BrightStor® ARCserve® Backup for Windows

Agent for Oracle Guide

r11.5

Contents

Chapter 1: Introducing the Agent

BrightStor® ARCserve® Backup is a comprehensive, distributed storage solution for applications, databases, distributed servers, and file systems. It provides backup and restore capabilities for databases, business-critical applications, and network clients.

Among the agents BrightStor ARCserve Backup offers is the BrightStor® ARCserve® Backup Agent for Oracle. This agent lets you:

- Manage backups remotely

- Back up tablespaces belonging to online databases by taking advantage of the Oracle backup features

- Restore a complete database or individual database objects such as a tablespace, data files, control files, archive log, or parameter file

- Schedule your backups

- Back up to a wide array of media storage devices

The agent handles all communications between BrightStor ARCserve Backup and the Oracle database during backup and restore jobs, including preparing, retrieving, and processing the data that is sent back and forth between the Oracle database and BrightStor ARCserve Backup.

Agent Features

The BrightStor ARCserve Backup Agent for Oracle contains a number of features that improve performance. Among those features are:

- **RMAN**—The BrightStor ARCserve Backup Agent for Oracle works with Recovery Manager (RMAN), an Oracle utility that you can use to backup, restore, and recover databases. The agent also lets you submit backup and restore jobs through the Oracle Backup Manager GUI. For additional information about Recovery Manager, see the *Oracle Backup and Recovery Guide*.

- **Cross-Platform Database Backups**—The agent can back up Oracle databases from Windows NT, Windows 2000, or Windows 2003 platforms to BrightStor ARCserve Backup servers running on UNIX. This capability provides centralized, cross-platform backups.

Agent Functionality

The agent and Oracle reside on the same computer. When BrightStor ARCserve Backup starts to back up a database object, it sends a request to the agent. The agent retrieves the object from Oracle and sends it to BrightStor ARCserve Backup, where the object is backed up to media. Similarly, the agent transfers the database object when the file is restored from media.

For more information about backing up databases and database objects, see the chapter "Using the Agent." For more information about Oracle backup and recovery procedures, see the *Oracle Server Administrator's Guide.*

Note: In an Oracle Fail Safe Cluster environment, a copy of the agent resides on the local drives of each node in the environment. Otherwise, the backup operation is essentially the same.

Online Database Backups

The BrightStor ARCserve Backup Agent for Oracle takes advantage of the Oracle tablespace backup mode to back up tablespaces, data files, archive log files, parameter files, and control files from an online database. During a backup operation, the agent instructs Oracle to begin backup mode operation for each online tablespace selected for backup. The agent then retrieves one of the tablespaces and passes it directly to BrightStor ARCserve Backup, where it is backed up to a media drive. When the backup is complete, the agent instructs Oracle to end backup mode operation.

Note: The agent and BrightStor ARCserve Backup can back up a complete database or objects within the database.

Offline Database Backups

Using BrightStor ARCserve Backup, you can back up complete offline databases, including their tablespaces, data files, redo log files, parameter files, and control files.

Note: You can back up offline databases in their entirety only.

Chapter 2: Installing the Agent

The Agent for Oracle is a client program you install **either** on the server machine with the Oracle server or on the local drives of all nodes in an Oracle Fail Safe Cluster environment.

Installation Prerequisites

Before installing the Agent for Oracle, verify that the following prerequisites:

- Your system meets the software requirements needed to install the option.

  For a list of these requirements, see the readme file.

- You have the following applications installed and working properly:

  - BrightStor ARCserve Backup r11.5

  - The appropriate version of Windows

  - The appropriate version of Oracle Server

- If you do not use the default installation path, make a note of the installation path you use for easy reference.

- If you are installing the agent on nodes in an Oracle Fail Safe Cluster environment, make a note of the Oracle Fail Safe Cluster computer names and the Oracle Fail Safe Cluster login IDs and passwords.

- You have administrative privileges or the proper authority to install software on the computers where you will be installing the agent.

  Note: Contact your BrightStor ARCserve Backup administrator to obtain the proper privileges if you do not have them.

Installation Considerations

Take the following considerations into account when you install the agent:

- When using the agent with the Oracle Recovery Manager (RMAN), you must stop and start Oracle services after you install the agent for the agent to work with RMAN.

- If you install the agent with RMAN support on the same server as an existing installation of BrightStor ARCserve Backup, and you subsequently uninstall BrightStor ARCserve Backup, you must reinstall the agent with RMAN support so that it can work with remote BrightStor ARCserve Backup.

Agent Installation

Install the Agent for Oracle on each database server you want BrightStor ARCserve Backup to manage.

For information about how to install the agent, see the *Getting Started*.

Perform Post-Installation Tasks

After you have installed the BrightStor ARCserve Backup Agent for Oracle, complete the following post-installation tasks:

1. Check whether Oracle Server is operating in ARCHIVELOG mode. For instructions, see Check the ARCHIVELOG Mode.

2. Start ARCHIVELOG mode if it is not running. For instructions, see Start ACHIVELOG Mode.

3. Enable the database for automatic archiving. For instructions, see Enable Automatic Archiving.

Important! *If you are installing the agent in an Oracle Fail Safe Cluster environment, you must perform these post-installation tasks on each machine on which you have installed the agent.*

Check ARCHIVELOG mode

To check whether the ARCHIVELOG mode is on, follow these steps:

1. Log in as an Oracle user with SYSDBA equivalent privileges.

2. Enter the following command at the SVRMGR or SQLPLUS prompt:

    ```
    ARCHIVE LOG LIST
    ```

This command displays the settings and status of the archive log files. The first line shows that ARCHIVELOG mode is enabled. If it is disabled, the database log mode is NOARCHIVELOG.

Start ARCHIVELOG Mode

To start ARCHIVELOG mode, follow these steps:

1. Shut down Oracle Server.

2. Depending on which version of Oracle you are running, execute the following statements:

   - At the SVRMGRL prompt:

     ```
     CONNECT INTERNAL
     STARTUP MOUNT EXCLUSIVE
     ALTER DATABASE ARCHIVELOG;
     ALTER DATABASE OPEN;
     ARCHIVE LOG START;
     ```

   - At the SQLPLUS prompt:

     ```
     CONNECT SYSTEM/SYSTEM_PASSWORD AS SYSDBA
     STARTUP MOUNT EXCLUSIVE
     ALTER DATABASE ARCHIVELOG;
     ALTER DATABASE OPEN;
     ARCHIVE LOG START;
     ```

Automatic Archiving

To back up tablespaces from an online database, you must configure the database for automatic archiving.

Enable Automatic Archiving for Oracle Installations Using PFILE

To configure the database for automatic archiving if your Oracle installation is configured to use PFILE, add the following log parameter lines to the INIT(SID).ORA file in your Oracle home directory:

```
LOG_ARCHIVE_START=TRUE
LOG_ARCHIVE_DEST="C:\Oracle\oradata\ORCL\archive"
LOG_ARCHIVE_FORMAT="ARC%S.%T"
```

Note: The actual value of LOG_ARCHIVE_DEST is specific to your environment.

The following table lists each log parameter and explains its function:

Parameter	Explanation
LOG_ARCHIVE_START	Enables automatic archiving.

Parameter	Explanation
LOG_ARCHIVE_DEST	Specifies the path to the archived redo log files. The BrightStor ARCserve Backup Agent for Oracle queries Oracle Server parameters for the archive log destination in the following order: LOG_ARCHIV_DEST, LOG_ARCHIVE_DEST_1 and so on through LOG_ARCHIVE_DEST_10. The agent backs up the archive logs from the first local destination it finds.
LOG_ARCHIVE_FORMAT	Specifies the filename format for the archived redo log files where %S specifies the log sequence number and %T specifies the thread number. For example, "ARC%S.%T" is acceptable.

Enable Automatic Archiving for Oracle Installation Using SPFILE

To configure the database for automatic archiving if your Oracle installation is configured to use SPFILE, follow these steps:

1. Verify the value of the log parameters by entering the following command at the SQLPlus prompt:

   ```
   show parameter log
   ```

2. If the parameters do not have the correct values, change them by entering the following commands at the SQLPlus prompt:

   ```
   ALTER SYSTEM SET LOG_ARCHIVE_START = TRUE SCOPE = SPFILE;
   ALTER SYSTEM SET LOG_ARCHIVE_DEST="/oracle/oradata/ORCL/archive"
   SCOPE = SPFILE;
   ALTER SYSTEM SET LOG_ARCHIVE_FORMAT="ARC%S.%T" SCOPE = SPFILE;
   ```

   Note: The actual value of LOG_ARCHIVE_DEST is specific to your environment.

