CA ARCserve® Backup for Windows

Agent for Oracle Guide

r12.5

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CA Product References

This documentation set references the following CA products:

- BrightStor® ARCserve® Backup for Laptops and Desktops
- BrightStor® CA-Dynam®/TLMS Tape Management
- BrightStor® CA-Vtape™ Virtual Tape System
- BrightStor® Enterprise Backup
- BrightStor® High Availability
- BrightStor® Storage Resource Manager
- CA Antivirus
- CA ARCserve® Backup Agent for Advantage™ Ingres®
- CA ARCserve® Backup Agent for Novell Open Enterprise Server for Linux
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- CA ARCserve® Backup Client Agent for Mainframe Linux
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- CA ARCserve® Backup for Windows Enterprise Option for StorageTek ACSLS
- CA ARCserve® Backup for Windows Image Option
- CA ARCserve® Backup for Windows Microsoft Volume Shadow Copy Service
- CA ARCserve® Backup for Windows NDMP NAS Option
- CA ARCserve® Backup for Windows Serverless Backup Option
- CA ARCserve® Backup for Windows Storage Area Network (SAN) Option
- CA ARCserve® Backup for Windows Tape Library Option
- CA Dynam®/B Backup for z/VM
- CA VM:Tape for z/VM
- CA XOsoft™ Assured Recovery™
- CA XOsoft™
- CA 1® Tape Management
- Common Services™
- eTrust® Firewall
- Unicenter® Network and Systems Management
- Unicenter® Software Delivery
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Documentation Changes

The following documentation updates have been made since the last release of this documentation:

- Oracle Support Matrix (see page 11)—Includes information about the Oracle versions supported by Windows.
- Configure the Agent for Oracle (see page 21)—Describes how you can configure the Agent for Oracle for the File-based mode and the RMAN mode.
- The chapter "Using the Agent in RMAN Mode" describes how the Agent for Oracle works in the RMAN mode.
- The chapter "Using the Agent in File-Based Mode" describes how the Agent for Oracle works in the File-based mode.

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Chapter 1: Introducing the Agent for Oracle

CA 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 CA ARCserve Backup offers is the CA 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 the CA 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 CA ARCserve Backup.

This section contains the following topics:

Oracle Support Matrix (see page 11)

Oracle Support Matrix

You can use the following compatibility matrix for comparing Oracle and Windows platforms.

Oracle Version	Supported	Not Supported
Oracle 9i	■ Windows Server 2000 (x86) ■ Windows Server 2003 (x86) ■ Windows Server 2003 R2 (x86)	

Oracle Version	Supported	Not Supported
Oracle 9.2	■ Windows Server 2003 (IA64)	
Oracle 10g r1	■ Windows Server 2000 (x86) ■ Windows Server 2003 (x86) ■ Windows Server 2003 R2 (x86)	
Oracle 10g r1	■ Windows Server 2003 (IA64)	
Oracle 10g r2	■ Windows Server 2003 (x64) ■ Windows Server 2003 R2 (x64)	
Oracle 10g r2	■ Windows Server 2000 (x86) ■ Windows Server 2003 (x86) ■ Windows Server 2003 R2 (x86) ■ Window Server 2008 (x86)	
Oracle 10g r2	■ Windows Server 2003 (IA64) ■ Windows Server 2003 R2 (IA64)	
Oracle 11g	■ Windows Server 2000 (x86) ■ Windows Server 2003 (x86) ■ Windows Server 2003 R2 (x86)	
Oracle 11g	■ Windows Server 2003 (x64) ■ Windows Server 2003 R2 (x64)	

Chapter 2: Installing the Agent for Oracle

The CA ARCserve Backup Agent for Oracle is a client application that is installed on the Oracle server or to a local drive on each node of an Oracle Fail Safe Cluster.

This section contains the following topics:

Installation Prerequisites (see page 13)
Agent Installation (see page 14)
Perform Post-Installation Tasks (see page 14)
Configure the Agent for Oracle (see page 21)
Reset the Oracle Agent Configuration (see page 23)
The Agent in an RAC Environment (see page 24)
Uninstall the Agent (see page 24)

Installation Prerequisites

Before installing the agent, verify the following prerequisites:

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

  For a list of these requirements, see the *Readme*.

- You have the following applications installed and working properly:
  - CA ARCserve Backup r12.5 and all of the latest service packs.

    Note: CA ARCserve Backup and the agent can be installed on different computers. For example, you can install CA ARCserve Backup on a local computer and the agent on a remote computer.

  - 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, oracle instance name, dbusername and password for agent configuration.
- 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 CA ARCserve Backup administrator to obtain the proper privileges if you do not have them.

Agent Installation

You must install the agent on each database server managed by CA ARCserve Backup.

For information about how to install the agent, see the *Implementation Guide*.

Perform Post-Installation Tasks

After installation is complete, perform the following tasks:

To perform post-installation tasks

1. Check whether Oracle Server is operating in ARCHIVELOG mode.

   For instructions, see Check the ARCHIVELOG Mode (see page 15).

2. Start ARCHIVELOG mode if it is not running.

   For more information, see Start ACHIVELOG Mode (see page 16).

3. Enable the database for automatic archiving. For more information, see Enable Automatic Archiving (see page 18).

   Note: For an Oracle 10g or 11g database, after you start the Archivelog mode, Oracle enables automatic archiving for you. For all other databases, you must follow all the steps in the Automatic Archiving section to enable automatic archiving.

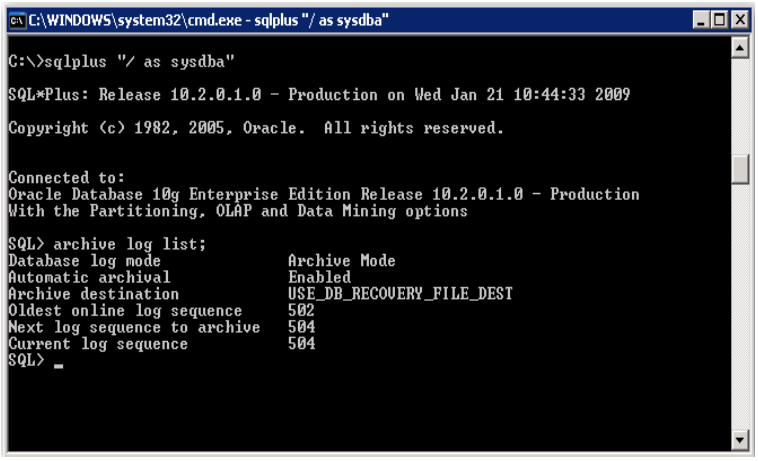
Check ARCHIVELOG mode

Use the following procedure to ensure that the ARCHIVELOG mode is enabled before starting the ARCHIVELOG mode.

To check if the ARCHIVELOG mode is enabled

1. Log in as an Oracle user with SYSDBA equivalent privileges.
2. Enter the following command at the SQL*Plus prompt:

```
ARCHIVE LOG LIST;
```



This command displays Oracle's archive log settings for this instance. For the agent to function properly the following should be set:

Database log mode: Archive Mode

Automatic archival: Enabled

Start ARCHIVELOG Mode

You must start the ARCHIVELOG MODE for backup of database after installing the agent.

To start ARCHIVELOG mode

1. Shut down Oracle Server.
2. Execute the following statements in Oracle:

   At the SQL*Plus prompt in Oracle:

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

If you are not using a flash recovery area with your Oracle 10g or Oracle 11g server, then you must include the following entries in either the PFILE or the SPFILE:

```
LOG_ARCHIVE_DEST_1="C:\Oracle\oradata\ORCL\archive"
LOG_ARCHIVE_FORMAT="ARC%S_%R.%T"
```

Note: With Oracle 10g or Oracle 11g, the LOG_ARCHIVE_START and LOG_ARCHIVE_DEST entries are considered obsolete and should not be made, in either the PFILE or the SPFILE.

For more information about why to start the Archive Log Mode, contact Technical Support at http://ca.com/support.

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:

LOG_ARCHIVE_START

Enables automatic archiving

LOG_ARCHIVE_DEST

Specifies the path to the archived redo log files. The agent 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

You can enable automatic archiving for the Oracle installation using SPFILE.

To configure the database for automatic archiving if your Oracle installation is configured to use SPFILE

1. Verify the value of the log parameters by entering the following command at the SQL*Plus prompt:

   ```
   show parameter log
   ```

2. If the parameters do not have the correct values, change them by entering the following commands at the SQL*Plus prompt after you shut down the server:

   ```
   CONNECT SYS/SYS_PASSWORD AS SYSDBA

   STARTUP MOUNT EXCLUSIVE

   ALTER SYSTEM SET LOG_ARCHIVE_START = TRUE SCOPE = SPFILE;
   ALTER SYSTEM SET LOG_ARCHIVE_DEST="c:\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 Oracle Documentation.

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	

Mode	Advantages	Disadvantage
	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 CA ARCserve Backup while the database is offline to ensure disaster recovery. When you are working with RMAN, ensure that the database runs in ARCHIVELOG mode.

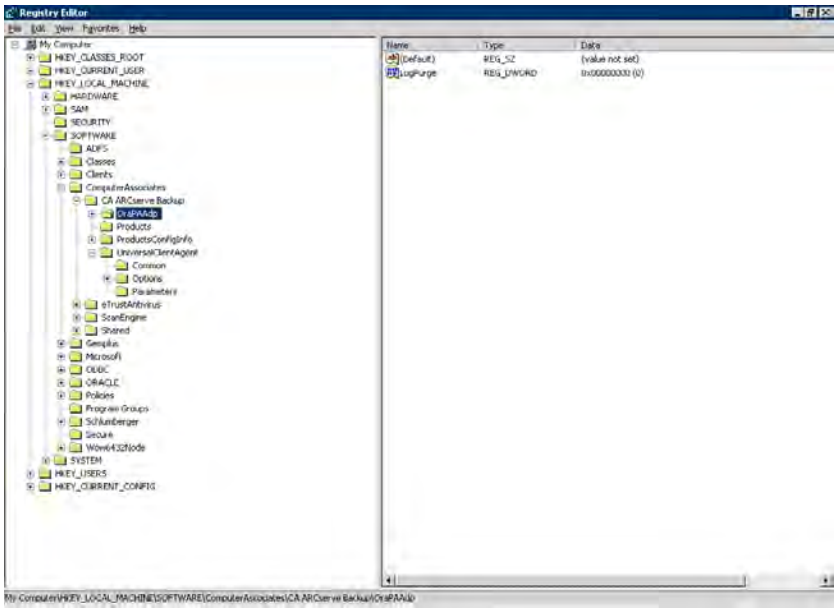
Agent Customization in the Windows Registry

You can customize the agent by modifying the registry entries in the Regedit32 utility of the Windows operating system in the File-based Mode.

Registry entries for the agent are listed in the HKEY_LOCAL_MACHINE window under the following key.

For a 64-bit Windows operating system using a 64-bit Oracle version and for a 32-bit Windows operating system using a 32-bit Oracle version update:

```
SOFTWARE\ComputerAssociates\CA ARCserve Backup\OraPAAdp
```



For 64-bit Windows operating systems using a 32-bit Oracle version update:

```
SOFTWARE\Wow6432Node\ComputerAssociates\CA ARCServe Backup\OraPAAdp
```

Important! Changes in the registry can affect the functionality of the agent.

For more information on customization and automatic purging, see Automatic Purging of Archive Log Files (see page 47) in the Troubleshooting section of this guide.

Configure the Agent for Oracle

After you install the Agent for Oracle, the Oracle Agent Configuration dialog appears. You must configure the agent to perform the backup and restore process.

To configure the Agent for Oracle

1. From the Windows Start menu, click Start, All Programs, CA, ARCserve Backup, and click Oracle Agent Configuration.

   The Oracle Agent Configuration dialog appears.

   Note: You can run the Oracle Agent Configuration tool as new Oracle instances are created.

2. Specify the necessary details to configure the agent. Some of the options include:

   Allow jobs to be submitted directly from the RMAN Console

   Lets you submit jobs from the RMAN console. For more information, see the topic Enable Submit Job From RMAN Console. (see page 22)

   Instance Name

   Auto detected. Ensure all instances are enabled that will be backed up.

   Username

   Enter user name.

   Password

   Enter user password.

   Log File

   Lets you specify the location of the log files. By default, the log files reside in the Log subfolder under the Oracle Agent Installation directory.

   Debugging Level

   Provides four debugging levels (Level 1 to Level 4).

   Important! If you are unable to set the debugging level option to the appropriate level, contact Technical Support.

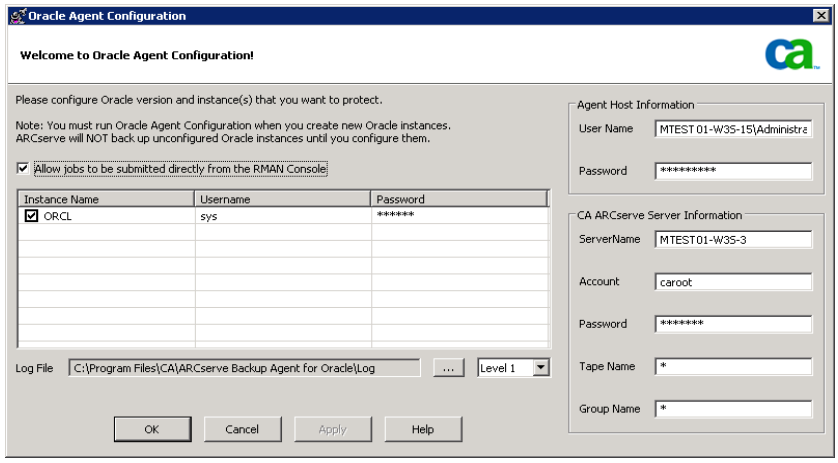
Enable Submit Job from RMAN Console

CA ARCserve Backup Agent for Oracle provides File Based Mode backup and restore and RMAN Mode backup and restore. The RMAN Mode backup and restore provides the most common functionalities for RMAN. If you want to use advanced RMAN features, you can submit jobs using the RMAN Console.

To enable submit job from the RMAN console

1. Start the Oracle Agent Configuration tool.
2. Check the Allow jobs to be submitted directly from the RMAN Console option.

   The Agent Host and the Server Information fields appear.



3. Enter details for the following parameters:

   Agent Host Information

   User name—Enter user details.

   Password—Enter password details.

   CA ARCserve Server Information

   Server Name—Enter the ARCserve server details to ensure the backups and restores are submitted on the server.

   Account—Enter CAROOT account details.

   Password—Enter the CAROOT password.

   Tape Name—Enter the tape name that you want to use for backup. If you want to use any tape then enter *.

   Group Name—Enter the group name that you want to use for backup. If you want to use any group then enter *.

4. Click OK.

   You can now submit RMAN scripts from the RMAN Console to be processed by the CA ARCserve server.

Reset the Oracle Agent Configuration

You can reset the Oracle agent configurations using the following steps:

To reset the Oracle agent configuration

1. Open the ARCserve Backup Agent for Oracle folder from

   `C:\Program Files\CA\ARCserve Backup Agent for Oracle`

2. Delete the configuration file named config.xml under the Agent for Oracle installation directory.
3. Start the Oracle Agent Configuration tool.

   The Oracle Agent Configuration tool options are set to default.

The Agent in an RAC Environment

To configure the agent in a Real Application Cluster (RAC) environment, you must install and configure the agent on at least one node that is a part of the RAC cluster and that has access to **all** archive logs. You can install the agent on more than one node in the RAC, but each node must also have access to all the archive logs. If you do install the agent on multiple nodes, note that the backup is executed from the node selected in the Backup Manager.

To enable the Agent for Oracle to access all archive logs for the recovery process similar to the way Oracle accesses them, you must follow Oracle's recommendation for building a RAC environment. Oracle requires access to all required archive logs, whatever their origin, in the RAC environment during recovery. To allow the Agent for Oracle access to all the archived logs, you must do one of the following:

- Put all required archive logs on a shared disk
- Put all required archive logs on a mounted NFS disk
- Use the replication of the archive logs

Uninstall the Agent

You can uninstall the Agent for Oracle using Add or Remove Programs in Windows.

Important! To ensure all agent files are removed without having to reboot the server the Oracle services should be shut down prior to the uninstall process. If the Oracle services are not stopped prior to the uninstall process, the remaining agent files will be removed the next time the server is rebooted.

Chapter 3: Using the Agent in File-Based Mode

This chapter explains how to back up, restore, and recover Oracle server databases using CA ARCserve Backup, the Agent for Oracle in file-based mode, and the Oracle backup, restore, and recovery features.

This section contains the following topics:

Backup, Restore, and Recovery Strategies (see page 25)
Back Up Using the Agent for Oracle in File-based Mode (see page 27)
Restore Using the Agent for Oracle in File-based Mode (see page 33)
Backup and Restore Limitations in File-Based Mode (see page 41)
Database Recovery in File-Based Mode (see page 41)
Automatic Purging of Archive Log Files (see page 47)

Backup, Restore, and Recovery Strategies

A backup and recovery plan should be established and tested as part of the design phase of a database prior to the database going into production use.

Pre-production testing can minimize problems and help to streamline the recovery process under production conditions. For more information on disaster recovery planning, see the appendix Disaster Recovery Scenarios.

For more information about Oracle backup and recovery procedures, see Oracle Documentation.

Develop a Backup Strategy

You can use the following guidelines to develop a backup strategy.

- Perform a full online backup of your Oracle databases.
- Perform an offline backup of the entire database using CA ARCserve Backup with the Client Agent for Windows. 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 Documentation.

Note: The CA ARCserve Backup server performs a license check only during the backup process.

For more information about Oracle backup and recovery procedures, see the Oracle Documentation.

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

CA ARCserve Backup and the 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 and Archived Redo Log Files

Oracle Server uses online redo log files to record changes to Oracle tablespaces. CA ARCserve Backup does not backup the online redo log files directly but requires that the database be in Archivelog Mode and set for automatic archiving. In Archivelog Mode Oracle will archive online redo log files as they are filled to archived redo log files. With Archivelog Mode set, CA ARCserve Backup will be able to backup the archived redo log files to ensure proper database recovery.

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

Back Up Using the Agent for Oracle in File-based Mode

Using the agent, you can back up individual Oracle database objects, such as tablespaces, archived redo log files, and control files.

Note: Using the Agent for Oracle in File-based Mode each tablespace is backed up as a separate session.

During the backup operation, the agent instructs Oracle to place each online tablespace in backup mode to be backed up. The agent retrieves the tablespace and passes it directly to CA ARCserve Backup, where it is backed up to a media device. When the backup is complete, the agent instructs Oracle to remove the object from backup mode.

Back Up Offline Databases Using CA ARCserve Backup in File-based Mode

You can back up an offline Oracle database. However, offline backups are performed directly by CA ARCserve Backup Client Agent for Windows. In this case, CA ARCserve Backup treats the Oracle database files the same way as it treats non-Oracle files.

To back up an offline Oracle database in File-based Mode

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.
5. The offline Oracle database is backed up.

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 Oracle database files in all locations. Database files that reside on RAW partitions have the additional requirement of being backed up to a file system drive using Oracle's OCOPY command prior to being backed up by CA ARCserve Backup.

Back Up One or More Databases Online

The agent 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

1. Ensure that the Oracle server is running.

   Note: You must have all CA ARCserve Backup engines running along with the CA ARCserve Universal Agent service.

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, if instance is not using Windows authentication. All options that apply to backing up a single online database can be applied to backing up multiple online databases.

     Note: The Backup Manager does not prompt you to enter the user name and password details, if the Oracle instance is using the Windows authentication.

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

   Note: If you select ARCHIVE LOG, the agent backs up all of the archived log files under the archive log directory.

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

4. Click the Schedule tab to select Custom Schedule or Use Rotation Scheme.

5. Click the Start toolbar button to submit the job.

   The Security and Agent Information dialog appears.

6. Select the Oracle object on the Security and Agent Information dialog, and then click Security.

   The Security dialog opens.

   Note: If you have a client agent installed, click Agent. The Agent Information dialog appears. Enter the configuration parameters for the client agent you have installed. Click OK when finished.

7. Enter the Oracle user name and password and click OK.

   Note: The user name and password must be for a user who has backup or database administrator privileges. The Oracle instance will not prompt you to enter the database user name and password, if it is using Windows authentication.

8. Click OK on the Security and Agent Information dialog.

   The Submit Job dialog appears.

9. 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

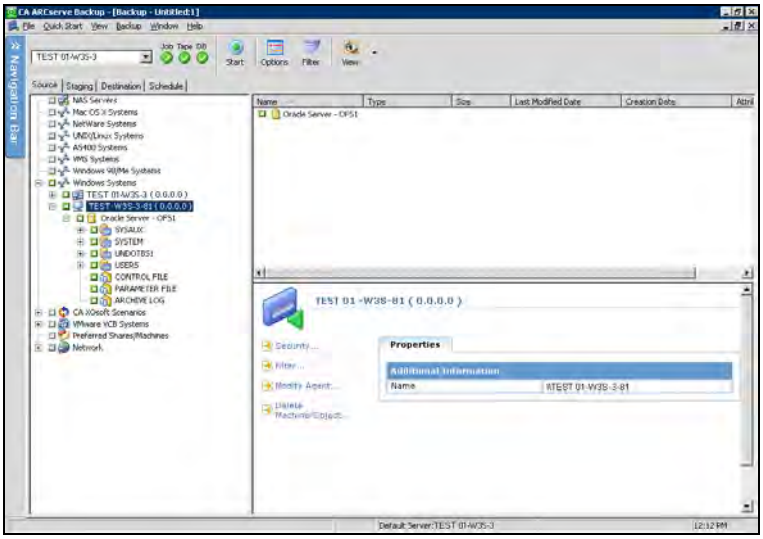
1. On the Backup Manager Source tab, select the first database to back up.
2. On the Backup Manager Destination tab, select the tape to which you want to back up the first database.
3. Finish the job submission procedure and run the job.
4. On the Backup Manager Source tab, select the second database 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

You can back up data in an Oracle Fail Safe environment. To know more about OFS, see the Oracle documentation.

To back up data in an Oracle Fail Safe environment

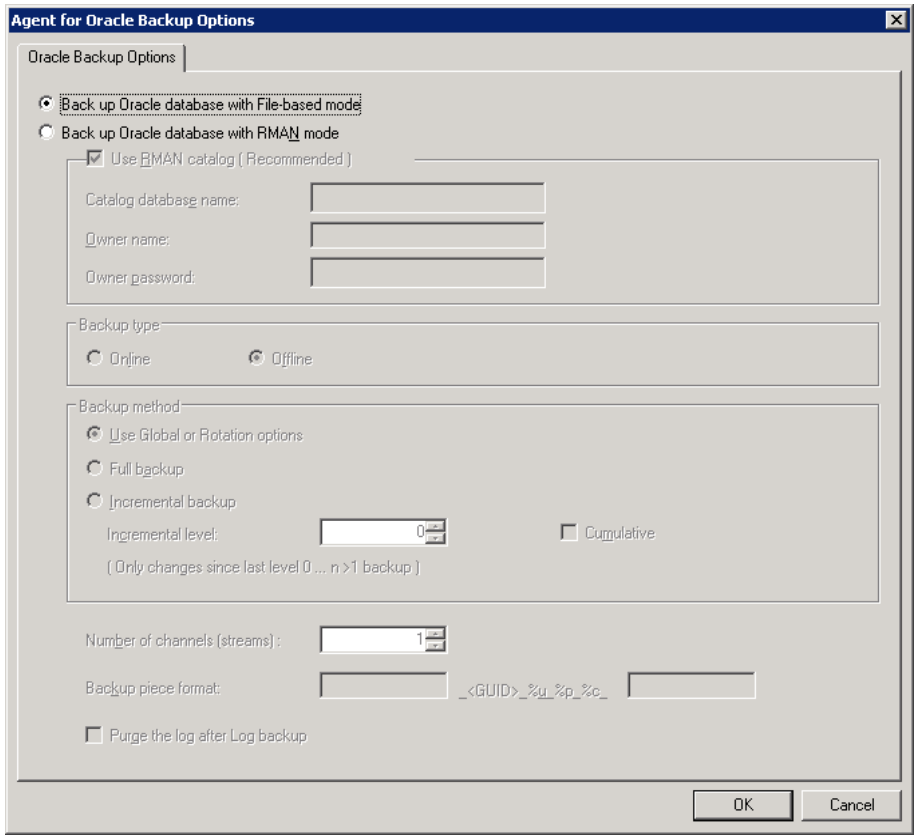
1. Make sure that the Oracle Fail Safe group is running in your Microsoft Cluster environment.
2. Start CA ARCserve Backup and start the Backup Manager.
3. On the Source tab, browse the Microsoft Network or the preferred shares to locate the Oracle Fail Safe groups.
4. Select the appropriate Oracle server from its Oracle Fail Safe group.



5. To set backup options, select the Source tab and then right-click to select Local Options.

   The Oracle Backup Options dialog appears.

6. On the Agent for Oracle Options dialog, select Back up Oracle database with File-based mode.



7. Double-click the Oracle server to display and select tablespaces for this instance.
8. Click the Destination tab and select a backup destination.
9. Click the Schedule tab and select the scheduling options you want to assign to this backup job.
10. Click Start.
11. 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.
12. 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 for Oracle in File-based Mode

The agent 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. You can also restore backups from earlier versions using the agent.

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.

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 CA 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 CA 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 Complete Databases (see page 42), Recover Complete Databases and Control Files (see page 44), Recover Tablespaces or Data Files, (see page 45) and Recover Offline Full Backups (see page 46) in this chapter.

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

You can restore complete databases, tablespaces, data files, or control files.

To perform complete restore

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 CA ARCserve Backup and open the Restore Manager.
3. On the Restore Manager Source tab, expand the Oracle server and select the objects to be restored using the Restore by Tree option.

   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 files to the appropriate directory.

     Important! You must overwrite all default database control files with the restored ones using the format

     ```
     copy CONTROL.ORCL path\CONTROL01.CTL
     ```

     For more information about restoring a control file, see the Oracle documentation.

   - 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.
4. If you are restoring to a different server than the original server, click the Destination tab.
5. In the Destination tab, first select the Windows System, 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.

6. Click the Schedule tab for scheduling options.
7. Click the Start toolbar button. The Session User Name and Password dialog appears.
8. 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.
9. Enter the user name SYSTEM (for Oracle 9, 9i, 10g, or 11g), or a user with SYSDBA equivalent privileges and the 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 Archive Logs

If the archive log files of the earlier versions that 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 (see page 35) and Restore a System Tablespace (see page 37) in this chapter.

Restore a System Tablespace

Use the following procedure to restore system tablespace.

To restore a system tablespace

1. Shut down the database.
2. Open the Restore Manager to select Restore by Tree.
3. On the Source tab, select the system tablespace you want to restore.

   The Oracle database objects are automatically restored to their original locations. You do not need to select a destination.
4. Click the Schedule tab for scheduling options.
5. Click the Start toolbar button.

   The Session User Name and Password dialog appears.
6. 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.
7. Enter the user name SYSTEM (for Oracle 9, 9i,10g, and 11g), or a user with SYSDBA equivalent privileges and password for your Oracle server.
8. 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 CA ARCserve Backup without the agent.

To restore a database that was backed up when it was offline

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

3. Initiate the restore.

   The database that was backed up when it was offline is restored.

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

Use the following procedure to restore the Oracle objects in the Oracle Fail Safe Environment.

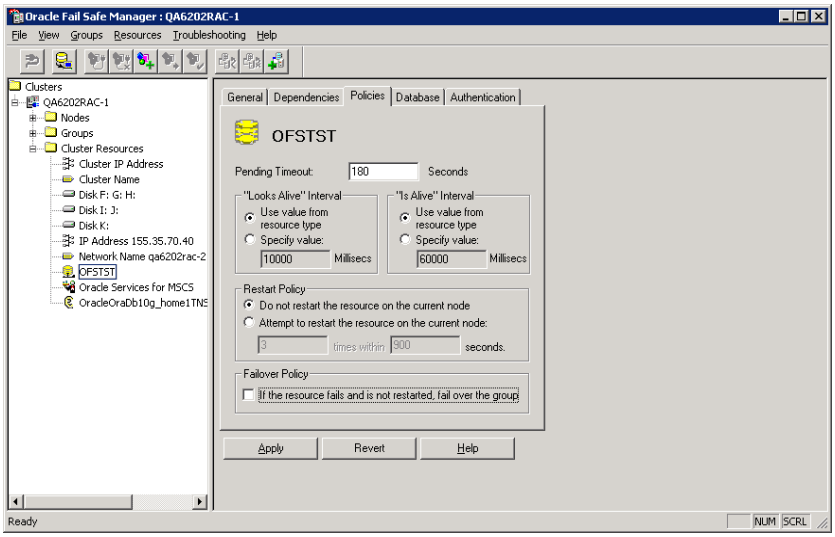
To restore in the Oracle Fail Safe environment

1. Open the Restore Manager and select a restore 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.

2. 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.
   - If you are performing a system tablespace restore or full database restore in the Oracle Fail Safe Manager, select the Policies tab. Ensure that you select the Do not restart the resource on the current node option under the Restart Policy and uncheck the Failover Policy option.



After changing the policies mentioned above, shutdown the database using SQL*Plus command.

Note: The Oracle Instance Service will shutdown as configured in the Policy Tab timeout. After restore, the Oracle Instance Service must start automatically, else you must start it manually.

3. Click the Start toolbar button. Schedule the job to run now or later.
4. Verify or change the user name and password for the Oracle Fail Safe Group tablespace and the Microsoft Cluster Server.
5. Click OK.

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

   Note: If you want to restore on a remote machine use the Restore to Alternative Location option, ensure that you perform the backup and restore operation on the machine that has the Oracle Database Instance.

Restore Database 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 Documentation.

Backup and Restore Limitations in File-Based Mode

Some of the backup and restore limitations include:

- The online redo logs are exclusively locked by Oracle while the Oracle server is online. Perform an offline backup, if necessary.
- 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 (see page 37) or Restore Complete Databases, Tablespaces, Data Files, or Control Files (see page 35) in this chapter.
- The Agent for Oracle in File-based mode can back up only those parameter files that are located under the default location (ORALCE_HOME\dbs and ORACLE_HOME\database). For more information, see Agent for Oracle does not Back Up non-default Parameter Files (see page 76).
- The Agent for Oracle in File-based mode does not support backup and restore processes on raw devices and Automatic Storage Management (ASM).

Database Recovery in File-Based Mode

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

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

   At the SQL*Plus prompt enter:

   ```
   CONNECT SYS/SYS_PASSWORD AS SYSDBA;
   STARTUP MOUNT
   ```

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

2. Begin the database recovery process by entering the following command at the SQL*Plus prompt:

   ```
   RECOVER DATABASE
   ```

   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
   ```

