



APPENDIX **A**

Backup and Restore

This appendix describes the following procedures:

- [Cisco ANA Registry Backup and Restore](#)
- [Oracle Database Backup and Restore](#)

Cisco ANA Registry Backup and Restore

This section describes the Cisco ANA Registry backup and restore procedure.

- [Overview](#)—Provides an overview of the backup procedure.
- [Backed-Up Content](#)—Describes the data that is backed up.
- [Backup Procedure](#)—Describes how to activate the backup procedure.
- [Changing Periodic Backup Time](#)—Describes how to change the backup time.
- [Restore Procedure](#)—Describes the restore procedure.



Note

Any new AVM that is added will not be deleted after the restore. So if a backup is made, and then another AVM is added, and the last backup is restored, the newly added AVM will still be available after the restore.



Note

SSH daemon must be enabled in order for the backup and restore to work.

Overview

The backup procedure is used to perform data backup once a week. It operates through the UNIX cron mechanism. The factory settings entry in the cron table (crontab) runs the backup procedure every Sunday at 1:00 AM. To activate the backup procedure, the user needs to remove the comment for the relevant line in the cron table.

The restoration is done manually by executing the restore.csh script.

Backed-Up Content

The data that has been backed-up is:

- Cisco ANA registry (Golden Source)
- cron table (crontab)

Backup Procedure

The backup script is a scheduled task. It operates through cron.

The backup files are stored in the following directory,
~[ana install directory]/db/db_backup/[date+time].



Note

The filler [date+time] is a directory name composed of a date and time of the backup. For example, ~[ana install directory]/db/db_backup/200604130404/ is created on 13 April 2006 at 4:04 AM. By default the cron table executes the backup procedure every Sunday at 1:00AM.



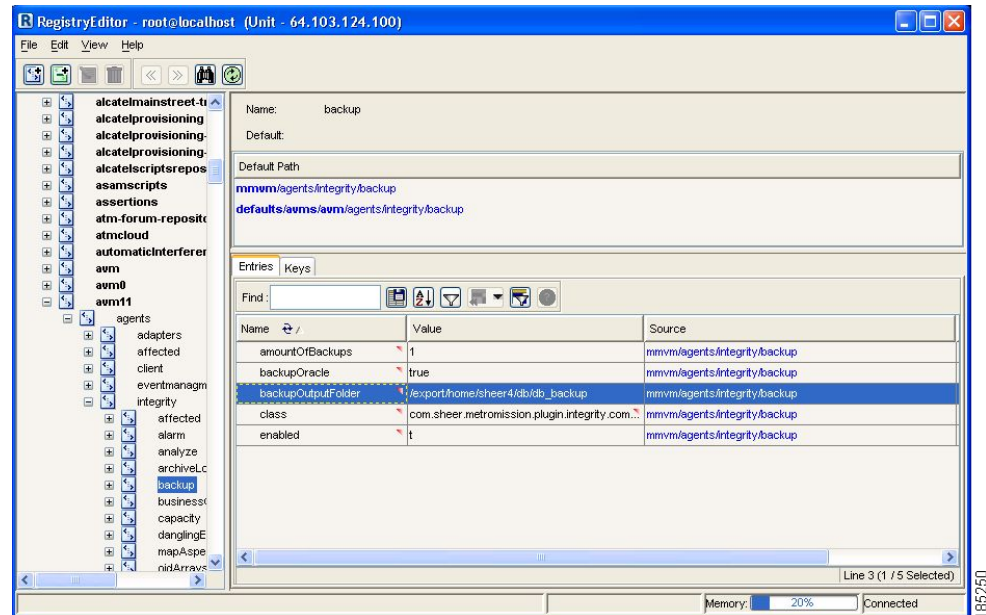
Note

Important: Reinstalling the server from scratch (install.pl) deletes the sheer user, and the content under it. The default backup directory is located under sheer, and it can be changed (see configuring the registry below) to another location, which must be accessible to writing for the sheer user, for example, the default directory permissions are: (`"drwx----- 2 sheer sheer 512 Sep 24 02:54"`)
It is also recommended that you do not locate the backup directory under /tmp, since this directory is deleted whenever the server is rebooted, and the backup content will be lost.
To maximize data safety, it is recommended that you copy the backed-up directory to another external storage location, for example, a DVD or another server's disk.

