples

**Reporting Database Schema: Example**  This example reports the names of all datafiles and tablespaces in the database one week ago:

```
REPORT SCHEMA AT TIME 'SYSDATE-7';
```

<table>
<thead>
<tr>
<th>File</th>
<th>K-bytes</th>
<th>Tablespace</th>
<th>RB segs</th>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>47104</td>
<td>SYSTEM</td>
<td>YES</td>
<td>/vobs/oracle/dbs/tbs_01.f</td>
</tr>
<tr>
<td>2</td>
<td>978</td>
<td>SYSTEM</td>
<td>YES</td>
<td>/vobs/oracle/dbs/tbs_02.f</td>
</tr>
<tr>
<td>3</td>
<td>978</td>
<td>TBS_1</td>
<td>NO</td>
<td>/vobs/oracle/dbs/tbs_11.f</td>
</tr>
<tr>
<td>4</td>
<td>978</td>
<td>TBS_1</td>
<td>NO</td>
<td>/vobs/oracle/dbs/tbs_12.f</td>
</tr>
<tr>
<td>5</td>
<td>978</td>
<td>TBS_2</td>
<td>NO</td>
<td>/vobs/oracle/dbs/tbs_21.f</td>
</tr>
<tr>
<td>6</td>
<td>978</td>
<td>TBS_2</td>
<td>NO</td>
<td>/vobs/oracle/dbs/tbs_22.f</td>
</tr>
<tr>
<td>7</td>
<td>500</td>
<td>TBS_3</td>
<td>NO</td>
<td>/vobs/oracle/dbs/tbs_31.f</td>
</tr>
<tr>
<td>8</td>
<td>500</td>
<td>TBS_3</td>
<td>NO</td>
<td>/vobs/oracle/dbs/tbs_32.f</td>
</tr>
<tr>
<td>9</td>
<td>5120</td>
<td>SYSTEM</td>
<td>YES</td>
<td>/vobs/oracle/dbs/tbs_03.f</td>
</tr>
</tbody>
</table>

**Reporting Datafiles Needing Incremental Backups: Example**  This example reports all datafiles in the database that require the application of five or more incremental backups to be recovered to their current state:

```
REPORT NEED BACKUP INCREMENTAL 5 DATABASE;
```

<table>
<thead>
<tr>
<th>File</th>
<th>Increm</th>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>9</td>
<td>/vobs/oracle/dbs/tbs_01.f</td>
</tr>
<tr>
<td>2</td>
<td>9</td>
<td>/vobs/oracle/dbs/tbs_02.f</td>
</tr>
<tr>
<td>3</td>
<td>9</td>
<td>/vobs/oracle/dbs/tbs_11.f</td>
</tr>
<tr>
<td>4</td>
<td>9</td>
<td>/vobs/oracle/dbs/tbs_12.f</td>
</tr>
</tbody>
</table>

**Reporting Datafiles Needing Backups: Example**  The following example reports all datafiles from tablespace SYSTEM that will need more than two days of archived redo logs to be applied during recovery after being restored from the most recent backup:

```
REPORT NEED BACKUP DAYS 2 TABLESPACE SYSTEM;
```

<table>
<thead>
<tr>
<th>File</th>
<th>Days</th>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>3</td>
<td>/vobs/oracle/dbs/tbs_01.f</td>
</tr>
<tr>
<td>2</td>
<td>3</td>
<td>/vobs/oracle/dbs/tbs_02.f</td>
</tr>
<tr>
<td>16</td>
<td>3</td>
<td>/vobs/oracle/dbs/tbs_03.f</td>
</tr>
</tbody>
</table>
**Reporting Unrecoverable Datafiles: Example**  The following example reports all datafiles that cannot be recovered from existing backups because redo may be missing:

```
REPORT UNRECOVERABLE;
```

Report of files that need backup due to unrecoverable operations

<table>
<thead>
<tr>
<th>File Type of Backup Required</th>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>FULL</td>
<td>/vobs/oracle/dbs/tbs_12.f</td>
</tr>
</tbody>
</table>

**Reporting Obsolete Backups and Copies: Example**  The following example reports obsolete backups and copies with a redundancy of 1:

```
REPORT OBSOLETE;
```

Report of obsolete backups and copies

<table>
<thead>
<tr>
<th>Type</th>
<th>Key</th>
<th>Completion Time</th>
<th>Filename/Handle</th>
</tr>
</thead>
<tbody>
<tr>
<td>Backup Set</td>
<td>836</td>
<td>04-OCT-00</td>
<td>/vobs/oracle/dbs/05aetj6b_1_1</td>
</tr>
<tr>
<td>Backup Piece</td>
<td>839</td>
<td>04-OCT-00</td>
<td>/vobs/oracle/dbs/03aetj1f_1_1</td>
</tr>
<tr>
<td>Backup Set</td>
<td>807</td>
<td>04-OCT-00</td>
<td></td>
</tr>
<tr>
<td>Backup Piece</td>
<td>810</td>
<td>04-OCT-00</td>
<td></td>
</tr>
</tbody>
</table>
RESET DATABASE

Syntax

```
RESET DATABASE [TO INCARNATION [primary_key]]
```

Purpose

To reset the target database in the RMAN repository, which means to do either of the following actions:

- Inform RMAN that the SQL statement `ALTER DATABASE OPEN RESETLOGS` has been executed and that a new incarnation of the target database has been created. Note that if you run the RMAN command `ALTER DATABASE OPEN RESETLOGS` (not the SQL statement with the same keywords), then RMAN resets the target database automatically so that you do not have to run `RESET DATABASE`. By resetting the database, RMAN considers the new incarnation as the current incarnation of the database.

- To reset the database to a previous incarnation. Typically, you would reset the incarnation when performing incomplete recovery to a point before a `RESETLOGS` operation, or when attempting to undo the affects of a `RESETLOGS` by restoring backups taken before a `RESETLOGS`.

Restrictions and Usage Notes

- Execute `RESET DATABASE` only at the RMAN prompt.

- You must be connected to the target database and a recovery catalog.

- You must issue a `RESET DATABASE` command before you can use RMAN with a target database that has been opened with the SQL statement `ALTER DATABASE OPEN RESETLOGS` option. If you do not, then RMAN refuses to access the recovery catalog because it cannot distinguish between a `RESETLOGS` operation and an accidental restore of an old control file. The `RESET DATABASE` command gives confirmation to RMAN that you issued a `RESETLOGS` command.

- You cannot specify `TO INCARNATION` unless the database is started but not mounted. If you mount a control file from an incarnation after the desired incarnation, then `RESET DATABASE TO INCARNATION` fails because of a control
RESET DATABASE

technique. If you mount the control file from the desired incarnation and
then run `RESET DATABASE TO INCARNATION`, then the connection to the target
database and recovery catalog fails due to an incarnation mismatch.

**Keywords and Parameters**

| TO INCARNATION primary_key | Changes the incarnation that RMAN considers to be current to an older incarnation. Specify the primary key of the DBINC record for the database incarnation. Obtain the key value using the `LIST INCARNATION OF DATABASE` command. After you start the instance and issue the `RESET DATABASE TO INCARNATION` command, then you can mount or restore a control file from the desired incarnation and then run RMAN commands in this incarnation. |

**Examples**

### Resetting RMAN to a Previous Incarnation: Example

The following scenario makes an old incarnation of database `prod1` current again:

```
# step 1: obtain the primary key of old incarnation
LIST INCARNATION OF DATABASE PROD1;

List of Database Incarnations
+-------+-------+-------+------++----------+----------+
<table>
<thead>
<tr>
<th>DB Key</th>
<th>Inc Key</th>
<th>DB Name</th>
<th>DB ID</th>
<th>CUR</th>
<th>Reset SCN</th>
<th>Reset Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>PROD1</td>
<td>1224038686</td>
<td>NO</td>
<td>1</td>
<td>02-JUL-00</td>
</tr>
<tr>
<td>1</td>
<td>582</td>
<td>PROD1</td>
<td>1224038686</td>
<td>YES</td>
<td>59727</td>
<td>10-JUL-00</td>
</tr>
</tbody>
</table>

# step 2: start instance and reset database
SHUTDOWN IMMEDIATE;
STARTUP NOMOUNT;
RESET DATABASE TO INCARNATION 2;

# step 3: restore control file from previous incarnation:
RESTORE CONTROLFILE;

# step 4: shut down and then and mount the database
SHUTDOWN IMMEDIATE
STARTUP MOUNT

# step 5: restore and recover the database to a point before the RESETLOGS
RESTORE DATABASE UNTIL SEQUENCE 1001;
RECOVER DATABASE UNTIL SEQUENCE 1001;

# step 6: make this incarnation the current incarnation:
ALTER DATABASE OPEN RESETLOGS;
```
RESTORE

Syntax

```
RESTORE
  | restoreObject
  | restoreSpecOperand

  CHANNEL 'channel_id'
  PARMS 'channel_parms'
  FROM 'BACKUPSET'
  DATAFILECOPY
  untilClause
  FROM TAG 'tag_name'
  VALIDATE
  CHECK LOGICAL
  CHECK READONLY
  DEVICE TYPE deviceSpecifier
  FORCE
```

2-172   Oracle9i Recovery Manager Reference
**Purpose**

To restore files from backups or image copies. By default, RMAN restores files to their default location. You can use the SET NEWNAME command to restore files to nondefault locations. RMAN restores backups from disk or tape and restores images copies from disk only.

Typically, you restore when a media failure has damaged a current datafile, control file, or archived log or prior to performing a point-in-time recovery. The RESTORE command restores full backups, incremental backups (level 0 only), or copies of datafiles, control files, and archived redo logs. Because the RECOVER command automatically restores archived logs as needed, you should seldom need to restore
logs manually. Possible reasons for manually restoring archived logs are to speed up recovery or to stage the logs to multiple destinations.

---

**Note:** In Oracle9i, unlike in previous RMAN releases, RMAN by default does not restore a datafile if the file is in the correct place and its header contains the expected data (RMAN does not scan the datafile body for corrupt blocks). The `FORCE` option overrides this behavior and restores the requested files unconditionally.

---

When you perform a restore operation by using a backup control file and use a recovery catalog, RMAN automatically adjusts the control file to reflect the structure of the restored database.

If you restore to the default location, then RMAN overwrites files with the same filenames. If you restore to a new location, then issue `SET NEWNAME` commands to rename the files and issue a `SWITCH` command to make the restored files current. If you do not issue `SWITCH` commands, then RMAN considers the restored files as valid copies for use in future restore operations.

If you do not manually allocate channels, then RMAN allocates all automatic channels possibly needed by the `RESTORE` command. For example, assume you configure 3 separate `sbt` channels (each with different `PARMS`) and then configure parallelism for `DISK` and `sbt` as follows:

```sql
CONFIGURE DEVICE TYPE DISK PARALLELISM 2;
CONFIGURE DEVICE TYPE sbt PARALLELISM 3;
CONFIGURE DEFAULT DEVICE TYPE TO sbt;
```

During a restore, RMAN allocates three `sbt` channels and the two preconfigured `DISK` channels. For a restore, RMAN allocates all configured channels unless the `DEVICE TYPE` option restricts the device type from which RMAN restores files.

---

**See Also:** Oracle9i Recovery Manager User’s Guide to learn how to restore files

**Restrictions and Usage Notes**

- To restore datafiles to their current location, the database must be started, mounted, or open with the tablespaces or datafiles to be restored offline. If the database is only started, then it is recommended that you only restore the control file, if necessary. To restore other files, mount the database and then continue.
To restore to a new location, use the `SET NEWNAME` commands to rename the datafiles and use `SWITCH` commands to make them the current database files. If you do not use `SWITCH`, then the repository lists the restored datafile as a datafile copy.

- If you use the `FROM DATAFILECOPY` option, then the allocated channels must be `DEVICE TYPE DISK`.
- If you use the `FROM BACKUPSET` operand, then the appropriate type of storage devices must be allocated for the backup sets that need to be restored. If the appropriate device is not allocated, then you may not be able to find a candidate backup set or copy to restore, and the `RESTORE` command fails.

RMAN only restores backups that were created on the same type of channels that are allocated for the `RESTORE` command. For example, if you made some backups of a datafile to `DISK` channels and others to `sbt` channels, and only a `DISK` channel is allocated for the `RESTORE` command, RMAN will not restore backups that were created on `sbt` channels.

- If datafile filenames are symbolic links, that is, files pointing to other files, then the control file contains the filenames of the link files but RMAN performs I/O on the datafiles pointed to by the link files. If a link file is lost and you `RESTORE` a datafile without first re-creating the symbolic link, then RMAN restores the datafile to the location of the link file rather than to the location pointed to by the link.

- Open the database `RESETLOGS` after restoring with a backup control file.

- You can only restore from a previous incarnation when restoring the whole database. For example, you cannot restore one datafile of a previous incarnation while the current database is in a different incarnation.

- Do not specify a datafile more than once in a restore job. For example, the following command is illegal because `datafile 1` is both specified explicitly and implied by the `SYSTEM` tablespace:

  ```sql
  RESTORE TABLESPACE SYSTEM DATAFILE 1;
  ```

- If you restore a control file from a release earlier than release 8.1.6 on Windows NT that has not been normalized, then you must normalize it before mounting the database by following the procedure described in *Oracle9i Database*.

**Note:** When performing a database validation by using `RESTORE ... VALIDATE`, the database can be open.
Migration. A flawed mechanism in releases prior to release 8.1.6 on Windows NT could allow two different filenames to refer to the same physical file.

- If you restore the control file and do not specify TO 'filename', then the database must be started but not mounted. RMAN restores the control file to the first location specified in the parameter file and then replicates it to all other locations. When the database is not mounted, you must set the DBID using the SET command or the restore fails. If you specify the TO 'filename' option, then RMAN only restores the control file to the specified location. In this case, you do not need to set the DBID because RMAN takes the value from the control file.

- You must have already configured a device type by using CONFIGURE (except for DISK, which is preconfigured) before specifying the DEVICE TYPE option.

- You cannot manually allocate channels and then run RECOVER with the DEVICE TYPE option.

- RMAN neither backs up nor restores temporary tablespaces.

**Keywords and Parameters**

<table>
<thead>
<tr>
<th><strong>restoreObject</strong></th>
<th>Specifies the objects to be restored.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CONTROLFILE</strong></td>
<td>Restores the current control file to the default location and automatically replicates it to all CONTROL_FILES locations in the initialization parameter file. The default location is the first filename specified in the CONTROL_FILES parameter. If you specify a new path name with the TO 'filename' option, then RMAN restores the control file to the new location: you must replicate it manually with the REPPLICATE command. Note that you must always run the RECOVER command after restoring a control file, and must also always open the database with the RESETLOGS option.</td>
</tr>
</tbody>
</table>
### DATABASE
Restores all datafiles in the database except those that are offline or read-only. Unlike BACKUP DATABASE, RESTORE DATABASE does not automatically include the control file—you must issue an additional RESTORE command to perform this operation.

If you specify the CHECK READONLY option, then RMAN examines the headers of all read-only files and restores any that need restoring.

Use an optional SKIP TABLESPACE 'tablespace_name' argument to avoid restoring specified tablespaces, which is useful when you want to avoid restoring tablespaces containing temporary data.

If you specify SKIP FOREVER TABLESPACE, then RMAN specifies the DROP option of ALTER DATABASE DATAFILE ... OFFLINE when taking the datafiles that belong to the tablesapce offline before the restore. The DROP option indicates that RMAN does not intend to recover these files and intends to drop their tablespaces from the database after the database is opened again. In other words, FOREVER indicates that RMAN never intends to do anything with the skipped tablespaces again.

### DATAFILE
datafileSpec
Restores the datafiles specified by filename or absolute datafile number.

See Also: "datafileSpec" on page 2-95

### TABLESPACE'tablespace_name'
Restores all datafiles in the specified tablespaces.

### archivelogRecordSpecifier
Restores the specified range of archived redo logs.

See Also: "archivelogRecordSpecifier" on page 2-22

Note: The database can be started, mounted, or open for this operation.

*restoreSpecOperand* specifies options for the *restoreObject* clause.

Note: These parameters override the parameters with the same name at the RESTORE command level.

### CHANNEL'thannel_id'
Specifies the case-sensitive name of a channel to use for this restore operation. If you do not specify a channel, then RMAN uses any available channel allocated with the correct device type.
## RESTORE

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>FROM TAG = 'tag_name'</td>
<td>Overrides the default selection of the most recent backups or file copy available. The tag restricts the automatic selection to backup sets or file copies that were created with the specified tag. If multiple backup sets or file copies have a matching tag, then RMAN selects the most recent one.</td>
</tr>
<tr>
<td>PARMS 'channel_parms'</td>
<td>Specifies a quoted string containing operating system-specific information. The string is passed to the operating system dependent layer each time a backup piece is restored.</td>
</tr>
<tr>
<td>FROM AUTOBACKUP</td>
<td>Restores a control file autobackup. You can only specify this option on the RESTORE CONTROLFILE command. RMAN begins the search on the current day or on the day specified with the SET UNTIL. If no autobackup is found in the current or SET UNTIL day, RMAN checks the previous day starting with sequence 256 (or the sequence specified by MAXSEQ) until it reaches 0. The search continues up to MAXDAYS days (default of 7, maximum of 366) from the current or SET UNTIL day. If no autobackup is found within MAXDAYS days, then RMAN signals an error and the command stops. Note these restrictions when restoring an autobackup:</td>
</tr>
<tr>
<td></td>
<td>• You must run SET DBID when the target database is in NOMOUNT mode and you are not using a recovery catalog.</td>
</tr>
<tr>
<td></td>
<td>• If you do not specify TO 'filename', then the database must be started but not mounted. RMAN restores the control file to the first location specified in the parameter file and then replicates to all other locations.</td>
</tr>
<tr>
<td></td>
<td>• If you specify TO 'filename', then RMAN only restores the control file to the specified location. In this case, you do not need to run SET DBID because RMAN takes the value from the control file.</td>
</tr>
<tr>
<td>FROM 'media_handle'</td>
<td>Specifies the name of the backup piece containing a control file backup. The media_handle can be any backup piece that contains a backup of a control file: the control file backup does not need to be an autobackup. Refer to the FROM AUTOBACKUP description for restrictions involving the restore of a control file autobackup.</td>
</tr>
<tr>
<td>CHANNEL 'channel_id'</td>
<td>Refer to the restoreSpecOperand clause.</td>
</tr>
<tr>
<td>PARMS 'channel_parms'</td>
<td>Refer to the restoreSpecOperand clause.</td>
</tr>
</tbody>
</table>
Examples

Restoring a Tablespace: Example  This example takes a tablespace offline, restores it, then performs media recovery:

SQL "ALTER TABLESPACE TBS_1 OFFLINE IMMEDIATE";
RESTORE TABLESPACE tbs_1;
RECOVER TABLESPACE tbs_1;
SQL "ALTER TABLESPACE TBS_1 ONLINE";

**Restoring the Control File: Example**  This example restores the control file to its default location, replicates it to all multiplexed locations, and mounts the database:

```sql
RUN
{
  STARTUP FORCE NOMOUNT;
  RESTORE CONTROLFILE;
  ALTER DATABASE MOUNT;
}
```

**Restoring the Control File Using a Tag: Example**  This example restores the control file specified by a tag, replicates it, and then mounts the database:

```sql
STARTUP NOMOUNT;
RESTORE CONTROLFILE FROM TAG 'monday_cf_backup';
ALTER DATABASE MOUNT;
```

**Restoring the Database Using a Backup Control File: Example**  This example restores the control file, replicates it to all control file locations specified in the parameter file, and then mounts the control file in order to restore the database:

```sql
STARTUP NOMOUNT;
RUN
{
  ALLOCATE CHANNEL c1 DEVICE TYPE sbt;
  RESTORE CONTROLFILE;
  ALTER DATABASE MOUNT;
  RESTORE DATABASE;
}
```

**Restoring Archived Redo Logs to a New Location: Example**  This example restores all archived redo logs to the `/oracle/temp_restore` directory:

```sql
RUN
{
  SET ARCHIVELOG DESTINATION TO '/oracle/temp_restore';
  RESTORE ARCHIVELOG ALL;
}
```

**Restoring a Control File Autobackup to a Nondefault Location: Example**  This example restores the latest control file autobackup made on or before June 23, 2000 with a nondefault format of `PROD_CF_AUTOBACKUP_%F`. It starts searching for backups with a sequence number of 20, and searches backwards for 5 months:
RUN
{
    SET UNTIL TIME '23-JUN-2000 00:00:00';
    SET CONTROLFILE AUTOBACKUP FORMAT TO 'PROD_CF_AUTOBACKUP_%F';
    ALLOCATE CHANNEL CHANNEL_1 DEVICE TYPE sbt;
    RESTORE CONTROLFILE TO '/tmp/autobackup_20001002.dbf' FROM AUTOBACKUP
        MAXSEQ 20 MAXDAYS 150;
}
RESYNC

Syntax

```
RESYNC CATALOG FROM CONTROLFILECOPY 'filename'
```

Purpose

To perform a full resynchronization of the recovery catalog.