3. Restart the Oracle instance to make the changes effective.

For more information about setting automatic archiving, see your *Oracle Database Administrator's Reference*.

ARCHIVELOG to NOARCHIVELOG Mode Comparison

The following table explains the advantages and disadvantages of ARCHIVELOG mode and NOARCHIVELOG mode.

Mode	Advantages	Disadvantage
ARCHIVELOG mode	You can perform hot backups (backups when the database is online).	It requires additional disk space to store archived log files. However, the agent offers the option to purge the logs after they have been backed up, giving you the opportunity to free disk space if you need it.
	The archive logs and the last full backup (offline or online) or an older backup can completely recover the database without losing any data because all changes made in the database are stored in the log file.	
NOARCHIVELOG mode	It requires no additional disk space to store archived log files.	If you must recover a database, you can only restore the last full offline backup. As a result, any changes made to the database after the last full offline backup are lost.
		Database downtime is significant because you cannot back up the database online. This limitation becomes a very serious consideration for large databases.

Note: Because NOARCHIVELOG mode does not guarantee Oracle database recovery if there is a disaster, the Agent for Oracle does not support this mode. If you need to maintain Oracle Server in NOARCHIVELOG mode, then you must backup full Oracle database files without the agent using BrightStor ARCserve Backup while the database is offline to ensure disaster recovery. Also note that RMAN requires that the database run in ARCHIVELOG mode.

Agent Customization in the Windows Registry

You can customize the agent by modifying registry entries in the Windows NT, 2000, or 2003 Registry using the Regedit32 utility. Registry entries for the agent are listed in the HKEY_LOCAL_MACHINE window under the following key:

```
SOFTWARE\ComputerAssociates\BrightStor ARCserve
Backup\DSAgent\CurrentVersion\agent\dbaora7@SID
```

where SID is the Oracle Database instance name.

Important! *Be very careful when making changes to the registry. Changes in the registry can affect the functionality of the agent.*

The modifiable registry entries for the agent under the dbaora7 key are listed in the right pane of the following sample HKEY_LOCAL_MACHINE window:
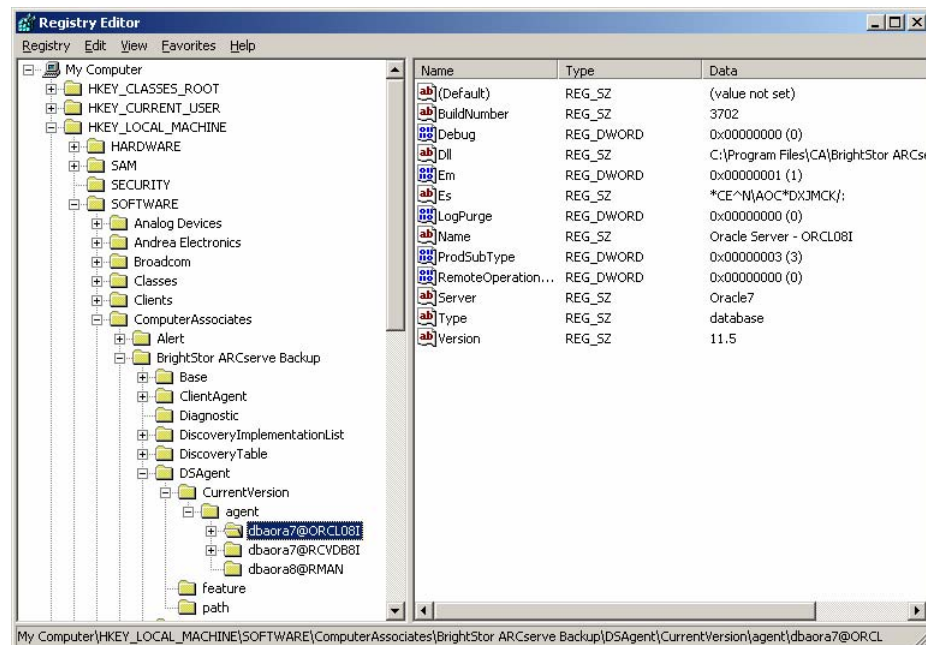
The following registry entries are modifiable:

- **Debug**—Lets you enable debug trace files for the agent. Change the default value only if instructed to by Computer Associates Technical Support.

  You can set Debug to 0, 1, 2, or 3. The default value is 0 (off). Any value other than 0 generates a debug trace file. A value of 1 generates a debug summary. A value of 3 generates a debug detail trace log. This log, called dbaora7.trc, is located in the agent home directory.

  Note: The agent normally provides an activity log with information about backup or restore jobs and their conditions. The agent log is called dbaora7.log and is located in the directory in which the agent is installed. If errors appear in the BrightStor ARCserve Backup job logs, check the agent log for more information about why the errors occurred.

- **Dll**—Specifies the location of the agent files.

- **LogPurge**— Lets you enable or disable the function that purges the archive redo logs after they have been backed up a second time. Purging the archive redo logs frees disk space. The default value is 0 (off).

Check the Backup Agent RPC Server Service Status

The Backup Agent RPC (Remote Procedure Call) Server, which lets the agent support remote backup and restore for the Oracle database, operates as a Windows service. You can configure this server to start automatically during setup; or after setup, configure the server using the Control Panel Services.

To check the Backup Agent RPC Server service status, follow these steps:

1. Open Control Panel; and then open Services.

2. Locate the Backup Agent RPC Server service icon. The current mode of the service is displayed.

3. To start or stop the service, highlight the Backup Agent RPC Server service icon and click Start or Stop, respectively.

Remove the Agent

To uninstall the agent, follow these steps:

1. Open the Control Panel.

2. Double-click the Add or Remove Programs icon.

3. Select CA BrightStor ARCserve Backup Agent for Oracle.

4. Click the Remove button. The Add or Remove Programs dialog opens, asking whether you want to remove CA BrightStor ARCserve Backup Agent for Oracle.

5. Click Yes.

When using the BrightStor ARCserve Backup Agent for Oracle with the Oracle Recovery Manager, you must stop Oracle services before uninstalling the agent to be able to delete all of the agent files. If you do not stop Oracle services, the agent files are deleted when you restart the server.

Chapter 3: Using the Agent with Recovery Manager

Recovery Manager (RMAN) is an Oracle utility used to backup, restore, and recover database files. RMAN performs important backup and recovery procedures, and greatly simplifies the task that administrators perform during these procedures. For more information about the Recovery Manager, see the *Oracle Backup and Recovery Guide*.

Before you start an RMAN backup or restore job, you must have all BrightStor ARCserve Backup engines running. If the BrightStor ARCserve Backup server is on a remote machine, the local Backup Agent RPC Server must also be running.

If you decide to back up the Oracle database using RMAN, you must restore the database using RMAN. Similarly, if you back up the Oracle database using BrightStor ARCserve Backup, you must restore the database using BrightStor ARCserve Backup.

How the Agent and BrightStor ARCserve Backup Work with RMAN

During setup, the agent file called orasbt.dll is copied to your %SystemRoot%\system32 directory. The Oracle server loads it when the Oracle server is started. When RMAN is started for backup or restore, orasbt.dll and the agent file called dbaora8.dll transfer data to and from the BrightStor ARCserve Backup server. The BrightStor ARCserve Backup server saves the data to media.

If you use the Oracle Recovery Manager to perform backups to tape, you must have media management software integrated with your Oracle software. BrightStor ARCserve Backup and the BrightStor ARCserve Backup Agent for Oracle provide this media management layer for you.

When a successful backup is complete, a new entry for each backup file is written to sbtio.log, under your Oracle agent home directory, in the following format:

```
<MM/DD/YY:HH:MM:SS>:Database_name\Backup_file_name::BrightStor_ARCserve_Backup_se
rver_name
```

The first part of the entry contains the backup time. The second part contains the name of the database that was backed up and the backup file name. The third part contains the name of the BrightStor ARCserve Backup server used for the backup.

Before an RMAN restore begins, the tape containing the backup file should be ready and in the tape drive connected to the BrightStor ARCserve Backup server. If it is not, BrightStor ARCserve Backup will display a message asking you to mount the correct media.