The location is configurable through the registry. For more information, refer to registry path, `avm11/agents/integrity/backup`.

Figure A-1 displays the backup registry entries.

Figure A-1 Backup Registry Entries



The backup is disabled by default.

To enable the backup:

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- Step 1** Telnet to the Cisco ANA gateway as `sheer` user.
- Step 2** Edit the cron table as follows:
- ```
crontab -e
```
- Step 3** Add the following line to the file, and save the change:
- ```
0 1 * * * 0 cd Main;./mc.csh localhost 8011 integrity.executeTest backup > /dev/null 2>&1
```
-



Note Refer to `crontab(1)` in the Solaris documentation for a detailed explanation about the cron table format.

The user can activate the backup procedure immediately.

To activate the backup procedure immediately:

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- Step 1** Telnet to the Cisco ANA gateway as `sheer` user.
- Step 2** Change the directory to `sheer/Main` by executing the following command:
- ```
cd ~/Main
```
- Step 3** At the prompt, run the following command line:
- ```
./mc.csh localhost 8011 integrity.executeTest backup
```



Note If null appears after running `./mc.csh localhost 8011 integrity.executeTest` backup this is normal.

Troubleshooting

The following message may be displayed when using the backup procedure:

1. sheer@sh-nv210-1v5 [~/Main]% The authenticity of host '127.0.0.1 (127.0.0.1)' can't be established.
DSA key fingerprint is 4e:cb:81:1c:bf:38:5c:ec:6e:b8:a8:d3:3b:d4:fe:b9.
Are you sure you want to continue connecting (yes/no)?

Solution

From sheer user do the following:
`ssh 127.0.0.1`

Changing Periodic Backup Time

A crontab file consists of lines of six fields each. The fields are separated by spaces or tabs. The first five are integer patterns that specify the following:

- minute (0-59)
- hour (0-23)
- day of the month (1-31)
- month of the year (1-12)
- day of the week (0-6 with 0=Sunday)

To specify days using only one field, the other field should be set to `*`.

For example, `0 0 * * 1` would run a command only on Mondays.

Another example cleans up core files every weekday morning at 3:15 am:

```
15 3 * * 1-5 find $HOME -name core 2>/dev/null | xargs rm -f
```

The sequence `0 0 1,15 * 1` runs a command on the first and fifteenth of each month as well as every Monday.

Restore Procedure

Install the Cisco ANA gateway. For more information, refer to the *Cisco Active Network Abstraction Installation Guide*. Note that you will need to login as root.

To restore from a backup:

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- Step 1** Change the directory `/export/home/[ana install directory]/Main/scripts` by executing the following command:

```
cd ~[ana install directory]/Main/scripts
```

Step 2 Execute the restoration script:

```
chmod 700 restore.csh
restore.csh [backup-files-location] [sheer-home-location]
```



Note By default the [backup-files-location] is ~[ana install directory]/db/db_backup/[date+time] (this is configurable through the registry). The filler [date+time] is a directory name composed of a date and time backup time. For example, ~[ana install directory]/db/db_backup/200604130404/ is created on 13 April 2006 at 4:04 AM.

Step 3 Once the restoration is successful, initialize the Cisco ANA gateway by running the following command:

```
su - sheer
cd Main
./mvm.csh
```



Note The default password for the user sheer is sheer.



Note When the registry is restored from the last backup, if new AVMs were added after this last registry backup, all the new AVMs that were added after this backup are still present.

Oracle Database Backup and Restore

This section describes the Oracle database backup and restore procedures.