Resynchronizations can be full or partial. When full, RMAN updates all changed records for the physical schema: datafiles, tablespaces, redo threads, and online redo logs. If the database is open, RMAN also obtains data about rollback segments. When partial, RMAN reads the current control file to update data, but does not resynchronize metadata about the physical schema or rollback segments.

When resynchronizing, RMAN creates a snapshot control file in order to obtain a read-consistent view of the control file, then updates the catalog with any new information from the snapshot. The `RESYNC CATALOG` command updates the classes or records described in the following table.

<table>
<thead>
<tr>
<th>Record Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Log history</td>
<td>Records that are created whenever a log switch occurs. Note that log history records describe an online log switch, not a log archival.</td>
</tr>
<tr>
<td>Archived redo logs</td>
<td>Records associated with archived logs that were created by archiving an online redo log, copying an existing archived redo log, or restoring backups of archived redo logs.</td>
</tr>
<tr>
<td>Backups</td>
<td>Records associated with backup sets, backup pieces, backup set members, proxy copies, and image copies.</td>
</tr>
<tr>
<td>Physical schema</td>
<td>Records associated with datafiles and tablespaces. If the target database is open, then rollback segment information is also updated.</td>
</tr>
</tbody>
</table>

RMAN automatically executes a full or partial resynchronization as needed when you execute RMAN commands, so long as the control file is mounted and the recovery catalog database is available at command execution. RMAN reads the current control file and does not resynchronize metadata about the physical schema.
unless it determines that this information has changed. If RMAN does detect a change, then it performs a full resynchronization.

Use `RESYNC CATALOG` to perform manual full resynchronizations when:

- The recovery catalog is unavailable when you issue any of the commands that automatically perform a resynchronization.
- You are running in `ARCHIVELOG` mode, since the catalog is *not* updated automatically when a log switch occurs or when an online redo log is archived.
- You have made changes to the physical structure of the target database such as adding or dropping a tablespace. As with archive operations, the recovery catalog is *not* updated automatically when the physical schema changes.

### Restrictions and Usage Notes

- You must be connected to a recovery catalog.
- RMAN updates physical schema information in the recovery catalog only when the target database has the current control file mounted. If the target database has mounted a backup control file, a freshly created control file, or a control file that is less current than a control file that was used previously, then RMAN does not update physical schema information in the recovery catalog.

### Keywords and Parameters

<table>
<thead>
<tr>
<th>FROM CONTROLFILECOPY</th>
<th>Specifies the name of the control file copy to use for resynchronization. Physical schema information is not updated when you use this option.</th>
</tr>
</thead>
</table>

### Examples

**Resynchronizing the Recovery Catalog After a Structural Change: Example**  This example adds a datafile to tablespace `tbs_1` and then resynchronizes the catalog:

```
STARTUP MOUNT;
SQL "ALTER TABLESPACE tbs_1 ADD DATAFILE '"sales.f"' NEXT 10K MAXSIZE 100K";
RESYNC CATALOG;
```

**Resynchronizing the Recovery Catalog in ARCHIVELOG Mode: Example**  This example performs a full resynchronization after archiving all unarchived redo logs:

```
SQL "ALTER SYSTEM ARCHIVE LOG ALL";
RESYNC CATALOG;
```
RUN

Syntax

backupCommands::=

backup

replicate

restore

recover

blockrecover

duplicate

switch

restoreCommands::=

RUN
maintenanceCommands ::= 

- catalog
- change
- configure
- crosscheck
- delete
- validate
- report
- delete
- show

miscellaneousCommands ::= 

- allocate
- alterDatabase
- beginLine
- executeScript
- host
- release
- resync
- send
- set
- shutdown
- sql
- startup
**Purpose**

To compile and execute job commands, which are one or more statements executed within the braces of `RUN`. The `RUN` command compiles the list of job commands into one or more job steps and then executes them immediately.

**Restrictions and Usage Notes**

- Execute this command only at the RMAN prompt.
- You must precede and follow the list of job commands with an opening and closing brace.

**Keywords and Parameters**

Refer to individual entries for information about commands that you can run from the RMAN prompt.

**Examples**

**Making a Backup: Example**  This example backs up a database by using a single manually allocated channel to perform the backup:

```sql
RUN
{
  ALLOCATE CHANNEL c1 TYPE sbt;
  BACKUP DATABASE;
}
```

**Restoring and Recovering a Tablespace: Example**  This example takes tablespace `tbs_1` offline, restores it, then performs complete media recovery:

```sql
RUN
{
  SQL "ALTER TABLESPACE tbs_1 OFFLINE IMMEDIATE";
  RESTORE TABLESPACE tbs_1;
  RECOVER TABLESPACE tbs_1;
  SQL "ALTER TABLESPACE tbs_1 ONLINE";
}
```

**Executing an RMAN Script: Example**  This example executes the stored script `backupdb`:

```sql
RUN { EXECUTE SCRIPT BACKUPDB; }
```
SEND

Syntax

```
SEND

DEVICE TYPE deviceSpecifier

PARMS = channel_parms

CHANNEL 'channel_id'

'command'
```

Purpose

To send a vendor-specific string to one or more channels. Refer to your media management documentation to determine which commands are supported.

Restrictions and Usage Notes

- Execute SEND at the RMAN prompt or within the braces of a RUN command.
- You must use a media manager to use SEND and only with commands supported by the media manager. The contents of the string are not interpreted by Oracle, but are passed unaltered to the media management subsystem.

Keywords and Parameters

- **DEVICE TYPE deviceSpecifier**: Specifies the type of storage device and sends the command to all channels of the specified type.
  - See Also: "deviceSpecifier" on page 2-101

- **CHANNEL 'channel_id'**: Specifies which channel to use. If you do not specify DEVICE TYPE or CHANNEL, then RMAN uses all allocated channels. You must specify a case-sensitive channel ID, which is the name of the channel, after the CHANNEL keyword. Oracle uses the channel ID to report I/O errors.
Example

**Sending a String to the Media Manager: Example**

This example sends vendor-specific commands to a media manager:

```sql
RMAN> SEND 'VAR=a82';
sent command to channel: ORA_SBT_TAPE_1

RMAN> BACKUP DATAFILE 2;
```
**SET**

Syntax

```
set_rman_option ::=  

set_run_option ::=  
```

**Purpose**

To configure settings that apply only to the current RMAN session. The *SET* command contrasts with the *CONFIGURE* command, which configures persistent
settings that apply to all RMAN sessions.

You can specify the SET command either at the RMAN prompt or within a RUN block. When you issue SET within a RUN block, the command sets attributes for a RUN command that persist until the end of the job. The specified attributes affect all statements within RUN that follow the SET command.

Use the SET specified at the RMAN prompt to:

- Display executed RMAN commands in the message log.
- Specify a database’s database identifier (DBID).

Use SET specified within a RUN block to:

- Specify the filenames for the auxiliary database during TSPITR or database duplication.
- Specify a limit for the number of permissible block corruptions.
- Override default archived redo log destinations.
- Set an end time, SCN, or log sequence number for recovery.
- Specify that backups should be duplexed, that is, multiple copies should be created of each backup piece in the backup set.
- Determine which server session corresponds to which channel.
- Turn RMAN’s automatic location feature on or off.
- Override the default format for control file autobackups at the session level.

**Restrictions and Usage Notes for SET Command Within RUN**

The following restrictions apply to SET when issued within a RUN command:

- The SET BACKUP COPIES command affects all backups in the RUN block after issuing the command and is in effect until explicitly disabled or changed. The SET BACKUP COPIES command does not affect previous backups.

- Issue SET AUTOLOCATE ON only in an Oracle Real Application Clusters configuration and only when the media manager from one node cannot access or update data created on a different node.

- Issue SET AUTOLOCATE ON before RESTORE and RECOVER commands.

- Include the %F substitution variable in the autobackup format.

- You cannot use SET NEWNAME TO NEW when creating a duplicate or standby database or performing RMAN TSPITR.
Restrictions and Usage Notes for the SET DBID Command

You should only run the SET DBID command in specialized circumstances. Table 2–22 describes the general requirements for running the SET DBID command.

Table 2–22 SET DBID Requirements: General

<table>
<thead>
<tr>
<th>Connected to Target?</th>
<th>Database Started NOMOUNT</th>
<th>Database Mounted or Open</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>SET DBID fails with RMAN-06188</td>
<td>SET DBID fails with RMAN-06188</td>
</tr>
<tr>
<td>No</td>
<td>You can run SET DBID</td>
<td>SET DBID value must match DBID of target database</td>
</tr>
</tbody>
</table>

Table 2–23 and Table 2–24 describe the requirements for running the SET DBID command when you are restoring a control file.

Table 2–23 SET DBID and RESTORE CONTROLFILE FROM AUTOBACKUP

<table>
<thead>
<tr>
<th>Connected to Catalog?</th>
<th>Database Started NOMOUNT</th>
<th>Database Mounted or Open</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>Run SET DBID only if RMAN issues RMAN-20005</td>
<td>SET DBID not necessary</td>
</tr>
<tr>
<td>No</td>
<td>Run SET DBID</td>
<td>SET DBID not necessary</td>
</tr>
</tbody>
</table>

Table 2–24 SET DBID Requirements for RESTORE CONTROLFILE

<table>
<thead>
<tr>
<th>Connected to Catalog?</th>
<th>Database Started NOMOUNT</th>
<th>Database Mounted or Open</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>Run SET DBID only if RMAN issues RMAN-20005</td>
<td>SET DBID not necessary</td>
</tr>
<tr>
<td>No</td>
<td>N/A</td>
<td>SET DBID not necessary</td>
</tr>
</tbody>
</table>
Keywords and Parameters

**ECHO (ON | OFF)** Controls whether RMAN commands are displayed in the message log. When reading commands from a command file, RMAN automatically echoes those commands to the message log. When reading commands from standard input, RMAN does not echo those commands to the message log unless the SET ECHO ON command is used.

The command is useful only when stdin and stdout have been redirected. For example, in UNIX you can redirect RMAN’s input and output in this manner:

```
% rman TARGET sys/sys_pwd@prod1 CATALOG rman/rman@rcat < input_file > output_file
```

By specifying SET ECHO ON, you enable the commands contained in `input_file` to be visible in `output_file`.

**DBID integer** Specifies the DBID, which is a unique 32-bit identification number computed when the database is created. RMAN displays the DBID upon connection to the target database. You can obtain the DBID by querying the V$DATABASE view or the RC_DATABASE and RC_DATABASE_INCARNATION recovery catalog views.

See Also: "Restrictions and Usage Notes for the SET DBID Command" on page 2-191

**CONTROLFILE AUTOBACKUP FORMAT FOR DEVICE TYPE deviceSpecifier TO 'format_string'** Overrides the default filename format for the control file autobackup on the specified device type. The override occurs at the session level only. You can run this command either in RUN or at the RMAN prompt. The order of precedence is as follows:

1. SET CONTROLFILE AUTOBACKUP executed within a RUN block
2. SET CONTROLFILE AUTOBACKUP executed at the RMAN prompt
3. CONFIGURE CONTROLFILE AUTOBACKUP FORMAT

See the `CONFIGURE` command for an explanation of the autobackup format.

**NEWNAME FOR DATAFILE datafileSpec TO 'filename'** Sets the default name for all subsequent RESTORE or SWITCH commands that affect the specified datafile. If you do not issue this command before the datafile restore operation, then RMAN restores the file to its default location.

After you restore a datafile to a new location, then you can run SWITCH to rename the file in the control file to the NEWNAME. If you do not run SWITCH, then the restored file functions as a datafile copy and is recorded as such in the repository.

See Also: "datafileSpec" on page 2-95

**NEW** Creates an Oracle-managed file in the directory specified in DB_CREATE_FILE_DEST. You cannot use this option when using the DUPLICATE command or performing RMAN TSPITR.

See Also: Oracle9i Database Administrator’s Guide for information about Oracle Managed Files
RMAN Commands 2-193

**MAXCORRUPT FOR DATAFILE**

Sets a limit on the number of previously undetected physical block corruptions that Oracle will allow in a specified datafile or list of datafiles. If a BACKUP or COPY command detects more than the specified number of corruptions, the command aborts. The default limit is zero, meaning that RMAN tolerates no corrupt blocks.

**Note:** If you specify CHECK LOGICAL, then the MAXCORRUPT limit applies to logical corruptions as well.

**See Also:** "datafileSpec" on page 2-95

**ARCHIVELOG DESTINATION TO 'log_archive_dest'**

Overrides the LOG_ARCHIVE_DEST_1 initialization parameter in the target database when forming names for restored archive logs during subsequent RESTORE and RECOVER commands. RMAN restores the logs to the destination specified in 'log_archive_dest'. Use this parameter to restore archived redo logs that are not already on disk.

Use this command to stage many archived logs to different locations while a database restore is occurring. RMAN knows where to find the newly restored archive logs; it does not require them to be in the destination specified by LOG_ARCHIVE_DEST_1. For example, if you specify a different destination from the one in the parameter file and restore archived redo log backups, subsequent restore and recovery operations will detect this new location. RMAN always looks for archived redo logs on disk first before restoring them from backup sets.

**untilClause**

Specifies an end time, SCN, or log sequence number for a subsequent RESTORE or RECOVER command.

**See Also:** "untilClause" on page 2-210

**BACKUP COPIES = integer**

Specifies the number of copies of each backup piece that the channels should create: 1, 2, 3, or 4. The SET BACKUP COPIES command, which affects only the BACKUP command, affects all channels allocated in the session. The order of precedence is as follows, with settings higher on the list overriding settings lower on the list:

- BACKUP COPIES
- SET BACKUP COPIES
- CONFIGURE ... BACKUP COPIES

The names of the backup pieces are dependent on the FORMAT clause in the BACKUP command. You can specify up to four FORMAT strings. RMAN uses the second, third, and fourth values only when BACKUP COPIES, SET BACKUP COPIES, or CONFIGURE ... BACKUP COPIES is in effect. When choosing which format to use for each backup piece, RMAN uses the first format value for copy 1, the second format value for copy 2, and so on. If the number of format values exceeds the number of copies, then the extra formats are not used. If the number of format values is less than the number of copies, RMAN reuses the format values, starting with the first one.

**Note:** Control file autobackups made within RUN are also duplexed.
Restoring the Control File: Example

This example uses the DBID to restore the control file because multiple target databases registered in the recovery catalog share the same `DB_NAME`. After you have restored the target control file, you can mount the database to restore the rest of the database. This example assumes that the database is started but not mounted.

```sql
% rman CATALOG cat_owner/pwd@rcatdb
RMAN> SET DBID = 862893450;
RMAN> CONNECT TARGET / # uses operating system authentication
RMAN> RESTORE CONTROLFILE; # assuming you have enabled automatic channel allocation
RMAN> ALTER DATABASE MOUNT;
```
**Setting the Command ID: Example**  This example sets the command ID, backs up the data_1 tablespace by using manually allocated disk channels, hosts out to the operating system, then archives the online redo logs:

```
RUN {
    ALLOCATE CHANNEL t1 DEVICE TYPE DISK FORMAT '/disk1/%U';
    ALLOCATE CHANNEL t2 DEVICE TYPE DISK FORMAT '/disk2/%U';
    SET COMMAND ID TO 'rman';
    BACKUP INCREMENTAL LEVEL 0 FILESPERSET 5 TABLESPACE data_1;
    HOST;
    SQL 'ALTER SYSTEM ARCHIVE LOG ALL';
}
```

**Duplexing a Backup Set: Example**  This example makes a nonduplexed backup of datafiles 1-5, then duplexes all archived logs and the current control file:

```
RUN {
    ALLOCATE CHANNEL dev1 DEVICE TYPE sbt;
    BACKUP FILESPERSET 1 DATAFILE 1,2,3,4,5;
    SET BACKUP COPIES = 2;
    BACKUP FILESPERSET 10 ARCHIVELOG ALL;
    BACKUP CURRENT CONTROLFILE;
}
```

**Overriding the Autobackup Format During a Restore: Example**  This example sets the DBID, sets a boundary time for the restore, then restores a control file autobackup by using a nondefault format:

```
% sqlplus SYS/sys_pwd@prod1
SQL> STARTUP NOMOUNT
SQL> EXIT

% rman
SET DBID 676549873;
CONNECT TARGET /
RUN {
    SET UNTIL TIME '10/10/1999 13:45:00';
    SET CONTROLFILE AUTOBACKUP FORMAT TO '/oracle/backups/%F.bck';
    ALLOCATE CHANNEL channel_1 DEVICE TYPE DISK;
    RESTORE CONTROLFILE FROM AUTOBACKUP MAXSEQ 100;
}
```
SHOW

Syntax

```
SHOW
```

Purpose

To display the current `CONFIGURE` command settings. The output of `SHOW` consists of the `CONFIGURE` commands used to set the configuration. RMAN default configurations are suffixed with `#default`.

Restrictions and Usage Notes

- Execute this command at the RMAN prompt.

Keywords and Parameters

- **RETENTION POLICY**
- **DEVICE TYPE**
- **AUXILIARY CHANNEL**
- **MAXSETSIZES**
- **DATAFILE ARCHIVELOG**
- **backup copies**
- **backup optimization**
- **SNAPSHOT CONTROLFILE NAME**
- **auxname**
- **exclude**
- **controlfile autobackup**
- **format**
- **all**

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### Examples

**Showing Channel Configurations: Example**  This example shows commands relevant for displaying automatic channel configurations:

```sql
SHOW CHANNEL;
SHOW DEVICE TYPE;
SHOW DEFAULT DEVICE TYPE;
SHOW MAXSETSIZE;
```

**Showing All Configurations: Example**  This example shows all persistent configurations for the target database (and includes sample output):

```sql
SHOW ALL;
```

RMAN configuration parameters are:

- `CONFIGURE RETENTION POLICY TO REDUNDANCY 1;`  # default
- `CONFIGURE BACKUP OPTIMIZATION ON;`
- `CONFIGURE DEFAULT DEVICE TYPE TO DISK;`  # default
CONFIGURE DEVICE TYPE 'SBT' PARALLELISM 1;
CONFIGURE DEVICE TYPE DISK PARALLELISM 1; # default
CONFIGURE DATAFILE BACKUP COPIES FOR DISK TO 2;
CONFIGURE DATAFILE BACKUP COPIES FOR SBT TO 1; #default
CONFIGURE ARCHIVELOG BACKUP COPIES FOR SBT TO 1; # default
CONFIGURE ARCHIVELOG BACKUP COPIES FOR DISK TO 1; # default
CONFIGURE MAXSETSIZE TO 2097152K;
CONFIGURE SNAPSHOT CONTROLFILE NAME TO '/oracle/dbs/cf_snap.f';
SHUTDOWN

Syntax

```
SHUTDOWN
```

Purpose

To shut down the target database without exiting RMAN. This command is equivalent to using the SQL*Plus SHUTDOWN statement.