After an RMAN backup or restore job is done, you can check the job status in the BrightStor ARCserve Backup Activity Log or using the BrightStor ARCserve Backup Database Manager.
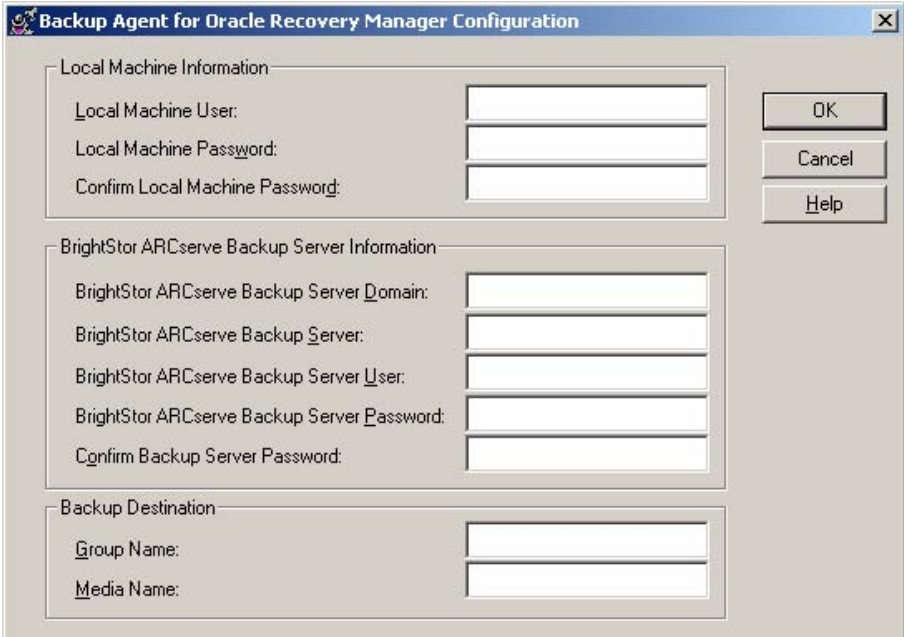
Configure the Agent to Support RMAN

Before starting any backup or restore with RMAN, you must run the Backup Agent Configuration for Recovery Manager utility to configure the BrightStor ARCserve Backup Agent for Oracle. The path to this utility is:

```
Program Files\CA\BrightStor ARCserve Backup Agent for Oracle\RmanCfg.exe
```

To run the Configuration for Recovery Manager utility, follow these steps:

1. Start the Configuration for Recovery Manager utility. The Backup Agent for Oracle Recovery Manager Configuration dialog opens, as shown in the following example:

2. Under Local Machine Information, enter the local machine user name and the password for the local machine user. Reenter the password for the local machine user in the Confirm Local Machine Password field to confirm the password.

3. Under BrightStor ARCserve Backup Server Information enter:

   - The BrightStor ARCserve Backup server domain name.

   - The BrightStor ARCserve Backup server name. This is the name of the machine on which BrightStor ARCserve Backup is installed.

- The BrightStor ARCserve Backup Server user name. This is the long name of the BrightStor ARCserve Backup server user who has BrightStor ARCserve Backup privileges.

- The password for the BrightStor ARCserve Backup server user.

- The password for the BrightStor ARCserve Backup server user again in the Confirm Backup Server Password field.

4. Under Backup Destination enter:

- The tape group name for the backup destination

- The media name for backups and restores

Note: You can enter an asterisk (*) for the tape group name and tape name if you want to use the default. The default is the current, active tape group and tape name.

5. Click OK.

Registry Settings for RMAN Support

The agent uses a separate registry entry for RMAN support under the following key:

```
SOFTWARE\ComputerAssociates\BrightStor ARCserve Backup
\DSAgent\CurrentVersion\agent\dbaora8@RMAN
```

Depending on circumstances, you may want to add or change the following registry parameters under this key:

- Timeout

- SessionStartTimeout

- Debug

The following sections explain what the parameters are and the circumstances in which you may want add or change them.

Important! *Before you add or change any values in the registry, consult with Computer Associates Technical Support to ensure the changes you intend to make are necessary and valid.*

Timeout

Timeout is the time in seconds the agent waits for Oracle to respond to calls made by orasbt.dll during a backup using RMAN. If the time exceeds the Timeout value, the agent stops the backup and the backup fails.

The Timeout parameter does not initially exist in the registry. Instead, the agent has a default, programmatic Timeout value of ten minutes. If you are experiencing frequent backup failures because Oracle fails to respond to orasbt.dll calls in the allotted time, you can create a Timeout parameter in the registry and set its value to greater than ten minutes. The value you set in the registry becomes the value the agent uses.

SessionStartTimeout

SessionStartTimeout is the time in seconds that the agent waits for the BrightStor ARCserve Backup server to begin an RMAN tape backup session. If the time exceeds the SessionStartTimeout value, the agent stops the backup and the backup fails.

The SessionStartTimeout parameter does not initially exist in the registry. Instead, the agent has a default, programmatic SessionStartTimeout value of ten minutes. If you are experiencing frequent backup failures because the BrightStor ARCserve Backup server fails to start an RMAN tape backup session in the allotted time, you can create a SessionStartTimeout parameter in the registry and set its value to greater than ten minutes. The value you set in the registry becomes the value the agent uses.

Debug

Changing the Debug parameter to the following setting activates the debug trace logs for the agent, called orasbt.trc and dbaora8.trc:

```
debug:REG_DWORD:1 (TRUE)
```

The logs are written to the agent home directory. Change this setting only when requested to by Computer Associates Technical Support.

Note: The default value of Debug is 0 (FALSE).

Oracle Recovery Manager Back Up

Before performing any backup or restore operations with RMAN, run the Backup Agent Configuration for Recovery Manager utility. For more information, see Using the Agent with Recovery Manager in this chapter.

You can use Oracle RMAN to back up any online database object by running RMAN from the Oracle Backup Manager interface or by starting it at the command line.

Important! *If you backed up data using the RMAN interface, you can only restore that data using the RMAN interface. Similarly, if you backed up data using the BrightStor ARCserve Backup interface, you can only restore that data using the BrightStor ARCserve Backup interface.*

Use RMAN to Back Up

To start RMAN at the command line and back up database objects, follow these steps:

1. Open a Command Prompt window and enter the following command:

    ```
    C:\>rman nocatalog
    ```

2. Enter the following commands in RMAN to back up database test:

    ```
    RMAN> connect target system/manager@test

    RMAN> run {

    2> allocate channel dev1 type 'sbt_tape';

    3> backup database format 'as_%s_%t';

    4> release channel dev1;

    5> }
    ```
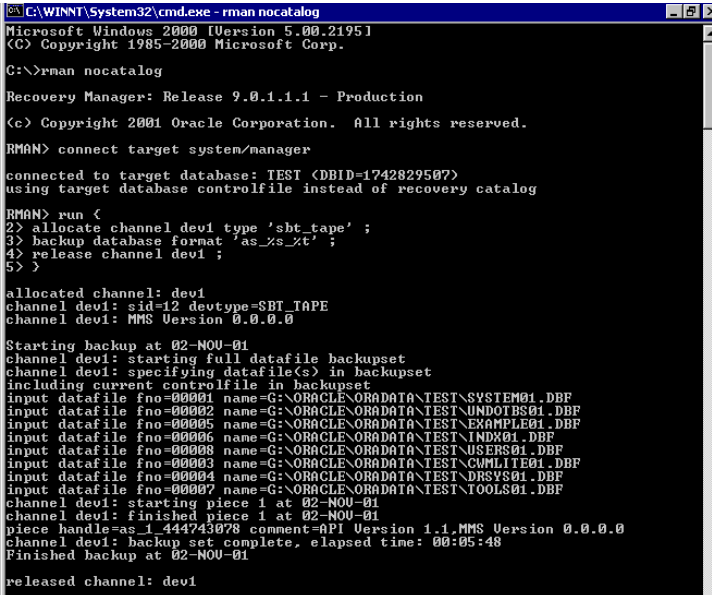
The following sample window shows where you enter these commands:

Note: To make using RMAN easier and more efficient, you can write or execute your own RMAN scripts.

Chapter 4: Using the Agent

This chapter explains how to back up, restore, and recover Oracle server databases using BrightStor ARCserve Backup, the BrightStor ARCserve Backup Agent for Oracle, and the Oracle backup, restore, and recovery features.

Backup, Restore, and Recovery Basics

The BrightStor ARCserve Backup Agent for Oracle performs the following processes when working with the Oracle server database: backup, restore, and recovery.

- To *back up* is to create a copy of a database or database objects on another device (usually a tape drive).

- To *restore* is to load a database or database objects from a backup of that database or the objects. A restore overwrites any information in the database with the backed up information.

- To *recover* is to bring the restored database to a consistent point in time prior to the point of failure or damage. An Oracle server database must first be restored and then recovered. After the database has been both restored and recovered successfully, then it is ready for use.

Backup, Restore, and Recovery Strategies

You should plan your backup, restore, and recovery strategies for a database before you create the database. If you do not plan these strategies before you create a database, database recovery may not be possible in certain cases. For more information on disaster recovery planning, see the appendix Disaster Recovery.

