



APPENDIX **A**

Backup and Restore

This appendix includes:

- [Before You Begin, page A-1](#)
- [Cisco ANA Registry Backup and Restore, page A-1](#)
- [Oracle Database Backup and Restore, page A-6](#)

Before You Begin

The `known_hosts` file must contain an entry for 127.0.0.1 for a successful backup of Cisco ANA. The `known_hosts` file can contain a row for localhost provided that it also contains a row for 127.0.0.1.

To add a row for 127.0.0.1 to the `/export/home/sheer4/.ssh/known_hosts` file:

Step 1 Examine the `/export/home/sheer4/.ssh/known_hosts` file to determine if it contains a row for 127.0.0.1 with the specific key 127.0.0.1.

Step 2 If the key 127.0.0.1 is missing, enter the following command as user `sheer` from the `~/Main` directory:

```
backup.pl 127.0.0.1%/export/home/sheer4/db/db_backup/
```

This command adds the 127.0.0.1 entry to the `known_hosts` file and displays the following:

```
remoteip: 127.0.0.1, remotedir: /export/home/sheer4/db/db_backup/  
backing up crontab  
The authenticity of host '127.0.0.1 (127.0.0.1)' can't be established.  
DSA key fingerprint is 33:dc:5a:39:20:48:5f:5d:7d:94:63:dc:83:1a:1d:13.  
Are you sure you want to continue connecting (yes/no)?
```

Step 3 Enter `yes`.

Cisco ANA Registry Backup and Restore

This section describes the Cisco ANA registry (Golden Source) backup and restore procedure and includes the following topics:

- [Overview, page A-2](#)
- [Backed-Up Content, page A-2](#)

- [Backup Procedure, page A-2](#)
- [Changing the Periodic Backup Time, page A-4](#)
- [Restore Procedure, page A-5](#)

**Note**

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

**Note**

The SSH daemon must be enabled for backup and restore to work.

Overview

The backup procedure is used to back up the data once a week. It operates through the UNIX cron mechanism. By default, an entry in the cron table (crontab) runs the backup procedure every Sunday at 1:00 AM.

To restore data, you must execute the **restore.csh** command manually.

Backed-Up Content

The data that is backed up is the Cisco ANA registry.

Backup Procedure

The backup script is a scheduled task that operates through the cron mechanism.

The backup files are stored in the directory `~[ana install directory]/db/db_backup/[date+time]` where:

- *db* is the name of the database directory.
- *db_backup* is the name of the database backup directory.
- *[date+time]* is a directory name composed of a date and time of the backup.

For example, `~[ana install directory]/db/db_backup/200904130404/` is created on 13 April 2009 at 4:04 AM. By default, the cron table executes the backup procedure every Sunday at 1:00AM.

**Note**

Reinstalling the server by using the `install.pl` script deletes the `sheer` user and the content under it. The default backup directory is located under `sheer`; you can change the location provided that the user `sheer` can write to it. For example, the default directory permissions are:

```
("drwx----- 2 sheer  sheer          512 Sep 24 02:54")
```

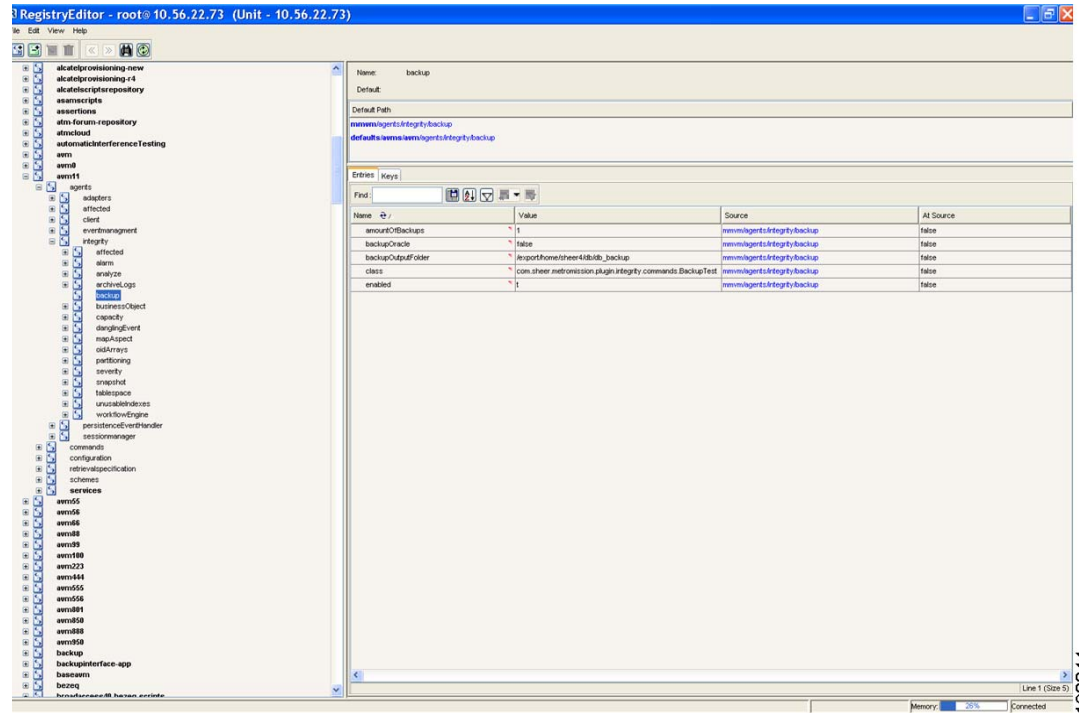
We recommend that you do not locate the backup directory under `/tmp`, since this directory is deleted whenever the server is rebooted, and the backed-up content lost.