See Also: Oracle9i Database Administrator’s Guide for information on how to start up and shut down a database, and SQL*Plus User’s Guide and Reference for SHUTDOWN syntax

Restrictions and Usage Notes

- Execute this command at the RMAN prompt or within the braces of a RUN command.
- You cannot use the RMAN SHUTDOWN command to shut down the recovery catalog database. To shut down this database, start a SQL*Plus session and issue a SHUTDOWN statement.
- The NORMAL, TRANSACTIONAL, and IMMEDIATE options all perform a clean close of the database. The ABORT option does not cleanly close the database; Oracle will perform instance recovery at startup.
- If the database operates in NOARCHIVELOG mode, then you must shut down the database cleanly and then issue a STARTUP MOUNT before making a backup.
Keywords and Parameters

<table>
<thead>
<tr>
<th>Keyword</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>NORMAL</td>
<td>Shuts down the database with normal priority (default option), which means:</td>
</tr>
<tr>
<td></td>
<td>■ No new connections are allowed after the statement is issued.</td>
</tr>
<tr>
<td></td>
<td>■ Before the database shuts down, Oracle waits for currently connected users to disconnect.</td>
</tr>
<tr>
<td></td>
<td>■ The next startup of the database will not require instance recovery.</td>
</tr>
<tr>
<td>ABORT</td>
<td>Aborts the target instance, with the following consequences:</td>
</tr>
<tr>
<td></td>
<td>■ All current client SQL statements are immediately terminated.</td>
</tr>
<tr>
<td></td>
<td>■ Uncommitted transactions are not rolled back until next startup.</td>
</tr>
<tr>
<td></td>
<td>■ Oracle disconnects all connected users.</td>
</tr>
<tr>
<td></td>
<td>■ Oracle will perform crash recovery on the database at next startup.</td>
</tr>
<tr>
<td>IMMEDIATE</td>
<td>Shuts down the target database immediately, with the following consequences:</td>
</tr>
<tr>
<td></td>
<td>■ Current client SQL statements being processed by Oracle are allowed to complete.</td>
</tr>
<tr>
<td></td>
<td>■ Uncommitted transactions are rolled back.</td>
</tr>
<tr>
<td></td>
<td>■ All connected users are disconnected.</td>
</tr>
<tr>
<td>TRANSACTIONAL</td>
<td>Shuts down the target database while minimizing interruption to clients, with the following consequences:</td>
</tr>
<tr>
<td></td>
<td>■ Clients currently conducting transactions are allowed to complete, that is, either commit or abort before shutdown.</td>
</tr>
<tr>
<td></td>
<td>■ No client can start a new transaction on this instance; any client attempting to start a new transaction is disconnected.</td>
</tr>
<tr>
<td></td>
<td>■ After all transactions have either committed or aborted, any client still connected is disconnected.</td>
</tr>
</tbody>
</table>

Examples

**Shutting Down a Database by Using the Immediate Option: Example**  This example waits for current SQL transactions to be processed before shutting down, then mounts the database:

```sql
SHUTDOWN IMMEDIATE;
STARTUP MOUNT;
```
Shutting Down a Database in NOARCHIVELOG Mode: Example

This example backs up a database running in NOARCHIVELOG mode:

STARTUP FORCE DBA;
SHUTDOWN IMMEDIATE;
STARTUP MOUNT;
# executing the above commands ensures that database is in proper state for NOARCHIVELOG
# backup
BACKUP COPIES 2 DATABASE;
ALTER DATABASE OPEN;
SPOOL

Syntax

```
SPOOL LOG OFF
TO filename
APPEND
```

Purpose

To write RMAN output to a log file.

If the file does not already exist, then RMAN creates it. If the file does exist, then RMAN overwrites the file, unless APPEND is specified, in which case RMAN appends its output to the end of the file. The SPOOL command does not abort if the specified file cannot be opened for writing. Instead, RMAN turns SPOOL to OFF.

See Also: "cmdLine" on page 2-57 for a description of LOG files

Restrictions and Usage Notes

Execute the SQL command at the RMAN prompt or within the braces of a RUN command.

Keywords and Parameters

<table>
<thead>
<tr>
<th>Keyword</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>OFF</td>
<td>Turns off spooling.</td>
</tr>
<tr>
<td>TO filename</td>
<td>Specifies the name of the log file to which RMAN directs its output. RMAN creates the file if it does not exist, or overwrites the file if it does exist.</td>
</tr>
<tr>
<td>APPEND</td>
<td>Specifies that RMAN should append its output to the end of the existing log file.</td>
</tr>
</tbody>
</table>

Examples

**Spooling RMAN Output to a File: Example**  This example directs RMAN output to standard output for the backup of datafile 1, then directs output to a log file for the backup of datafile 2, then directs output to a different log file for the whole database backup:

```
% rman target / nocatalog
```
BACKUP DATAFILE 1;
SPOOL LOG TO '/oracle/log/df2log.f';
BACKUP DATAFILE 2;
SPOOL LOG OFF;
SPOOL LOG TO '/oracle/log/dblog.f';
BACKUP DATABASE;
SPOOL LOG OFF;
SQL

Syntax

\texttt{SQL \{command\}}

Purpose

To execute a SQL statement or a PL/SQL stored procedure from within Recovery Manager.

Restrictions and Usage Notes

- Execute the SQL command at the RMAN prompt or within the braces of a RUN command.
- If the string that RMAN passes to PL/SQL contains a filename, then the filename must be enclosed in duplicate single quotes and the entire string following the SQL keyword must be enclosed in double quotes. For example, use the following syntax:

\begin{verbatim}
SQL "CREATE TABLESPACE templ DATAFILE '\oracle/dbs/templ.f' SIZE 10M TEMPORARY"
\end{verbatim}

If you attempt to use single quotes for the string following the SQL keyword or use only one set of single quotes for the filename, then the command fails.

- You cannot execute SELECT statements.

See Also: For valid SQL syntax, see the Oracle9i SQL Reference

Keywords and Parameters

<table>
<thead>
<tr>
<th><code>command</code></th>
<th>Specifies a SQL statement for execution. For example, issue the following at the RMAN prompt to archive the online redo logs:</th>
</tr>
</thead>
</table>
|           | \begin{verbatim}
|           | SQL 'ALTER SYSTEM ARCHIVE LOG ALL';
|           | Because EXECUTE is a SQL*Plus command, you cannot execute a PL/SQL command by specifying EXECUTE within the RMAN SQL command. Instead, you must use the BEGIN and END keywords. For example, to execute a PL/SQL procedure named \texttt{rman.rman_purge} through the RMAN SQL command, issue the following:
|           | SQL 'BEGIN rman.rman_purge; END;';                                                                                   |
Examples

Archiving the Unarchived Online Logs: Example
This example backs up a tablespace and then archives all unarchived online logs:

```
BACKUP TABLESPACE users;
SQL "ALTER SYSTEM ARCHIVE LOG CURRENT";
```

Specifying a Filename within a Quoted String: Example
This example specifies a filename by using duplicate single quotes within the context of a double-quoted string:

```
SQL "ALTER TABLESPACE tbs_1 ADD DATAFILE ''/oracle/dbs/tbs_7.f'' NEXT 10K MAXSIZE 100k;"
```

Executing a PL/SQL Stored Procedure Within RMAN: Example
This example issues a PL/SQL stored procedure called `scott.update_log`:

```
RUN
{
  SQL ' BEGIN scott.update_log; END; ';
}
```
STARTUP

Syntax

```
STARTUP [FORCE] [NOMOUNT] [MOUNT] [DBA]
PFILE = 'filename';
```

Purpose

To start the target database from within the RMAN environment. This command is equivalent to using the SQL*Plus STARTUP command. You can:

- Start the instance without mounting a database.
- Start the instance and mount the database, but leave it closed.
- Start the instance, and mount and open the database in:
  - unrestricted mode (accessible to all users)
  - restricted mode (accessible to DBAs only)

See Also: Oracle9i Database Administrator’s Guide to learn how to start up and shut down a database, and SQL*Plus User’s Guide and Reference for SQL*Plus STARTUP syntax

Restrictions and Usage Notes

- Execute this command either at the RMAN prompt or within the braces of a RUN command.
- You cannot use the RMAN STARTUP command to open the recovery catalog database. To start this database, start a SQL*Plus session and execute a STARTUP statement.
Keywords and Parameters

If you do not specify any options, then RMAN mounts and opens the database with the default server parameter file.

<table>
<thead>
<tr>
<th>Keyword</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>STARTUP</strong></td>
<td>If you specify only STARTUP with no other options, then Oracle starts the instance, then mounts and opens the database.</td>
</tr>
<tr>
<td><strong>FORCE</strong></td>
<td>Executes either of these operations:</td>
</tr>
<tr>
<td></td>
<td>■ If the database is open, then this option first shuts down the database with a SHUTDOWN ABORT statement before re-opening it.</td>
</tr>
<tr>
<td></td>
<td>■ If the database is closed, then this option opens the database.</td>
</tr>
<tr>
<td><strong>NOMOUNT</strong></td>
<td>Starts the instance without mounting the database.</td>
</tr>
<tr>
<td><strong>MOUNT</strong></td>
<td>Starts the instance, then mounts the database without opening it</td>
</tr>
<tr>
<td><strong>DBA</strong></td>
<td>Restricts access to the database to users with the RESTRICTED SESSION privilege.</td>
</tr>
<tr>
<td><strong>PFILE=’filename’</strong></td>
<td>Specifies the filename of the init.ora file for the target database. If this parameter is not specified, then the default init.ora filename is used.</td>
</tr>
</tbody>
</table>

Examples

**Opening the Database by Using the Default Parameter File: Example**  This example starts and opens the database:

```sql
STARTUP;
```

**Mounting the Database While Specifying the Parameter File: Example**  This example forces a SHUTDOWN ABORT and then mounts the database with restricted access, specifying a nondefault parameter file location:

```sql
STARTUP FORCE MOUNT DBA PFILE=t_init1.ora;
```
SWITCH

Syntax

```
SWITCH
  DATAFILE datafileSpec
  TO DATAFILECOPY
  DATAFILE ALL
```  

Purpose

To specify that a datafile copy is now the current datafile, that is, the datafile pointed to by the control file. A switch is equivalent to using the ALTER DATABASE RENAME FILE statement: Oracle renames the files in the control file but does not actually rename them on the operating system. Note that this command deletes the records for the datafile copy from the recovery catalog and updates the control file records to status DELETED.

Restrictions and Usage Notes

- Execute SWITCH within the braces of a RUN command.
- If the control file is a restored backup control file, then SWITCH adds the datafile to the control file if it is not there already. You can only add datafiles through SWITCH that were created after the backup control file was created.

Keywords and Parameters

<table>
<thead>
<tr>
<th>Keyword</th>
<th>Description</th>
</tr>
</thead>
</table>
| DATAFILE | Specifies the datafile that you wish to rename. After the switch, the control file no longer views the specified file as current. For example, this command points the control file from `tbs_1.f` to `cp1.f`:

```
SWITCH DATAFILE '/oracle/dbs/tbs_1.f' TO DATAFILECOPY '/oracle/dbs/copies/cp1.f';
```

If you do not specify a TO option, then RMAN uses the filename specified on a prior SET NEWNAME command for this file number as the switch target.

If you do not specify a TO option, then RMAN uses the filename specified on a prior SET NEWNAME command for this file number as the switch target.
Example

**Switching Datafile Filenames After a Restore: Example** This example allocates one disk device and one tape device to allow RMAN to restore both from disk and tape.

```
RUN
{
  ALLOCATE CHANNEL dev1 DEVICE TYPE DISK RATE 1000;
  ALLOCATE CHANNEL dev2 DEVICE TYPE sbt;
  SQL "ALTER TABLESPACE tbs_1 OFFLINE IMMEDIATE";
  SET NEWNAME FOR DATAFILE '/disk7/oracle/tbs11.f'
    TO '/disk9/oracle/tbs11.f';
  RESTORE TABLESPACE tbs_1;
  SWITCH DATAFILE ALL;
  RECOVER TABLESPACE tbs_1;
  SQL "ALTER TABLESPACE tbs_1 ONLINE";
}
```
untilClause

Syntax

```
UNTIL TIME = 'date_string'
UNTIL SCN = integer
UNTIL SEQUENCE = integer
THREAD = integer
```

Purpose

A subclause that specifies an upper limit by time, SCN, or log sequence number for various RMAN operations.

See Also: Oracle9i Recovery Manager User's Guide to learn how to set the Globalization Support date format used by RMAN

Restrictions and Usage Notes

When specifying dates in RMAN commands, the date string must be either:

- A literal string whose format matches the NLS_DATE_FORMAT setting.
- A SQL expression of type DATE, for example, 'SYSDATE-10' or "TO_DATE('01/30/1997', 'MM/DD/YYYY')". Note that the second example includes its own date format mask and so is independent of the current NLS_DATE_FORMAT setting.

Following are examples of typical date settings in RMAN commands:

```
BACKUP ARCHIVELOG FROM TIME 'SYSDATE-31' UNTIL TIME 'SYSDATE-14';
RESTORE DATABASE UNTIL TIME "TO_DATE('09/20/00','MM/DD/YY')";
```

Keywords and Parameters

- **UNTIL TIME = 'date_string'**: Specifies a time as an upper limit. RMAN performs the operation on files up to but not including the specified time.
- **UNTIL SCN = integer**: Specifies an SCN as an upper limit. RMAN performs the operation on files up to but not including the specified SCN.
Examples

Performing Incomplete Recovery Until a Log Sequence Number: Example  This example assumes that log sequence 1234 was lost due to a disk crash and the database needs to be recovered by using available archived redo logs.

RUN
{
    SET UNTIL SEQUENCE 1234 THREAD 1;
    RESTORE CONTROLFILE TO '$ORACLE_HOME/dbs/cf1.f';
    REPlicate CONTROLFILE FROM '$ORACLE_HOME/dbs/cf1.f';
    ALTER DATABASE MOUNT;
    RESTORE DATABASE;
    RECOVER DATABASE;  # recovers through log 1233
    SQL "ALTER DATABASE OPEN RESESTLOGS";
}

Performing Incomplete Recovery to a Specified SCN: Example  This example recovers the database until a specified SCN:

STARTUP MOUNT;
RUN
{
    ALLOCATE CHANNEL ch1 TYPE sbt;
    RESTORE DATABASE;
    RECOVER DATABASE UNTIL SCN 1000;  # recovers through SCN 999
    SQL "ALTER DATABASE OPEN RESESTLOGS";
}

Reporting Obsolete Backups: Example  This example assumes that you want to be able to recover to any point within the last week. It considers backups made more than a week ago as obsolete:

REPORT OBSOLETE UNTIL TIME 'SYSDATE-7';
UPDATE CATALOG

Syntax

```
UPDATE CATALOG TABLESPACE 'tablespace_name';
```

Purpose

To upgrade the recovery catalog schema from an older version to the version required by the RMAN executable. For example, if you use a release 8.0 recovery catalog with a release 8.1 version of RMAN, then you must upgrade the catalog.

Note that `UPDATE CATALOG` does not run scripts to perform the upgrade. Instead, RMAN sends various SQL DDL statements to the recovery catalog to update the recovery catalog schema with new tables, views, columns, and so forth.

Restrictions and Usage Notes

- You must be connected to the catalog database, and the catalog database must be open. You do not have to be connected to the target database.
- You must enter the `UPDATE` command twice in a row to confirm the upgrade.
- You will receive an error if the recovery catalog is already at a version greater than needed by the RMAN executable. RMAN permits the command to be run if the recovery catalog is already current, however, so that the packages can be re-created if necessary. RMAN displays all error messages generated during the upgrade in the message log.

Keywords and Parameters

<table>
<thead>
<tr>
<th>TABLESPACE 'tablespace_name'</th>
</tr>
</thead>
<tbody>
<tr>
<td>Specifies the tablespace in which to store the recovery catalog. If not specified, then no TABLESPACE parameter will be used for the new tables that may be created as part of the upgrade, which means that these new tables will be stored in the default tablespace for the catalog owner.</td>
</tr>
</tbody>
</table>
Example

Upgrading a Recovery Catalog: Example  This example connects to recovery catalog database recdb at the operating system command line and then upgrades it to a more current version:

% rman CATALOG rcat/rcat@recdb

classified to recovery catalog database
PL/SQL package rcat.DBMS_RCVCAT version 08.00.04 in RCVCAT database is too old

RMAN> UPGRADE CATALOG

recovery catalog owner is rcat
enter UPGRADE CATALOG command again to confirm catalog upgrade

RMAN> UPGRADE CATALOG

recovery catalog upgraded to version 09.00.01
DBMS_RCMAN package upgraded to version 09.00.01
DBMS_RCVCAT package upgraded to version 09.00.01
VALIDATE

VALIDATE

Syntax

Purpose

To examine a backup set and report whether it can be restored. RMAN scans all of the backup pieces in the specified backup sets and looks at the checksums to verify that the contents are intact so that the backup can be successfully restored if necessary.

**Note:** The `VALIDATE BACKUPSET` command tests whether the backup sets can be restored, whereas `CROSSCHECK` merely examines the headers of the specified files if they are on disk or queries the media management catalog if they are on tape.

Use this command when you suspect that one or more backup pieces in a backup set are missing or have been damaged. Use `VALIDATE BACKUPSET` to specify which backups to test; use the `VALIDATE` option of the `RESTORE` command to let RMAN choose which backups to validate.