You should check your backup and recovery strategy in a test environment before and after you move to a production system. Testing can minimize problems before they occur in a real situation.

For more information about Oracle backup and recovery procedures, see the *Oracle Server Administrator's Guide* or *Administrator Reference.*

Develop a Good Backup Strategy

To have a good backup strategy, you should:

- Perform a full online backup of your Oracle databases.

- Perform an offline backup of the entire database using BrightStor ARCserve Backup with the agent. This provides copies of all data files, redo log files, and control files of your database.

- Back up database objects to update the full database backup. Heavily used tablespaces should be backed up frequently to reduce database recovery time.

- Back up the database control file each time you make a structural change to the database.

- Mirror Oracle online redo logs. The agent does not perform this procedure. For more information about mirroring online redo logs, see the *Oracle Server On-Line Generic Documentation CD-ROM.*

For more information about Oracle backup and recovery procedures, see the *Oracle Database Administrator's Reference.*

Oracle Server Organization

Oracle Server is organized into databases that are subdivided into database objects. An Oracle database contains the following types of objects:

- Tablespaces that contain data. Tablespaces can consist of multiple data files.

- Data files that contain the database data. Data files are the physical files that define a tablespace.

- Online redo log files that contain records of transactions applied to the tablespaces.

- Control files that describe the structure of the database, including the tablespaces. There can be more than one control file for the database.

- Parameter files that contain the various initialization parameters the database uses when it starts up.

Complete Database Backup

BrightStor ARCserve Backup and the BrightStor ARCserve Backup Agent for Oracle can back up a complete database or individual objects within a database. To back up a complete database, you must configure the backup to include all of the objects contained within the database.

At a minimum, you must back up a complete database when the database is created or when the database structure is changed. Tablespaces and other database objects require more frequent backups.

Online Redo Log Files

Oracle Server uses online redo log files to record all entries to the Oracle tablespaces. However, the BrightStor ARCserve Backup Agent for Oracle requires archived online redo log files to function properly. For Oracle to create archived redo log files, you must set Oracle to operate in ARCHIVELOG mode. Also, for the agent to back up and restore properly, you must set Oracle to automatically archive online redo log files.

Note: For information about setting Oracle so that it operates in ARHIVELOG mode and automatically archives online redo log files, see Perform Post-Installation Tasks in the chapter "Installing the Agent."

Archive Log Backup

A redo log file has an allocated amount of disk space. When the Oracle server generates the next archive log file, the server copies the online redo log file to a sequential archive file called an archived online redo log file or, more simply, an archived log file.

Multiple Databases

If your Oracle configuration has more than one database you can:

- View and log in to the databases you specified during installation.

- View and log in to the databases you specified if you reconfigured the agent by running DBAConfig.EXE from the agent home directory.

- Configure the agent so that the Backup Manager window displays the objects from any specified database.

- Quickly find the database objects that you want to back up.

Configure a Backup Session for Multiple Databases

To configure a backup session so you can log in to and view the databases you specified during installation on an Oracle configuration containing multiple databases, follow these steps:

1. Ensure that all the BrightStor ARCserve Backup and agent-related services are running.

2. Open the Backup Manager window.

3. In the Backup Manager window, expand the server on which the Oracle server is installed. All the databases you configured on the Oracle server appear.

4. Right-click the database you want to log in to. A pop-up menu opens.

5. Select Security.

6. Enter the user name and password you specified during configuration. This user name should be INTERNAL (for Oracle 8 and 8i), SYSTEM (for Oracle 9, 9i, and 10g), or have SYSDBA equivalent privileges.

7. Click OK. Expand the selected database to view objects and to select the objects to back up.

Backup and Restore Limitations

The following table contains limitations for backups and restores:

Action or Parameter	Current Limitation
Backing up online redo logs	The online redo logs are exclusively locked by Oracle while the Oracle server is online. Perform an offline backup if necessary.
Restoring the system tablespace or tablespaces with rollback segments	To restore either the system tablespace or a tablespace containing rollback segments, you must first shut down the database and perform a full database restore. For more information about restoring, see Restore a System Tablespace or Restore Complete Databases, Tablespaces, Data Files, or Control Files in this chapter.

Back Up Using the Agent

Using the BrightStor ARCserve Backup Agent for Oracle, you can back up individual Oracle database objects, such as tablespaces, archived redo log files, and control files.

Note: Each tablespace in a database is backed up as a separate session.

During a backup operation, the agent instructs Oracle to begin backup mode operation for each online tablespace to be backed up. The agent retrieves the tablespace and passes it directly to BrightStor ARCserve Backup, where it is backed up to a media device. When the backup is complete, the agent instructs Oracle to end the backup mode operation.

Back Up Offline Databases Using BrightStor ARCserve Backup

You can back up an offline Oracle database. However, offline backups are performed directly by BrightStor ARCserve Backup, without the agent. In this case, BrightStor ARCserve Backup treats the Oracle database files the same way as it treats non-Oracle files.

To back up an offline Oracle database, follow these steps:

1. In the Backup Manager window, expand the server and volumes containing the Oracle databases. The directories containing the Oracle database files appear.

2. Expand the directories.

3. Select all of the individual datafiles that make up the Oracle database, or select the directory under which the files exist.

4. Initiate the backup.

Note: Oracle database files can be located anywhere (on any hard disk or in any directory). If you are performing a full offline backup of your Oracle server, you must select all of the Oracle database files located on different drives.

Back Up One or More Databases Online

The BrightStor ARCserve Backup Agent for Oracle lets you back up individual Oracle database objects, such as tablespaces, archived redo log files, and control files. To back up one or more Oracle databases online using the agent, follow these steps:

1. Ensure that the Oracle server is running.

   Note: You must have all BrightStor ARCserve Backup engines running. If the BrightStor ARCserve Backup server is on a remote machine, the local Backup Agent RPC Server must also be running.

2. On the Backup Manager Source tab, select the databases that you want to back up. You can select any number of databases in any combination or all of them together. Ensure all of the tablespaces on the database are online before backing up the Oracle database.

   - When you back up multiple databases, the Backup Manager prompts you to enter the user name and password for each database. All options that apply to backing up a single online database can be applied to backing up multiple online databases.

   - Databases are backed up sequentially on the media. BrightStor ARCserve Backup saves each tablespace (or database object) as a session. Therefore, the total number of sessions equals the total number of tablespaces, plus two additional sessions—one for archive logs for each Oracle database and the other for the control file.

   Note: If you select ~ARCHIVE LOG, the agent backs up all of the archived log files under the archive log directory. If you select the control file, you must select only the control file or select the control file and **all** other tablespaces; otherwise the backup job will fail.

3. Click the Destination tab to select a backup destination.

4. Click the Schedule tab. Choose Custom Schedule or Use Rotation Scheme.

5. Click the Start toolbar button to submit the job. The Security and Agent Information dialog opens, as shown in the following example:

6. If you have a client agent installed, click Agent. The Agent Information dialog opens. Enter the configuration parameters for the client agent you have installed. Click OK when finished. The Agent Information dialog closes.

    Note: For more information about client agent configuration, see the *Client Agents Guide*.

7. Select the Oracle object on the Security and Agent Information dialog, and then click Security. The Security dialog opens.

8. Enter the Oracle user name and password. When you are finished, click OK. The Security dialog closes.

    Note: The user name and password must be for a user who has backup or database administrator privileges.

9. Click OK on the Security and Agent Information dialog. The Submit Job dialog opens.

10. Click OK. The job is submitted to the queue and can be monitored from the Job Status Manager.

Back Up Multiple Databases to Multiple Tape Drives

If you have multiple databases and multiple tape drives and you want to back up each database to a different tape drive, you must pair each database with the tape that you want to contain the database backup. Use the Backup Manager Source and Destination tabs to create the pairs. Then, you must submit each pair as a separate backup job.

To back up multiple databases to multiple tape drives, follow these steps:

1. On the Backup Manager Source tab, select the first database to back up.

2. On the Backup Manager Destination tab, select the tape to which you want to back up the first database.

3. Finish the job submission procedure and run the job.

4. On the Backup Manager Source tab, select the second database to back up.

5. On the Backup Manager Destination tab, select a different tape to use for the second database to be backed up.

6. Finish the job submission procedure and run the job. You can repeat these steps for as many databases and tape drives as you have available.