3. 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 documentation.

4. 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 Oracle Documentation.

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

1. Shut down the database by entering the following command at the SQL*Plus 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 SQL*Plus prompt enter:

   ```
   CONNECT SYS/SYS_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 SQL*Plus 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 SQL*Plus 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

1. Take the tablespace offline by entering the following command at the SQL*Plus 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 CA ARCserve Backup and the CA 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 SQL*Plus prompt:

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

   - If you are recovering a **data file**, enter the following command at the SQL*Plus prompt:

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

     For example,

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

   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
   ```

4. 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.

5. You can bring the database online 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 documentation.

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 CA ARCserve Backup Client Agent for Windows 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

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

3. Initiate the restore.

   The database that was backed up while offline is recovered.

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 the Oracle database files located on different drives.

Automatic Purging of Archive Log Files

Symptom:

How to purge archive log files?

Solution:

You can enable automatic purging of archive logs once they have been backed up by adjusting the following registry value:

```
HKEY_LOCAL_MACHINE\SOFTWARE\ComputerAssociates\CA ARCServe Backup\OraPAAdp
```

Value: LogPurge

Data: 1

Note: The LogPurge entry 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). You can modify this entry.

Chapter 4: Using the Agent in RMAN Mode

Recovery Manager (RMAN) is an Oracle utility that you can use 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.

Using RMAN and CA ARCserve Backup, you specify your own RMAN scripts to perform backups. You can also use RMAN directly to back up any online database object by connecting directly to RMAN with or without a recovery catalog at the command line.

Note: When using the agent or RMAN to back up, we recommend that you use a recovery catalog installed in a separate database. After backing up an Oracle database using RMAN, you can restore the database using either the agent or RMAN. Similarly, if you back up an Oracle database using the Agent for Oracle, you can restore the database using either RMAN or the agent.

For more information about the Recovery Manager, see the Oracle documentation.

This section contains the following topics:

Create an RMAN Catalog (see page 49)
About the SBT 2.0 Interface (see page 51)
Backup Using the Agent for Oracle in RMAN Mode (see page 51)
Restore Using the Agent for Oracle in RMAN Mode (see page 62)
Database Recovery in RMAN Mode (see page 71)

Create an RMAN Catalog

You can use the RMAN catalog when performing a backup as RMAN stores all relative backup information in this catalog. Without the catalog, RMAN will rely only on control files to manage backups. This is very risky because if all the control files are lost, RMAN will not be able to restore the database. In addition, you will not be able to restore your control files and your database will be lost.

Note: Ensure that the Catalog Database is available while performing backup and restore jobs using RMAN catalog.

To create an RMAN catalog

Note: Because RMAN relies heavily on this catalog when restoring, you should create it in a separate database (that is, a database other than the one being backed up).

1. Create a new tablespace using this SQL*Plus command:

   ```
   *  create tablespace <RMAN catalog tablespace> datafile <datafile name> size <datafile size> m;
   ```

2. Create the user who will be the owner of the RMAN catalog by entering this command:

   ```
   * create user <RMAN catalog owner> identified by <password> default tablespace <RMAN catalog tablespace> quota unlimited on <RMAN catalog tablespace>;
   ```

3. Assign the correct privileges to this user by using the following command:

   ```
   * grant recovery_catalog_owner to <RMAN catalog owner>;
   ```

4. Open a new command prompt and run the following command to connect to the catalog database of RMAN:

   ```
   rman catalog <RMAN catalog owner>/<RMAN catalog password>@rmandb
   ```

   where rmandb is the TNS Name for the RMAN catalog database.

5. Create a catalog using this command:

   ```
   create catalog;
   ```

6. Connect to the catalog database and target database of RMAN.

   ```
   *rman target <user(sys) who has sysdba privilege>/< password for user(sys)>@targetdb catalog <RMAN catalog owner>/<RMAN catalog password>@rmandb
   ```

   where rmandb is the TNS Name for the RMAN catalog Database and the targetdb is the TNS Name for the Target Database.

7. Execute the following command.

   ```
   register database;
   ```

For more information about Recovery Manager, see the Oracle Documentation.

Important! If you are not using an RMAN catalog, you need to manage your control files on your own either by using a file system backup or by mirroring the control files for fault tolerance.

About the SBT 2.0 Interface

The SBT (Systems Backup to Tape) SBT 2.0 interface is the Oracle API (Application Programming Interface) that enable CA ARCserve Backup to provide backup and restore capabilities to RMAN. These interfaces use the OracleAgent Config.xml parameter file and the CA ARCserve Backup ca_backup and ca_restore commands to initiate backup and restore operations from RMAN.

Backup Using the Agent for Oracle in RMAN Mode

Using CA ARCserve Backup and the agent, you can perform two types of backups:

- Offline backup
- Online backup

Back Up Offline Databases Using CA ARCserve Backup in RMAN Mode

Performing an "offline" backup through the agent puts the database in a quiescent state before the backup process begins. The reason for this is that RMAN must be able to connect to the database; therefore, the database processes must be running and accepting connection. Performing a true offline backup does not allow this connection to occur. The only way to allow RMAN to connect to the database and not have it online is to use the quiescent state, which prevents all user transactions from occurring.

Note: To perform a true offline backup, use the agent to back up your database after manually shutting it down. To restore your database, use the agent again, and then manually start up your database.

Perform a Backup in Offline Mode

You can perform a back up in offline mode using the following instructions.

Note: Before opening the Backup Manager, ensure that the Oracle Server is running, and be sure to start the CA ARCserve Backup and the agent.

To perform a backup of an Oracle database in offline mode

1. Open the Backup Manager, select the Source tab, and expand the Windows Agents.
2. In the Windows Agents option, click the host on which Oracle is installed.

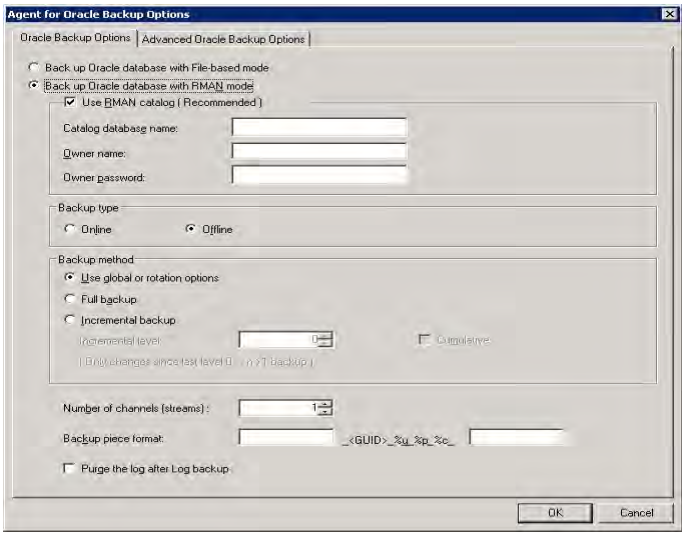
   The Login dialog appears.
3. Enter the host user name and password, and then click OK.

   The host appears with the list.
4. Select the Oracle database that you want to back up.

   The Login dialog appears.
5. Enter the Oracle database DBA user name and password and then click OK.

   Note: Ensure that the Oracle user name and password that you use to connect to Oracle has the sysdba privileges.
6. To set backup options, select the Source tab, and then right-click to select Local Options.

   The Agent for Oracle Backup Options dialog appears.
7. Select the Back up Oracle database with RMAN mode option to enable the fields.



8. Enter information in the fields:

Use RMAN catalog (Recommended)

Ensure the Use RMAN catalog (Recommended) is selected and enter the catalog database name and owner password.

Note: You can use the RMAN catalog, otherwise RMAN will rely only on the control files to manage backups. Using only the control files presents a risk in that if the database and all control files are somehow lost, it will prevent RMAN from being able to restore the database. By using the RMAN catalog option, you prevent the possibility of losing the control files backup-related information as well as other valuable information. Also ensure that if you do not use the RMAN catalog, you limit the possibility of performing a point-in-time recovery.

If you choose not to select the catalog database option, a warning message displays reminding you that the Agent for Oracle cannot perform a full database backup or restore using RMAN.

Backup Type

Select the offline mode.

Backup method

Use global or rotation option—This option is enabled by default. If you do not disable this, backup job will use the global or rotation backup method on the Schedule tab.

Full Backup—This method typically minimizes the number of tapes you will need when restoring the database, but takes more time during the backup.

Incremental Backup—This method reduces the backup time, but restoring typically requires more time and tapes to be loaded (that is, the last full backup plus all the incremental ones).

Number of Channels (Streams)

If you have more than one drive and volume in your system, you can use the Number of Channels (Streams) option on the Backup Manager to enhance the performance of your backups. After you allocate a certain number of channels to be used for the backup, the agent and RMAN determine how the multiple channels are organized and distributed, and whether all the channels you specified are necessary. In some cases, RMAN may determine that instead of using all the channels you specified, the backup job could be better accomplished by sequentially packaging more than one job (backup piece) per channel, and as a result will use a smaller number of channels for the job. The number of devices or device groups available on your system dictates the number of jobs RMAN runs simultaneously.

Important! After specifying more than one channel in the Backup Manager, avoid selecting a specific media or media device group on the Destination tab as this prevents multistreaming from occurring.

Note: In the Oracle Backup Options dialog, ensure that the value in the Number of Channels (Streams) option is between 1 and 255. As this parameter affects the Agent, RMAN determines the actual number of channels (streams) needed for the backup and restore job.

Backup Pieces Format

Enter the prefix and suffix of backup pieces format string.

Purge Log After Log Backup

Use this option to purge the Archivelog after they are backed up.

9. (Optional) Select the Advanced Oracle Backup Options tab.

   The Advanced Oracle Backup Options dialog appears.

10. Enter any of these fields if you want to modify the performance of your backup. Some of the Backup parameters include:

Backup Piece Size

Enter a number (in KB) in the Backup Piece Size field if you want RMAN to generate more than a single backup piece.

Read Rate (# Buffers)

Enter the maximum number of buffers per second in the Read Rate (# Buffers) field that you want RMAN to use when reading data from the disk.

Number of Files per Backup Set

Enter a number in the Number of Files per Backup Set field to limit the number of backup pieces that RMAN should use per backup set.

Block Size (Bytes)(Oracle 9i)

Enter a value in the Block Size (Bytes) field to allow RMAN to determine the size of the data blocks to send to the agent when performing a backup.

Maximum Number of Opened Files

Enter a number in the Maximum Number of Opened Files to limit the total number of files that RMAN will open at the same time. Leaving this field empty allows RMAN to use the default value.

Backup Set Size (KB)

Enter a number in the Backup Set Size (KB) field to limit the amount of data that should go into a backup set. We recommend that you leave this field empty.

Number of Copies

Enter a number between one and four in the Number of Copies field to indicate how many copies of the backup pieces RMAN should generate.

Note: To be able to generate more than one copy, you must enable the BACKUP_TAPE_IO_SLAVES option in either your init<sid>.ora or SPFILE file; otherwise you will receive an error message.

Fail the job if number of copies is more than 1 and so many drives are not available

Use this option to fail the backup job when the number of copies is more than 1 and the job cannot gain access to enough devices to support them. The backup job continues to run, if you do not select this option. But, the number of copies is automatically reduced, if the job finds that the number of devices is insufficient.

Archived Logs Selection

Select all the archived logs or select them based on the time.

There are four choices to backup archived logs. They are:

All—Backs up all archived logs

Time based—Backs up archived logs based on time

SCN based—Backs up archived logs based on SCN number

Log Sequence Based—Backs up archived logs based on log sequence number

Thread—Available when you are not using the All option. Ensure, the thread number should be always set to 1, if it is not a RAC environment.

RMAN Backup Tag

Enter a string used to set a tag on backup set.

Load RMAN Script

Use this option to enter the path of your RMAN script.

Important! This option overrides all options you may have selected in the Restore Manager.

Device availability waiting time (minutes)

Specifies how long you want a backup job to wait if it is unable to access the number of devices it requires. After the time you specify expires, the job fails or it continues if you enabled the Continue backup even if some requested devices are not available option.