To maximize data safety, we recommend that you copy the backed-up directory to an external storage location, such as a DVD or a disk on a different server.

The default backup directory can be configured through the registry. For more information, see the registry path `avm11/agents/integrity/backup`.

Figure A-1 displays the backup registry entries.

Figure A-1 Backup Registry Entries



The backup is enabled by default. If a backup is not required, you can prevent it from running by using the Registry Editor to edit the entry in the registry.

Configuring Automatic Backups

If the backup does not run automatically:

- Step 1** Log into the Cisco ANA gateway machine as user `sheer`.
- Step 2** Edit the cron table as follows:

```
crontab -e
```
- Step 3** Add the following line to back up the integrity tasks and the Cisco ANA registry automatically every 12 hours at 11:00AM and 11:00PM:

```
0 11, 23 * * * local/cron/every_12_hours.cmd > /dev/null 2>&1
```



Note

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

Initiating Backups Manually

To activate the backup procedure immediately:

Step 1 Telnet to the Cisco ANA gateway as sheer user.

Step 2 Change the directory to sheer/Main:

```
cd ~/Main
```

Step 3 At the prompt, enter:

```
./mc.csh localhost 8011 integrity.executeTest backup
```



Note It is normal for null to appear in response to this command.

Troubleshooting

The following message might appear during the backup procedure:

```
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, enter:

```
ssh 127.0.0.1
```

Changing the 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, set the other fields to *.

For example, 0 0 * * * 1 runs a command only on Mondays.

In the following example, core files are cleaned up every weekday morning at 3:15AM:

```
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, see the [Cisco Active Network Abstraction 3.6.6 Installation Guide](#). You need to log in as root.

To restore from a backup:

Step 1 Change to 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, `[backup-files-location]` is `~[ana install directory]/db/db_backup/[date+time]` (as configured through the registry). The filler `[date+time]` is a directory name composed of a date and 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 commands:

```
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 new AVMs that were added after this backup are present.

Oracle Database Backup and Restore

This section describes the Oracle database backup and restore procedures, and includes the following topics:

- [Overview, page A-6](#)
- [Creating the RMAN Catalog Database, page A-8](#)
- [Accessing SQL, page A-8](#)
- [Creating an RMAN User, page A-8](#)
- [Creating an RMAN Catalog, page A-8](#)
- [Registering the Cisco ANA Database with the RMAN Catalog, page A-8](#)
- [Editing the Cisco ANA Database Initial Parameter File, page A-9](#)
- [Backing Up the Database, page A-9](#)
- [Recovering the Database, page A-10](#)

**Note**

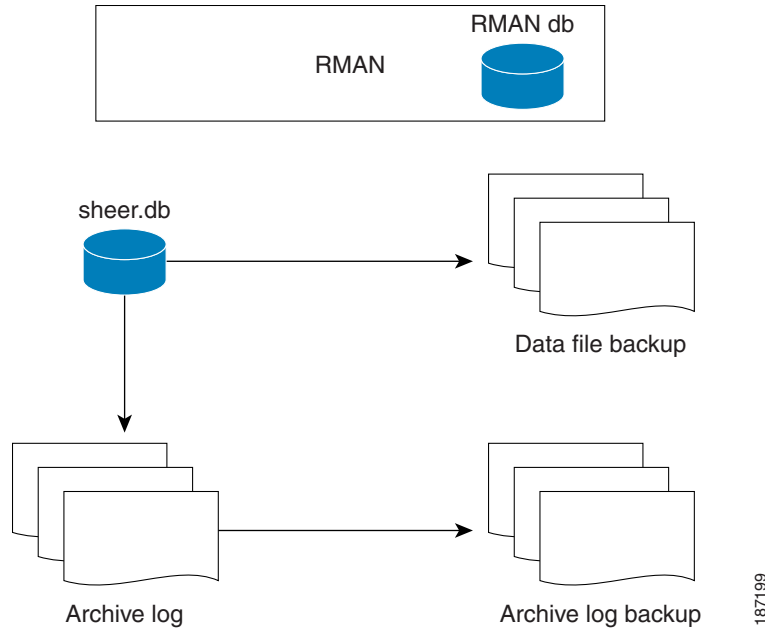
This section is provided as an example only of the Oracle database backup and restore procedure. For more information, see the [Oracle Database Recovery Manager Quick Start Guide](#).

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 [Creating the RMAN Catalog Database, page A-8](#)). RMAN maintains the bookkeeping intelligence of backup and recovery files and backs up data at the block level. Therefore, RMAN can significantly speed backups and reduce server load by using incremental backups.

[Figure A-2](#) displays the Oracle Database Backup diagram.

Figure A-2 Oracle Database Backup

**Note**

For more information about RMAN for Oracle 10g, see the [Oracle Database Recovery Manager Quick Start Guide](#).

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

Be sure that the backup data and RMAN catalog are located on a disk other than the disk that contains the Oracle database. However, both can reside on the same Cisco ANA database server.

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

As an alternative to the Oracle Enterprise manager, the following sections describe how to configure RMAN using the command line. Complete the steps in the sequence given.

1. [Creating the RMAN Catalog Database, page A-8.](#)
2. [Accessing SQL, page A-8.](#)
3. [Creating an RMAN User, page A-8.](#)
4. [Creating an RMAN Catalog, page A-8.](#)
5. [Registering the Cisco ANA Database with the RMAN Catalog, page A-8.](#)
6. [Editing the Cisco ANA Database Initial Parameter File, page A-9.](#)
7. [Backing Up the Database, page A-9.](#)
8. [Recovering the Database, page A-10.](#)

**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](#).

Creating the RMAN Catalog Database

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

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

Accessing SQL

You need to work in SQL mode to create an RMAN user and to verify that the database is in ARCHIVELOG mode. To enter SQL mode, log into SQL*Plus using the `sqlplus` command and enter the username and password when prompted; for example:

```
sheer@ana-gw1 [~]% sqlplus
SQL*Plus: Release 9.2.0.5.0 - Production on Mon Apr 20 14:54:17 2009
Copyright (c) 1982, 2002, Oracle Corporation. All rights reserved.
Enter user-name: system
Enter password:
Connected to:
Oracle9i Enterprise Edition Release 9.2.0.5.0 - Production
With the Partitioning option
JServer Release 9.2.0.5.0 - Production
SQL>
```

Creating an RMAN User

Creating an RMAN user is the same as creating a Cisco 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;
```

Creating an RMAN Catalog

Create a catalog from the RMAN command prompt:

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

Registering the Cisco ANA Database with the RMAN Catalog

Set the `ORACLE_SID` environment variable to 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 Cisco ANA database.

Editing the Cisco ANA Database Initial Parameter File

To edit the MCDB database initial parameter file:

- Step 1** Verify that the database is in archive log mode by entering:

```
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 Cisco ANA database server with the ARCHIVELOG mode enabled, as follows:

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

- Step 3** Check the archive log mode, as follows:

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

Backing Up the Database

To back up the database:

- Step 1** Create a file named `full_backup.rcv`, then enter the following text in the file:

```
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 specified directory (in this case `/var/tmp/backup`) has enough space to hold the backup and that the Oracle user has write permissions.

- Step 2** Run the `rman` command:

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

Recovering the Database

To recover a database:

Step 1 Define the environment variables for Oracle:

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

Step 2 Create a file named `time_based_recovery.rcv`, then insert the following content:

```
# Restore and Recover Database using RMAN
shutdown immediate;
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
```

- Put the restoration time in the SET UNTIL TIME clause.
 - After a time-based recovery, immediately back up the database since the database can only be recovered after the previous recovery time, and all previous backups used for the last recovery are no longer recoverable.
-