**Restrictions and Usage Notes**

- Execute this command within the braces of a `RUN` command or at the RMAN prompt.
- If you do not have automatic channels configured, manually allocate at least one channel before executing a `VALIDATE BACKUPSET` statement.
- The target instance must be started.
## Keywords and Parameters

<table>
<thead>
<tr>
<th>Keyword</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>primary_key</strong></td>
<td>Specifies the backup sets to be validated by <code>primary_key</code>. Obtain the primary keys of backup sets by executing a <code>LIST</code> statement or, if you use a recovery catalog, by querying the <code>RC_BACKUP_SET</code> recovery catalog view.</td>
</tr>
<tr>
<td><strong>CHECK LOGICAL</strong></td>
<td>Tests data and index blocks that pass physical corruption checks for logical corruption, for example, corruption of a row piece or index entry. If RMAN finds logical corruption, then it logs the block in the <code>alert.log</code> and server session trace file. The RMAN command completes and Oracle populates the <code>V$BACKUP_CORRUPTION</code> and <code>V$COPY_CORRUPTION</code> views with corrupt block ranges. <strong>Note:</strong> <code>VALIDATE</code> does not use <code>MAXCORRUPT</code>.</td>
</tr>
<tr>
<td><strong>DEVICE TYPE</strong></td>
<td>Allocates automatic channels for the specified device type only. This option is valid only if you have configured automatic channels and have not manually allocated channels. For example, if you configure automatic disk and tape channels, and run <code>VALIDATE ... DEVICE TYPE DISK</code>, RMAN allocates only disk channels. <strong>See Also:</strong> &quot;<code>deviceSpecifier</code>&quot; on page 2-101</td>
</tr>
</tbody>
</table>

## Example

**Validating a Backup Set: Example**  
This example validates the status of the backup set whose primary key is 218:

```
VALIDATE BACKUPSET 218;
# As the output indicates, RMAN determines whether it is possible to restore the
# specified backup set.

allocated channel: ORA_DISK_1
channel ORA_DISK_1: sid=8 devtype=DISK
channel ORA_DISK_1: starting validation of datafile backupset
channel ORA_DISK_1: restored backup piece 1
piece handle=/oracle/dbs/c-3939560491-20010419-00 tag=null params=NULL
channel ORA_DISK_1: validation complete
```
VALIDATE
This chapter contains descriptions of recovery catalog views. You can only access these views if you have created a recovery catalog. For a summary of the recovery catalog views, refer to "Summary of RMAN Recovery Catalog Views" on page 3-2.

**Note:** These views are not normalized, but are optimized for RMAN usage. Hence, most catalog views have redundant values that result from joining of several underlying tables.
Summary of RMAN Recovery Catalog Views

The following table provides a functional summary of RMAN recovery catalog views.

<table>
<thead>
<tr>
<th>Recovery Catalog View</th>
<th>Corresponding V$ View</th>
<th>Description of Recovery Catalog View</th>
</tr>
</thead>
<tbody>
<tr>
<td>RC_ARCHIVED_LOG</td>
<td>V$ARCHIVED_LOG</td>
<td>Contains historical information about archived and unarchived redo logs.</td>
</tr>
<tr>
<td>RC_BACKUP_CONTROLFILE</td>
<td>V$BACKUP_DATAFILE</td>
<td>Lists information about control files in backup sets.</td>
</tr>
<tr>
<td>RC_BACKUP_CORRUPTION</td>
<td>V$BACKUP_CORRUPTION</td>
<td>Lists corrupt block ranges in datafile backups.</td>
</tr>
<tr>
<td>RC_BACKUP_DATAFILE</td>
<td>V$BACKUP_DATAFILE</td>
<td>Lists information about datafiles in backup sets.</td>
</tr>
<tr>
<td>RC_BACKUP_PIECE</td>
<td>V$BACKUP_PIECE</td>
<td>Lists information about backup pieces.</td>
</tr>
<tr>
<td>RC_BACKUP_REDOLOG</td>
<td>V$BACKUP_REDOLOG</td>
<td>Lists information about archived redo logs in backup sets.</td>
</tr>
<tr>
<td>RC_BACKUP_SET</td>
<td>V$BACKUP_SET</td>
<td>Lists information about backup sets for all incarnations of the database.</td>
</tr>
<tr>
<td>RC_CHECKPOINT</td>
<td></td>
<td>Deprecated in favor of RC_RESYNC.</td>
</tr>
<tr>
<td>RC_CONTROLFILE_COPY</td>
<td>V$DATAFILE_COPY</td>
<td>Lists information about control file copies on disk.</td>
</tr>
<tr>
<td>RC_COPY_CORRUPTION</td>
<td>V$COPY_CORRUPTION</td>
<td>Lists information about control file copies on disk.</td>
</tr>
<tr>
<td>RC_DATABASE</td>
<td>V$DATABASE</td>
<td>Lists information about the databases registered in the recovery catalog.</td>
</tr>
<tr>
<td>RC_DATABASE_INCARNATION</td>
<td>V$DATABASE (contains only current incarnation and one previous incarnation)</td>
<td>Lists information about all database incarnations registered in the recovery catalog.</td>
</tr>
<tr>
<td>RC_DATAFILE</td>
<td>V$DATAFILE</td>
<td>Lists information about all datafiles registered in the recovery catalog.</td>
</tr>
<tr>
<td>RC_DATAFILE_COPY</td>
<td>V$DATAFILE_COPY</td>
<td>Lists information about datafile copies on disk.</td>
</tr>
<tr>
<td>RC_LOG_HISTORY</td>
<td>V$LOG_HISTORY</td>
<td>Lists historical information about the online redo logs.</td>
</tr>
<tr>
<td>RC_OFFLINE_RANGE</td>
<td>V$OFFLINE_RANGE</td>
<td>Lists the offline ranges for datafiles.</td>
</tr>
<tr>
<td>Recovery Catalog View</td>
<td>Corresponding V$ View</td>
<td>Description of Recovery Catalog View</td>
</tr>
<tr>
<td>-----------------------------</td>
<td>-------------------------</td>
<td>------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>RC_PROXY_CONTROLFILE</td>
<td>V$PROXY_DATAFILE</td>
<td>Lists control file backups that were taken using the proxy copy functionality.</td>
</tr>
<tr>
<td>RC_PROXY_DATAFILE</td>
<td>V$PROXY_DATAFILE</td>
<td>Lists datafile backups that were taken using the proxy copy functionality.</td>
</tr>
<tr>
<td>RC_REDO_LOG</td>
<td>V$LOG and V$LOGFILE</td>
<td>Lists the online redo logs for all incarnations of the database since the last catalog resynchronization.</td>
</tr>
<tr>
<td>RC_REDO_THREAD</td>
<td>V$THREAD</td>
<td>Lists all redo threads for all incarnations of the database since the last catalog resynchronization.</td>
</tr>
<tr>
<td>RC_RESYNC</td>
<td>n/a</td>
<td>Lists information about recovery catalog resynchronizations.</td>
</tr>
<tr>
<td>RC_RMAN_CONFIGURATION</td>
<td>V$RMAN_CONFIGURATION</td>
<td>Lists information about RMAN persistent configuration settings.</td>
</tr>
<tr>
<td>RC_STORED_SCRIPT</td>
<td>n/a</td>
<td>Lists information about RMAN persistent configuration settings.</td>
</tr>
<tr>
<td>RC_STORED_SCRIPT_LINE</td>
<td>n/a</td>
<td>Lists information about lines of the scripts stored in the recovery catalog.</td>
</tr>
<tr>
<td>RC_TABLESPACE</td>
<td>V$TABLESPACE</td>
<td>Lists all table spaces registered in the recovery catalog, all dropped table spaces, and table spaces that belong to old incarnations.</td>
</tr>
</tbody>
</table>
RC_ARCHIVED_LOG

This view contains historical information about archived and unarchived redo logs. It corresponds to the V$ARCHIVED_LOG view in the target database control file.

Oracle inserts an archived redo log record after the online redo log is successfully archived or cleared (NAME column is NULL if the log was cleared). If the log is archived multiple times, then the view will contain multiple archived log records with the same THREAD#, SEQUENCE#, and RESETLOGS_CHANGE#, but with a different name. An archived log record is also inserted when an archived log is restored from a backup set or a copy. Note that an archived log can have no record if the record ages out of the control file.

<table>
<thead>
<tr>
<th>Column</th>
<th>Datatype</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DB_KEY</td>
<td>NUMBER</td>
<td>The primary key for the target database. Use this column to form a join with almost any other catalog view.</td>
</tr>
<tr>
<td>DBINC_KEY</td>
<td>NUMBER</td>
<td>The primary key for the incarnation of the target database to which this record belongs. Use this column to form a join with RC_DATABASE_INCARNATION.</td>
</tr>
<tr>
<td>DB_NAME</td>
<td>VARCHAR2(8)</td>
<td>The DB_NAME of the database incarnation to which this record belongs.</td>
</tr>
<tr>
<td>AL_KEY</td>
<td>NUMBER</td>
<td>The primary key of the archived redo log in the recovery catalog. If you issue the LIST command while connected to the recovery catalog, this value appears in the KEY column of the output.</td>
</tr>
<tr>
<td>RECID</td>
<td>NUMBER</td>
<td>The archived redo log RECID from V$ARCHIVED_LOG. RECID and STAMP form a concatenated primary key that uniquely identifies this record in the target database control file.</td>
</tr>
<tr>
<td>STAMP</td>
<td>NUMBER</td>
<td>The archived redo log stamp from V$ARCHIVED_LOG. RECID and STAMP form a concatenated primary key that uniquely identifies this record in the target database control file.</td>
</tr>
<tr>
<td>NAME</td>
<td>VARCHAR2(1024)</td>
<td>The filename of the archived redo log.</td>
</tr>
<tr>
<td>THREAD#</td>
<td>NUMBER</td>
<td>The number of the redo thread.</td>
</tr>
<tr>
<td>SEQUENCE#</td>
<td>NUMBER</td>
<td>The log sequence number.</td>
</tr>
<tr>
<td>RESETLOGS_CHANGE#</td>
<td>NUMBER</td>
<td>The SCN of the most recent RESETLOGS when the record was created.</td>
</tr>
<tr>
<td>RESETLOGS_TIME</td>
<td>DATE</td>
<td>The time stamp of the most recent RESETLOGS when the record was created.</td>
</tr>
<tr>
<td>FIRST_CHANGE#</td>
<td>NUMBER</td>
<td>The first SCN of this redo log.</td>
</tr>
<tr>
<td>FIRST_TIME</td>
<td>DATE</td>
<td>The time when Oracle switched into the redo log.</td>
</tr>
<tr>
<td>NEXT_CHANGE#</td>
<td>NUMBER</td>
<td>The first SCN of the next redo log in the thread.</td>
</tr>
<tr>
<td>NEXT_TIME</td>
<td>DATE</td>
<td>The first time stamp of the next redo log in the thread.</td>
</tr>
<tr>
<td>BLOCKS</td>
<td>NUMBER</td>
<td>The size of this archived log in operating system blocks.</td>
</tr>
</tbody>
</table>
This view lists information about control files in backup sets. Note that the VSBACKUP_DATAFILE view contains both datafile and control file records: a backup datafile record with file number 0 represents the backup control file. In the recovery catalog, the RC_BACKUPCONTROLFILE view contains only control file records, while the VSBACKUP_DATAFILE view contains only datafile records.

<table>
<thead>
<tr>
<th>Column</th>
<th>Datatype</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DB_KEY</td>
<td>NUMBER</td>
<td>The primary key for the target database. Use this column to form a join with virtually any other catalog view.</td>
</tr>
<tr>
<td>DBINC_KEY</td>
<td>NUMBER</td>
<td>The primary key for the incarnation of the target database. Use this column to form a join with RC_DATABASE_INCARNATION.</td>
</tr>
<tr>
<td>DB_NAME</td>
<td>VARCHAR2(8)</td>
<td>The DB_NAME of the database incarnation to which this record belongs.</td>
</tr>
<tr>
<td>BCF_KEY</td>
<td>NUMBER</td>
<td>The primary key of the control file backup in the recovery catalog. If you issue the LIST command while connected to the recovery catalog, this value appears in the KEY column of the output.</td>
</tr>
</tbody>
</table>
### Column | Datatype | Description
--- | --- | ---
RECID | NUMBER | The RECID value from V$BACKUP_DATAFILE. RECID and STAMP form a concatenated primary key that uniquely identifies this record in the target database control file.
STAMP | NUMBER | The STAMP value from V$BACKUP_DATAFILE. RECID and STAMP form a concatenated primary key that uniquely identifies this record in the target database control file.
BS_KEY | NUMBER | The primary key of the backup set to which this record belongs in the recovery catalog. Use this column to form a join with RC_BACKUP_SET.
SET_STAMP | NUMBER | The SET_STAMP value from V$BACKUP_SET. SET_STAMP and SET_COUNT form a concatenated key that uniquely identifies the backup set to which this record belongs in the target database control file.
SET_COUNT | NUMBER | The SET_COUNT value from V$BACKUP_SET. SET_STAMP and SET_COUNT form a concatenated key that uniquely identifies the backup set to which this record belongs in the target database control file.
RESETLOGS_CHANGE# | NUMBER | The SCN of the most recent RESETLOGS when the record was created.
RESETLOGS_TIME | DATE | The time stamp of the most recent RESETLOGS when the record was created.
CHECKPOINT_CHANGE# | NUMBER | The control file checkpoint SCN.
CHECKPOINT_TIME | DATE | The control file checkpoint time.
CREATION_TIME# | DATE | The control file creation time.
BLOCK_SIZE | NUMBER | The size of the blocks in bytes.
OLDEST_OFFLINE_RANGE | NUMBER | Internal use only.
STATUS | VARCHAR2(1) | The status of the backup set: A (available), U (unavailable), or D (deleted).
BS_RECID | NUMBER | The control file RECID of the backup set that contains this backup control file.
BS_STAMP | NUMBER | The control file stamp of the backup set that contains this backup control file.
BS_LEVEL | NUMBER | The incremental level (NULL, 0, 1, 2) of the backup set that contains this backup control file. Although an incremental backup set can contain the control file, it is always contains a complete copy of the control file. There is no such thing as an incremental control file backup.
COMPLETION_TIME | DATE | The date that the control file backup completed.
CONTROLFILE_TYPE | VARCHAR2(1) | The type of control file backup: B (normal backup) or S (standby backup).
AUTOBACKUP_DATE | DATE | The date of the control file autobackup.
AUTOBACKUP_SEQ | NUMBER | The sequence of the control file autobackup: 1 - 255.
RC_BACKUP_CORRUPTION

This view lists corrupt block ranges in datafile backups. It corresponds to the V$BACKUP_CORRUPTION view in the control file. Note that corruptions are not tolerated in control file and archived redo log backups.

<table>
<thead>
<tr>
<th>Column</th>
<th>Datatype</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DB_KEY</td>
<td>NUMBER</td>
<td>The primary key for the target database. Use this column to form a join with almost any other catalog view.</td>
</tr>
<tr>
<td>DBINC_KEY</td>
<td>NUMBER</td>
<td>The primary key for the incarnation of the target database. Use this column to form a join with RC_DATABASE_INCARNATION.</td>
</tr>
<tr>
<td>DB_NAME</td>
<td>VARCHAR2(8)</td>
<td>The DB_NAME of the database incarnation to which this record belongs.</td>
</tr>
<tr>
<td>RECID</td>
<td>NUMBER</td>
<td>The record identifier from V$BACKUP_CORRUPTION. RECID and STAMP form a concatenated primary key that uniquely identifies this record in the target database control file.</td>
</tr>
<tr>
<td>STAMP</td>
<td>NUMBER</td>
<td>The stamp propagated from V$BACKUP_CORRUPTION. RECID and STAMP form a concatenated primary key that uniquely identifies this record in the target database control file.</td>
</tr>
<tr>
<td>BS_KEY</td>
<td>NUMBER</td>
<td>The primary key of the backup set to which this record belongs in the recovery catalog. Use this column to form a join with RC_BACKUP_SET.</td>
</tr>
<tr>
<td>SET_STAMP</td>
<td>NUMBER</td>
<td>The SET_STAMP value from V$BACKUP_SET. SET_STAMP and SET_COUNT form a concatenated key that uniquely identifies the backup set to which this record belongs in the target database control file.</td>
</tr>
<tr>
<td>SET_COUNT</td>
<td>NUMBER</td>
<td>The SET_COUNT value from V$BACKUP_SET. SET_STAMP and SET_COUNT form a concatenated key that uniquely identifies the backup set to which this record belongs in the target database control file.</td>
</tr>
<tr>
<td>PIECE#</td>
<td>NUMBER</td>
<td>The backup piece that contains this corrupt block.</td>
</tr>
<tr>
<td>BDF_KEY</td>
<td>NUMBER</td>
<td>The primary key for the datafile backup or copy in the recovery catalog. Use this key to join with RC_BACKUP_DATAFILE. If you issue the LIST command while connected to the recovery catalog, this value appears in the KEY column of the output.</td>
</tr>
<tr>
<td>BDF_RECID</td>
<td>NUMBER</td>
<td>The RECID value from V$BACKUP_DATAFILE.</td>
</tr>
<tr>
<td>BDF_STAMP</td>
<td>NUMBER</td>
<td>The STAMP value from V$BACKUP_DATAFILE.</td>
</tr>
<tr>
<td>FILE#</td>
<td>NUMBER</td>
<td>The absolute file number for the datafile that contains the corrupt blocks.</td>
</tr>
<tr>
<td>CREATION_CHANGE#</td>
<td>NUMBER</td>
<td>The creation SCN of the datafile containing the corrupt blocks.</td>
</tr>
<tr>
<td>BLOCK#</td>
<td>NUMBER</td>
<td>The block number of the first corrupted block in this range of corrupted blocks.</td>
</tr>
<tr>
<td>BLOCKS</td>
<td>NUMBER</td>
<td>The number of corrupted blocks found beginning with BLOCK#.</td>
</tr>
<tr>
<td>CORRUPTION_CHANGE#</td>
<td>NUMBER</td>
<td>For media corrupt blocks, this value is zero. For logically corrupt blocks, this value is the lowest SCN in the blocks in this corrupt range.</td>
</tr>
</tbody>
</table>
This view lists information about datafiles in backup sets. It corresponds to the `V$BACKUP_DATAFILE` view. A backup datafile is uniquely identified by `BDF_KEY`.