Continue backup even if some requested devices are not available

Select this option when you have at least one device assigned to run the job. If this option is not selected, the job fails when it cannot access enough devices within the time specified in the option Device availability waiting time (minutes).

Click OK.

11. Select the Destination tab, and then select the media device group and media in which you want to store the back up.

    Important! If you set the Number of Channels option to a number higher than one, do not select a specific media or media device group on the Destination tab.

12. Click the Method/Schedule tab, and select one of these Schedule types:
    - Custom
    - Rotation
    - GFS Rotation
13. Click Start. The Submit Job dialog appears.
14. Schedule the job to run now or at another time. Click OK.

    The Job Submission dialog appears.

15. Click OK. The Backup Manager has submitted the job to the queue. You can monitor the job on the Job Status Manager.

    Note: For information about restrictions related to monitoring your backups, see the Backup Limitations section of this chapter.

    A backup can take up multiple sessions on the media even if you choose only one object. For example, if you enter a limit on the Backup Set Size field on the Advanced Oracle Backup Options tab, it will create multiple sessions.

Back Up Oracle Database Online

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

Perform a Backup in Online Mode

You can perform a backup in the online mode using the following procedure.

Note: Before opening the Backup Manager, ensure that Oracle Server is running and that all of the tablespaces in the databases you want to back up are online. Also, start the CA ARCserve Backup and the Agent.

To perform a backup in the online mode

1. Open the Backup Manager, select the Source tab, and expand the Windows Agents.
2. In the Windows Agents list, click the green marker on the host on which Oracle is installed.

   The Login dialog appears.
3. Enter the host user name and password, and then click OK.

   Note: Expand the host if it did not expand automatically.
4. Select an Oracle database.

   The Database Login dialog appears.
5. Enter the Oracle DBA user name and password.

   Note: Ensure that the Oracle user name and password that you use to connect to Oracle has the sysdba privileges.

   When backing up a database, a single job called the master job is created in the queue. When the backup begins, the master job calls RMAN, which launches the child jobs.

   The child jobs appear in the job queue.
6. To set the backup options, select the Source tab and right-click to select Local Options.

   The Agent for Oracle Backup options dialog appears.

   Note: In the Oracle Backup Options dialog, ensure that the value in the Number of Channels (Streams) option is between 1 and 255. As this parameter affects the Agent, RMAN determines the actual number of channels (streams) needed for the backup and restore job.
7. Select Back up Oracle database with RMAN mode option to enable the fields.
8. Enter information in the Oracle Backup Options tab fields to perform an online backup.

   Click OK.
9. (Optional) Select the Advanced Oracle Backup Options tab.

   The Advanced Oracle Backup Options dialog appears.

10. Enter details, if necessary.
11. Select the Destination tab, and then select the media device group and media in which you want to store the back up.

    Important! If you set the Number of Channels option to a number higher than one, do not select a specific media or media device group on the Destination tab.
12. Click the Method/Schedule tab, and select one of these schedule types:
    - Custom
    - Rotation
    - GFS Rotation
13. Click Start and schedule the job to run now or at another time. Click OK.

    The Job Submission dialog appears.
14. Click OK on the Job Submission dialog.

    The Backup Manager has submitted the job to the queue. You can monitor the job on the Job Status Manager.

    Note: For information about restrictions related to monitoring your backups, see the Backup Limitations section of this chapter.

    A backup can take up multiple sessions on the media even if you choose only one object. For example, if you enter a limit on the Backup Set Size field on the Advanced Oracle Backup Options tab, it will create multiple sessions.

Back Up in an Oracle RAC Environment

You can back up data in an Oracle RAC environment with CA ARCserve Backup and the Agent.

To back up in an Oracle RAC Environment

1. Ensure that Oracle Server is running in your RAC environment.
2. Start CA ARCserve Backup and select the Backup Manager.
3. On the Source tab, browse the Microsoft Network or the preferred shares to locate one of Oracle RAC nodes.
4. Select the appropriate Oracle server from its Oracle RAC nodes.
5. To set backup options, select the Source tab and then right-click to select Local Options. The Oracle Backup Options dialog appears. On the Agent for Oracle Options dialog, select Backup Oracle with RMAN Backup.
6. Double-click the Oracle server to display and select tablespaces for this instance.
7. Click the Destination tab and select a backup destination.
8. Click the Schedule tab and select the scheduling options you want to assign to this backup job.
9. Click Start.
10. Enter the user name and password of the Oracle RAC node. To enter or change security information for the Oracle RAC node, select the Oracle RAC node and click Security.
11. Click OK to submit the job.

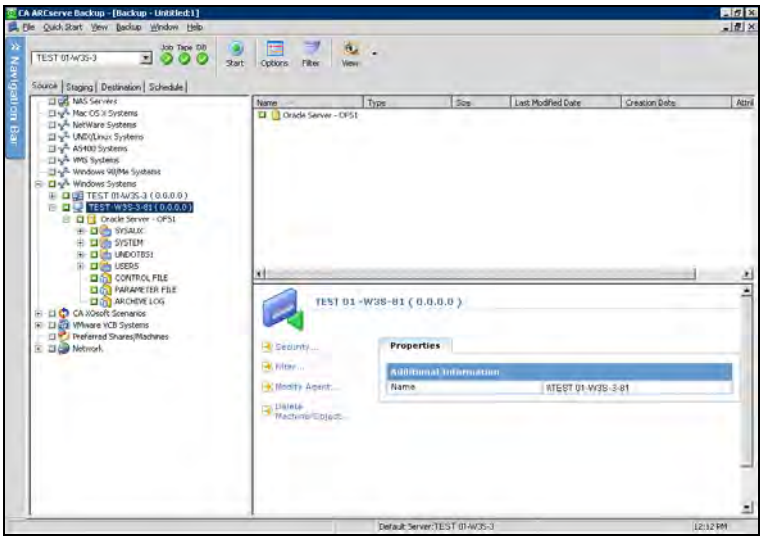
Back Up in an Oracle Fail Safe Environment in RMAN Mode

You can back up data in an Oracle Fail Safe environment. To know more about OFS, see the Oracle documentation.

To back up data in an Oracle Fail Safe environment

1. Make sure that the Oracle Fail Safe group is running in your Microsoft Cluster environment.
2. Start CA 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. To set backup options, select the Source tab and then right-click to select Local Options.

   The Oracle Backup Options dialog appears.

6. On the Agent for Oracle Options dialog, select Back up Oracle database with RMAN mode.

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

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

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

10. Click Start.

11. 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.

12. 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.

Backup Limitations using the RMAN Mode

Some of the backup limitations include:

- You cannot duplicate the Catalog database SID or share it with any other SID name.
- The online redo logs are exclusively locked by Oracle while the Oracle server is online. You can perform an offline backup, if necessary.
- Ensure that you do not have the same name for two tablespaces, as the ARCserve Manager selects and backs up only one of them. If you want to back up all the tablespaces in the Manager, then select the entire database to back up. However, there is no such a limitation, if you use the CA ARCserve command line or an RMAN script to submit backup job.
- Do not back up individual data files using RMAN.
- The Agent for Oracle backs up the parameter files located under the default location ORALCE_HOME\dbs and ORACLE_HOME\database.

  Note: If your Oracle environment is in Oracle Real Application Clusters (RAC) or Oracle Fail Safe (OFS) or the parameter files are not in default location, see the Agent for Oracle does not Back up Non-default Parameter Files (see page 76)section to configure and protect them.
- The Restore by Media and Restore by Session options are not supported.
- The Agent for Oracle in RMAN mode does not support backing up parameter files on raw devices.
- While performing an RMAN backup job using the Agent for Oracle, if your agent computer is unable to resolve the backup server name (for instance, the Backup server is in a different domain using a separate DNS server), you can manually modify your mgmtsvc.conf and clishell.cfg files on both the ARCserve server and the agent computer to ensure proper hostname resolution. For more information about how to resolve this, see Remote Oracle Instance Backup fails in RMAN mode (see page 90).
- Agent cannot convert Unicode characters.

  To display Unicode characters correctly in RMAN or CA ARCserve Backup Restore Manager, verify the Oracle DB character set matches the value for the NLS-LANG setting in the registry, as shown in the example below:

  `HKEY_LOCAL_MACHINE\SOFTWARE\ORACLE\KEY_OraDb10g_home1`

  Key: NLS_LANG

  Value: Specify the same value as the Oracle database character set. For example, SIMPLIFIED CHINESE_CHINA.ZHS16GBK.

  Note: This setting also changes the SQL*Plus command-line prompt to the value you specified.

For further information about customizing your backup, see the *Administration Guide*.

Restore Using the Agent for Oracle in RMAN Mode

The agent in RMAN mode 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.

Note: For more information on how to restore a database to another host manually using RMAN, see Scenario for Creating a Duplicate Database on a Remote Host (see page 116) in the Appendix C in this guide.

Restore and Recover Databases and Database Objects

You can restore and recover a complete database backed up online or offline by performing the following steps.

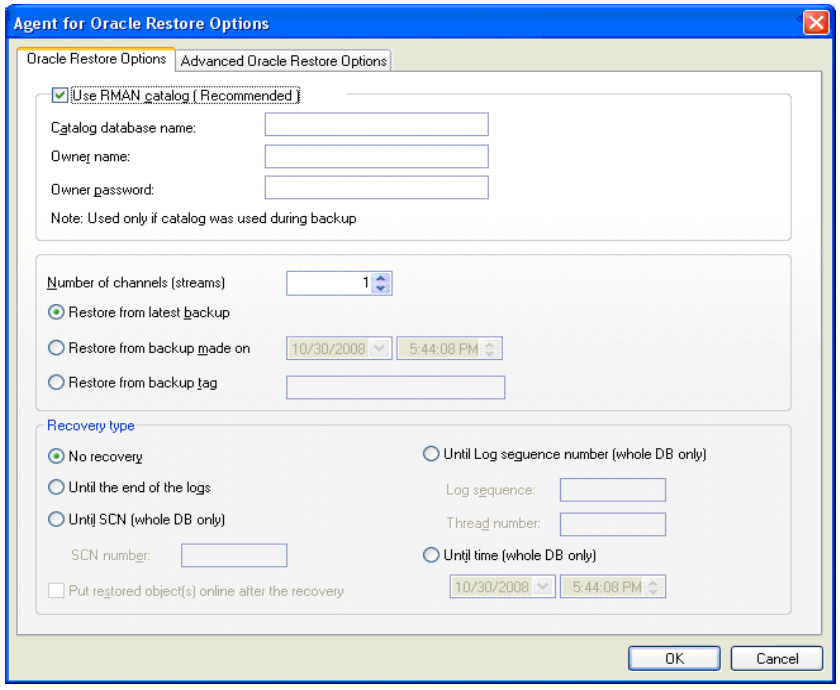
Note: Before starting the Restore Manager, be sure to start CA ARCserve Backup.

To restore a complete database backed up offline or online

1. Open the Restore Manager, select the Source tab, and then select the Restore by Tree view.
2. Expand the Windows Agents, and then expand the Oracle host under the Windows Agents.
3. Select the database you want to restore, or select the database objects to restore.
4. To set the Oracle Restore Options, select the Source tab, right-click the Oracle database you want to restore and select Local Options.

   The Oracle Restore Options dialog appears.
5. To set restore options, click the Oracle Restore Options tab.

   The Agent for Oracle Restore Options tab appears.



6. Enter details in the following fields, if necessary.

   - Use RMAN catalog (Recommended)—Ensure the Use RMAN catalog (Recommended) check box is selected and enter the catalog owner name and owner password.
   - Number of Channels (Streams) Option—When you enter a number in the Number of Channels (Streams) option, the agent tells RMAN the maximum number of channels to use. RMAN then determines how many channels it actually allocates to the restore operation. RMAN submits the jobs in parallel, one for each channel.

     Note: Since RMAN determines the appropriate number of channels to use, RMAN may use less than the number of channels you specify.
   - Restore From Latest Backup Option—When you select the Restore From Latest Backup option, the agent tells RMAN to use the latest available backup.

     Note: No Recovery is the default selection in the Recovery Types section of the Oracle Restore Options tab. Ensure you select one of the other Recovery Types, if you want to recover your database after restoring it.
   - Restore From Backup Made On Option—When you select the Restore From Backup Made On option, you specify the date and time as the upper time limit of the backup from which you want to restore. RMAN will perform the operation on files up to, but not including, the specified time. This option is useful when you have a database that you must bring back to a known state (consistency level). You can also use this option when you know the latest backup is inaccessible. In that case, you can use this option in conjunction with the Until End of Logs recovery option to restore the database from an older backup set and "replay" all transactions to bring the database to its latest state.

     Note: No Recovery is the default selection in the Recovery Types section of the Oracle Restore Options tab. Be sure to select one of the other Recovery Types if you want to recover your database after restoring it.
   - Restore From Backup Tag Option—When you select the Restore From Backup Tag option, you specify the tag that was used during backup to indicate which backup sessions to restore. The tag is the logical name assigned to a particular backup (for example, Monday Morning Backup).

     Note: No Recovery is the default selection in the Recovery Types section of the Oracle Restore Options tab. Ensure that you select one of the other Recovery Types if you want to recover your database after restoring it.

     Other recovery options include:

- No Recovery—Selecting this option restores the data but does not perform any recovery. You must recover the database yourself and then put it back online. You generally use this option when you already know that a restore cannot be recovered, such as when additional restore jobs are required or you need to set up before starting the recovery process.
- Until the End of Logs—RMAN recovers the database, tablespaces, and data files up to the current time.
- Until SCN (Whole DB Only)—RMAN recovers the database up to the specified System Change Number (that is, a checkpoint number). This recovery is valid for the entire database only. The database is opened with the resetlogs option.
- Until Log Sequence Number (Whole DB Only)—RMAN recovers the database up to the specified Archived Log Sequence. This recovery is valid for the entire database only. The database is opened with the resetlogs option.
- Until Time (Whole DB Only)—RMAN recovers the database up to the specified point in time. This recovery is valid for the entire database only. The database is opened with the resetlogs option.

  Important! When using one of these recovery methods, all logs are reset to the last registered date in the control file, so any data recovered after this date will be lost and cannot be retrieved.
- Put Restore Object(s) Online after Recovery—When selected, this option puts the tablespaces and data files online and opens the database after the recovery has been performed.