Back Up in an Oracle Fail Safe Environment with BrightStor ARCserve Backup

To back up data in an Oracle Fail Safe environment with BrightStor ARCserve Backup, follow these steps:

1. Make sure that Oracle Fail Safe group is running in your Microsoft Cluster environment.

2. Start BrightStor ARCserve Backup and start the Backup Manager.

3. On the Source tab, browse the Microsoft Network or the preferred shares to locate the Oracle Fail Safe groups.

4. Select the appropriate Oracle server from its Oracle Fail Safe group.

5. Double-click the Oracle server to display and select tablespaces for this instance.

6. Click the Destination tab and select a backup destination.

7. Click the Schedule tab and select the scheduling options you want to assign to this backup job.

8. Click Start.

9. Enter the user name and password of the Oracle Fail Safe group. To enter or change security information for the Oracle Fail Safe group, select the Oracle Fail Safe group and click Security.

10. Click OK to submit the job.

Note: Although you can browse all Oracle databases from any Oracle Fail Safe group, you can only achieve a successful backup by selecting the Oracle databases from its corresponding Oracle Fail Safe group. If the node on which the Oracle Fail Safe group is currently running enters failover mode during a backup job, the back up job is incomplete and must be resubmitted.

Restore Using the Agent

The BrightStor ARCserve Backup Agent for Oracle lets you restore database objects such as tablespaces, archive log files, and control files, either individually or in groups, and lets you restore the control file when you restore a database.

Important! *The backup sessions you select to restore must be from successfully completed backup jobs. You should not attempt to restore using sessions from a cancelled or failed backup job.*

Note: If the Oracle database is **online**, you can restore an individual tablespace or data file if the **tablespace** is **offline**. If the database is **offline**, you must restore the entire database to restore a tablespace or data file.

Restore Views

For any type of restore, you can choose one of the following restore views:

- **Restore by Tree**—Displays a tree of the networks and machines backed up by BrightStor ARCserve Backup. To run a restore, expand the networks and machines to display databases and files, and then select the specific databases or files you want to restore. The databases displayed are from the most recent backup sessions. Restore by Tree is the default restore view.

  Select Restore by Tree if you want a quick way to restore the most current backup sessions or need a good overall picture of your network and the files you can restore.

  Note: Restore by Tree is the default restore view. The Restore by Tree view also provides a Version History option that lets you restore a backup session that is older than the most recent session.

- **Restore by Session**—Displays a list of media you have used when backing up with BrightStor ARCserve Backup. To run a restore, choose the media containing the backup you want, browse the backup sessions contained on the media, and select the specific session, database, or log you want to restore.

  Select Restore by Session if you are an experienced user and want to restore specific backup sessions or specific databases and logs in specific sessions.

Recovery After Restoring

When a restore job is completed, the database or database objects are restored to the Oracle server. You must then take the next step and recover the database or database objects. For recovery instructions, see Recover A Complete Database, Recover Complete Databases and Control Files, Recover Tablespaces or Data Files, and Recover Offline Full Backups in this chapter.

Restore Complete Databases, Tablespaces, Data Files, or Control Files

To restore complete database, tablespaces, data files, or control files, follow these steps:

1. Shut down the Oracle server. If you prefer not to shut down the Oracle server and you are restoring only a tablespace or data file, that the tablespace offline.

2. Start BrightStor ARCserve Backup.

3. Open the Restore Manager.

4. On the Restore Manager Source tab, expand the Oracle server and select the objects to be restored using the Restore by Tree option as shown in the following example:
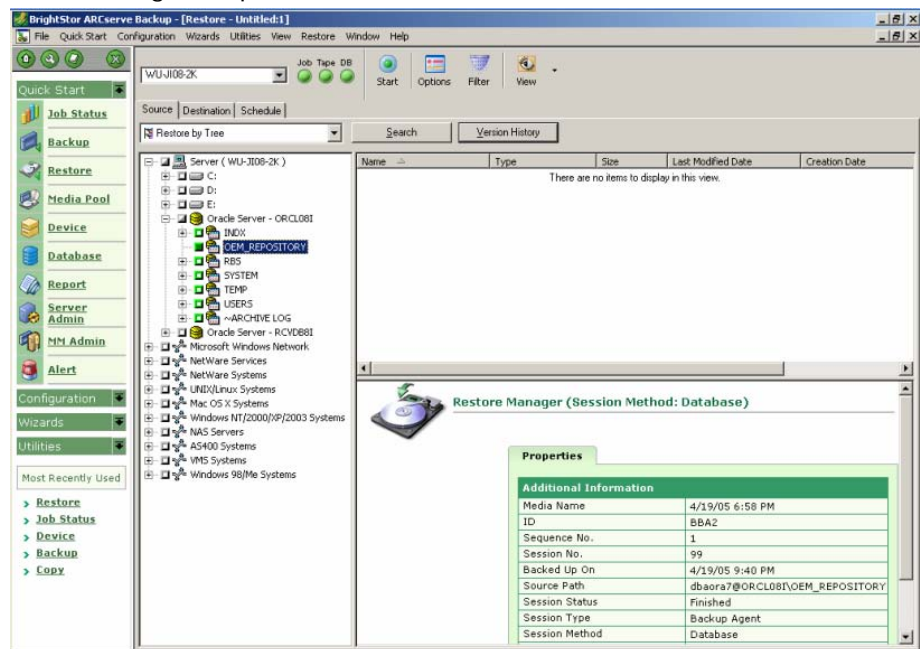
Note: The oracle database objects are restored automatically to their original locations. If you are restoring to the original locations, you do not need to select a destination.

Remember these considerations when selecting objects to be restored:

- To restore the control file, select the ~CONTROLFILE object. The restore process saves the control file as CONTROL.SIDNAME in the agent home directory. You can then use the MS-DOS copy command to copy the restored control to the appropriate directory.

  Important! *You must overwrite all default database control files with the restored one. Use this format: copy CONTROL.ORCL path\clt1ORCL.ORA.*

  For more information about restoring a control file, see the Oracle Server Administrator's Guide.

- To restore either the system tablespace or a tablespace containing rollback segments, you must shut down the database and perform a full database restore.

- In Tree view, to restore an older session of a tablespace, click Version History and select the session you want to restore. After you have selected a session, click OK, and then finish the rest of the restore procedure.

- If your current control files and the archived redo log files are not damaged, you may not want to recover the backed up control files and overwrite the current control files. Keeping the current control files allows you to restore your database to the latest usable version.

5. If you are restoring to a different server than the original server, click the Destination tab.

6. In the Destination tab, first select the Windows NT, 2000, or 2003 server, and then select the file directory on the server to which you want to restore.

   Note: You may need to move the Oracle files into their proper locations manually after the restore is finished. If the Oracle database has multiple archived log directories and archived log files are restored, you must copy the restored files to all of the archived log directories to synchronize them.

   You cannot browse the individual tablespaces within the database, since you must restore database objects to the parent container and not to the individual objects themselves.