<table>
<thead>
<tr>
<th>Column</th>
<th>Datatype</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DB_KEY</td>
<td>NUMBER</td>
<td>The primary key for the target database. Use this column to form a join with almost any other catalog view.</td>
</tr>
<tr>
<td>DBINC_KEY</td>
<td>NUMBER</td>
<td>The primary key for the incarnation of the target database. Use this column to form a join with <code>RC_DATABASE_INCARNATION</code>.</td>
</tr>
<tr>
<td>DB_NAME</td>
<td>VARCHAR2(8)</td>
<td>The <code>DB_NAME</code> of the database incarnation to which this record belongs.</td>
</tr>
<tr>
<td>BDF_KEY</td>
<td>NUMBER</td>
<td>The primary key of the datafile backup in the recovery catalog. If you issue the <code>LIST</code> command while connected to the recovery catalog, this value appears in the <code>KEY</code> column of the output.</td>
</tr>
<tr>
<td>RECID</td>
<td>NUMBER</td>
<td>The backup datafile <code>RECID</code> from <code>V$BACKUP_DATAFILE</code>. <code>RECID</code> and <code>STAMP</code> form a concatenated primary key that uniquely identifies this record in the target database control file.</td>
</tr>
<tr>
<td>STAMP</td>
<td>NUMBER</td>
<td>The backup datafile <code>STAMP</code> from <code>V$BACKUP_DATAFILE</code>. <code>RECID</code> and <code>STAMP</code> form a concatenated primary key that uniquely identifies this record in the target database control file.</td>
</tr>
<tr>
<td>BS_KEY</td>
<td>NUMBER</td>
<td>The primary key of the backup set to which this record belongs in the recovery catalog. Use this column to form a join with <code>RC_BACKUP_SET</code>.</td>
</tr>
<tr>
<td>SET_STAMP</td>
<td>NUMBER</td>
<td>The <code>SET_STAMP</code> value from <code>V$BACKUP_SET</code>. <code>SET_STAMP</code> and <code>SET_COUNT</code> form a concatenated key that uniquely identifies the backup set to which this record belongs in the target database control file.</td>
</tr>
<tr>
<td>SET_COUNT</td>
<td>NUMBER</td>
<td>The <code>SET_COUNT</code> value from <code>V$BACKUP_SET</code>. <code>SET_STAMP</code> and <code>SET_COUNT</code> form a concatenated key that uniquely identifies the backup set to which this record belongs in the target database control file.</td>
</tr>
<tr>
<td>BS_RECID</td>
<td>NUMBER</td>
<td>The <code>RECID</code> from <code>V$BACKUP_SET</code>.</td>
</tr>
<tr>
<td>BS_STAMP</td>
<td>NUMBER</td>
<td>The <code>STAMP</code> from <code>V$BACKUP_SET</code>.</td>
</tr>
<tr>
<td>Column</td>
<td>Datatype</td>
<td>Description</td>
</tr>
<tr>
<td>---------------------</td>
<td>------------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>BACKUP_TYPE</td>
<td>VARCHAR2 (1)</td>
<td>The type of the backup: D (full or level 0 incremental) or I (incremental level 1 or higher).</td>
</tr>
<tr>
<td>INCREMENTAL_LEVEL</td>
<td>NUMBER</td>
<td>The level of the incremental backup: NULL or 0 - 4.</td>
</tr>
<tr>
<td>COMPLETION_TIME</td>
<td>DATE</td>
<td>The completion time of the backup.</td>
</tr>
<tr>
<td>FILE#</td>
<td>NUMBER</td>
<td>The absolute file number of the datafile.</td>
</tr>
<tr>
<td>CREATION_CHANGE#</td>
<td>NUMBER</td>
<td>The creation SCN of the datafile.</td>
</tr>
<tr>
<td>RESETLOGS_CHANGE#</td>
<td>NUMBER</td>
<td>The SCN of the most recent RESETLOGS in the datafile header.</td>
</tr>
<tr>
<td>RESETLOGS_TIME</td>
<td>DATE</td>
<td>The time stamp of the most recent RESETLOGS in the datafile header.</td>
</tr>
<tr>
<td>INCREMENTAL_CHANGE#</td>
<td>NUMBER</td>
<td>The SCN that determines whether a block will be included in the incremental backup. A block is only included if the SCN in the block header is greater than or equal to INCREMENTAL_CHANGE#. The range of redo covered by the incremental backup begins with INCREMENTAL_CHANGE# and ends with CHECKPOINT_CHANGE#.</td>
</tr>
<tr>
<td>CHECKPOINT_CHANGE#</td>
<td>NUMBER</td>
<td>The checkpoint SCN of this datafile in this backup set.</td>
</tr>
<tr>
<td>CHECKPOINT_TIME</td>
<td>DATE</td>
<td>The time associated with CHECKPOINT_CHANGE#.</td>
</tr>
<tr>
<td>ABSOLUTE_FUZZY_CHANGE#</td>
<td>NUMBER</td>
<td>The absolute fuzzy SCN.</td>
</tr>
<tr>
<td>DATAFILE_BLOCKS</td>
<td>NUMBER</td>
<td>The number of data blocks in the datafile.</td>
</tr>
<tr>
<td>BLOCKS</td>
<td>NUMBER</td>
<td>The number of data blocks written to the backup. This value is often less than DATAFILE_BLOCKS because for full backups, blocks that have never been used are not included in the backup, and for incremental backups, blocks that have not changed are not included in the backup. This value is never greater than DATAFILE_BLOCKS.</td>
</tr>
<tr>
<td>BLOCK_SIZE</td>
<td>NUMBER</td>
<td>The size of the data blocks in bytes.</td>
</tr>
<tr>
<td>STATUS</td>
<td>VARCHAR2 (1)</td>
<td>The status of the backup set: A (all pieces available), D (all pieces deleted), O (some pieces are available but others are not, so the backup set is unusable).</td>
</tr>
<tr>
<td>BS_LEVEL</td>
<td>NUMBER</td>
<td>The incremental level (NULL or 0-4) specified when this backup was created. This value can be different from the INCREMENTAL_LEVEL column because if you run, for example, a level 2 incremental backup, but no previous level 0 backup exists for some files, a level 0 backup is automatically taken for these files. In this case, BS_LEVEL is 2 and INCREMENTAL_LEVEL is 0.</td>
</tr>
<tr>
<td>PIECES</td>
<td>NUMBER</td>
<td>The number of backup pieces in the backup set that contains this backup datafile.</td>
</tr>
</tbody>
</table>
This view lists information about backup pieces. This view corresponds to the `V$BACKUP_PIECE` view. Each backup set contains one or more backup pieces. Multiple copies of the same backup piece can exist, but each copy has its own record in the control file and its own row in the view.

<table>
<thead>
<tr>
<th>Column</th>
<th>Datatype</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DB_KEY</td>
<td>NUMBER</td>
<td>The primary key for the target database. Use this column to form a join with almost any other catalog view.</td>
</tr>
<tr>
<td>DB_ID</td>
<td>NUMBER</td>
<td>The database identifier.</td>
</tr>
<tr>
<td>BP_KEY</td>
<td>NUMBER</td>
<td>The primary key for the backup piece in the recovery catalog. If you issue the LIST command while connected to the recovery catalog, this value appears in the KEY column of the output.</td>
</tr>
<tr>
<td>RECID</td>
<td>NUMBER</td>
<td>The backup piece RECID from <code>V$BACKUP_PIECE</code>. RECID and STAMP form a concatenated primary key that uniquely identifies this record in the target database control file.</td>
</tr>
<tr>
<td>STAMP</td>
<td>NUMBER</td>
<td>The backup piece stamp propagated from <code>V$BACKUP_PIECE</code>. RECID and STAMP form a concatenated primary key that uniquely identifies this record in the target database control file.</td>
</tr>
<tr>
<td>BS_KEY</td>
<td>NUMBER</td>
<td>The primary key of the backup set to which this record belongs in the recovery catalog. Use this column to form a join with <code>RC_BACKUP_SET</code>.</td>
</tr>
<tr>
<td>SET_STAMP</td>
<td>NUMBER</td>
<td>The SET_STAMP value from <code>V$BACKUP_SET</code>. SET_STAMP and SET_COUNT form a concatenated key that uniquely identifies the backup set to which this record belongs in the target database control file.</td>
</tr>
<tr>
<td>SET_COUNT</td>
<td>NUMBER</td>
<td>The SET_COUNT value from <code>V$BACKUP_SET</code>. SET_STAMP and SET_COUNT form a concatenated key that uniquely identifies the backup set to which this record belongs in the target database control file.</td>
</tr>
<tr>
<td>BACKUP_TYPE</td>
<td>VARCHAR2 (1)</td>
<td>The type of the backup: D (full or level 0 incremental), I (incremental level 1 or higher), L (archived redo log).</td>
</tr>
<tr>
<td>INCREMENTAL_LEVEL</td>
<td>NUMBER</td>
<td>The level of the incremental backup: NULL or 0 - 4.</td>
</tr>
<tr>
<td>PIECE#</td>
<td>NUMBER</td>
<td>The number of the backup piece. The first piece has the value of 1.</td>
</tr>
<tr>
<td>COPY#</td>
<td>NUMBER</td>
<td>The copy number of the backup piece.</td>
</tr>
<tr>
<td>DEVICE_TYPE</td>
<td>VARCHAR2 (255)</td>
<td>The type of backup device, for example, DISK.</td>
</tr>
<tr>
<td>HANDLE</td>
<td>VARCHAR2 (1024)</td>
<td>The filename of the backup piece.</td>
</tr>
<tr>
<td>COMMENTS</td>
<td>VARCHAR2 (255)</td>
<td>Comments about the backup piece.</td>
</tr>
<tr>
<td>MEDIA</td>
<td>VARCHAR2 (80)</td>
<td>A comment that contains further information about the media manager that created this backup.</td>
</tr>
<tr>
<td>MEDIA_POOL</td>
<td>NUMBER</td>
<td>The number of the media pool in which the backup is stored.</td>
</tr>
</tbody>
</table>
This view lists information about archived redo logs in backup sets. It corresponds to the V$BACKUP_REDOLOG view.

You cannot back up online logs directly: you must first archive them to disk and then back them up. An archived log backup set contains one or more archived logs.

<table>
<thead>
<tr>
<th>Column</th>
<th>Datatype</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CONCUR</td>
<td>VARCHAR2 (3)</td>
<td>Specifies whether backup media supports concurrent access: YES or NO.</td>
</tr>
<tr>
<td>TAG</td>
<td>VARCHAR2 (32)</td>
<td>The user-specified tag for the backup piece.</td>
</tr>
<tr>
<td>START_TIME</td>
<td>DATE</td>
<td>The time when RMAN started to write the backup piece.</td>
</tr>
<tr>
<td>COMPLETION_TIME</td>
<td>DATE</td>
<td>The time when the backup piece was completed.</td>
</tr>
<tr>
<td>ELAPSED SECONDS</td>
<td>NUMBER</td>
<td>The duration of the creation of the backup piece.</td>
</tr>
<tr>
<td>STATUS</td>
<td>VARCHAR2 (1)</td>
<td>The status of the backup piece: A (available), U (unavailable), D (deleted), or X (expired). Note that status D will not appear in Oracle9i unless an older recovery catalog is upgraded.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Column</th>
<th>Datatype</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DB_KEY</td>
<td>NUMBER</td>
<td>The primary key for the target database. Use this column to form a join with almost any other catalog view.</td>
</tr>
<tr>
<td>DBINC_KEY</td>
<td>NUMBER</td>
<td>The primary key for the incarnation of the target database. Use this column to form a join with RC_DATABASE_INCARNATION.</td>
</tr>
<tr>
<td>DB_NAME</td>
<td>VARCHAR2 (8)</td>
<td>The DB_NAME of the database incarnation to which this record belongs.</td>
</tr>
<tr>
<td>BRLO_KEY</td>
<td>NUMBER</td>
<td>The primary key of the archived redo log in the recovery catalog. If you issue the LIST command while connected to the recovery catalog, this value appears in the KEY column of the output.</td>
</tr>
<tr>
<td>RECID</td>
<td>NUMBER</td>
<td>The record identifier propagated from V$BACKUP_REDOLOG.RECID and STAMP form a concatenated primary key that uniquely identifies this record in the target database control file.</td>
</tr>
<tr>
<td>STAMP</td>
<td>NUMBER</td>
<td>The stamp from V$BACKUP_REDOLOG.RECID and STAMP form a concatenated primary key that uniquely identifies this record in the target database control file.</td>
</tr>
<tr>
<td>BS_KEY</td>
<td>NUMBER</td>
<td>The primary key of the backup set to which this record belongs in the recovery catalog. Use this column to form a join with RC_BACKUP_SET.</td>
</tr>
<tr>
<td>SET_STAMP</td>
<td>NUMBER</td>
<td>The SET_STAMP value from V$BACKUP_SET.SET_STAMP and SET_COUNT form a concatenated key that uniquely identifies the backup set to which this record belongs in the target database control file.</td>
</tr>
</tbody>
</table>
This view lists information about backup sets for all incarnations of the database. It corresponds to the V$BACKUP_SET view. A backup set record is inserted after the backup has successfully completed.

<table>
<thead>
<tr>
<th>Column</th>
<th>Datatype</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DB_KEY</td>
<td>NUMBER</td>
<td>The primary key for the target database. Use this column to form a join</td>
</tr>
<tr>
<td>DB_ID</td>
<td>NUMBER</td>
<td>with almost any other catalog view.</td>
</tr>
</tbody>
</table>

**RC_BACKUP_SET**

This view lists information about backup sets for all incarnations of the database. It corresponds to the V$BACKUP_SET view. A backup set record is inserted after the backup has successfully completed.

<table>
<thead>
<tr>
<th>Column</th>
<th>Datatype</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SET_COUNT</td>
<td>NUMBER</td>
<td>The SET_COUNT value from V$BACKUP_SET. SET_STAMP and SET_COUNT form a</td>
</tr>
<tr>
<td></td>
<td></td>
<td>concatenated key that uniquely identifies the backup set to which this</td>
</tr>
<tr>
<td></td>
<td></td>
<td>record belongs in the target database control file.</td>
</tr>
<tr>
<td>BACKUP_TYPE</td>
<td>VARCHAR2(1)</td>
<td>The type of the backup: L (archived redo log).</td>
</tr>
<tr>
<td>COMPLETION_TIME</td>
<td>DATE</td>
<td>The time when the backup completed.</td>
</tr>
<tr>
<td>THREAD#</td>
<td>NUMBER</td>
<td>The thread number of the redo log.</td>
</tr>
<tr>
<td>SEQUENCE#</td>
<td>NUMBER</td>
<td>The log sequence number.</td>
</tr>
<tr>
<td>RESETLOGS_CHANGE#</td>
<td>NUMBER</td>
<td>The SCN of the most recent RESETLOGS when the record was created.</td>
</tr>
<tr>
<td>RESETLOGS_TIME</td>
<td>DATE</td>
<td>The time stamp of the most recent RESETLOGS when the record was created.</td>
</tr>
<tr>
<td>FIRST_CHANGE#</td>
<td>NUMBER</td>
<td>The SCN generated when Oracle switched into the redo log.</td>
</tr>
<tr>
<td>FIRST_TIME</td>
<td>DATE</td>
<td>The time when Oracle switched into the redo log.</td>
</tr>
<tr>
<td>NEXT_CHANGE#</td>
<td>NUMBER</td>
<td>The first SCN of the next redo log in the thread.</td>
</tr>
<tr>
<td>NEXT_TIME</td>
<td>DATE</td>
<td>The first time stamp of the next redo log in the thread.</td>
</tr>
<tr>
<td>BLOCKS</td>
<td>NUMBER</td>
<td>The number of operating system blocks written to the backup.</td>
</tr>
<tr>
<td>BLOCK_SIZE</td>
<td>NUMBER</td>
<td>The number of bytes in each block of this redo log.</td>
</tr>
<tr>
<td>STATUS</td>
<td>VARCHAR2(1)</td>
<td>The status of the backup set: A (all pieces available), D (all pieces</td>
</tr>
<tr>
<td></td>
<td></td>
<td>deleted), O (some pieces are available but others are not, so the backup</td>
</tr>
<tr>
<td></td>
<td></td>
<td>set is unusable).</td>
</tr>
<tr>
<td>BS_RECID</td>
<td>NUMBER</td>
<td>The RECID value from V$BACKUP_SET.</td>
</tr>
<tr>
<td>BS_STAMP</td>
<td>NUMBER</td>
<td>The STAMP value from V$BACKUP_SET. Note that BS_STAMP is different from</td>
</tr>
<tr>
<td></td>
<td></td>
<td>SET_STAMP. BS_STAMP is the stamp of the backup set record when created</td>
</tr>
<tr>
<td></td>
<td></td>
<td>in the control file, whereas SET_STAMP joins with SET_COUNT to make a</td>
</tr>
<tr>
<td></td>
<td></td>
<td>unique identifier.</td>
</tr>
<tr>
<td>PIECES</td>
<td>NUMBER</td>
<td>The number of pieces in the backup set.</td>
</tr>
<tr>
<td>Column</td>
<td>Datatype</td>
<td>Description</td>
</tr>
<tr>
<td>---------------</td>
<td>-------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>BS_KEY</td>
<td>NUMBER</td>
<td>The primary key of the backup set in the recovery catalog. If you issue the LIST command while connected to the recovery catalog, this value appears in the KEY column of the output.</td>
</tr>
<tr>
<td>RECID</td>
<td>NUMBER</td>
<td>The backup set RECID from V$BACKUP_SET. RECID and STAMP form a concatenated primary key that uniquely identifies this record in the target database control file. Use either RECID and STAMP or SET_STAMP and SET_COUNT to access V$BACKUP_SET.</td>
</tr>
<tr>
<td>STAMP</td>
<td>NUMBER</td>
<td>The backup set STAMP from V$BACKUP_SET. RECID and STAMP form a concatenated primary key that uniquely identifies this record in the target database control file. Use either RECID and STAMP or SET_STAMP and SET_COUNT to access V$BACKUP_SET.</td>
</tr>
<tr>
<td>SET_STAMP</td>
<td>NUMBER</td>
<td>The SET_STAMP value from V$BACKUP_SET. SET_STAMP and SET_COUNT form a concatenated key that uniquely identifies this record in the target database control file. Use either RECID and STAMP or SET_STAMP and SET_COUNT to access V$BACKUP_SET.</td>
</tr>
<tr>
<td>SET_COUNT</td>
<td>NUMBER</td>
<td>The SET_COUNT value from V$BACKUP_SET. SET_STAMP and SET_COUNT form a concatenated key that uniquely identifies this record in the target database control file. Use either RECID and STAMP or SET_STAMP and SET_COUNT to access V$BACKUP_SET.</td>
</tr>
<tr>
<td>BACKUP_TYPE</td>
<td>VARCHAR2 (1)</td>
<td>The type of the backup: D (full backup or level 0 incremental), I (incremental of level 1 or higher), L (archived redo log).</td>
</tr>
<tr>
<td>INCREMENTAL_LEVEL</td>
<td>NUMBER</td>
<td>The level of the incremental backup: NULL or 0 - 4.</td>
</tr>
<tr>
<td>PIECES</td>
<td>NUMBER</td>
<td>The number of backup pieces in the backup set.</td>
</tr>
<tr>
<td>START_TIME</td>
<td>DATE</td>
<td>The time when the backup began.</td>
</tr>
<tr>
<td>COMPLETION_TIME</td>
<td>DATE</td>
<td>The time when the backup completed.</td>
</tr>
<tr>
<td>ELAPSED_SECONDS</td>
<td>NUMBER</td>
<td>The duration of the backup in seconds.</td>
</tr>
<tr>
<td>STATUS</td>
<td>VARCHAR2 (1)</td>
<td>The status of the backup set: A (all backup pieces available), D (all backup pieces deleted), 0 (some backup pieces are available but others are not, so the backup set is unusable).</td>
</tr>
<tr>
<td>CONTROLFILE_INCLUDED</td>
<td>VARCHAR2 (1)</td>
<td>Possible values are NONE (backup set does not include a backup control file), BACKUP (backup set includes a normal backup control file), and STANDBY (backup set includes a standby control file).</td>
</tr>
<tr>
<td>INPUT_FILE_SCAN_ONLY</td>
<td>VARCHAR2 (3)</td>
<td>This backup set record was created by the BACKUP VALIDATE command. No real backup set exists. This record is only a placeholder used to keep track of which datafiles were scanned and which corrupt blocks (if any) were found in those files.</td>
</tr>
<tr>
<td>KEEP</td>
<td>VARCHAR2 (3)</td>
<td>Indicates whether this backup set has a retention policy different from the value for CONFIGURE RETENTION POLICY. Possible values are YES and NO.</td>
</tr>
</tbody>
</table>
**RC_CHECKPOINT**

This view is deprecated. See **RC_RESYNC** on page 3-26 instead.

**RC_CONTROLFILE_COPY**

This view lists information about control file copies on disk. A datafile copy record with a file number of 0 represents the control file copy in **V$DATAFILE_COPY**.