- [Overview](#)—Provides an overview of the backup and restore Recovery Manager (RMAN) tool.
- [Create RMAN Catalog Database](#)— Describes how to create a RMAN catalog database.
- [Create RMAN User](#)—Describes how to create a RMAN user.
- [Create RMAN Catalog](#)—Describes how to create a RMAN catalog.
- [Register the ANA Database with the RMAN Catalog](#)—Describes how to register the database with the RMAN catalog.
- [Modify ANA Database Initial Parameter File](#)—Describes how to modify the MCDB database initial parameter file.
- [Backup Database](#)—Describes how to backup the database.
- [Recover Database](#)—Describes how to recover the database.



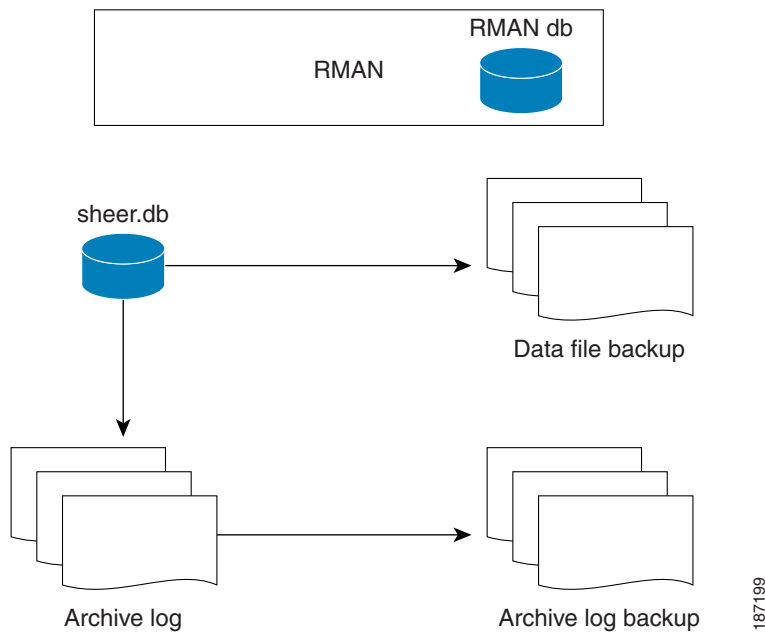
Note This section is provided as an example only of the Oracle database backup and restore procedure. For more information see the:
[Oracle Database Recovery Manager Quick Start Guide](#)

Overview

Oracle databases have a backup and restore Recovery Manager (RMAN) tool. To use this tool for online backup, the Oracle database must be in ARCHIVELOG mode, (see [Create RMAN Catalog Database](#)). RMAN maintains the bookkeeping intelligence of backup and recovery files and backs up data at the block level. Therefore, RMAN can significantly speed up backups and reduce the server load by using incremental backups.

Figure A-2 displays the Oracle Database Backup diagram.

Figure A-2 Oracle Database Backup



For more information about RMAN for Oracle 10g see the:

[Oracle Database Recovery Manager Quick Start Guide](#)



Note

RMAN is convenient to use. However, it only provides a command line interface, and it still demands database analyst knowledge when recovery is needed.

Be sure that the backup data and RMAN catalog are located on a different disk from where the Oracle database (data files, redo logs, and control files) are located. Both can however reside on the same ANA database server.

The Oracle Enterprise manager (GUI) can be used to set up RMAN.

Alternatively, the RMAN configuration is explained in the following sections, and should be implemented sequentially:

- Step 1** [Create RMAN Catalog Database.](#)
- Step 2** [Create RMAN User.](#)
- Step 3** [Create RMAN Catalog.](#)

- Step 4** [Register the ANA Database with the RMAN Catalog.](#)
- Step 5** [Modify ANA Database Initial Parameter File.](#)
- Step 6** [Backup Database.](#)
- Step 7** [Recover Database.](#)

**Note**

These steps are provided as an example only of the Oracle database backup and restore procedure. For more information see the:

[Oracle Database Recovery Manager Quick Start Guide](#)

Create RMAN Catalog Database

The catalog database holds the recovery catalogs. This database typically is set up on a different server from any database being registered in it. It also works if this database is set up on the same database server as the ANA database.