7. (Optional) You can update the following Advanced Oracle Restore Options.
   - Archived Logs Selection—You can select one of the archived logs selection options listed below.
   - Do Not Restore—Selecting this option does not restore any of the archived logs.

     Note: This option is checked automatically.
   - Time Based—This option restores the archived logs based on the time they were created, and not on the time they were backed up. If you are using this option, you must also enter a value either in the From Time field or in the Until Time field.
   - Thread—This option lets you specify the thread number used to identify the Oracle instance. The default value of the thread is 1 for the Oracle instance in exclusive mode.
   - SCN Based—This option restores the range of archived logs by SCN (System Change Number).
   - Log Sequence Based—This option restores the archived logs by the archived log sequence number.

- Include Control File—Select this option if you want to restore the control files. Keep in mind that you should restore the control files only if they are corrupted or lost.

  Important! Restoring a control file resets all the logs causing you to lose the most recent data once the database is started. There is no way to recover this data.

- Block Size (Oracle 9i)—If you use this option, the size of the data blocks must match the block size used during backup; otherwise, the restore will fail.

- List Backup Sets for Selected Objects—When selected, it sends a request to list all backup sets that include the objects you selected.

  Note: This option does not restore the selected objects. To restore the selected objects, you must submit another restore job.

- Validate Backup Set Number—This option asks RMAN to validate the integrity of a backup without actually restoring it.

- Load RMAN Script—Use this option to enter the path of your RMAN script.

  Important! Using this option overrides all options you may have selected in the Restore Manager.

8. Select the Destination tab, and uncheck Restore files to their original location(s) option, if you want to restore the database or the database objects to an alternative location.
9. Expand the target Windows agent, enter the username and password.

   Click OK.
10. Select the Oracle database under the target Windows agent and click Start.

    The Restore Media dialog appears.
11. Select a server to perform the restore and click OK.

    The Session User name and Password dialog appears.
12. Enter the username and password details.
13. Enter the Oracle username and password in DBAgent tab. In addition, since the Use RMAN catalog (Recommended) option is checked by default, you must enter the Owner Name and Owner Password of the RMAN catalog, unless the box is unchecked.
14. Click OK.

    The Submit Job dialog appears. Schedule the job to run now or at a later time.

    For more information about submitting a restore job, see the *Administration Guide.*

Restore Archived Logs and Control Files

If your control files or archived log files have been lost or corrupted, you can restore them by selecting them on the Source tab of the Restore Manager when you configure a restore.

Important! If you selected the Purge Logs after Backup option during backup, you must select one of the Archived Logs options (except Do Not Restore) on the Advanced Oracle Restore Options tab to ensure that RMAN triggers the restore of the required logs. If you do not select one of the Archived Logs options, the recovery phase will not function properly since the necessary logs may be missing. If you are using Oracle 9i and above, however, RMAN automatically restores the needed archived logs when you select one of the Recovery options.

If your archived redo log files are not damaged, generally you should not include them in a restore. By keeping the archived redo log, you can restore your database to the latest usable version that existed before your system or database failed.

If you select the Until the End of Logs option when you configure a restore, do not include the control files in the restore unless missing or corrupted. If you include the control files in the restore, the agent recovers the database using the restored control files. As a result, all transactions made in the database that occurred after the last transaction recorded in the restored backup files are lost.

Restore Parameter File

You can restore parameter files to a specific version using the Restore Manager.

To restore a specific version of a parameter file

1. Select the parameter file you want to restore (such as, orapwfile).
2. Click the Version History button at the top of the Source tab.
3. At the resulting dialog, select the exact version of the parameter file you want to restore.
4. Click OK.

Parameter files are the only type of database objects that you can restore to a specific version. Restoring your parameter files this way uses the CA ARCserve Backup agent directly and does not involve RMAN.

Note: If the SQLNET.AUTHENTICATION_SERVICES option (set to "none") is in the init.ora file for any instance that you intend to backup and restore, you should comment it out before attempting to restore the orapwfile (included in the PARAMETER-FILES). Leaving it as it is prevents further sysdba database connections, and prevents normal management activities (such as recovery, shut down, and start up).

Restore Point-in-Time

To restore a database or tablespace to a point-in-time, follow the procedures to restore a complete database and the associated archive log files. For the appropriate procedure, see the different restore and recovery procedures in this guide.

For more information about restoring or recovering the database or tablespace to a point-in-time, see the Oracle documentation.

Note: The Until the End of Logs option, which automatically recovers a database after it has been restored, does not support point-in-time recoveries. If you want to perform a point-in-time recovery, you must perform the recovery steps manually.

Restore in the Oracle RAC Environment

You can restore in an Oracle RAC Environment using the following procedure.

To restore in the Oracle RAC environment

1. Select the Restore by Tree. Select the source you want to restore.
2. 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 RAC, 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.
3. Click Start and schedule the job to run now or later.
4. Verify the user name and password for the Oracle RAC tablespace.
5. Click OK. The Restore Manager submits the job to the queue.

   You can monitor the job on the Job Status Manager.

Restore Oracle Objects in the Oracle Fail Safe Environment

Use the following procedure to restore the Oracle objects in the Oracle Fail Safe Environment. With Oracle Fail Safe, you can reduce downtime for single-instance Oracle databases. For more information about the Oracle Fail Safe, refer the Oracle Documentation.

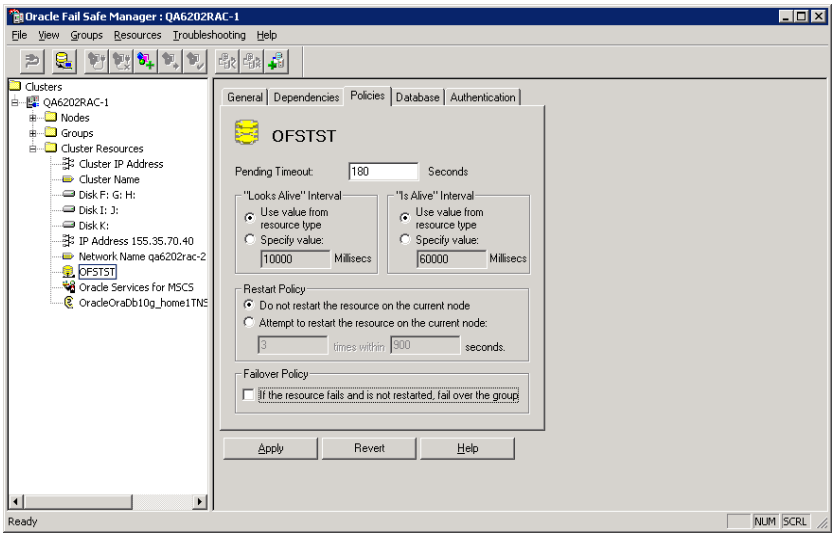
To restore in the Oracle Fail Safe environment

1. Open the Restore Manager and select a restore 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.

2. 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 need not specify a path. Ensure that the Restore files to the original locations is selected.
   - 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.
   - If you are performing a system tablespace restore or full database restore in the Oracle Fail Safe Manager, select the Policies tab. Ensure that you select the Do not restart the resource on the current node option under the Restart Policy and uncheck If the resource fails and is not restarted, fail over the group in the Failover Policy option.



After changing the policies mentioned above, shutdown the database using SQL*Plus command.

Note: The Oracle Instance Service will shut down as configured in the Policy Tab timeout. After restore, the Oracle Instance Service must start automatically; else you must start it manually.

3. Click the Start toolbar button. Schedule the job to run now or later.
4. Verify or change the user name and password for the Oracle Fail Safe Group tablespace and the Microsoft Cluster Server.
5. Click OK.

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

   Note: If you want to restore on a remote machine use the Restore to Alternative Location option, ensure that you perform the backup and restore operation on the machine that has the Oracle Database Instance.

Database Recovery in RMAN Mode

After restoring a database or database objects to the server, you must recover them. You can recover the database or database objects automatically using the Restore Manager or you can perform a manual recovery using the Oracle Server Manager Console.

Manual Recovery

You can manually recover a complete database when the control files have been lost or become corrupted. The following section provides the details for performing this type of database recovery.

Recover Databases with Lost or Corrupted 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, recover the control files, and then recover the database, follow these steps.

To recover database with lost or corrupted control files

1. Shut down the database by entering the following command at the SQL*Plus prompt:

   ```
   SHUTDOWN;
   ```

2. At the appropriate prompt, start and mount the database and begin the recovery process. At the SQL*Plus prompt enter, enter the following command:

   ```
   CONNECT SYS/SYS_PASSWORD AS SYSDBA;
   STARTUP MOUNT;
   RECOVER DATABASE USING BACKUP CONTROLFILE;
   ```

3. 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, re-enter the command:

   ```
   RECOVER DATABASE USING BACKUP CONTROLFILE;
   ```

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

4. Enter the following command at the SQL*Plus prompt to bring the database back online and reset the logs:

   ```
   ALTER DATABASE OPEN RESETLOGS;
   ```

5. Go to the directory where the archived redo logs are stored and delete all of the log files.

6. If any tablespaces are still offline, enter the following command at the SQL*Plus prompt to bring them back online:

   ```
   ALTER TABLESPACE TABLESPACE_NAME ONLINE;
   ```

7. If you are using RMAN to recover your complete database with backed up control files, resynchronize the database information in RMAN to reflect the newly recovered database. To resynchronize the database information, follow these steps:

   a. Login as oracle.

   b. Enter the following command to set oracle SID to the recovered database SID:

```
ORACLE_SID=database SID
```

c. Enter the following commands to complete the process:

```
rman target dbuser/ dbuserpassword rcvcat catowner/catownerpassword@rman
service name
reset database
```

where:

- *dbuser* is the user with dba privileges for the recovered database.
- *dbuserpassword* is the *dbuser* password.
- *catowner* is the Oracle user name of the Oracle Recovery Manager catalog owner.
- *rman service name* is the name of the service used to access the database where the rman catalog is installed.

Recover from Offline Full Backups

If you backed up your database in offline mode, you will use the same process to recover it as if you had backed up the database in online mode. This is because the offline backup actually puts the database in a quiescent state, which means that the database is still online (although you cannot access it or process transactions).

Oracle Constraints on Recovery Operations

The following Oracle constraints affect the recovery operations you can perform on a database:

- When recovering data files and old control files, you must recover the entire database. You cannot perform a data file level recovery.
- When performing a full database recovery and some tablespaces are already offline prior to the restore operation, they will not be recovered automatically. You must recover data files manually before putting them back online.
- After you perform a point-in-time recovery or restore old control files, the redo logs can no longer recover data files restored from previous backups. Consequently, you must open the database with the resetlogs option. You must also run a full backup as soon as possible.

Files the Agent Cannot Recover

When you use one of the Recovery Type options, the Agent for Oracle *cannot* recover the following files:

- Corrupted or missing online redo logs
- Corrupted or missing data files that were not backed up by the agent
- Corrupted or missing control files that were not backed up by the agent
- Corrupted or missing archive logs that were not backed up by the agent
- Files belonging to a database running in the no archive log mode

Restore and Recovery Limitations

Some of the restore and recovery limitations include:

- Online redo logs are not backed up; consequently, they cannot be restored.
- Catalog database SID should not be duplicated or shared with any other SID name.
- Restore full database will not restore tablespaces in offline mode. If you want to restore them, restore the tablespaces separately. For more information about tablespaces in offline mode, see the Oracle Documentation.

Appendix A: Troubleshooting

This appendix explains the most common messages for the agent on the Windows platforms. Each message has a brief description and a possible solution.

This section contains the following topics:

Agent for Oracle does not Back Up Non-default Parameter Files (see page 76)
Multiple Oracle Version Support Using the File-Based Mode (see page 78)
Setting the Number of Channels for Backup and Restore (see page 81)
Checking the CA ARCserve Universal Agent Service Status (see page 82)
Agent backup prerequisite: Oracle component name should be created (see page 82)
Restore a Database to Another Node from the RMAN Console (see page 83)
Using RMAN command to Backup, Restore, and Recover Archived Logs (see page 84)
Warning AW53704: Unable to locate the Archived Log. It will not be backed up. (Archived Log=[archived log file name]). (see page 86)
Backup Agent Errors (see page 87)
BackUp and Restore Problems in the Agent for Oracle in RMAN Mode (see page 88)

Agent for Oracle does not Back Up Non-default Parameter Files

Symptom:

Agent for Oracle does not back up parameter files that are not default, including parameters files which reside on the shared disk in the RAC (Real Application Clusters) and OFS (Oracle Fail Safe) environment.

Solution:

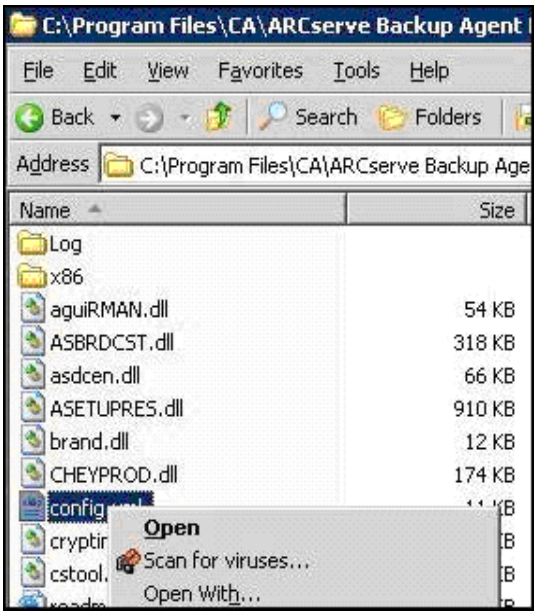
Agent for Oracle in CA ARCserve Backup r12.5 can back up parameter files. It only backs up following default parameter files under the directory %ORACLE_HOME%\dbs and %ORACLE_HOME%\database.

- init<SID>.ora
- spfile<SID>.ora
- config<SID>.ora
- pwd<SID>.ora
- orapwd<SID>

You can use the Agent for Oracle to add additional parameter files. Perform the following steps to add additional parameter files.

To add additional parameter files

1. After you install and configure the Agent for Oracle, open the installation directory of the agent.
2. Right-click the file config.xml and select Open With....



3. Choose WordPad and click OK.

   The XML file appears.

4. Search for the instance you want to backup as an additional parameter file.

5. Find the XML element <ParameterfilePath></ParameterfilePath> and add the path of the additional parameter file in XML element.