<table>
<thead>
<tr>
<th>Column</th>
<th>Datatype</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DB_KEY</td>
<td>NUMBER</td>
<td>The primary key for the target database. Use this column to form a join with almost any other catalog view.</td>
</tr>
<tr>
<td>DBINC_KEY</td>
<td>NUMBER</td>
<td>The primary key for the incarnation of the target database. Use this column to form a join with <strong>RC_DATABASE_INCARNATION</strong>.</td>
</tr>
<tr>
<td>DB_NAME</td>
<td>VARCHAR2(8)</td>
<td>The <strong>DB_NAME</strong> of the database incarnation to which this record belongs.</td>
</tr>
<tr>
<td>CCF_KEY</td>
<td>NUMBER</td>
<td>The primary key of the control file copy in the recovery catalog. If you issue the LIST command while connected to the recovery catalog, this value appears in the KEY column of the output.</td>
</tr>
<tr>
<td>RECID</td>
<td>NUMBER</td>
<td>The record identifier from <strong>V$DATAFILE_COPY.RECID</strong> and <strong>STAMP</strong> form a concatenated primary key that uniquely identifies this record in the target database control file.</td>
</tr>
<tr>
<td>STAMP</td>
<td>NUMBER</td>
<td>The stamp from <strong>V$DATAFILE_COPY.RECID</strong> and <strong>STAMP</strong> form a concatenated primary key that uniquely identifies this record in the target database control file.</td>
</tr>
<tr>
<td>NAME</td>
<td>VARCHAR2(1024)</td>
<td>The control file copy filename.</td>
</tr>
<tr>
<td>TAG</td>
<td>VARCHAR2(32)</td>
<td>The tag of the control file copy. NULL if no tag used.</td>
</tr>
<tr>
<td>RESETLOGS_CHANGE#</td>
<td>NUMBER</td>
<td>The SCN of the most recent RESETLOGS when the record was created.</td>
</tr>
<tr>
<td>RESETLOGS_TIME</td>
<td>DATE</td>
<td>The time stamp of the most recent RESETLOGS when the record was created.</td>
</tr>
</tbody>
</table>
RC_COPY_CORRUPTION

This view lists corrupt block ranges in datafile copies. It corresponds to the V$COPY_CORRUPTION view.

<table>
<thead>
<tr>
<th>Column</th>
<th>Datatype</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHECKPOINT_CHANGE#</td>
<td>NUMBER</td>
<td>The control file checkpoint SCN.</td>
</tr>
<tr>
<td>CHECKPOINT_TIME</td>
<td>DATE</td>
<td>The control file checkpoint time.</td>
</tr>
<tr>
<td>CREATION_TIME</td>
<td>DATE</td>
<td>The control file creation time.</td>
</tr>
<tr>
<td>BLOCK_SIZE</td>
<td>NUMBER</td>
<td>The block size in bytes.</td>
</tr>
<tr>
<td>MIN_OFFR_RECID</td>
<td>NUMBER</td>
<td>Internal use only.</td>
</tr>
<tr>
<td>OLDEST_OFFLINE_RANGE</td>
<td>NUMBER</td>
<td>Internal use only.</td>
</tr>
<tr>
<td>COMPLETION_TIME</td>
<td>DATE</td>
<td>The time when the copy was generated.</td>
</tr>
<tr>
<td>STATUS</td>
<td>VARCHAR2(1)</td>
<td>The status of the copy: A (available), U (unavailable), X (expired), or D (deleted).</td>
</tr>
<tr>
<td>KEEP</td>
<td>VARCHAR2(3)</td>
<td>Indicates whether this copy has a retention policy different from the value for CONFIGURE RETENTION POLICY. Possible values are YES and NO.</td>
</tr>
<tr>
<td>KEEP_OPTIONS</td>
<td>VARCHAR2(10)</td>
<td>The KEEP options specified for this control file copy. Options can be LOGS (RMAN keeps the logs needed to recover this backup), NOLOGS (RMAN does not keep the logs needed to recover this backup), or NULL (the backup has no KEEP options and will be made obsolete based on the retention policy).</td>
</tr>
<tr>
<td>KEEP_UNTIL</td>
<td>DATE</td>
<td>If the KEEP UNTIL TIME clause of the COPY command was specified, then this column shows the date after which this file becomes obsolete. If the column is NULL and KEEP OPTIONS is not NULL, the file never becomes obsolete.</td>
</tr>
<tr>
<td>CONTROLFILE_TYPE</td>
<td>VARCHAR2(1)</td>
<td>The type of control file copy: B (normal copy) or S (standby copy).</td>
</tr>
</tbody>
</table>

RC_COPY_CORRUPTION

This view lists corrupt block ranges in datafile copies. It corresponds to the V$COPY_CORRUPTION view.

<table>
<thead>
<tr>
<th>Column</th>
<th>Datatype</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DB_KEY</td>
<td>NUMBER</td>
<td>The primary key for the target database. Use this column to form a join with almost any other catalog view.</td>
</tr>
<tr>
<td>DBINC_KEY</td>
<td>NUMBER</td>
<td>The primary key for the incarnation of the target database. Use this column to form a join with RC_DATABASE_INCARNATION.</td>
</tr>
<tr>
<td>DB_NAME</td>
<td>VARCHAR2(8)</td>
<td>The DB_NAME of the database incarnation to which this record belongs.</td>
</tr>
<tr>
<td>RECID</td>
<td>NUMBER</td>
<td>The record identifier from V$COPY_CORRUPTION. RECID and STAMP form a concatenated primary key that uniquely identifies this record in the target database control file.</td>
</tr>
</tbody>
</table>
**RC_DATABASE**

This view gives information about the databases registered in the recovery catalog. It corresponds to the V$DATABASE view.

<table>
<thead>
<tr>
<th>Column</th>
<th>Datatype</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DB_KEY</td>
<td>NUMBER</td>
<td>The primary key for the database. Use this column to form a join with almost any other catalog view.</td>
</tr>
<tr>
<td>DBINC_KEY</td>
<td>NUMBER</td>
<td>The primary key for the current incarnation. Use this column to form a join with RC_DATABASE_INCARNATION.</td>
</tr>
<tr>
<td>DBID</td>
<td>NUMBER</td>
<td>Unique identifier for the database obtained from V$DATABASE.</td>
</tr>
<tr>
<td>NAME</td>
<td>VARCHAR2 (8)</td>
<td>The DB_NAME of the database for the current incarnation.</td>
</tr>
<tr>
<td>RESETLOGS_CHANGE#</td>
<td>NUMBER</td>
<td>The SCN of the most recent RESETLOGS operation when the record was created.</td>
</tr>
<tr>
<td>RESETLOGS_TIME</td>
<td>DATE</td>
<td>The time stamp of the most recent RESETLOGS operation when the record was created.</td>
</tr>
</tbody>
</table>
**RC_DATABASE_INCARNATION**

This view lists information about all database incarnations registered in the recovery catalog. Oracle creates a new incarnation whenever you open a database with the **RESETLOGS** option. Records about the current and immediately previous incarnation are also contained in the **V$DATABASE** view.

<table>
<thead>
<tr>
<th>Column</th>
<th>Datatype</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DB_KEY</td>
<td>NUMBER</td>
<td>The primary key for the database. Use this column to form a join with almost any other catalog view.</td>
</tr>
<tr>
<td>DBID</td>
<td>NUMBER</td>
<td>Unique identifier for the database.</td>
</tr>
<tr>
<td>DBINC_KEY</td>
<td>NUMBER</td>
<td>The primary key for the incarnation.</td>
</tr>
<tr>
<td>NAME</td>
<td>VARCHAR2(8)</td>
<td>The <strong>DB_NAME</strong> for the database at the time of the <strong>RESETLOGS</strong>. The value is <strong>UNKNOWN</strong> if you have done at least one <strong>RESETLOGS</strong> before registering the target database with RMAN, because RMAN does not know the <strong>DB_NAME</strong> prior to the <strong>RESETLOGS</strong>.</td>
</tr>
<tr>
<td>RESETLOGS_CHANGE#</td>
<td>NUMBER</td>
<td>The SCN of the <strong>RESETLOGS</strong> operation that created this incarnation.</td>
</tr>
<tr>
<td>RESETLOGS_TIME</td>
<td>DATE</td>
<td>The time stamp of the <strong>RESETLOGS</strong> operation that created this incarnation.</td>
</tr>
<tr>
<td>CURRENT_INCARNATION</td>
<td>VARCHAR2(3)</td>
<td>YES if it is the current incarnation; NO if it is not.</td>
</tr>
<tr>
<td>PARENT_DBINC_KEY</td>
<td>NUMBER</td>
<td>The <strong>DBINC_KEY</strong> of the previous incarnation for this database. The value is <strong>NULL</strong> if it is the first incarnation recorded for the database.</td>
</tr>
</tbody>
</table>

**RC_DATAFILE**

This view lists information about all datafiles registered in the recovery catalog. It corresponds to the **V$DATAFILE** view. A datafile is shown as dropped if its tablespace was dropped.

<table>
<thead>
<tr>
<th>Column</th>
<th>Datatype</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DB_KEY</td>
<td>NUMBER</td>
<td>The primary key for the target database.</td>
</tr>
<tr>
<td>DBINC_KEY</td>
<td>NUMBER</td>
<td>The primary key for the incarnation of the target database. Use this column to form a join with <strong>RC_DATABASE_INCARNATION</strong>.</td>
</tr>
<tr>
<td>DB_NAME</td>
<td>VARCHAR2(8)</td>
<td>The <strong>DB_NAME</strong> of the database incarnation to which this record belongs.</td>
</tr>
<tr>
<td>TS#</td>
<td>NUMBER</td>
<td>The number of the tablespace to which the datafile belongs. The <strong>TS#</strong> may exist multiple times in the same incarnation if the tablespace is dropped and re-created.</td>
</tr>
<tr>
<td>TABLESPACE_NAME</td>
<td>VARCHAR2(30)</td>
<td>The tablespace name. The name may exist multiple times in the same incarnation if the tablespace is dropped and re-created.</td>
</tr>
</tbody>
</table>
### RC_DATAFILE_COPY

This view lists information about datafile copies on disk. It corresponds to the V$DATAFILE_COPY view.

<table>
<thead>
<tr>
<th>Column</th>
<th>Datatype</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>FILE#</td>
<td>NUMBER</td>
<td>The absolute file number of the datafile. The same datafile number may exist multiple times in the same incarnation if the datafile is dropped and re-created.</td>
</tr>
<tr>
<td>CREATION_CHANGE#</td>
<td>NUMBER</td>
<td>The SCN at datafile creation.</td>
</tr>
<tr>
<td>CREATION_TIME</td>
<td>DATE</td>
<td>The time of datafile creation.</td>
</tr>
<tr>
<td>DROP_CHANGE#</td>
<td>NUMBER</td>
<td>The SCN recorded when the datafile was dropped. If a new datafile with the same file number is discovered then the DROP_CHANGE# is set to CREATION_CHANGE# for the datafile; otherwise the value is set to RC_CHECKPOINT.CKP_SCN.</td>
</tr>
<tr>
<td>DROP_TIME</td>
<td>DATE</td>
<td>The time when the datafile was dropped. If a new datafile with the same file number is discovered then the DROP_TIME is set to CREATION_TIME for the datafile; otherwise the value is set to RC_CHECKPOINT.CKP_TIME.</td>
</tr>
<tr>
<td>BYTES</td>
<td>NUMBER</td>
<td>The size of the datafile in bytes.</td>
</tr>
<tr>
<td>BLOCKS</td>
<td>NUMBER</td>
<td>The size of the datafile in blocks.</td>
</tr>
<tr>
<td>BLOCK_SIZE</td>
<td>NUMBER</td>
<td>The size of the data blocks in bytes.</td>
</tr>
<tr>
<td>NAME</td>
<td>VARCHAR2(1024)</td>
<td>The datafile filename.</td>
</tr>
<tr>
<td>STOP_CHANGE#</td>
<td>NUMBER</td>
<td>For offline or read-only datafiles, the SCN value such that no changes in the redo stream at an equal or greater SCN apply to this file.</td>
</tr>
<tr>
<td>STOP_TIME</td>
<td>DATE</td>
<td>For offline normal or read-only datafiles, the time beyond which there are no changes in the redo stream that apply to this datafile.</td>
</tr>
<tr>
<td>READ_ONLY</td>
<td>NUMBER</td>
<td>1 if the file is read-only; otherwise 0.</td>
</tr>
<tr>
<td>RFILE#</td>
<td>NUMBER</td>
<td>The relative file number of this datafile within its tablespace.</td>
</tr>
<tr>
<td>INCLUDED_IN_DATABASE_</td>
<td>VARCHAR2(3)</td>
<td>Indicates whether this tablespace is included in whole database backups: YES or NO. The NO value occurs only if CONFIGURE EXCLUDE was run on the tablespace that owns this datafile.</td>
</tr>
</tbody>
</table>

### RC_DATAFILE_COPY

**Column**

**Datatype**

**Description**

<table>
<thead>
<tr>
<th>Column</th>
<th>Datatype</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DB_KEY</td>
<td>NUMBER</td>
<td>The primary key for the target database. Use this column to form a join with almost any other catalog view.</td>
</tr>
<tr>
<td>DBINC_KEY</td>
<td>NUMBER</td>
<td>The primary key for the incarnation of the target database. Use this column to form a join with RC_DATABASE_INCARNATION.</td>
</tr>
<tr>
<td>DB_NAME</td>
<td>VARCHAR2(8)</td>
<td>The DB_NAME of the database incarnation to which this record belongs.</td>
</tr>
<tr>
<td>Column</td>
<td>Datatype</td>
<td>Description</td>
</tr>
<tr>
<td>----------------------</td>
<td>---------------</td>
<td>----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>CDF_KEY</td>
<td>NUMBER</td>
<td>The primary key of the datafile copy in the recovery catalog. If you issue the LIST command while connected to the recovery catalog, this value appears in the KEY column of the output.</td>
</tr>
<tr>
<td>RECID</td>
<td>NUMBER</td>
<td>The datafile copy record from V$DATAFILE_COPY. RECID and STAMP form a concatenated primary key that uniquely identifies this record in the target database control file.</td>
</tr>
<tr>
<td>STAMP</td>
<td>NUMBER</td>
<td>The datafile copy stamp from V$DATAFILE_COPY. RECID and STAMP form a concatenated primary key that uniquely identifies this record in the target database control file.</td>
</tr>
<tr>
<td>NAME</td>
<td>VARCHAR2(1024)</td>
<td>The filename of the datafile copy.</td>
</tr>
<tr>
<td>TAG</td>
<td>VARCHAR2(32)</td>
<td>The tag for the datafile copy.</td>
</tr>
<tr>
<td>FILE#</td>
<td>NUMBER</td>
<td>The absolute file number for the datafile.</td>
</tr>
<tr>
<td>CREATION_CHANGE#</td>
<td>NUMBER</td>
<td>The creation SCN of the datafile.</td>
</tr>
<tr>
<td>RESETLOGS_CHANGE#</td>
<td>NUMBER</td>
<td>The SCN of the most recent RESETLOGS when the datafile was created.</td>
</tr>
<tr>
<td>RESETLOGS_TIME</td>
<td>DATE</td>
<td>The time stamp of the most recent RESETLOGS in the datafile header.</td>
</tr>
<tr>
<td>INCREMENTAL_LEVEL</td>
<td>NUMBER</td>
<td>The incremental level of the copy: 0 or NULL.</td>
</tr>
<tr>
<td>CHECKPOINT_CHANGE#</td>
<td>NUMBER</td>
<td>The SCN of the most recent datafile checkpoint.</td>
</tr>
<tr>
<td>CHECKPOINT_TIME</td>
<td>DATE</td>
<td>The time of the most recent datafile checkpoint.</td>
</tr>
<tr>
<td>ABSOLUTE_FUZZY_CHANGE#</td>
<td>NUMBER</td>
<td>The highest SCN in any block of the file, if known. Recovery must proceed to at least this SCN for the file to become not fuzzy.</td>
</tr>
<tr>
<td>RECOVERY_FUZZY_CHANGE#</td>
<td>NUMBER</td>
<td>The SCN to which recovery must proceed for the file to become not fuzzy. If not NULL, this file must be recovered at least to the specified SCN before the database can be opened with this file.</td>
</tr>
<tr>
<td>RECOVERY_FUZZY_TIME</td>
<td>DATE</td>
<td>The time that is associated with the RECOVERY_FUZZY_CHANGE#.</td>
</tr>
<tr>
<td>ONLINE_FUZZY</td>
<td>VARCHAR2(3)</td>
<td>YES/NO. If set to YES, this copy was made after a crash or OFFLINE IMMEDIATE (or is a copy that was taken improperly while the database was open). Recovery will need to apply all redo up to the next crash recovery marker to make the file consistent.</td>
</tr>
<tr>
<td>BACKUP_FUZZY</td>
<td>VARCHAR2(3)</td>
<td>YES/NO. If set to YES, this is a copy taken using the BEGIN BACKUP/END BACKUP technique. To make this copy consistent, Recovery needs to apply all redo up to the marker that is placed in the redo stream when the ALTER TABLESPACE END BACKUP command is used.</td>
</tr>
<tr>
<td>BLOCKS</td>
<td>NUMBER</td>
<td>The number of blocks in the datafile copy (also the size of the datafile when the copy was made).</td>
</tr>
<tr>
<td>BLOCK_SIZE</td>
<td>NUMBER</td>
<td>The size of the blocks in bytes.</td>
</tr>
<tr>
<td>COMPLETION_TIME</td>
<td></td>
<td>The time when the copy completed.</td>
</tr>
<tr>
<td>STATUS</td>
<td>VARCHAR2(1)</td>
<td>The status of the copy: A (available), U (unavailable), X (expired), or D (deleted).</td>
</tr>
</tbody>
</table>
**RC_LOG_HISTORY**

This view lists historical information about the online redo logs. RMAN adds a new row during a catalog resynchronization whenever Oracle has switched out of the online redo log. This catalog view corresponds to the V$LOG_HISTORY view.

<table>
<thead>
<tr>
<th>Column</th>
<th>Datatype</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>KEEP</td>
<td>VARCHAR2(3)</td>
<td>Indicates whether this copy has a retention policy different from the value for CONFIGURE RETENTION POLICY. Possible values are YES and NO.</td>
</tr>
<tr>
<td>KEEP_OPTIONS</td>
<td>VARCHAR2(10)</td>
<td>The KEEP options specified for this datafile copy. Options can be LOGS (RMAN keeps the logs needed to recover this backup), NOLOGS (RMAN does not keep the logs needed to recover this backup), or NULL (the backup has no KEEP options and will be made obsolete based on the retention policy).</td>
</tr>
<tr>
<td>KEEP_UNTIL</td>
<td>DATE</td>
<td>If the KEEP UNTIL TIME clause of the COPY command was specified, then this column shows the date after which this datafile copy becomes obsolete. If the column is NULL and KEEP OPTIONS is not NULL, the copy never becomes obsolete.</td>
</tr>
<tr>
<td>DB_KEY</td>
<td>NUMBER</td>
<td>The primary key for the target database. Use this column to form a join with almost any other catalog view.</td>
</tr>
<tr>
<td>DBINC_KEY</td>
<td>NUMBER</td>
<td>The primary key for the incarnation of the target database. Use this column to form a join with RC_DATABASE_INCARNATION.</td>
</tr>
<tr>
<td>DB_NAME</td>
<td>VARCHAR2(8)</td>
<td>The DB_NAME of the database incarnation to which this record belongs.</td>
</tr>
<tr>
<td>RECID</td>
<td>NUMBER</td>
<td>The redo log history RECID from V$LOG_HISTORY. RECID and STAMP form a concatenated primary key that uniquely identifies this record in the target database control file.</td>
</tr>
<tr>
<td>STAMP</td>
<td>NUMBER</td>
<td>The redo log history stamp from V$LOG_HISTORY. RECID and STAMP form a concatenated primary key that uniquely identifies this record in the target database control file.</td>
</tr>
<tr>
<td>THREAD#</td>
<td>NUMBER</td>
<td>The thread number of the online redo log.</td>
</tr>
<tr>
<td>SEQUENCE#</td>
<td>NUMBER</td>
<td>The log sequence number of the redo log.</td>
</tr>
<tr>
<td>FIRST_CHANGE#</td>
<td>NUMBER</td>
<td>The SCN generated when switching into the redo log.</td>
</tr>
<tr>
<td>FIRST_TIME</td>
<td>DATE</td>
<td>The time stamp when switching into the redo log.</td>
</tr>
<tr>
<td>NEXT_CHANGE#</td>
<td>NUMBER</td>
<td>The first SCN of the next redo log in the thread.</td>
</tr>
<tr>
<td>CLEARED</td>
<td>VARCHAR2(3)</td>
<td>YES if the redo log was cleared with the ALTER DATABASE CLEAR LOGFILE statement; otherwise, NULL. This statement allows a log to be dropped without archiving it first.</td>
</tr>
</tbody>
</table>
RC_OFFLINE_RANGE

This view lists the offline ranges for datafiles. It corresponds to the V$OFFLINE_RANGE view.