7. Click the Schedule tab for scheduling options.

8. Click the Start toolbar button. The Session User Name and Password dialog opens, as shown in the following example:
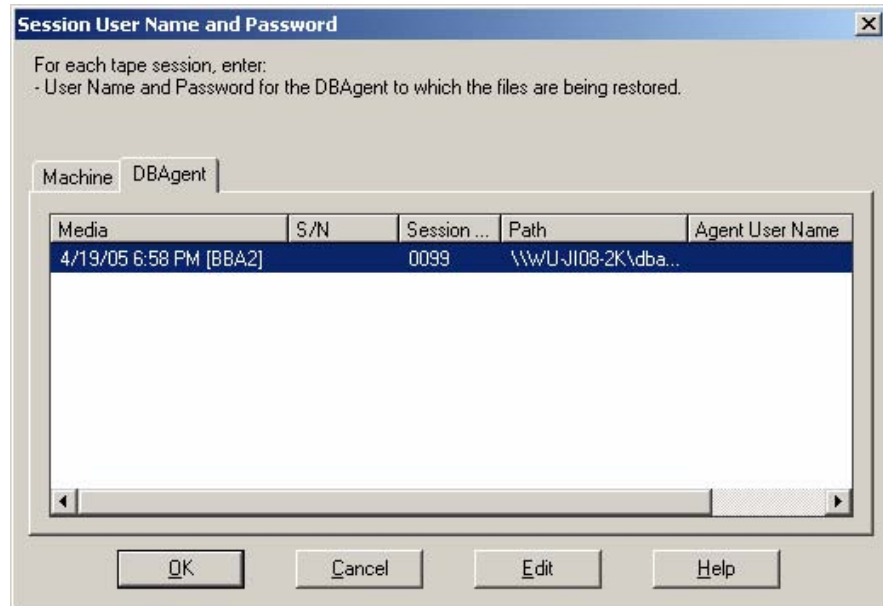
9. To enter or change the user name and password (including the session password) for the machine on which the source Oracle server is running, select the session and click Edit, as shown in the following example:
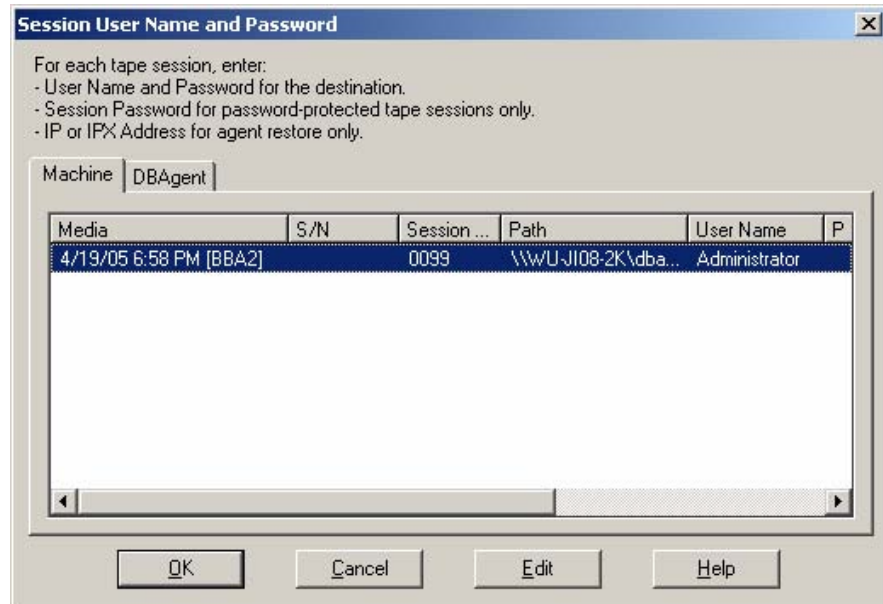
10. Enter the user name INTERNAL (for Oracle 8 or 8i), SYSTEM (for Oracle 9, 9i, or 10g), or a user with SYSDBA equivalent privileges and the password for your Oracle server.

11. Click OK. The Restore Manager submits the job to the queue. You can monitor the job on the Job Status Manager.

Restore a System Tablespace

To restore a system tablespace, follow these steps:

1. Shut down the database.

2. Open the Restore Manager.

3. Select Restore by Tree.

4. On the Source tab, select the system tablespace you want to restore.

5. The Oracle database objects are automatically restored to their original locations. You do not need to select a destination.

6. Click the Schedule tab for scheduling options.

7. Click the Start toolbar button. The Session User Name and Password dialog opens.

8. To enter or change the use name and password (including the session password) for the machine on which the Oracle server is running, select the session and click Edit.

9. Enter the user name INTERNAL (for Oracle 8 and 8i), SYSTEM (for Oracle 9, 9i, and 10g), or a user with SYSDBA equivalent privileges and password for your Oracle server.

10. Click OK. The Restore Manager submits the job to the queue. You can monitor the job on the Job Status Manager.

Restore a Database Backed Up Offline

To restore a database that was backed up when it was offline, you must shut down the Oracle server and restore the Oracle files using BrightStor ARCserve Backup without the agent.

To restore a database that was backed up when it was offline, follow these steps:

1. In the Restore Manager window, expand the server and volumes containing the Oracle database backups. The directories containing the Oracle database backups appear.

2. Expand the directories.

3. Select all of the individual backups that make up the Oracle database, or select the directory under which the backups exist.

4. Initiate the restore.

   Note: Oracle database files can be located anywhere (on any hard disk or in any directory). If you are performing a full restore of your Oracle server, you must select all of the Oracle database files located on the different drives.

Restore in the Oracle Fail Safe Environment

To restore in the Oracle Fail Safe environment, follow these steps:

1. Open the Restore Manager.

2. Select the Restore by Tree or Restore by Session option. If you choose Restore by Tree, select the source you want to restore and a backup version on the Source tab. If you choose Restore by Session, select the sessions for the tablespace on the Source tab.

3. Click the Destination tab and select a destination. You can restore either to the original location or server, or to an alternative location or server.

    ■   If you are restoring to the original location, you do not need to specify a path. Also, do not change the default option, which is Restore files to the original locations.

    ■   If you are restoring to a specific node in the Oracle Fail Safe Group, clear the Restore files to the original locations option. Next, in the Destination tab of the Restore Manager, locate and select the Oracle database directory in the node to which you want to restore, as shown in the following example:
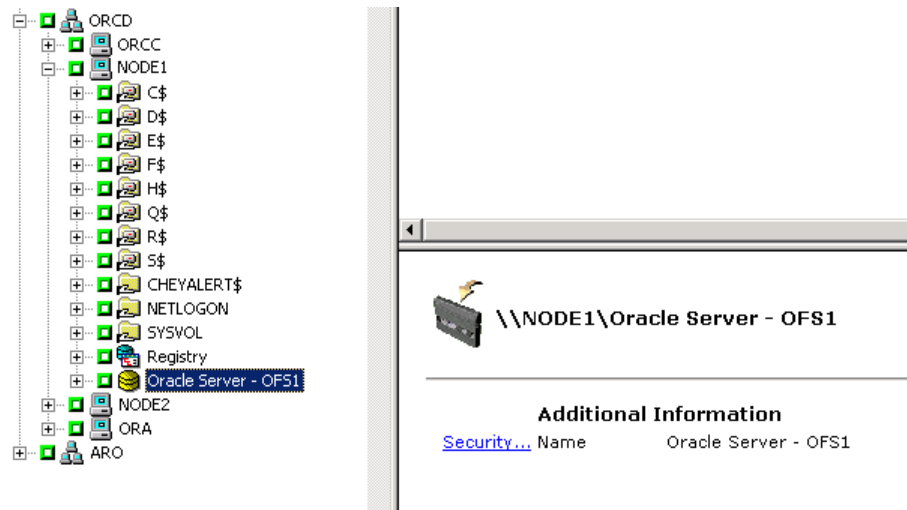
4. Click the Start toolbar button. Schedule the job to run now or later.

5. Verify or change the user name and password for the Oracle Fail Safe Group tablespace and the Microsoft Cluster Server.

6. Click OK. The Restore Manager submits the job to the queue. You can monitor the job on the Job Status Manager.

Restore to a Point in Time

To restore a database or tablespace to a point in time, follow the procedures to restore a database or a tablespace and the associated archive log files. For the appropriate procedure, see Restore Complete Databases, Tablespaces, Data Files, or Control Files and Restore a System Tablespace in this chapter.

For more information about restoring or recovering the database or tablespace to a point in time, see the *Oracle Server Administrator's Guide*.

Restore Archive Logs

If the archive log files have been lost or corrupted, you must select ~ARCHIVE LOG objects as source sessions to be restored. For information about recovering files, see Restore Complete Databases, Tablespaces, Data Files, or Control Files and Restore a System Tablespace in this chapter.

Database Recovery

After restoring a database or database objects to the server, you must then recover the database or the objects. Depending on what you have restored, you can:

- Recover a complete database

- Recover a complete database with a backed-up control file

- Recover a tablespace or data file

- Recover from an offline full backup

For instructions on these recovery procedures, see Recover a Complete Database, Recover Complete Databases and Control Files, Recover Tablespaces or Data Files, or Recover Offline Full Backups in this chapter.

Recover Complete Databases

After you have completed a successful restore of a database, you must use the Oracle Server Manager Console to recover the database. To recover a database with current control files, follow these steps:

1. Start the database instance, and mount the database without opening it:

   ■ At the SVRMGR prompt enter:

   ```
   CONNECT INTERNAL
   STARTUP MOUNT
   ```

   ■ At the SQLPLUS prompt enter:

   ```
   CONNECT SYSTEM/SYSTEM_PASSWORD AS SYSDBA;
   STARTUP MOUNT
   ```

   Note: You may use a different Oracle SYSDBA instead of INTERNAL or SYSTEM if the SYSDBA has the proper backup and restore privileges.

2. Begin the database recovery process by entering the following command at the SVRMGR or SQLPLUS prompt:

   ```
   RECOVER DATABASE
   ```

3. Oracle checks for the archive redo log files it needs to apply and prompts for the names of theses archive redo log files in chronological order.

   For example, if Oracle needs the name of the archive redo log file with a sequence number of 49, the following message displays:

   ```
   ORA-00279: Change 10727 generated at 09/15/95 16:33:17 needed for
   thread 1
   ORA-00289: Suggestion : D:\ORANT|saparch\ARC00049.001
   ORA-00200: Change 10727 for thread 1 is in sequence #49
   Specify log<<RET>=suggested : filename : AUTO : FROM logsource : CANCEL
   ```

4. If you have all of the necessary archived log files, enter AUTO to apply the files. Oracle applies the log data to restore the datafiles. After Oracle finishes applying the redo log file, the following message is displayed:

   ```
   Applying suggested logfile...
   Log applied.
   ```

   After each log is applied, Oracle continues to apply the next redo log file until the recovery is complete.