   For example, if you want to add

   ```
   C:\Addtional Parameter File.ora
   ```

   you can replace the text

   ```
   <ParameterfilePath></ParameterfilePath> using <ParameterfilePath>
   C:\Addtional Parameter File.ora </ParameterfilePath>
   ```

   Note: If you have more than one additional parameter files that you want to back up, append another <ParameterfilePath></ParameterfilePath> after the original one.

   For example, if you want to add another Parameter File

   ```
   C:\Another Parameter File.ora
   ```

   you can replace the text <ParameterfilePath></ParameterfilePath> using

   ```
   <ParameterfilePath> C:\Addtional Parameter File.ora
   </ParameterfilePath><ParameterfilePath> C:\Another Parameter File.ora
   </ParameterfilePath>
   ```

6. Save the file.

   Submit the parameter files backup job to test whether the additional parameter files have been backed up.

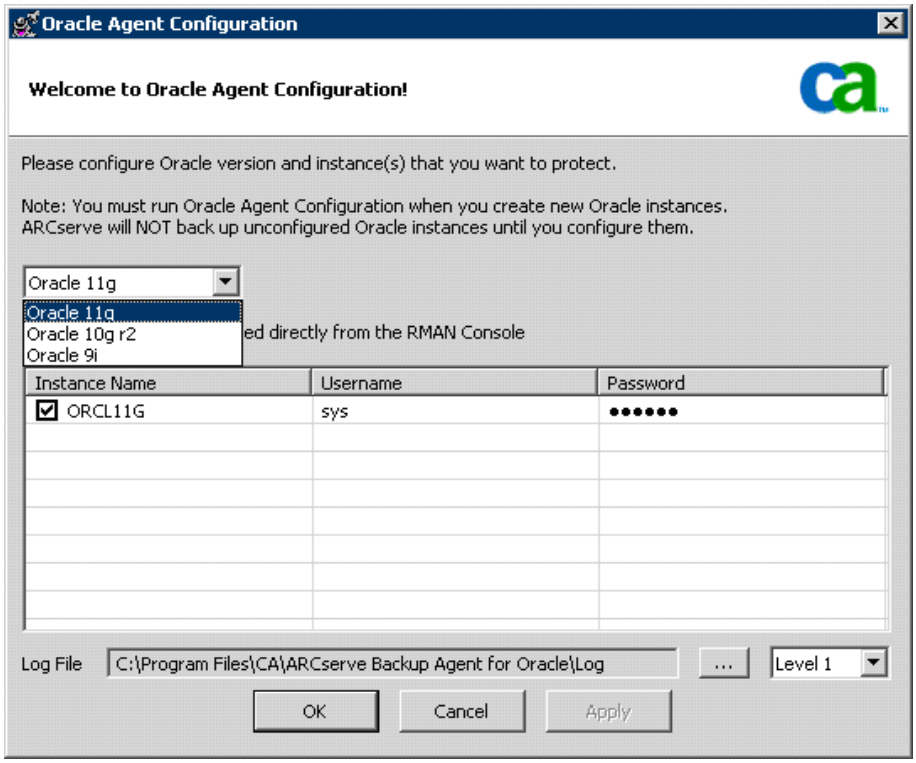
Multiple Oracle Version Support Using the File-Based Mode

Symptom:

How to perform backup and restore jobs when there are multiple Oracle versions?

Solution:

The Oracle Agent Configuration Tool shows an additional option that lets you select which version of Oracle you want to back up and restore.



You can use the following procedure to backup and restore oracle instances of different versions.

Note: If you want to use RMAN Mode to backup and restore after you apply this procedure to protect multiple Oracle versions using the file-based mode, delete the file config.xml under the Oracle Agent installation directory, and then launch the Oracle Configuration utility.

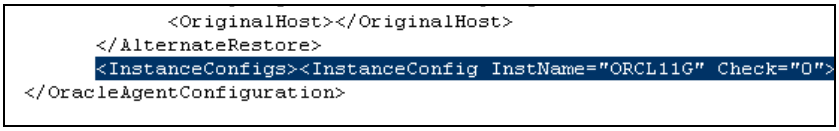
To backup and restore Oracle instances of different versions

1. Launch Oracle Agent Configuration utility.
2. From the Windows Start menu, select Programs (or All Programs).
3. Select CA, and CA ARCserve Backup Oracle Agent Configuration.
4. Select the latest Oracle version from the list. The Oracle Agent Configuration utility will detect the Oracle version installed on your machine.

   Note: The Oracle version you selected should be equal or larger than the Oracle you want to protect. For example, if you want to protect Oracle 9i and Oracle 10g r2, you can select Oracle 10g r2, not Oracle 11g.
5. Click OK.
6. Open the installation directory of the Agent for Oracle from the following location.

   `C:\Program Files\CA\ARCserve Backup Agent for Oracle`
7. Right click the file config.xml and select Open With….
8. Choose WordPad and click OK.

   The XML file appears.
9. Search for the instance you want to backup.

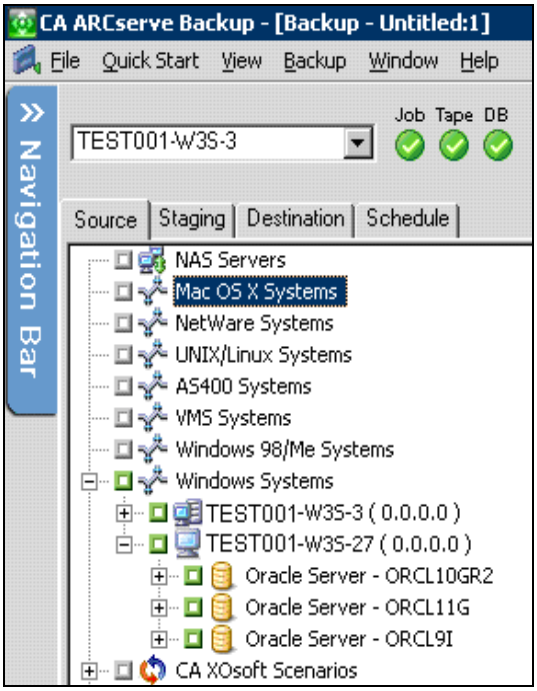


10. Find the XML attribute named Check in the XML element InstanceConfig. Change the value of Check parameter from 0 to 1.

    Note: If there are many InstanceConfig XML elements you can use the find option to search for the necessary parameter.

11. Save the file.

    All the Oracle instances are now backed up and listed under the Oracle Server on the ARCserve Backup Manager.



Setting the Number of Channels for Backup and Restore

Symptom:

How can I set the number of channels for backup and restore jobs?

Solution:

When you are using the Agent for Oracle options, the maximum number of channels is 255. However, the maximum number of channels for an Oracle instance depends on the current Oracle running status, load status, hardware, and Oracle instance parameters. You can perform the following steps to set the number of channels.

To set the Number of Channels for Backup and Restore

1. Check the computer environment variable NUMBER_OF_PROCESSORS to get the processor count.
2. Log into SQL*Plus prompt.
3. Execute command to check whether the I/O slave is enabled.

   ```
   show parameter backup_tape_io_slaves
   ```

4. Execute command to check the maximum processes that can be used in the current Oracle instance.

   ```
   show parameter processes
   ```

5. Execute command

   ```
   select count (*) from v$process
   ```

   Check the current processes count. You could calculate the maximum channel number you could use for backup and restore. Calculate the result of (<maxprocesses> - <current processes used>) / (processor count + 1).

   a. When the I/O slave is TRUE, if the result is less than 35, then the max channel number is that result, otherwise, the maximum channel number is 35.

   b. When the I/O slave is FALSE, if the result is less than 255. Then the maximum channel number is that result, otherwise, the max channel number is 255.

Checking the CA ARCserve Universal Agent Service Status

Symptom:

How to check the status of the Universal Agent Service?

Solution:

The CA ARCserve Universal Agent service facilitates remote backup and restore of Oracle databases. During the installation the service is installed with a startup type of Automatic. The service's status can be verified via the Windows Services applet.

To view the CA ARCserve Universal Agent Service status

1. Open Control Panel and Services.

   The Services dialog appears.

2. Locate the CA ARCserve Universal Agent service icon.

   The current mode of the service is displayed.

3. To start or stop the service, highlight the CA ARCserve Universal Agent service icon and click Start or Stop, respectively.

Note: For more information on the default TCP port for the Agent for Oracle, see CA *Implementation guide*.

Agent backup prerequisite: Oracle component name should be created

The CA ARCserve Backup Agent for Oracle utilizes the Oracle RMAN technology to backup and restore Oracle. RMAN requires the names of all the Oracle components (database, tablespace, parameter file, control, achieve log). These components must be created using correct character set; else, the Oracle component name will be converted to unrecognized character and stored by Oracle and the RMAN based backup and restore possibly fails. The CA ARCserve does not support this scenario.

If Oracle component is created in DOS mode using language other than English and CJK (Japanese, Korean, Simplified Chinese, and Traditional Chinese), NLS_LANGUAGE must be set properly to guarantee the Agent for Oracle component name is created using correct charset. For more information on how to setup the NLS_LANG properly for Windows and DOS Code Pages, go to:

http://www.oracle.com/technology/tech/globalization/htdocs/nls_lang%20faq.ht or the Oracle documentation.

Restore a Database to Another Node from the RMAN Console

You can restore a database to another node from the RMAN console. You must modify the config.xml file in the directory %Oracle_Agent_Home% to enable alternative restore.

Use the following session for alternative restore:

```
<AlternateRestore>
    <IsAnyOriginalHost>0</IsAnyOriginalHost>
    <OriginalHo
</AlternateRestore>
```

There are two methods could be used for alternative restore:

- Set OriginalHost equal to the host using which the session was backed up. The Oracle agent will use the sessions backed up from that machine to do the alternative restore.
- Set IsAnyOriginalHost to 1. The Oracle agent will use any session to do the alternative restore.

Using RMAN command to Backup, Restore, and Recover Archived Logs

You can perform the backup, restore and recovery operations for the archived logs using the advanced RMAN command, if you do not want to change the database settings in the RAC environment or unable to map to a computer the network.

However, ensure that you put the archived logs on a shared disk or use multiple archived logs destination or map each computer to the network so that they can access the archived logs on all other computers.

Note: For more information on network mapping, see Unable to Access Archived Logs in Oracle Cluster Environment (see page 92) in this chapter.

Assuming that there are three computers ORA-RAC1, ORA-RAC2 and ORA-RAC3 in the RAC environment, perform the backup and recovery operations using the advanced RMAN scripts.

To perform backup, restore and recovery processes in RAC environment

1. Open command prompt on ORA-RAC1.
2. Execute the command

   ```
   RMAN target sys/oracle@RAC1 catalog <catalog owner name>/<password of owner>@<catalog database>
   ```

3. Run RMAN scripts to perform the backup and restore processes.
   - Run the following RMAN script to backup the archived logs.

     ```
     RUN
     {
     ALLOCATE CHANNEL C1 DEVICE TYPE SBT;
     ALLOCATE CHANNEL C2 DEVICE TYPE SBT CONNECT sys/oracle@RAC2;
     ALLOCATE CHANNEL C3 DEV1 DEVICE TYPE SBT CONNECT sys/oracle@RAC3;
     SQL 'ALTER SYSTEM ARCHIVE LOG CURRENT';
     BACKUP ARCHIVELOG ALL;
     }
     ```

   - Run the following RMAN script to restore the archived logs.

     ```
     RUN
     {
     ALLOCATE CHANNEL C1 DEVICE TYPE SBT;
     ALLOCATE CHANNEL C2 DEVICE TYPE SBT CONNECT sys/oracle@RAC2;
     ALLOCATE CHANNEL C3 DEVICE TYPE SBT CONNECT sys/oracle@RAC3;
     RESTORE ARCHIVELOG ALL;
     }
     ```

     OR

```
RUN
{
ALLOCATE CHANNEL C1 DEVICE TYPE SBT;
ALLOCATE CHANNEL C2 DEVICE TYPE SBT CONNECT sys/oracle@RAC2;
ALLOCATE CHANNEL C3 DEVICE TYPE SBT CONNECT sys/oracle@RAC3;
RESTORE ARCHIVELOG FROM LOGSEQ 1 UNTIL LOGSEQ 10 THREAD 1;
RESTORE ARCHIVELOG FROM LOGSEQ 1 UNTIL LOGSEQ 15 THREAD 2;
RESTORE ARCHIVELOG FROM LOGSEQ 1 UNTIL LOGSEQ 20 THREAD 3;
}
```

Important! Before running the RMAN command for recovery, you must copy all the Archive Logs from ORA-RAC2 and ORA-RAC3 to the Archive Logs destination of RAC1 on ORA-RAC1.

Warning AW53704: Unable to locate the Archived Log. It will not be backed up. (Archived Log=[archived log file name]).

Symptom:

The Warning AW53704 Unable to locate the Archived Log. It will not be backed up. (Archived Log=[archived log file name]) occurs:

- if you delete the expected archived log files on the disk.
- if you are using Oracle 9i, Oracle 10g and Oracle 11g, in RAC environment, you use a local disk instead of shared disk to put archived logs or you do not use multiple archived logs destination and network mapping to make each machine access the archived logs on all other machines.
- if you are using Oracle 11g, in RAC environment, you use shared disk to put archived logs, if FLASH_RECOVERY_AREA exceed the maximal size limit, the newly generated archived logs will be put into standby_archive_dest which is on the local disk.
- if you are using Oracle 9i, Oracle 10g and Oracle 11g, in OFS environment, you use a local disk, instead of shared disk to put archived logs or you do not use multiple archived logs destination and network mapping to make each machine access the achieved logs on all other machines or you have performed a failover.
- if you are using Oracle 11g, in OFS environment, you use a shared disk to put the archived logs, if FLASH_RECOVERY_AREA exceed the maximal size limit, the newly generated archived logs will be put into standby_archive_dest which is on the local disk. This error still appears even after performing a failover.

Solution:

You can perform the following steps to resolve this error in the file-based mode:

- Ensure that you put the archived logs on a shared disk or use multiple archived logs destination and network mapping to ensure that each computer can access the achieved logs on all other machines.

  Note: For more information on network mapping and accessing the archived logs, see Unable to Access Archived Logs in Oracle Cluster Environment (see page 92) and for information on how to perform backup and restore, see Using RMAN command to Backup, Restore, and Recover Archived Logs (see page 84) in the Troubleshooting section of this guide.