An offline range is created for a datafile when its tablespace is first altered to be offline normal or read-only, and then subsequently altered to be online or read/write. Note that no offline range is created if the datafile itself is altered to be offline or if the tablespace is altered to be offline immediate.

<table>
<thead>
<tr>
<th>Column</th>
<th>Datatype</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DB_KEY</td>
<td>NUMBER</td>
<td>The primary key for the target database. Use this column to form a join with almost any other catalog view.</td>
</tr>
<tr>
<td>DBINC_KEY</td>
<td>NUMBER</td>
<td>The primary key for the incarnation of the target database. Use this column to form a join with RC_DATABASE_INCARNATION.</td>
</tr>
<tr>
<td>DB_NAME</td>
<td>VARCHAR2(8)</td>
<td>The DB_NAME of the database incarnation to which this record belongs.</td>
</tr>
<tr>
<td>RECID</td>
<td>NUMBER</td>
<td>The record identifier for the offline range from V$OFFLINE_RANGE. RECID and STAMP form a concatenated primary key that uniquely identifies this record in the target database control file.</td>
</tr>
<tr>
<td>STAMP</td>
<td>NUMBER</td>
<td>The stamp for the offline range from V$OFFLINE_RANGE. RECID and STAMP form a concatenated primary key that uniquely identifies this record in the target database control file.</td>
</tr>
<tr>
<td>FILE#</td>
<td>NUMBER</td>
<td>The absolute file number of the datafile.</td>
</tr>
<tr>
<td>CREATION_CHANGE#</td>
<td>NUMBER</td>
<td>The SCN at datafile creation.</td>
</tr>
<tr>
<td>OFFLINE_CHANGE#</td>
<td>NUMBER</td>
<td>The SCN taken when the datafile was taken offline.</td>
</tr>
<tr>
<td>ONLINE_CHANGE#</td>
<td>NUMBER</td>
<td>The online checkpoint SCN.</td>
</tr>
<tr>
<td>ONLINE_TIME</td>
<td>DATE</td>
<td>The online checkpoint time.</td>
</tr>
<tr>
<td>CF_CREATE_TIME</td>
<td>DATE</td>
<td>The time of control file creation.</td>
</tr>
</tbody>
</table>

RC_PROXY_CONTROLFILE

This view contains descriptions of control file backups that were taken using the proxy copy functionality. It corresponds to the V$PROXY_DATAFILE view.

In a proxy copy, the media manager takes over the operations of backing up and restoring data. Each row represents a backup of one control file.

<table>
<thead>
<tr>
<th>Column</th>
<th>Datatype</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DB_KEY</td>
<td>NUMBER</td>
<td>The primary key for the target database. Use this column to form a join with almost any other catalog view.</td>
</tr>
</tbody>
</table>
## RC_PROXY_CONTROLFILE

<table>
<thead>
<tr>
<th>Column</th>
<th>Datatype</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DBINC_KEY</td>
<td>NUMBER</td>
<td>The primary key for the incarnation of the target database. Use this column to form a join with RC_DATABASE_INCARNATION.</td>
</tr>
<tr>
<td>DB_NAME</td>
<td>VARCHAR2(8)</td>
<td>The DB_NAME of the database incarnation to which this record belongs.</td>
</tr>
<tr>
<td>XCF_KEY</td>
<td>NUMBER</td>
<td>The proxy copy primary key in the recovery catalog. If you issue the LIST command while connected to the recovery catalog, this value appears in the KEY column of the output.</td>
</tr>
<tr>
<td>RECID</td>
<td>NUMBER</td>
<td>The proxy copy record identifier from V$PROXY_DATAFILE. RECID and STAMP form a concatenated primary key that uniquely identifies this record in the target database control file.</td>
</tr>
<tr>
<td>STAMP</td>
<td>NUMBER</td>
<td>The proxy copy stamp from V$PROXY_DATAFILE. RECID and STAMP form a concatenated primary key that uniquely identifies this record in the target database control file.</td>
</tr>
<tr>
<td>TAG</td>
<td>VARCHAR2(32)</td>
<td>The tag for the proxy copy.</td>
</tr>
<tr>
<td>RESETLOGS_CHANGE#</td>
<td>NUMBER</td>
<td>The RESETLOGS SCN of the database incarnation to which this datafile belongs.</td>
</tr>
<tr>
<td>RESETLOGS_TIME</td>
<td>DATE</td>
<td>The RESETLOGS time stamp of the database incarnation to which this datafile belongs.</td>
</tr>
<tr>
<td>CHECKPOINT_CHANGE#</td>
<td>NUMBER</td>
<td>Datafile checkpoint SCN when this copy was made.</td>
</tr>
<tr>
<td>CHECKPOINT_TIME</td>
<td>DATE</td>
<td>Datafile checkpoint time when this copy was made.</td>
</tr>
<tr>
<td>CREATION_TIME</td>
<td>DATE</td>
<td>The control file creation time.</td>
</tr>
<tr>
<td>BLOCK_SIZE</td>
<td>NUMBER</td>
<td>The block size for the copy in bytes.</td>
</tr>
<tr>
<td>MIN_OFFR_RECID</td>
<td>NUMBER</td>
<td>Internal use only.</td>
</tr>
<tr>
<td>OLDEST_OFFLINE_RANGE</td>
<td>NUMBER</td>
<td>Internal use only.</td>
</tr>
<tr>
<td>DEVICE_TYPE</td>
<td>VARCHAR2(255)</td>
<td>The type of sequential media device.</td>
</tr>
<tr>
<td>HANDLE</td>
<td>VARCHAR2(1024)</td>
<td>The name or “handle” for the proxy copy. RMAN passes this value to the operating system-dependent layer that identifies the file.</td>
</tr>
<tr>
<td>COMMENTS</td>
<td>VARCHAR2(255)</td>
<td>Comments about the proxy copy.</td>
</tr>
<tr>
<td>MEDIA</td>
<td>VARCHAR2(80)</td>
<td>A comment that contains further information about the media manager that created this backup.</td>
</tr>
<tr>
<td>MEDIA_POOL</td>
<td>NUMBER</td>
<td>The number of the media pool in which the proxy copy is stored.</td>
</tr>
<tr>
<td>START_TIME</td>
<td>DATE</td>
<td>The time when proxy copy was initiated.</td>
</tr>
<tr>
<td>COMPLETION_TIME</td>
<td>DATE</td>
<td>The time when the proxy copy was completed.</td>
</tr>
<tr>
<td>ELAPSED_SECONDS</td>
<td>NUMBER</td>
<td>The duration of the proxy copy.</td>
</tr>
<tr>
<td>STATUS</td>
<td>VARCHAR2(1)</td>
<td>The status of the backup set: A (available), U (unavailable), X (expired), or D (deleted).</td>
</tr>
</tbody>
</table>
The `RC_PROXY_DATAFILE` view contains descriptions of datafile backups that were taken using the proxy copy functionality. It corresponds to the `V$PROXY_DATAFILE` view.

In a proxy copy, the media manager takes over the operations of backing up and restoring data. Each row represents a backup of one database file.

### Column Datatype Description

<table>
<thead>
<tr>
<th>Column</th>
<th>Datatype</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>KEEP</td>
<td>VARCHAR2(3)</td>
<td>Indicates whether this proxy copy has a retention policy different from the value for <code>CONFIGURE RETENTION POLICY</code>. Possible values are YES and NO.</td>
</tr>
<tr>
<td>KEEP_OPTIONS</td>
<td>VARCHAR2(10)</td>
<td>The <code>KEEP</code> options specified for this control file backup. Options can be LOGS (RMAN keeps the logs needed to recover this backup), NOLOGS (RMAN does not keep the logs needed to recover this backup), or NULL (the backup has no <code>KEEP</code> options and will be made obsolete based on the retention policy).</td>
</tr>
<tr>
<td>KEEP_UNTIL</td>
<td>DATE</td>
<td>If the <code>KEEP UNTIL TIME</code> clause of the <code>BACKUP</code> command was specified, then this column shows the date after which this control file backup becomes obsolete. If the column is NULL and <code>KEEP OPTIONS</code> is not NULL, the backup never becomes obsolete.</td>
</tr>
<tr>
<td>CONTROLFILE_TYPE</td>
<td>VARCHAR2(1)</td>
<td>The type of control file copy: B (normal copy) or S (standby copy).</td>
</tr>
</tbody>
</table>

### RC_PROXY_DATAFILE

This view contains descriptions of datafile backups that were taken using the proxy copy functionality. It corresponds to the `V$PROXY_DATAFILE` view.

In a proxy copy, the media manager takes over the operations of backing up and restoring data. Each row represents a backup of one database file.

<table>
<thead>
<tr>
<th>Column</th>
<th>Datatype</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DB_KEY</td>
<td>NUMBER</td>
<td>The primary key for the target database. Use this column to form a join with almost any other catalog view.</td>
</tr>
<tr>
<td>DBINC_KEY</td>
<td>NUMBER</td>
<td>The primary key for the incarnation of the target database. Use this column to form a join with <code>RC_DATABASE_INCARNATION</code>.</td>
</tr>
<tr>
<td>DB_NAME</td>
<td>VARCHAR2(8)</td>
<td>The <code>DB_NAME</code> of the database incarnation to which this record belongs.</td>
</tr>
<tr>
<td>XDF_KEY</td>
<td>NUMBER</td>
<td>The proxy copy primary key in the recovery catalog. If you issue the <code>LIST</code> command while connected to the recovery catalog, this value appears in the <code>KEY</code> column of the output.</td>
</tr>
<tr>
<td>RECID</td>
<td>NUMBER</td>
<td>The proxy copy record identifier from <code>V$PROXY_DATAFILE.RECID</code> and <code>STAMP</code> form a concatenated primary key that uniquely identifies this record in the target database control file.</td>
</tr>
<tr>
<td>STAMP</td>
<td>NUMBER</td>
<td>The proxy copy stamp from <code>V$PROXY_DATAFILE.RECID</code> and <code>STAMP</code> form a concatenated primary key that uniquely identifies this record in the target database control file.</td>
</tr>
<tr>
<td>TAG</td>
<td>VARCHAR2(32)</td>
<td>The tag for the proxy copy.</td>
</tr>
<tr>
<td>FILE#</td>
<td>NUMBER</td>
<td>The absolute file number of the datafile that is proxy copied.</td>
</tr>
<tr>
<td>CREATION_CHANGE#</td>
<td>NUMBER</td>
<td>The datafile creation SCN.</td>
</tr>
</tbody>
</table>
### Column Datatype Description

<table>
<thead>
<tr>
<th>Column</th>
<th>Datatype</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>RESETLOGS_CHANGE#</td>
<td>NUMBER</td>
<td>The SCN of the most recent RESETLOGS in the datafile header.</td>
</tr>
<tr>
<td>RESETLOGS_TIME</td>
<td>DATE</td>
<td>The time stamp of the most recent RESETLOGS in the datafile header.</td>
</tr>
<tr>
<td>INCREMENTAL_LEVEL</td>
<td>NUMBER</td>
<td>0 if this copy is part of an incremental backup strategy, otherwise NULL.</td>
</tr>
<tr>
<td>CHECKPOINT_CHANGE#</td>
<td>NUMBER</td>
<td>Checkpoint SCN when the copy was made.</td>
</tr>
<tr>
<td>CHECKPOINT_TIME</td>
<td>DATE</td>
<td>Checkpoint time when the copy was made.</td>
</tr>
<tr>
<td>ABSOLUTEFUZZYCHANGE#</td>
<td>NUMBER</td>
<td>The highest SCN in any block of the file, if known. Recovery must proceed to at least this SCN for the file to become not fuzzy.</td>
</tr>
<tr>
<td>RECOVERYFUZZYCHANGE#</td>
<td>NUMBER</td>
<td>The SCN to which recovery must proceed for the file to become not fuzzy. If not NULL, this file must be recovered at least to the specified SCN</td>
</tr>
<tr>
<td>RECOVERYFUZZY_TIME</td>
<td>DATE</td>
<td>The time that is associated with the RECOVERYFUZZYCHANGE#.</td>
</tr>
<tr>
<td>ONLINE_FUZZY</td>
<td>VARCHAR2 (3)</td>
<td>YES/NO. If set to YES, this copy was made after a crash or offline immediate (or is a copy of a copy which was taken improperly while the database was open). Recovery will need to apply all redo up to the next crash recovery marker to make the file consistent.</td>
</tr>
<tr>
<td>BACKUP_FUZZY</td>
<td>VARCHAR2 (3)</td>
<td>YES/NO. If set to YES, this is a copy taken using the BEGIN BACKUP/END BACKUP backup method. To make this copy consistent, recovery must apply all redo up to the marker that is placed in the redo stream when the ALTER TABLESPACE END BACKUP statement is issued.</td>
</tr>
<tr>
<td>BLOCKS</td>
<td>NUMBER</td>
<td>Size of the datafile copy in blocks (also the size of the datafile when the copy was made).</td>
</tr>
<tr>
<td>BLOCK_SIZE</td>
<td>NUMBER</td>
<td>The block size for the copy in bytes.</td>
</tr>
<tr>
<td>DEVICE_TYPE</td>
<td>VARCHAR2 (255)</td>
<td>The type of sequential media device.</td>
</tr>
<tr>
<td>HANDLE</td>
<td>VARCHAR2 (1024)</td>
<td>The name or “handle” for the proxy copy. RMAN passes this value to the operating system-dependent layer that identifies the file.</td>
</tr>
<tr>
<td>COMMENTS</td>
<td>VARCHAR2 (255)</td>
<td>Comments about the proxy copy.</td>
</tr>
<tr>
<td>MEDIA</td>
<td>VARCHAR2 (80)</td>
<td>A comment that contains further information about the media manager that created this backup.</td>
</tr>
<tr>
<td>MEDIA_POOL</td>
<td>NUMBER</td>
<td>The number of the media pool in which the proxy copy is stored.</td>
</tr>
<tr>
<td>START_TIME</td>
<td>DATE</td>
<td>The time when proxy copy was initiated.</td>
</tr>
<tr>
<td>COMPLETION_TIME</td>
<td>DATE</td>
<td>The time when the proxy copy was completed.</td>
</tr>
<tr>
<td>ELAPSED_SECONDS</td>
<td>NUMBER</td>
<td>The duration of the proxy copy.</td>
</tr>
<tr>
<td>STATUS</td>
<td>VARCHAR2 (1)</td>
<td>The status of the backup set: A (available), U (unavailable), X (expired), or D (deleted).</td>
</tr>
</tbody>
</table>
Recovery Catalog Views

RC_REDO_THREAD

This view lists information about the online redo logs for all incarnations of the database since the last catalog resynchronization. This view corresponds to a combination of the V$LOG and V$LOGFILE views.

<table>
<thead>
<tr>
<th>Column</th>
<th>Datatype</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DB_KEY</td>
<td>NUMBER</td>
<td>The primary key for the target database. Use this column to form a join with almost any other catalog view.</td>
</tr>
<tr>
<td>DBINC_KEY</td>
<td>NUMBER</td>
<td>The primary key for the incarnation of the target database. Use this column to form a join with RC_DATABASE_INCARNATION.</td>
</tr>
<tr>
<td>DB_NAME</td>
<td>VARCHAR2(8)</td>
<td>The DB_NAME of the database incarnation to which this record belongs.</td>
</tr>
<tr>
<td>THREAD#</td>
<td>NUMBER</td>
<td>The number of the redo thread.</td>
</tr>
<tr>
<td>GROUP #</td>
<td>NUMBER</td>
<td>The number of the online redo log group.</td>
</tr>
<tr>
<td>NAME</td>
<td>VARCHAR2(1024)</td>
<td>The name of the online redo log file.</td>
</tr>
</tbody>
</table>

RC_REDO_LOG

This view lists information about the online redo logs for all incarnations of the database since the last catalog resynchronization. This view corresponds to a combination of the V$LOG and V$LOGFILE views.

<table>
<thead>
<tr>
<th>Column</th>
<th>Datatype</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DB_KEY</td>
<td>NUMBER</td>
<td>The primary key for the target database. Use this column to form a join with almost any other catalog view.</td>
</tr>
<tr>
<td>DBINC_KEY</td>
<td>NUMBER</td>
<td>The primary key for the incarnation of the target database. Use this column to form a join with RC_DATABASE_INCARNATION.</td>
</tr>
<tr>
<td>DB_NAME</td>
<td>VARCHAR2(8)</td>
<td>The DB_NAME of the database incarnation to which this record belongs.</td>
</tr>
<tr>
<td>THREAD#</td>
<td>NUMBER</td>
<td>The number of the redo thread.</td>
</tr>
<tr>
<td>GROUP #</td>
<td>NUMBER</td>
<td>The number of the online redo log group.</td>
</tr>
<tr>
<td>NAME</td>
<td>VARCHAR2(1024)</td>
<td>The name of the online redo log file.</td>
</tr>
</tbody>
</table>

RC_REDO_THREAD

This view lists data about all redo threads for all incarnations of the database since the last catalog resynchronization. This view corresponds to V$THREAD.

<table>
<thead>
<tr>
<th>Column</th>
<th>Datatype</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DB_KEY</td>
<td>NUMBER</td>
<td>The primary key for the target database. Use this column to form a join with almost any other catalog view.</td>
</tr>
<tr>
<td>DBINC_KEY</td>
<td>NUMBER</td>
<td>The primary key for the incarnation of the target database. Use this column to form a join with RC_DATABASE_INCARNATION.</td>
</tr>
<tr>
<td>DB_NAME</td>
<td>VARCHAR2(8)</td>
<td>The DB_NAME of the database incarnation to which this record belongs.</td>
</tr>
<tr>
<td>THREAD#</td>
<td>NUMBER</td>
<td>The redo thread number for the database incarnation.</td>
</tr>
</tbody>
</table>
RC_RESYNC

<table>
<thead>
<tr>
<th>Column</th>
<th>Datatype</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>STATUS</td>
<td>VARCHAR2(1)</td>
<td>The status of the redo thread: D (disabled), E (enabled), or O (open).</td>
</tr>
<tr>
<td>SEQUENCE#</td>
<td>NUMBER</td>
<td>The last allocated log sequence number.</td>
</tr>
<tr>
<td>ENABLE_CHANGE#</td>
<td>NUMBER</td>
<td>The SCN at which this thread was enabled.</td>
</tr>
<tr>
<td>ENABLE_TIME</td>
<td>DATE</td>
<td>The time at which this thread was enabled.</td>
</tr>
<tr>
<td>DISABLE_CHANGE#</td>
<td>NUMBER</td>
<td>The most recent SCN at which this thread was disabled. If the thread is</td>
</tr>
<tr>
<td></td>
<td></td>
<td>still disabled, then no redo at or beyond this SCN exists for this thread.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>If the thread is now enabled, then no redo exists between the DISABLE_</td>
</tr>
<tr>
<td>DISABLE_TIME</td>
<td>DATE</td>
<td>CHANGE# and the ENABLE_CHANGE# for this thread.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>The most recent time at which this thread was disabled.</td>
</tr>
</tbody>
</table>

RC_RESYNC

This view lists information about recovery catalog resynchronizations. Every full resynchronization takes a snapshot of the target database control file and resynchronizes the recovery catalog from the snapshot.