   Note: If Oracle returns an error indicating that the log file cannot be opened, the log file may not be available. At the prompt, enter CANCEL. This command stops the complete media recovery.

   For more information about recovery and archive redo log files, see the Oracle Server Administrator's Guide.

5. Open the database by entering the following command:

```
ALTER DATABASE OPEN;
```

The database is now recovered to the last log file available.

Note: For the most reliable database objects recovery, you should back up archived log files using the ~ARCHIVELOG object. For more information on database recovery, see the *Oracle Server Administrator's Guide.*

Recover Complete Databases and Control Files

If a control file has been lost or corrupted, you must first shut down the database and recover the control files before recovering the database. To shut down the database and recover the control files, follow these steps:

1. Shut down the database by entering the following command at the SVRMGR or SQLPLUS prompt:

```
SHUTDOWN;
```

2. Go to the Oracle home directory. Copy the control file from the agent home directory to its original location.

3. Rename the restored control files to their original control file names.

   Note: The restore process restores the original control file. You must rename the restored version of the control file to its original file name.

4. Start and mount the database and begin the recovery process:

   ■ At the SVRMGR prompt enter:

   ```
   CONNECT INTERNAL;
   STARTUP MOUNT;
   RECOVER DATABASE USING BACKUP CONTROLFILE UNTIL CANCEL;
   ```

   ■ At the SQLPLUS prompt enter:

   ```
   CONNECT SYSTEM/SYSTEM_PASSWORD AS SYSDBA;
   STARTUP MOUNT;
   RECOVER DATABASE USING BACKUP CONTROLFILE UNTIL CANCEL;
   ```

5. Oracle prompts you to enter the log file names. Oracle first looks for the archive log files and automatically supplies the correct names for those that exist. If Oracle cannot find the necessary archive log files, you must manually apply the online redo logs it needs.

   When you apply the online redo logs manually, you must supply the full path and file name. If you enter an incorrect log, reenter the command:

   ```
   RECOVER DATABASE USING BACKUP CONTROLFILE UNTIL CANCEL;
   ```

   Supply the correct online redo log file name at the prompt. Continue this procedure until Oracle has applied all logs successfully.

6. Enter the following command at the SVRMGR or SQLPLUS prompt to bring the database back online and reset the logs:

```
ALTER DATABASE OPEN RESETLOGS;
```

7. In the directories where the archived redo logs are stored, delete all of the log files.

8. If any tablespaces are still offline, enter the following command at the SVRMGR or SQLPLUS prompt to bring them back online:

```
ALTER TABLESPACE TABLESPACE_NAME ONLINE;
```

Recover Tablespaces or Data Files

If the Oracle database is open, you can restore and recover a tablespace by first placing the tablespace offline. To recover a tablespace or data file, follow these steps:

1. Take the tablespace offline by entering the following command at the SVRMGR or SQLPLUS prompt:

```
ALTER TABLESPACE "tablespace_name" OFFLINE;
```

   Note: The Oracle server may take the damaged tablespace offline automatically. If that is the case, go to Step 2.

2. Restore the tablespace or data file using BrightStor ARCserve Backup and the BrightStor ARCserve Backup Agent for Oracle if you have not done so.

3. Begin the database recovery process:

   ■ If you are recovering a **tablespace,** enter the following command at the SVRMGR or SQLPLUS prompt:

   ```
   RECOVER TABLESPACE "tablespace_name";
   ```

   ■ If you are recovering a **data file**, enter the following command at the SVRMGR or SQLPLUS prompt:

   ```
   RECOVER DATAFILE 'path';
   ```

   For example,

   ```
   RECOVER DATAFILE 'T\Oracle\Oradata\Orcl\Backup.Ora';
   ```

4. Oracle checks for the archive redo log files it needs to apply and prompts for the names of these archive redo log files in chronological order.

   For example, when Oracle needs the name of the archive redo log file with a sequence number of 49, it displays the following message:

```
ORA-00279: Change 10727 generated at 09/15/95 16:33:17 needed for
thread 1
ORA-00289: Suggestion : D:\ORANT|saparch\ARC00049.001
ORA-00200: Change 10727 for thread 1 is in sequence #49
Specify log<<RET>=suggested : filename : AUTO : FROM logsource : CANCEL
```

5. If you have all the necessary archived log files, enter AUTO to apply the files. Oracle applies the log data to restore the datafiles. After Oracle finishes applying the redo log file, it displays the following message:

```
Applying suggested logfile...
Log applied.
```

After each log is applied, Oracle continues to apply the next redo log file until the recovery is complete.

Note: If Oracle returns an error indicating that the log file cannot be opened, the log file may not be available. At the prompt, enter CANCEL. This command stops the complete media recovery. In this case, perform the incomplete media recovery to restore the tablespace again. After all the log files are applied, database recovery is complete. For more information about incomplete media recovery, see the Oracle Server Administrator's Guide.

6. Open the database by entering the following command:

```
ALTER TABLESPACE "tablespace_name" ONLINE;
```

The tablespace is now recovered to the last available log file.

Note: For the most reliable database objects recovery, you should back up archived log files using the ~ARCHIVELOG object. For more information on database recovery, see the Oracle Server Administrator's Guide.

Recover Offline Full Backups

To recover a database that was backed up in full while it was offline, shut down the Oracle server and use the BrightStor ARCserve Backup restore procedure without the agent to recover the Oracle database.

Note: Restoring a database from a full offline backup also fully recovers the database.

To recover a database that was backed up while offline, follow these steps:

1. In the Restore Manager window, expand the server and volumes containing the Oracle database backups. The directories containing the Oracle database backups appear.

2. Expand the directories.

3. Select all of the individual backups that make up the Oracle database, or select the directory under which the backups exist.

4. Initiate the restore.

Note: Oracle database files can be located anywhere (on any hard disk or in any directory). If you are performing a full restore of your Oracle server, you must select all of the Oracle database files located on the different drives.

Appendix A: Troubleshooting

This appendix explains the most common messages for the BrightStor ARCserve Backup Agent for Oracle on the Windows NT, 2000, or 2003 platforms. Each message has a brief description and a possible solution.

No Oracle Server Icon in BrightStor ARCserve Browser

Reason:

This message occurred for any of the following reasons:

- The Backup Agent RPC Server is not running or functioning.
- The BrightStor ARCserve Backup Agent for Oracle is not installed.
- No agent entry exists in the registry. The entry should be at this location:
- SOFTWARE\ComputerAssoicates\BrightStor ARCserve\DSAgent\CurrentVersion\agent\dbaora7@*Oracle_SID*

Action:

Perform the following actions:

- Restart the Backup Agent RPC Server.
- Install the BrightStor ARCserve Backup Agent for Oracle.

Backup Agent Error - (83) remote pipe open failed: timeout.

Reason:

There is a problem with the Backup Agent RPC Server on the remote machine.

Action:

Restart the Backup Agent RPC Server on the remote machine. If the server continues to fail, restart the remote machine.

Backup Agent Error - (85) Invalid user ID or password was submitted.

Reason:

An incorrect user name or password was submitted.

Action:

Enter the user name or password for the database server again.

Backup Agent Error - (265) Cannot get tablespace names. Please check Oracle Server.
E8608 - Failed to enumerate databases.

Reason 1:

The BrightStor ARCserve Backup Agent for Oracle was installed with an Oracle database instance name that does not exist, and a backup was performed by selecting the Oracle Server icon for that Oracle database instance or by selecting the entire Windows NT server.

Action 1:

Rerun the BrightStor ARCserve Backup Agent for Oracle configuration utility using a valid Oracle database instance.

Reason 2:

A backup of an unmounted, unopened Oracle server was attempted.

Action 2:

Mount and open the Oracle server.

Backup Agent Error - (207) Oracle Server is in NOARCHIVELOG mode. Please set to ARCHIVELOG mode.
E86064 - Failed to start backup. Cannot get Archive Log information. Please check your database and/or login user.

Reason:

A backup with a database in NOARCHIVELOG mode was attempted.

Action:

Set the database to ARCHIVELOG mode.

Backup Agent Error - (263) Cannot back up control file because not all the tablespaces were backed up in the session.
E8604 - Failed to start backup.

Reason:

A backup of the control file and some, but not all, tablespaces was tried.