- Perform the following steps:

To resolve Warning AW53704 in file-based mode

1. Log into the machine on which the Agent for Oracle Agent is installed.
2. Open the RMAN console.

3. Run the following command

   ```
   crosscheck archivelog all
   ```

4. Then run the command

   ```
   delete expired archivelog all.
   ```

   Note: The command **delete expired archivelog all** will *delete* the archivelog record information in the control file and catalog database. Contact your Oracle DBA before you execute these commands.

Backup Agent Errors

Some of the backup agent errors include:

ORA-19511: Error received from Media Manager Layer

ORA-19511: Error received from media manager layer, error text: SBT error = 7009, errno = 115773632, sbtopen: can't connect with media manager.

Reason:

This error occurs when a restore is performed from AutoBackup script in RMAN command console using the following RMAN script.

```
RMAN> run{
allocate channel dev1 type sbt;
restore spfile from autobackup;
release channel dev1;
}
```

Action:

Specify the backup piece name in the restore command

```
restore spfile from '<backup piece name>'.
```

No Oracle Server Icon in CA ARCserve Browser

No Oracle Server Icon in CA ARCserve Browser

Reason:

This message occurred for any of the following reasons:

- The CA ARCserve Universal Agent service is not running or functioning.
- The CA ARCserve Backup Agent for Oracle is not installed.
- Oracle Agent Configuration is not configured properly.

Action:

Perform the following steps:

1. Restart the CA ARCserve Universal Agent service.
2. Install the CA ARCserve Backup Agent for Oracle.
3. Launch Oracle Agent Configuration utility.
   a. From the Windows Start menu, select Programs (or All Programs).
   b. Select CA, and CA ARCserve Backup Oracle Agent Configuration to configure properly.

BackUp and Restore Problems in the Agent for Oracle in RMAN Mode

This section provides troubleshooting information to help you identify and resolve problems that relate to backing up and restoring when using the Agent for Oracle with CA ARCserve Backup.

RMAN Exits with an Error during Backup or Restore

Symptom:

When I try to run a backup or restore with RMAN, RMAN exits with an error right away. What should I do?

Solution:

Try the following steps only if you are performing a manual RMAN job:

Note: If you used Restore Manager to start RMAN, these steps are performed automatically for you.

Ensure that you have created the caroot equivalency with CA ARCserve Backup for the user who runs RMAN.

RMAN Exits with an Error Agent Not Started

Symptom:

My RMAN job exited and I got an error saying that the agent has not been started. How do I correct this?

Solution:

If the job stays inactive in the CA ARCserve Backup job queue for more than the number of minutes specified by the SBT Timeout on Oracle Parameter Configuration Tab using the Configuration Tool (because the tapes are not available, for instance), then RMAN will time out. Increase the value of SBT_TIMEOUT parameter based on your environment.

Remote Oracle Instance Backup fails in RMAN mode

Symptom:

When I try performing a full backup of remote Oracle instance without selecting the RMAN catalog option, the backup fails. How to correct this?

Solution:

This happens when you try to perform a remote database backup. You can check the mgmtsvc.log file on the server side at

```
<ARCserve_HOME>\LOG\mgmtsvc.log
```

and the cli.log file on the client side at

```
<CA_HOME>\SharedComponents\ARCserve Backup\jcli\cli.log
```

Perform the following steps to ensure the host name resolution:

1. On the client machine, if you have multiple NICs installed and DNS server configuration fails.

   Modify the clishell.cfg as:

   ```
   #jcli.client.IP=0.0.0.0
   ```

   Remove the '#' and set the correct IP address.

2. On the server machine, if you have multiple NICs installed and DNS server configuration fails.

   Modify the mgmtsvc.conf as:

   ```
   #wrapper.java.additional.10=-Djava.rmi.server.hostname=0.0.0.0
   ```

   Remove the '#' and set a correct IP address.

3. Restart CA Management Service.

   Note: If you find the

   ```
   java.rmi.ConnectException: Connection refused to host
   ```

   in cli.log file, you must modify the server side mgmtsvc.conf configuration file.

   If you find the

   ```
   java.rmi.ConnectException: Connection refused to host
   ```

   in mgmtsvc.log, you must modify the client side clishell.conf configuration file.

Oracle Permission Error

Symptom:

While trying to perform a restore operation with the Until End of Logs option enabled, I get Oracle permission errors. How can I prevent the errors?

Solution:

Ensure that the Oracle user name and password you use to connect to Oracle through the Restore Manager has the permission to connect to Oracle using the as sysdba clause.

You can verify your permissions by running the following commands:

```
sqlplus /nolog
connect username/password as sysdba
```

If you do not have permission, ask the Oracle DBA to configure the security for you.

Restore the Oracle Data Files in a Different Directory

Symptom:

How do I perform a CA ARCserve Backup GUI restore operation to restore the Oracle data files in a different directory?

Solution:

You cannot do this. Although it is possible to restore a database to a different node, the whole directory structure where the database will be restored must be identical to the one on the source node.

Unable to Access Archived Logs in Oracle Cluster Environment

Symptom:

In Oracle cluster environment, after configuring the archive logs on a local disk, the CA ARCserve Backup Agent for Oracle is not accessing the archived logs on other computers in the cluster.

Solution:

If you want to access the archived logs on a computer in the network, ensure that you put the logs on a shared disk or map to the network as the Oracle service is running on a local disk.

To map a machine to the network to access archived logs

1. Go to http://technet.microsoft.com/en-us/sysinternals/bb897553.aspx and download psexec.exe utility.

   The utility is downloaded.

2. Open command prompt and go to the directory which contains the psexec.exe utility.

3. Run command

   ```
   psexec.exe  -s cmd
   ```

4. Execute this command to connect to the network.

   ```
   net use X: \\ORA-RAC1\C$ /PERSISTENT:YES
   ```

   You can now map Y: and Z: drives to the network.

Note: If you are unable to map to the network, then you can perform the backup, restore and recovery operations using the advanced RMAN commands. For more information, see Using RMAN command to Backup, Restore, and Recover Archived Logs (see page 84) in this chapter.

Unable to Run Concurrent Backups on the Same Database

Symptom:

I get error messages when I try to run concurrent backups on the same database. Should this happen?

Solution:

Yes. It is normal. Parallel operations that are handling the same Oracle objects at the same time are not supported.

Until End of Logs Option does not Work

Symptom:

For some reason, the Until End of Logs option does not work. How do I get it to work?

Solution:

Make sure that you have restored all the necessary archive logs. If it still does not work, try to perform a manual recovery on the restored files.

RMAN exits with error code: ORA-00020: Maximum Number of Processes (%s) Exceeded

Symptom:

When I try to back up or restore, I use multiple channels. But the RMAN exits with error code

ORA-00020: maximum number of processes (%s) exceeded.

Solution:

This is caused by incorrect channel count specified. For more information, see Setting the Number of Channels for Backup and Restore (see page 81).

RMAN exits with error code: ORA-17619: Maximum Number of Processes using I/O Slaves in a Instance Reached

Symptom:

When I try to back up or restore, I use multiple channels. But the RMAN exits with error code: ORA-17619: max number of processes using I/O slaves in a instance reached.

Solution:

This is caused by incorrect channel count specified. For more information, see Setting the Number of Channels for Backup and Restore (see page 81).

RMAN exits with error code: RMAN-06004: ORACLE error from recovery catalog database: RMAN-20005: target database name is ambiguous

Symptom:

When I restore full database, I get the error code RMAN-06004: ORACLE error from recovery catalog database: RMAN-20005: target database name is ambiguous from RMAN.

Solution:

Set DBID manually in the config.xml file under the Oracle Agent installation directory. For more information, see Restore the Database to the Original Server (see page 110).

Error AE53034 RMAN-06059: Expected archived log not found, lost of archived log compromises recoverability

Symptom:

The Error AE53034 RMAN-06059: Expected archived log not found, lost of archived log compromises recoverability error occurs:

- if you are using Oracle 9i, Oracle 10g and Oracle 11g, in RAC environment, you use a local disk instead of shared disk to put archived logs or you do not use multiple archived logs destination and network mapping to make each machine access the archived logs on all other machines.
- if you are using Oracle 11g, in RAC environment, you use shared disk to put archived logs, if FLASH_RECOVERY_AREA exceed the maximal size limit, the newly generated archived logs will be put into standby_archive_dest which is on the local disk.
- if you are using Oracle 9i, Oracle 10g and Oracle 11g, in OFS environment, you use local disk, instead of shared disk to put archived logs or you do not use multiple archived logs destination and network mapping to make each machine access the achieved logs on all other machines or you have performed a failover.
- if you are using Oracle 11g, in OFS environment, you use a shared disk to put the archived logs, if FLASH_RECOVERY_AREA exceed the maximal size limit, the newly generated archived logs will be put into standby_archive_dest which is on the local disk. This error still appears even after performing a failover.
- if you delete the expected archived log files on the disk.

Solution:

You can perform the following steps to resolve this error in RMAN Mode:

- Ensure you put the archived logs on a shared disk or use multiple archived logs destination and network mapping to ensure that each machine can access the achieved logs on all other machines.

  Note: For more information on network mapping and accessing the archived logs, see Unable to Access Archived Logs in Oracle Cluster Environment (see page 92) in Troubleshooting section of this guide.

- Perform the following steps:

To resolve Error AE53034 RMAN-06059 in RMAN Mode

1. Logon the machine which has Oracle Agent installed.
2. Open RMAN console.
3. Run command

   ```
   crosscheck archivelog all
   ```

4. Then run command

```
delete expired archivelog all.
```

Note: The command delete expired archivelog all will delete the archivelog record information in the control file and catalog database. Contact your Oracle DBA before you execute these commands.

RMAN exits with error codes

Symptom:

When I try to back up or restore, I use multiple channels. But RMAN exits with these error codes:

RMAN-12001: could not open channel <channel name>.

RMAN-10008: could not create channel context.

RMAN-10003: unable to connect to target database.

Solution:

This is caused by incorrect channel count specified. For more information, see Setting the Number of Channels for Backup and Restore (see page 81).

Media information is not listed in the Restore Media after submitting the RMAN restore job

Symptom:

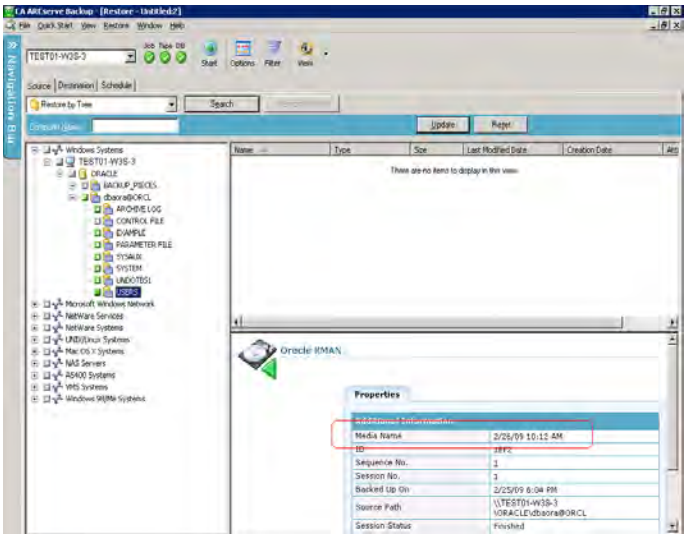
After submitting an RMAN restore job, no media information appears on the Restore Media dialog.

Solution:

You can view the media name and other details for the various tablespaces, archived logs, and control files using one of these methods:

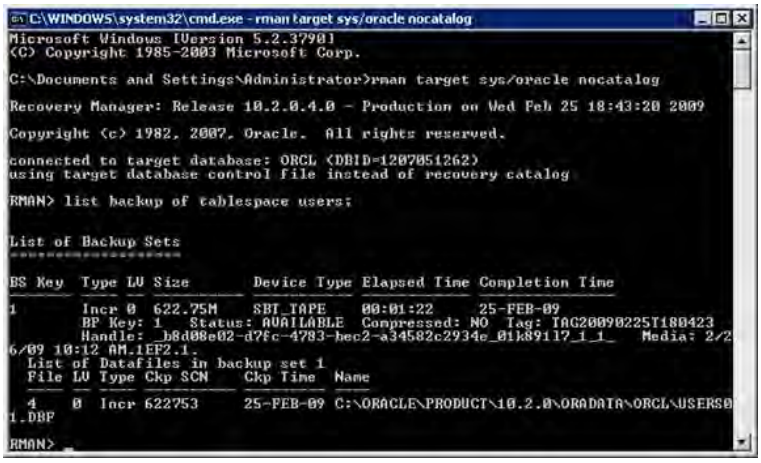
- Click on the tablespace or archived log or control file or parameter file node on the restore tree to view the media details on the right-bottom panel of Restore Manager.

  Note: Media other than the one displayed on the Restore Manager can be used.



- You can also log into the Oracle Server and run one of the following advanced RMAN commands:
  - To access media information about a tablespace

    `list backup of tablespace <tablespace name>`



  - To access media information about a database

    `list backup of database`

  - To access media information about archived logs

    `list backup of archivelog all`

  - To access media information of a specific log sequence

    `list backup of archivelog from logseq 1 until logseq 10 for specific log sequence`

  - To access media information about control file

    `list backup of controlfile`

  Note: The media information appears in the following format:

  `<Media Name>.<Media Id>.<Media Sequence Number>.`

  For more information about the advanced RMAN commands, see Oracle Documentation.

Garbage Characters in Activity Log

Symptom:

When I open my Activity log, I see these ????? characters in the RMAN output.

Solution:

The Machine Language Code Page should be compatible with Oracle Instance and Oracle Database Language settings. For example, if your database uses JPN language, the Machine Language Code Page should use JPN too. However, if you are using English, this problem will not occur.

Appendix B: Disaster Recovery Scenarios for File-Based Mode

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.

This section contains the following topics:

Scenarios for Restoring to the Original Windows Server (see page 101)
Scenarios for Restoring to an Alternate Server (see page 105)

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.

To recover ORCL1 database

1. Reinstall Windows.
2. Install CA 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 SYS in Oracle Version 9i and above).
9. Mount the database.
10. Enter the following command at the SQL*Plus 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

You can recover the database using the following procedure.

To recover the ORCL2 database

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 SQL*Plus 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 SQL*Plus 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. 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

The following scenarios provide the necessary information and procedures to restore and recover database to an alternate server using the current and the previous versions of the Agent for Oracle.