<table>
<thead>
<tr>
<th>Column</th>
<th>Datatype</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DB_KEY</td>
<td>NUMBER</td>
<td>The primary key for the target database. Use this column to form a join</td>
</tr>
<tr>
<td></td>
<td></td>
<td>with almost any other catalog view.</td>
</tr>
<tr>
<td>DBINC_KEY</td>
<td>NUMBER</td>
<td>The primary key for the incarnation of the target database. Use this</td>
</tr>
<tr>
<td></td>
<td></td>
<td>column to form a join with RC_DATABASE_INCARNATION.</td>
</tr>
<tr>
<td>DB_NAME</td>
<td>VARCHAR2(8)</td>
<td>The DB_NAME of the database incarnation to which this record belongs.</td>
</tr>
<tr>
<td>RESYNC_KEY</td>
<td>NUMBER</td>
<td>The primary key for the resynchronization.</td>
</tr>
<tr>
<td>CONTROLFILE_CHANGE#</td>
<td>NUMBER</td>
<td>The control file checkpoint SCN from which the catalog was resynchronized.</td>
</tr>
<tr>
<td>CONTROLFILE_TIME</td>
<td>DATE</td>
<td>The control file checkpoint time stamp from which the catalog was resynchronized.</td>
</tr>
<tr>
<td>CONTROLFILE_SEQUENCE#</td>
<td>NUMBER</td>
<td>The control file sequence number.</td>
</tr>
<tr>
<td>CONTROLFILE_VERSION</td>
<td>DATE</td>
<td>The creation time for the version of the control file from which the catalog was resynchronized.</td>
</tr>
<tr>
<td>RESYNC_TYPE</td>
<td>VARCHAR2(7)</td>
<td>The type of resynchronization: FULL or PARTIAL.</td>
</tr>
<tr>
<td>DB_STATUS</td>
<td>VARCHAR2(7)</td>
<td>The status of the target database: OPEN or MOUNTED.</td>
</tr>
<tr>
<td>RESYNC_TIME</td>
<td>DATE</td>
<td>The time of the resynchronization.</td>
</tr>
</tbody>
</table>
**RC_RMAN_CONFIGURATION**

This view lists information about RMAN persistent configuration settings. It corresponds to the `V$RMAN_CONFIGURATION` view.

<table>
<thead>
<tr>
<th>Column</th>
<th>Datatype</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DB_KEY</td>
<td>NUMBER</td>
<td>The primary key for the target database corresponding to this configuration. Use this column to form a join with almost any other catalog view.</td>
</tr>
<tr>
<td>CONF#</td>
<td>NUMBER</td>
<td>A unique key identifying this configuration record within the target database that owns it.</td>
</tr>
<tr>
<td>NAME</td>
<td>VARCHAR2(65)</td>
<td>The type of configuration. All options of <code>CONFIGURE</code> command are valid types except: <code>CONFIGURE EXCLUDE</code>, (described in <code>RC_TABLESPACE</code>), <code>CONFIGURE AUXNAME</code>, (described in <code>RC_DATAFILE</code>), and <code>CONFIGURE SNAPSHOT CONTROLFILE</code> (stored only in control file).</td>
</tr>
<tr>
<td>VALUE</td>
<td>VARCHAR2(1025)</td>
<td>The <code>CONFIGURE</code> command setting. For example: <code>RETENTION POLICY TO RECOVERY WINDOW OF 1 DAYS</code>.</td>
</tr>
</tbody>
</table>

**RC_STORED_SCRIPT**

This view lists information about scripts stored in the recovery catalog. The view contains one row for each stored script.

<table>
<thead>
<tr>
<th>Column</th>
<th>Datatype</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DB_KEY</td>
<td>NUMBER</td>
<td>The primary key for the database that owns this script. Use this column to form a join with almost any other catalog view.</td>
</tr>
<tr>
<td>DB_NAME</td>
<td>VARCHAR2(8)</td>
<td>The <code>DB_NAME</code> of the database incarnation to which this record belongs.</td>
</tr>
<tr>
<td>SCRIPT_NAME</td>
<td>VARCHAR2(100)</td>
<td>The name of the script.</td>
</tr>
</tbody>
</table>

**RC_STORED_SCRIPT_LINE**

This view lists information about lines of the scripts stored in the recovery catalog. The view contains one row for each line of each stored script.

<table>
<thead>
<tr>
<th>Column</th>
<th>Datatype</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DB_KEY</td>
<td>NUMBER</td>
<td>The primary key for the database that owns this script. Use this column to form a join with almost any other catalog view.</td>
</tr>
<tr>
<td>SCRIPT_NAME</td>
<td>VARCHAR2(100)</td>
<td>The name of the stored script.</td>
</tr>
<tr>
<td>LINE</td>
<td>NUMBER</td>
<td>The number of the line in the script. The line of a script is uniquely identified by <code>SCRIPT_NAME</code> and <code>LINE</code>.</td>
</tr>
</tbody>
</table>
This view lists all tablespaces registered in the recovery catalog, all dropped tablespaces, and tablespaces that belong to old incarnations. It corresponds to the `V$TABLESPACE` view. The current value is shown for tablespace attributes.

<table>
<thead>
<tr>
<th>Column</th>
<th>Datatype</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>TEXT</td>
<td>VARCHAR2(1024)</td>
<td>The text of the line of the script.</td>
</tr>
<tr>
<td>DB_KEY</td>
<td>NUMBER</td>
<td>The primary key for the target database. Use this column to form a join with almost any other catalog view.</td>
</tr>
<tr>
<td>DBINC_KEY</td>
<td>NUMBER</td>
<td>The primary key for the incarnation of the target database. Use this column to form a join with <code>RC_DATABASE_INCARNATION</code>.</td>
</tr>
<tr>
<td>DB_NAME</td>
<td>VARCHAR2(8)</td>
<td>The <code>DB_NAME</code> of the database incarnation to which this record belongs.</td>
</tr>
<tr>
<td>TS#</td>
<td>NUMBER</td>
<td>The tablespace identifier in the target database. The TS# may exist multiple times in the same incarnation if the tablespace is dropped and re-created.</td>
</tr>
<tr>
<td>NAME</td>
<td>VARCHAR2(30)</td>
<td>The tablespace name. The name may exist multiple times in the same incarnation if the tablespace is dropped and re-created.</td>
</tr>
<tr>
<td>CREATION_CHANGE#</td>
<td>NUMBER</td>
<td>The creation SCN (from the first datafile).</td>
</tr>
<tr>
<td>CREATION_TIME</td>
<td>DATE</td>
<td>The creation time of the tablespace. NULL for offline tablespaces after creating the control file.</td>
</tr>
<tr>
<td>DROP_CHANGE#</td>
<td>NUMBER</td>
<td>The SCN recorded when the tablespace was dropped. If a new tablespace with the same TS# is discovered then the DROP_CHANGE# is set to <code>CREATION_CHANGE</code> for the tablespace; otherwise, the value is set to <code>RC_CHECKPOINT.CKP_SCN</code>.</td>
</tr>
<tr>
<td>DROP_TIME</td>
<td>DATE</td>
<td>The date when the tablespace was dropped.</td>
</tr>
<tr>
<td>INCLUDED_IN_DATABASE_BACKUP</td>
<td>VARCHAR2(3)</td>
<td>Indicates whether this tablespace is included in whole database backups: YES or NO. The YES value occurs only if <code>CONFIGURE EXCLUDE</code> was run on the tablespace that owns this datafile.</td>
</tr>
</tbody>
</table>
This appendix describes Recovery Manager syntax that is deprecated and describes preferred syntax if any exists.

Deprecated RMAN syntax continues to be supported in subsequent releases for backward compatibility. For example, the `SET AUXNAME` command replaced the `SET CLONENAME` command in release 8.1.5, and the `CONFIGURE AUXNAME` command replaced the `SET AUXNAME` command in Oracle9i, but you can continue to run both `SET CLONENAME` and `SET AUXNAME` in all subsequent RMAN releases.

<table>
<thead>
<tr>
<th>Deprecated Syntax</th>
<th>Deprecated in Release</th>
<th>Preferred Current Syntax</th>
</tr>
</thead>
<tbody>
<tr>
<td>ALLOCATE CHANNEL FOR DELETE</td>
<td>9.0.1</td>
<td>n/a</td>
</tr>
<tr>
<td>ALLOCATE CHANNEL CLONE</td>
<td>8.1.5</td>
<td>CONFIGURE AUXILIARY CHANNEL</td>
</tr>
<tr>
<td>ALLOCATE CHANNEL ... TYPE</td>
<td>9.0.1</td>
<td>CONFIGURE CHANNEL ... DEVICE TYPE</td>
</tr>
<tr>
<td>ALLOCATE CHANNEL ... KBYTES</td>
<td>9.0.1</td>
<td>CONFIGURE CHANNEL ... MAXPIECESIZE</td>
</tr>
<tr>
<td>ALLOCATE CHANNEL ... READRATE</td>
<td>9.0.1</td>
<td>CONFIGURE CHANNEL ... RATE</td>
</tr>
<tr>
<td>... ARCHIVELOG ... LOGSEQ</td>
<td>9.0.1</td>
<td>... ARCHIVELOG ... SEQUENCE</td>
</tr>
<tr>
<td>BACKUP ... SETSIZE</td>
<td>9.0.1</td>
<td>BACKUP ... MAXSETSIZE</td>
</tr>
<tr>
<td>CHANGE ... CROSSCHECK</td>
<td>9.0.1</td>
<td>CROSSCHECK</td>
</tr>
<tr>
<td>CHANGE ... DELETE</td>
<td>9.0.1</td>
<td>DELETE</td>
</tr>
<tr>
<td>CHANGE ... VALIDATE</td>
<td>8.1.5</td>
<td>CROSSCHECK</td>
</tr>
<tr>
<td>CLONE (see &quot;cmdLine&quot;)</td>
<td>8.1.5</td>
<td>AUXILIARY (see &quot;cmdLine&quot;)</td>
</tr>
<tr>
<td>CONFIGURE COMPATIBLE</td>
<td>8.1.7</td>
<td>n/a</td>
</tr>
</tbody>
</table>
### Table 3–2  Deprecated RMAN Syntax

<table>
<thead>
<tr>
<th>Deprecated Syntax</th>
<th>Deprecated in Release</th>
<th>Preferred Current Syntax</th>
</tr>
</thead>
<tbody>
<tr>
<td>CONNECT CLONE</td>
<td>8.1.5</td>
<td>CONNECT AUXILIARY</td>
</tr>
<tr>
<td>MSGLOG (see &quot;cmdLine&quot;)</td>
<td>8.1.5</td>
<td>LOG (see &quot;cmdLine&quot;)</td>
</tr>
<tr>
<td>RCVCAT (see &quot;cmdLine&quot;)</td>
<td>8.1.5</td>
<td>CATALOG (see &quot;cmdLine&quot;)</td>
</tr>
<tr>
<td>REPORT ... AT LOGSEQ</td>
<td>9.0.1</td>
<td>REPORT ... AT SEQUENCE</td>
</tr>
<tr>
<td>SET AUXNAME</td>
<td>9.0.1</td>
<td>CONFIGURE AUXNAME</td>
</tr>
<tr>
<td>SET DUPLEX</td>
<td>9.0.1</td>
<td>SET BACKUP COPIES</td>
</tr>
<tr>
<td></td>
<td></td>
<td>CONFIGURE BACKUP COPIES</td>
</tr>
<tr>
<td>SET LIMIT CHANNEL ...</td>
<td>9.0.1</td>
<td>ALLOCATE CHANNEL ...</td>
</tr>
<tr>
<td></td>
<td></td>
<td>CONFIGURE CHANNEL ...</td>
</tr>
<tr>
<td>SET SNAPSHOT</td>
<td>9.0.1</td>
<td>CONFIGURE SNAPSHOT</td>
</tr>
<tr>
<td>UNTIL LOGSEQ (see &quot;untilClause&quot;)</td>
<td>9.0.1</td>
<td>UNTIL SEQUENCE (see &quot;untilClause&quot;)</td>
</tr>
</tbody>
</table>
This section contains these topics:

- About RMAN Compatibility
- RMAN Compatibility Matrix
- RMAN Compatibility: Scenario
About RMAN Compatibility

The RMAN environment can contain the following components:

- RMAN executable
- Recovery catalog database
- Recovery catalog schema in the recovery catalog database
- Target database
- Auxiliary database (that is, a duplicate or standby database)

Each component has a release number. For example, you can use a release 9.0.1 RMAN executable with:

- A release 9.0.1 target database
- A release 9.0.1 duplicate database
- A release 8.1.5 recovery catalog database whose catalog tables were created with RMAN release 9.0.1

RMAN Compatibility Matrix

In general, the rules of RMAN compatibility are as follows:

- The RMAN catalog schema version should be greater than or equal to the catalog database version (refer to "Note 1: 8.1 or Later Catalog Schemas in 8.0 Catalog Databases" on page B-3).

- The RMAN catalog is backwards compatible with target databases from earlier releases (refer to "Note 2: 8.1 or Later Catalog Schemas and 8.0 Target Databases" on page B-3).

- The versions of the RMAN executable and the target database should be the same (refer to Table B–1 for other legal combinations).
Table B–1 shows version requirements for RMAN components.

Table B–1  RMAN Compatibility Table

<table>
<thead>
<tr>
<th>Target/Auxiliary Database</th>
<th>RMAN Executable</th>
<th>Catalog Database</th>
<th>Catalog Schema</th>
</tr>
</thead>
<tbody>
<tr>
<td>8.0.3</td>
<td>8.0.3</td>
<td>&gt;=8.x</td>
<td>8.0.3</td>
</tr>
<tr>
<td>8.0.4</td>
<td>8.0.4</td>
<td>&gt;=8.x</td>
<td>&gt;= 8.0.4, see &quot;Note 2: 8.1 or Later Catalog Schemas and 8.0 Target Databases&quot;</td>
</tr>
<tr>
<td>8.0.5</td>
<td>8.0.5</td>
<td>&gt;=8.x</td>
<td>&gt;= 8.0.5, see &quot;Note 2: 8.1 or Later Catalog Schemas and 8.0 Target Databases&quot;</td>
</tr>
<tr>
<td>8.0.6</td>
<td>8.0.6</td>
<td>&gt;=8.x</td>
<td>8.0.6</td>
</tr>
<tr>
<td>8.0.6</td>
<td>8.0.6</td>
<td>&gt;=8.1.x</td>
<td>&gt;= 8.1.x</td>
</tr>
<tr>
<td>8.1.5</td>
<td>8.1.5</td>
<td>&gt;=8.1.x</td>
<td>&gt;= 8.1.5</td>
</tr>
<tr>
<td>8.1.6</td>
<td>8.0.6.1</td>
<td>&gt;=8.x</td>
<td>8.0.6</td>
</tr>
<tr>
<td>8.1.6</td>
<td>8.0.6.1</td>
<td>&gt;=8.1.x</td>
<td>&gt;= 8.1.x</td>
</tr>
<tr>
<td>8.1.6</td>
<td>8.1.5</td>
<td>&gt;=8.1.x</td>
<td>&gt;= RMAN executable</td>
</tr>
<tr>
<td>8.1.6</td>
<td>8.1.6</td>
<td>&gt;=8.1.x</td>
<td>&gt;= RMAN executable</td>
</tr>
<tr>
<td>8.1.7</td>
<td>8.0.6.1</td>
<td>&gt;=8.x</td>
<td>8.0.6</td>
</tr>
<tr>
<td>8.1.7</td>
<td>8.0.6.1</td>
<td>&gt;=8.1.x</td>
<td>&gt;= 8.1.x</td>
</tr>
<tr>
<td>8.1.7</td>
<td>8.1.x</td>
<td>&gt;=8.1.x</td>
<td>&gt;= RMAN executable</td>
</tr>
<tr>
<td>9.0.1</td>
<td>&gt;= 9.0.1</td>
<td>&gt;=8.1.x</td>
<td>&gt;= RMAN executable</td>
</tr>
</tbody>
</table>

**Note 1: 8.1 or Later Catalog Schemas in 8.0 Catalog Databases**
RMAN cannot create release 8.1 or later catalog schemas in 8.0 catalog databases.

**Note 2: 8.1 or Later Catalog Schemas and 8.0 Target Databases**
Restore operations for an 8.0.4 or 8.0.5 target with an 8.1 or later catalog schema do not work when both these conditions are met:

- The target database is mounted or open
- You are connected to a recovery catalog

If any of these conditions is not met, then you can use an 8.1 or later catalog schema with an 8.0.4 or 8.0.5 target database.
**Note 3: 8.1.6 Catalog Schema and Pre-8.1.6 RMAN Executable**

Using a pre-8.1.6 release of the RMAN executable with recovery catalog schema of release 8.1.6 (newly created by 8.1.6 RMAN executable with the `CREATE CATALOG` command) requires the following update at the catalog database:

```
SQL> UPDATE CONFIG SET VALUE='080004' WHERE NAME='COMPATIBLE';
```

**RMAN Compatibility: Scenario**

Assume that you maintain a production databases of the following releases:

- 8.0.3
- 8.0.4
- 8.0.5
- 8.0.6
- 8.1.6
- 8.1.7
- 9.0.1

You want to record metadata about these databases in a single recovery catalog database. According to Table B–1, you can use a single 9.0.1 recovery catalog database with a 9.0.1 catalog schema for all but the 8.0.3, 8.0.4, and 8.0.5 target databases. The 8.0.3 target database requires an 8.0.3 catalog schema. "Note 2: 8.1 or Later Catalog Schemas and 8.0 Target Databases" on page B-3 indicates that in general 8.0.4 and 8.0.5 target databases should not use the 9.0.1 catalog schema.

RMAN permits you to create multiple catalog schemas in a single catalog database. Hence, the solution illustrated in Table B–2 is to do the following:

- Use a single release 9.0.1 catalog database to store all metadata, but create three separate catalog schemas of the following releases: 8.0.3, 8.0.5, and 9.0.1
- Ensure that the RMAN executable version matches the release of the target database that it is backing up
Table B–2  RMAN Compatibility Scenario with Release 9.0.1 Catalog Database

<table>
<thead>
<tr>
<th>Target Database</th>
<th>Catalog Schema</th>
</tr>
</thead>
<tbody>
<tr>
<td>8.0.3</td>
<td>8.0.3</td>
</tr>
<tr>
<td>8.0.4</td>
<td>8.0.5</td>
</tr>
<tr>
<td>8.0.5</td>
<td>8.0.5</td>
</tr>
<tr>
<td>8.0.6</td>
<td>9.0.1</td>
</tr>
<tr>
<td>8.1.5</td>
<td>9.0.1</td>
</tr>
<tr>
<td>8.1.6</td>
<td>9.0.1</td>
</tr>
<tr>
<td>8.1.7</td>
<td>9.0.1</td>
</tr>
<tr>
<td>9.0.1</td>
<td>9.0.1</td>
</tr>
</tbody>
</table>
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