Action:

Select **all** the tablespaces **and** the control file (that is, the entire database) or only the control file for backup.

Oracle - (209) ORA-01219: database not open: queries allowed on fixed tables/views only.
E8606 - Failed to enumerate databases.

Reason:

A backup of a mounted, but unopened Oracle server was attempted.

Action:

Open the Oracle server.

Appendix B: Disaster Recovery

Planning your backup methodology in advance is critical for protecting your database against failures, and for quick recovery of your database server in case of disaster.

For most efficient disaster recovery, implement the following backup strategy:

- Perform a full offline backup of your Oracle data files, configuration files, and registry information so you can restore an offline image of Oracle server.

- Perform a full offline or online backup each time there is a major schema change in your databases (for example, when you delete a tablespace, create a new one, or add a data file). A full offline backup is not required, but it is highly recommended.

- Perform full online backups regularly; for example, once a week. You can choose to back up only the archive redo log files for the remaining days of the week, if the time needed for a full online backup prohibits a full backup.

Scenarios for Restoring to the Original Windows Server

Assume you have a Windows server running Oracle, and that there are two Oracle database instances on the server: ORCL1 and ORCL2. A disaster occurs and it is necessary to rebuild the entire server.

Recovery of your Oracle databases proceeds in two phases, each of which is explained in detail in the following sections:

- Phase 1 - Recover the ORCL1 database
- Phase 2 - Recover the ORCL2 database

Recover the ORCL1 Database

You must create an Oracle instance before you start the recovery procedure. Because you had the starter database (ORCL) when reinstalling Oracle, we recommend that you create the instance for ORCL1.

1. Reinstall Windows.

2. Install BrightStor ARCserve Backup if it was on the same server as your Oracle databases.

3. Do **one** of the following:

   ■ Reinstall Oracle

   ■ Restore all necessary sessions (files) from media (for example, sessions for Oracle executables, configuration files and registry information)

4. Reinstall the option, and create an Oracle database instance entry for **each** of the instances you intend to restore.

5. Restore the last full backup of ORCL1.

   Note: If it is an offline backup, then no further recovery is needed. Proceed to the section Recover the ORCL2 Database in this appendix. If it is an online backup, continue with the next step.

6. Check the INITORCL1.ORA file to see if it contains all the necessary settings for the following entries:

   ```
   LOG_ARCHIVE_START
   LOG_ARCHIVE_DEST
   LOG_ARCHIVE_FORMAT
   ```

7. Copy the restored control file (CONTROL.ORCL1) from the option home directory to all necessary directories and rename this file with the appropriate name.

8. Connect to ORCL1 as user INTERNAL (or as a user SYSTEM in Oracle Version 9i and above).

9. Mount the database.

10. Enter the following command at the SVRMGR or SQLDBA prompt:

    ```
    recover database using backup controlfile until cancel;
    ```

11. When the recovery has been completed, enter the following command:

    ```
    alter database open resetlogs
    ```

    Note: If the database does not open and a message reports on the status of the redo logs, enter the following query at the Server Manager or SQL*Plus prompt:

    ```
    select * from v$logfile
    ```

This query returns, among other information, the directory structure in which Oracle looks for the redo logs. If the directory structure does not exist, create it. When you have done so, enter the following command again:

```
alter database open resetlogs
```

Oracle should open the database and recreate the redo logs.

Important! *The following step is very important. DO NOT OMIT IT.*

12. Delete all archive logs for ORCL1.

The ORCL1 database is now fully recovered. You can now proceed to the second phase, recovering the ORCL2 database.

Recover the ORCL2 Database

To recover the ORCL2 database, follow these steps:

1. Create an instance for the ORCL2 database and start the ORCL2 instance.

2. Make sure the INITORCL2.ORA file contains all the necessary configuration information, as described in Step 6 of the previous phase. Do one of the following:

   ▪ Restore the latest backup copy of the INITORCL2.ORA file from media.

   ▪ Recreate this file by using INITORCL1.ORA as your template and making all the necessary changes to it.

3. Restore the last full backup of ORCL2.

   Note: If it is an offline backup, then no further recovery is needed. You have now completed recovery of your Oracle server.

4. Copy the restored control file (CONTROL.ORCL2) from the option home directory to all necessary directories and rename it with the appropriate name.

5. Connect to the instance you started in Step 1 of this procedure.

6. To mount the ORCL2 database, enter the following command:

   ```
   startup mount pfile=DRIVE:\PATH\initORCL2.ora
   ```

7. Enter the following command at the SQLDBA or Server Manager prompt:

   ```
   recover database using backup controlfile until cancel;
   ```

8. When the recovery has been completed, enter the following command:

   ```
   alter database open resetlogs
   ```

   If the database does not open and a message reports on the status of the redo logs, enter the following query at the SQLDBA or Server Manager prompt:

   ```
   select * from v$logfile
   ```

   This query returns, among other information, the directory structure in which Oracle looks for the redo logs. If the directory structure does not exist, create it. When you have done so, enter the following command again:

   ```
   alter database open resetlogs
   ```

   Oracle should open the database and recreate the redo logs.

9. Delete all archive logs for ORCL2. The ORCL2 database is now fully recovered.

10. (Optional) You can recreate an instance for ORCL2 using the oradim utility (for example, oradim.exe for Oracle 8.1.7). The syntax is:

```
oradim -new -sid SID -srvc ServiceName -intpwd Password -startmode auto
| manual -pfile FullPathToOracleInitSIDFile
```

11. (Optional) Create the password file if necessary, using the orapwdx.exe utility.

Scenarios for Restoring to an Alternate Server

For faster disaster recovery, you may prefer restoring the Oracle database to a different server than the original server. In this section, we present two typical scenarios as examples for restoring to alternate servers:

- Scenario 1 - The alternate server can support the exact directory structures of the original Oracle server.

- Scenario 2 - The alternate server cannot support the exact directory structures of the original Oracle Server. For example, the destination server does not have a volume (such as drive f:) that the original server had.

Restore to a Server that Supports the Exact Directory Structures

To restore an Oracle database to an alternative server that can support the exact directory structures of the original Oracle server, follow these steps:

1. Install the agent on the target server, and add another database instance for the new database that you want to recover.

2. On the Restore Manager Destination tab, clear the Restore to original location option. Select the directory on the target machine in which you want to restore.

3. Restore all necessary files for recovering (for example, the configuration files) to their original location on the target server.

4. Restore the database to the target's temp directory. The temp directory is where you would like to keep the files—database files, archive logs, and control files.

5. Move the database files and archive logs to their original location on the target server.

6. Copy the restored control file (CONTROL.%SID%) to all necessary directories and rename it with the appropriate name.

7. After you have restored the database files, recover the database. For instructions on recovering databases, see Recover the ORCL1 Database and Recover the ORCL2 Database sections of this chapter.

Restore to a Server with Different Directory Structures

To restore to an alternate server that cannot support the exact directory structure, follow these steps:

1. Install the option on the target server, and add an additional Oracle database instance for the new database that you want to recover.

2. Create an ORACLE instance or PWFILE if necessary, as described in the section Recover the ORCL Database in this appendix.

3. In the BrightStor ARCserve Backup Restore Manager, clear the Restore to original location option.

4. Restore all necessary recovery files (for example, configuration files) to a new location on the target server.

5. Restore the database to the target's temporary directory (the temporary directory is where you would like to keep the files—database files, archive logs, and control files).

6. Move database files and archive logs to their new location on the target server.

7. Edit the INITSID.ORA to reflect your new directory structure. Because the directory structures are different from the original, the control files must be recreated.

8. Start up the instance but **do not mount or open** the database.

9. Connect to the instance.

10. Execute the following command:

```
Startup nomount
```

11. Issue the create control file command. For the exact syntax, see the *Oracle Administrators Guide*. An example might be:

```
create controlfile
set database TEST
logfile group 1('e:\oracle\test\redlog1a.ora') size 200K,
group 2('e:\oracle\test\redlog1b.ora') size 50K
RESETLOGS
datafile 'e:\oracle\test\systest.ora' size 10M,
'e:\oracle\test\testrollback.dbs' size 2M
maxlogfiles 50
maxlogmembers 3
maxdatafiles 200
maxinstances 6
archivelog;
```

Note: The user has specified the RESETLOGS and ARCHIVELOG options.

12. Ensure that the control file is copied to all necessary locations and renamed with the appropriate name.

13. Enter the following command:

    `Recover database using backup controlfile until cancel;`

14. When the recovery is complete, enter the following command:

    `Alter database open resetlogs`

    This action recreates the redo logs and opens the database. If you get an error, check the previous section.

15. Delete the archive logs.

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