Restore to a Server that Supports the Exact Directory Structures

Use the following procedure to restore an Oracle database to an alternative server that can support the exact directory structures of the original Oracle server.

To restore an Oracle database to an alternative server that supports exact directory structures

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

Use the following procedure to restore to an alternate server that cannot support the different directory structure.

To restore the database to a server with different directory structure

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 CA 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 documentation. 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.

Appendix C: Disaster Recovery Scenarios for RMAN Mode

You can plan a backup in advance to protect your database against failures, and for recovery of your database in case of disaster. Some of the disaster recovery scenarios in RMAN are given below.

This section contains the following topics:

Scenarios for Restoring to the Original Windows Server (see page 109)
Scenarios for Restoring to an Alternate Server for RMAN Mode (see page 113)
Scenario for Creating a Duplicate Database on a Remote Host (see page 116)

Scenarios for Restoring to the Original Windows Server

The following scenarios provide the necessary information and procedures to restore and recover database to the original server using the current and the previous versions of the Agent for Oracle.

Restore the Database to the Original Server

Assume you have a Windows server running Oracle with a single Oracle database instance, ORCL on the server. A disaster occurs and it is necessary to rebuild the entire server along with the directory structure should be exactly the same as the original server.

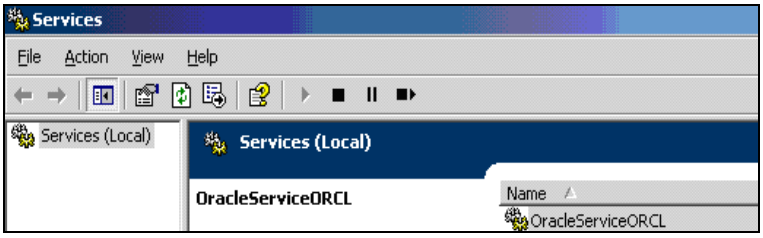
If you want to change the directory structure, see the Oracle Documentation.

In this scenario, you can try to restore the database from the CA ARCserve Base. Remember that the full database session needs backing up using catalog database. So, when a restore is performed, you will require the catalog database. The catalog database for the Oracle instance ORCL is CATA.

To restore the database to the original server

1. Reinstall the Windows Operating system.
2. Install the CA ARCserve Agent for Oracle. Also, install the CA ARCserve Backup, if you are using the same server that has the Oracle databases.
3. Rebuild the Oracle environment by performing the following steps:
   a. Reinstall Oracle.
   b. Restore all necessary sessions (files) from media (for example, sessions for Oracle executables, configuration files and registry information)
   c. Create Oracle Service for ORCL. Use oradim.exe -NEW -SID ORCL -startmode auto -srvcstart system command.

      Windows Service name OracleServiceORCL is created.



d. Create password file for ORCL. Use orapwd.exe file=%ORACLE_HOME%\database\PWDORCL.ora password=oracle command and set password as oracle. After the restore is complete the parameter file and the original password file will be restored. Replace the string %ORACLE_HOME% to the directory name of the Oracle Home.

Note: The password file is for temporary use only.

From the Windows Start menu, click Start, select All programs, <OracleHome>, Configuration and Migration Tools and click Net Manager. Add the catalog database SID into Service Name by using Oracle Net Manager. Use tnsping CATA command to confirm the connection to the catalog database.

e. Check the directories. Ensure that all directories of the original Oracle ORCL instance exist on the destination server. You can restore the parameter files only to check these directories and restore the full database. The directories include:

- Control files
- Datafiles
- Online redo logs
- Dump files specified in the parameter files
  - audit_file_dest (adump)
  - background_dump_dest (bdump)
  - core_dump_dest (cdump)
  - user_dump_dest (udump)

4. Open the Oracle RMAN Agent Configuration tool and add an oracle instance ORCL, with catalog enabled.
5. Use CA ARCserve Backup Server to restore.
6. In the Restore Manager, select the Source tab and select the backup of the Oracle Instance dbaora@orcl.
7. Select the instance and click the Local Options on the right-bottom panel.
8. Open the Oracle Restore Options dialog and enter details.
9. Select the Advanced Oracle Restore Options and select the Include Control File option. Click OK.
10. On the Destination Tab, check Restore files to their original location(s).
11. Click Start to submit the restore job.
12. After restore, check the database status and content.

Now, the database restore is complete.

Restore the Database to a Server with Different Directory Structures

You can restore the Oracle database to a server with different directory structure. Ensure that you separate the Oracle Components when you perform the restore job.

Note: You can restore to the original server and an alternate server.

To restore the database to a server with a different directory structure

1. You can change the file/directory location in the parameter files and restore the parameter files. Some of the parameters include:
   - Control files location (control_files)
   - Flash recovery area location (db_recovery_file_dest)
   - Audit files location (audit_file_dest)
   - Background dump destination (background_dump_dest)
   - Core dump destination (core_dump_dest)
   - User dump destination (user_dump_dest)
   - Archived log file location (log_archive_dest_n)
2. After the parameter files are restored, you can edit these files before processing the other components.
3. If you want to change the datafile/online redo log files location, use one of the two methods:
   a. Recreate a control file using create controlfile command. For example:

```
Create controlfile
set database TEST
logfile group 1('c:\oracle\test\redolog1a.ora') size 200K,
group 2('c:\oracle\test\redolog1b.ora') size 50K
RESETLOGS
datafile 'c:\oracle\test\system01.dbf' size 10M,
'c:\oracle\test\undotbs1.dbf' size 2M
maxlogfiles 50
maxlogmembers 3
maxdatafiles 200
maxinstances 6
archivelog;
```

   b. Restore control file using the CA ARCserve Backup. You can now log into the SQL*Plus prompt, using SQL alter database rename file command to change the location. For example:

```
alter database rename file 'c:\ORCL\SYSTEM01.DBF' to
'd:\ORCL_Rename\SYSTEM01_Rename.DBF';
```

4. After you change the location, restore the datafiles to the CA ARCserve Backup.

Scenarios for Restoring to an Alternate Server for RMAN Mode

The following scenarios provide the necessary information and procedures to restore and recover database to an alternate server using the Agent for Oracle.

Restore Database to an Alternate Windows Server for RMAN Mode

In this scenario, you can try to restore the database from the CA ARCserve Base. Remember the full database session needs backing up using catalog database. So, when a restore is performed, you will require the catalog database. The catalog database for the Oracle instance ORCL is CATA.

To restore database to an alternate Windows server

1. Reinstall the Windows Operating system.
2. Install the CA ARCserve Agent for Oracle. Also, install the CA ARCserve Backup, if you are using the same server that has the Oracle databases.
3. Rebuild the Oracle environment by performing the following steps:
   a. Reinstall Oracle
   b. Restore all necessary sessions (files) from media (for example, sessions for Oracle executables, configuration files and registry information).
   c. Create Oracle Service for ORCL. Use oradim.exe -NEW -SID ORCL -startmode auto -srvcstart system command.

      Windows Service name OracleServiceORCL is created.

      Create password file for ORCL. Use orapwd.exe file=%ORACLE_HOME%\database\PWDORCL.ora password=oracle command and set password as oracle. After the restore is complete the parameter file and the original password file will be restored. Replace the string %ORACLE_HOME% to the directory name of the Oracle Home.

      Note: The password file is for temporary use only.

      From the Windows Start menu, click Start, select All programs, <OracleHome>, Configuration and Migration Tools and click Net Manager. Add the catalog database SID into Service Name by using Oracle Net Manager. Use tnsping CATA command to confirm the connection to the catalog database.
   d. Check the directories. Ensure that all directories of the original Oracle ORCL instance exist on the destination server. You can restore the parameter files only to check these directories and restore the full database. The directories include:
      - Control files
      - Datafiles
      - Online redo logs
      - Dump files specified in the parameter files
        - audit_file_dest (adump)
        - background_dump_dest (bdump)

- core_dump_dest (cdump)
- user_dump_dest (udump)

4. Modify config.xml in directory %Oracle_Agent_Home% to set the DBID. Find the DBID element under the <OracleAgentConfiguration>\<InstanceConfigs>\<InstanceConfig> element. Fill in the DBID. Save the file.
5. Use CA ARCserve Backup Server to restore.
6. In the Restore Manager, select the Source tab and select the backup of the Oracle Instance dbaora@orcl.
7. Select the instance and click the Local Options on the right-bottom panel.
8. Open the Oracle Restore Options dialog and enter details.
9. Select the Advanced Oracle Restore Options and select the Include Control File option. Click OK.
10. On the Destination Tab, uncheck Restore files to their original location(s) options. Add the destination machine and expand the machine node to select ORCL instance.
11. Click the Security option on the right-bottom panel.
12. Enter the destination ORCL instance security information.
13. Click Start to submit the restore job.
14. After restore, check the database status and content.

    The database restore is complete.

Scenario for Creating a Duplicate Database on a Remote Host

In this scenario you can duplicate a database on a remote host with the same directory structure as of original database. In this example the original database is **orcl** and the hostname of the original database is **host1**, the original database orcl uses an RMAN recovery catalog database catdb on **host2**. While the duplicate database name will be **dup** and the hostname of the duplicate database is **host3**.

To create a duplicate database on a remote host

1. On the host1, do one full backup for target database orcl with CA ARCserve Oracle Agent to make sure we have the necessary backups and archived redo logs. Here you can start the Oracle Agent Configuration utility to enable submit job from the RMAN console and configure the Oracle Agent.

   ```
   C:\> rman catalog rman/rman@catdb target sys/sys_pwd@orcl
   RMAN> run {
   allocata channel dev1 type "sbt_tape"
   backup database plus archivelog;
   release channel dev1;}
   ```

   Note: Ensure you must enable rman catalog to do the full backup and perform the full backup from GUI.

2. On host3, create one Auxiliary Instance with oradim.

   ```
   oradim -new -sid dup
   ```

3. On the host3, create an Oracle Password File for the Auxiliary Instance. For example:

   ```
   Orapwd file="c:\oracle\product\10.2.0\db_1\database\PWDdup.ora"
   password=sys_pwd entries=5
   ```

4. Establish Oracle Net Connectivity to the Auxiliary Instance.

   - On the host3, modify listener.ora.

     Add the following entry to listener.ora

     ```
     (SID_DESC =
     (SID_NAME = DUP)
     (ORACLE_HOME = C:\oracle\product\10.2.0\db_1)
     )
     ```

   - On the host1, modify tnsnames.ora.

     Add the following entry to tnsnames.ora

     ```
     DUP =
     (DESCRIPTION =
     (ADDRESS_LIST =
     (ADDRESS = (PROTOCOL = TCP)(HOST = host3)(PORT = 1521))
     ```

```
)
(CONNECT_DATA =
(SERVICE_NAME = dup)
)
)
```

Note: The auxiliary instance must be accessible via Net8. Before proceeding, use RMAN to ensure that you can establish a connection to the target database, the auxiliary instance, and the recovery catalog database.

In this example, the connection is established to three databases, all using net service names:

```
C:\> rman catalog rman/rman@catdb target sys/sys_pwd@orcl  auxiliary
sys/sys_pwd@dup
```

5. On the host3, create an initialization parameter file initdup.ora for the auxiliary instance dup.

   Following are the examples of the initialization parameter settings for the duplicate database:

```
db_name=dup
db_unique_name=dup
background_dump_dest='C:\oracle\product\10.2.0\admin\dup\bdump'
compatible='10.2.0.1.0'
control_files='C:\oracle\product\10.2.0\oradata\dup\control01.ctl','C:\oracle
\product\10.2.0\oradata\dup\control02.ctl','C:\oracle\product\10.2.0\oradata\
dup\control03.ctl'
core_dump_dest='C:\oracle\product\10.2.0\admin\dup\cdump'
user_dump_dest='C:\oracle\product\10.2.0\admin\dup\udump'
DB_FILE_NAME_CONVERT=('c:\oracle\product\10.2.0\oradata\orcl','C:\oracle\prod
uct\10.2.0\oradata\dup\')
LOG_FILE_NAME_CONVERT=('c:\oracle\product\10.2.0\oradata\orcl','C:\oracle\pro
duct\10.2.0\oradata\dup\')
```

6. Now on the host3, start the auxiliary instance

   Before you begin the RMAN duplication, use SQL*Plus to connect to the auxiliary instance and start it in NOMOUNT mode (specifying a parameter file). In this example, sys_pwd is the password for the user with SYSDBA authority and dup is the net service name for the auxiliary instance.

```
SQL> connect sys/sys_pwd@dup
SQL> startup nomount pfile='
c:\oracle\product\10.2.0\db_1\database\PWDdup.ora ';
```

   Note: Because the auxiliary instance does not have a control file, you can only start the instance in the NOMOUNT mode. Do not create a control file or try to mount or open the auxiliary instance.

7. You can install CA ARCserve Oracle Agent and start Oracle agent configuration utility on the host3. Ensure the instance dup is checked to protect.

8. Modify config.xml in directory %Oracle_Agent_Home% to enable alternative restore.

   Locate the following section in config.xml file:

   ```
   <AlternateRestore>
            <IsAnyOriginalHost>0</IsAnyOriginalHost>
            <OriginalHost\>
       </AlternateRestore>
   ```

   You can perform alternate restore using Set OriginalHost equal to the host1 or Set IsAnyOriginalHost to 1.

9. On the host1, use RMAN to connect to the target database, the duplicate database, and the recovery catalog database and issue Duplicate command.

   ```
   C:\> rman catalog rman/rman@catdb target sys/sys_pwd@orcl auxiliary
   sys/sys_pwd@dup
   connected to target database: ORCL (DBID=1143972091)
   connected to recovery catalog database
   connected to auxiliary database: DUP (not mounted)
   RMAN> run
   {
   allocate auxiliary channel aux1 type "sbt_tape";
   duplicate target database to dup;
   release channel aux1;
   }
   ```

10. Database duplication is complete. You can now run the following command on host3,

    ```
    C:\> sqlplus / as sysdba
    ```

    Connected to:

    Oracle Database 10g Enterprise Edition Release 10.2.0.1.0 - Production

    With the Partitioning, OLAP and Data Mining options

    ```
    SQL> select status from v$database;STATUS
    ----------
    OPEN
    SQL> SELECT NAME FROM V$DATABASE;
    NAME
    ---------

    DUP
    ```

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