Use the Oracle utility **dbassist** to create a catalog database. (This is the same as MCDB database creation, except you should name the RMAN global name **rcat**, and you should name the SID **rcat**.)

Create RMAN User

Creating an RMAN user is the same as creating an ANA user on an **rcat** database. Name the RMAN user ID **rmanuser** and name the password **rmanpassword**. Make sure **rmanuser** has proper privileges. For example:

```
SQL> grant connect, resource, recovery_catalog_owner to rmanuser;
```

Create RMAN Catalog

Create a catalog from the RMAN command prompt:

```
RMAN> connect catalog rmanuser/rmanpassword@rcat
RMAN> create catalog;
```

Register the ANA Database with the RMAN Catalog

Set the ORACLE_SID environment variable = MCDB.

```
%rman
RMAN > connect catalog rmanuser/rmanpassword@rcat
RMAN > connect target sys/change_on_install
RMAN > register database
RMAN> configure controlfile autobackup on;
```

The default password for an Oracle sys account after Oracle installation is **change_on_install**. Replace this sys account password with the correct sys account password for the ANA database.

Modify ANA Database Initial Parameter File

To modify the MCDB database initial parameter file, do the following:

Step 1 To ensure the database is in archive log mode, enter the following:

```
SQL> alter system set log_archive_dest_1 = 'location=</var/tmp/oradata/arch>' SCOPE=BOTH;
SQL> alter system archive log start;
```

where *</var/tmp/oradata/arch>* is the location of the archive destination.

Step 2 Restart the ANA database server with the ARCHIVELOG mode turned on, as follows:

```
startup mount
alter database archivelog;
alter database open
```

Step 3 Check the archive log mode, as follows:

```
SQL> archive log list;
```

Backup Database

To backup the database, do the following:

Step 1 Create a file called full_backup.rcv. Inside the file, enter the following text.

```
run {
    allocate channel d1 type disk;
    backup
        incremental level = 0 cumulative
        database
        format '/var/tmp/backup/db_%d_%s_%p_%t'
        include current controlfile for standby
        tag = 'ANA_WEEKLY_FULL';
    sql 'alter system archive log current';
    backup
        archivelog all delete input
        format '/var/tmp/backup/ar_%d_%s_%p_%t';
    release channel d1;
}
```

Make sure the directory such as *'/var/tmp/backup'* has enough space to hold the backup and also the Oracle user has write permissions.

Step 2 Run the rman command:

```
rman target / catalog rmanuser/rmanpassword@rcat @full_backup.rcv
```

Recover Database

To recover a database, do the following:

Step 1 Setup the environment variable for Oracle as follows:

- export NLS_LANG=american
- export NLS_DATE_FORMAT="Mon DD YYYY HH24:MI:SS"
- export ORACLE_SID=MCDB

Step 2 Create a file `time_based_recovery.rcv`, and insert the content as follows:

```
# Restore and Recover Database using RMAN
shutdown abort;
startup mount;
run {
    SET UNTIL TIME = 'Mar 18 2008 10:00:00';
    #Point in time recovery
    allocate channel d1 type disk;
    restore database;
    recover database;
}
alter database open resetlogs ;
```

Step 3 Run the `rman` command:

```
rman target / catalog rmanuser/rmanpassword@rcat @ time_based_recovery.rcv
```

- Please put a desirable restore time in the `SET UNTIL TIME` clause.
 - After a time based recovery, it is important to immediately do another database backup, since at this time, the database can only be recovered after last recovery time, and all the previous backups used for the last recovery are no longer recoverable.
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