Back up the Embedded Oracle database of a Red Hat Network Satellite

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Abstract

This document will help you create a backup of the Oracle® database of a Red Hat® Network (RHN) Satellite with Embedded Database. It also discusses the steps required to verify and restore the database.

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Requirements
Before beginning, review the necessary requirements listed below:

Red Hat Network
Your RHN Hosted account must have one Red Hat® Enterprise Linux® channel entitlement and one RHN Satellite entitlement.

Hardware
This configuration requires a RHN Satellite Server with embedded Oracle® database and a storage solution with at least 12 GB of storage space. Actual space requirements depend on the size of your Satellite, including custom channels. This storage solution can be any partition or directory specifiable at backup time. Choosing a storage solution that is a separate set of disks off-site may lead to increased reliability of backups. Hardware requirements for the Satellite can be found in the Satellite Installation Guide.

Software
As with hardware, software requirements for the RHN Satellite and the embedded Oracle® database can be found in the Satellite Installation Guide.

Backing up the Database
Red Hat recommends performing nightly backups of the Embedded Database and moving the resulting directory to another system via NFS, SCP, FTP, rsync, or other secure file transfer utility.

Preparation
It is necessary to shut down the database and related services before attempting to back up the database, or the backup will fail. (It is also possible that attempting to write to the database while a backup is in process will corrupt the database.) To stop the database and all related services, issue the command:

```
service rhn-satellite stop
```

Creating the backup with db-control
Switch to the Oracle user in preparation for using the db-control utility. The password of the Oracle user is set during the Satellite installation process. Refer to the Satellite Installation Guide for information on the initial database configuration.

```
su - oracle
```
To initiate the backup, issue the following command:

```
db-control backup <directory>
```

Here, replace `<directory>` with the absolute path to the location at which you intend to store the database’s output. This process takes several minutes.

Return to root user mode and restart the database and related services:

```
su -
service rhn-satellite start
```

**Verifying the Backup**

Red Hat recommends verifying the integrity of the resulting backup. There are two methods of doing so: `examine` and `verify`.

The `examine` option of `db-control`, issued as the Oracle user, conducts a quick check of the backup’s timestamp and determines any missing files:

```
su - oracle
db-control examine <directory>
```

The `verify` option of `db-control`, also issued as the Oracle user, conducts a thorough review. This includes checking the md5sum of each of the files in the backup:

```
db-control verify <directory>
```

If the verification returns as successful, it is safe to rely on the contents of `<directory>` to restore the database.

**Automation**

Red Hat strongly recommends scheduling the backup process automatically using cron jobs. In the following example `crontab` excerpt and scripts, the database is backed up at 3 AM and the resulting files are moved to a separate repository at 6 AM.

The following is an example excerpt from root’s `crontab`:

```
0 3 * * * backup-db.sh
0 6 * * * move-files.sh
```

This `crontab` excerpt mentions two scripts, `backup-db.sh` and `move-files.sh`. A good location for these scripts would be `/usr/bin`, although they can be placed anywhere in root’s path. The scripts must be executable,
which can be achieved with a command such as:

```bash
chmod 744 /usr/bin/backup-db.sh
chmod 744 /usr/bin/move-files.sh
```

In the above example, `backup-db.sh` could look something like:

```bash
#!/bin/bash
/
sbin/service rhn-satellite stop; su - oracle -c'

d=db-backup-$(date "+%F"); mkdir -p /tmp/$d;
db-control backup /tmp/$d 
';
/sbin/service rhn-satellite start;
} &> /dev/null
```

Similarly, `move-files.sh` could look something like the following:

```bash
#!/bin/bash
rsync -avz /tmp/db-backup-$(date "+%F") destination &> /dev/null

or

```

```bash
#!/bin/bash
scp -r /tmp/db-backup-$(date "+%F") destination &> /dev/null
```

In both of these examples, replace `destination` with the storage location of the backup.

**Restoring the Database**

RHN Database Control makes Embedded Database restoration a relatively simple process. First, stop the database and related services:

```
service rhn-satellite stop
```

Then switch to the Oracle user and user the following command, replacing `<directory>` with the directory that contains the backup:

```
su - oracle
db-control restore <directory>
```

This not only restores the Embedded Database, but first verifies the contents of the backup directory using md5sums. Once the restoration is complete, return to root user mode and restart the database and related services in this order:
su -
service rhn-satellite start

Conclusion

Backing up, verifying, and restoring the Embedded Database is easily accomplished with the above commands. Red Hat advises backing up the database on a daily basis, preferably to an off-site storage solution.

Appendix – Useful documentation

*RHN Satellite Server Installation Guide*
https://rhn.redhat.com/rhn/help/satellite/index.jsp

*Red Hat Network Reference Guide*
https://rhn.redhat.com/rhn/help/reference/index.jsp

Red Hat Knowledgebase
http://kbase.redhat.com

Appendix – db-control options

RHN Database Control offers many command line options. To use them, insert the option and the appropriate value, if needed, after the *db-control* command. Remember that you must be the Oracle user to use *db-control*.

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>--help</td>
<td>Lists these <em>db-control</em> options with additional details.</td>
</tr>
<tr>
<td>backup &lt;directory&gt;</td>
<td>Backs up the database to the specified directory.</td>
</tr>
<tr>
<td>examine &lt;directory&gt;</td>
<td>Examines the contents of a backup directory. Returns the timestamp of backup creation and reports on the backup's contents.</td>
</tr>
<tr>
<td>extend</td>
<td>Increase the RHN Oracle tablespace.</td>
</tr>
<tr>
<td>report</td>
<td>Reports on the current usage of database space.</td>
</tr>
<tr>
<td>restore &lt;directory&gt;</td>
<td>Restores the database from the backup kept in &lt;directory&gt;. The database must be stopped for this command to run successfully.</td>
</tr>
<tr>
<td><strong>Option</strong></td>
<td><strong>Description</strong></td>
</tr>
<tr>
<td>---------------</td>
<td>-----------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>start</td>
<td>Starts the database instance. This is the same as issuing the <code>service rhn-database start</code> command as the root user.</td>
</tr>
<tr>
<td>status</td>
<td>Shows the current status of the database, either “running” or “offline.”</td>
</tr>
<tr>
<td>stop</td>
<td>Stops the database instance. This is the same as issuing the <code>service rhn-database stop</code> command as the root user.</td>
</tr>
<tr>
<td>tablesizes</td>
<td>Shows a space report for each table in the database.</td>
</tr>
<tr>
<td>verify &lt;directory&gt;</td>
<td>Verifies the contents of the backup stored in <code>&lt;directory&gt;</code>. This command checks the md5sum of each of the files kept in the backup.</td>
</tr>
</tbody>
</table>