# Backup the Oracle Database with the OraPowerShell Script library

## Overview

To backup a server you have three scripts in the library:

* Oracle DB Backup – runOracleBackup.ps1
* Backup open Files with VSS – runVSSFileBackup.ps1
* Backup normal Files – runSimpleFileBackup.ps1

For each script check the following chapter for the configuration

If you need only the file backup ( for example on a separate server) , you not need the \*oracle\* files.

The configuration of this scripts is done in XML Files, to use this scripts you copy the \*\_template.xml files in the same directory to \*.xml and set your environment in this files. In the next release it is planned to do this automatically out of the runtime environment with a script

Each run of a script generates one log file per each day of the week (Monday = 1 to Sunday  
 = 7) in the log directory.

Each script can be started only one time, a semaphore will be created at start time and if one script is running the other instance of the same script waits until this script is finished.

Steps:

* Prepare general setup
* Configure backup configuration
* Test the scripts

## General Setup for all scripts

Copy all files and folders in one folder, for example d:\scripts\

Decide your PowerShell security policy and set the execution rights

#### No Security

Open administrative PowerShell console and set the security:

set-Executionpolicy -list

set-ExecutionPolicy -scope CurrentUser RemoteSigned

get-Executionpolicy -list

#### Certificate Security

See instruction under <http://www.pipperr.de/dokuwiki/doku.php?id=windows:powershell_script_aufrufen>   
(only German in the moment!)

#### Edit the $profile environment

Open PowerShell and check the value of $profile.

Create this file (and the folder structure!) if the file is not there.

Example:

# Location of the profile

$profile

C:\Users\gpipperr\Documents\WindowsPowerShell\Microsoft.PowerShell\_profile.ps1

# test if profile extis

test-path $Profile.CurrentUserAllHosts

false

# if false create

new-item -path $profile -type file -force

#edit

notepad C:\Users\gpipperr\Documents\WindowsPowerShell\Microsoft.PowerShell\_profile.ps1

And add:

## Call the global profile from OraPowershell

. D:\scripts\profile.ps1

#############################################

Exit the console and reopen the console

#### Edit the Oracle Home XML File for the setdb cmd-let

If you like to use the PowerShell console to work with Oracle DB (sqlplus / rman and so on) and you have more than one Oracle Home it is very handy to set the environment in a console to the right Oracle home, especially if you work in a GRID/ASM environment.

Copy the file conf/oracle\_homes\_template.xml to conf/oracle\_homes.xml and edit the file.

For each Oracle DB add on <oracle\_home> block. Fill out the SID section.

In the next release auto generation of this xml file is in planning

#### Call the cmd-let setdb

Call setdb in the PowerShell to test the environment script.

#### Install the PowerShell zip library

If you like to use the zip library, download from <http://powershellzip.codeplex.com/> the files and copy the files to the folder “lib/zip”.

## Setup the oracle Standard Backup – runOracleBackup.ps1

To setup the backup you copy as first step the file conf/backup\_config\_template.xml to the file conf/backup\_config.xml. Open this file in an editor and edit the values to your needs.

#### Parts of this script

The main Oracle backup script is the runOracleBackup.ps1 script.

Overview:

|  |  |
| --- | --- |
| Script | Explanation |
| conf/backup\_config.xml | Configuration file – edit this file! |
| runOracleBackup.ps1   * lib/backuplib.ps1 * lib/orabackuplib.ps1 * lib/ oracle\_dotnet\_connect .ps1 * sql/info.sql * sql/infoASM.sql | Oracle Backup Script – Call runOracleBackup.ps1 to start the backup |
| lib/registerEventSource.ps1 | Setup to register the event source in the windows event log ( please use fort hat a administrative session). |
| sql/create\_rman\_user.sql | Script to create an alternative user for the setup. |
|  |  |

#### Step 1 – Configuration of the file backup\_config.xml

Copy the example file conf/backup\_config\_template.xml to the file conf/backup\_config\_template.xml.

You can add password in clear text but you must set the attribute encrypt="false".

The password will be encrypted on the next run of the script.

The configuration file has four sections:

* ASM
* GRID
* DB ( repeat this section for each database)
  + DB\_USER\_Export

##### Overview over the configuration parameter in the XML file

|  |  |  |  |
| --- | --- | --- | --- |
| Section | Parameter | Description | Values |
| ASM | asm\_in\_use | Is ASM in use | true | false |
|  | asm\_meta\_info | Backup the ASM meta files and information like the disk header description | true | false |
|  | asm\_backup\_dest | Location for the backup. | <path> |
|  | asm\_instancesid | SID of the ASM Instance | +ASM | +ASM[n]  Like +ASM or +ASM1 for RAC |
|  | asm\_oracle\_home | ORACLE\_HOME ASM Instance | Default | Path  If set to „Default“ the path will be read from the Oracle inventory |
|  |  |  |  |
| GRID | grid\_in\_use | RAC in use | true | false |
|  | backup\_grid | Backup the RAC meta files and information like the voting disks | true | false |
|  | grid\_backup\_dest | Location for the backup. | <path> |
|  | grid\_oracle\_home | ORACLE\_HOME of the RAC/Grid installation | Default | Path  If set to „Default“ the path will be read from the Oracle inventory |
|  |  |  |  |
| DB | dbname | Name of the DB | <NAME of the DB>  The name of the DB is mostly the same like the SID, if RAC is in use SID and ID of the node! |
|  | sid | SID of the DB | <SID> |
|  | oracle\_home | ORACLE\_HOME for this DB | <PATH> |
|  | **nls\_settings** |  |  |
|  | use\_direct\_connnect\_for\_sys | if „true“ the connection to the DB will be done as „/ as sysdba“  if “false” the parameter username and tns\_alias will be used. | true | false |
|  | tns\_alias | SQL\*Net Alias | <sql\_net alias>  This value must be in the file TNSNames.ora |
|  | username | Attribute:  **password**  Use this password to write down the password  **encrypt**  if „false“ the password will be encrypted by the first call of the script  **certificate**  if „ true“ the s SQL\*Net Feature „Certificate autorisierung“ will be used. | <name of the backup user> |
|  | nls\_lang | NLS Settings for this Session | Example: GERMAN\_GERMANY.UTF8 |
|  |  |  |  |
|  | tns\_admin | if the value is "default" the Oracle Home Path is used, else the path | Path to the tnsnames.ora configuratoin |
|  | db\_backup\_dest | Location for the backup. | <path> |
|  | db\_backup\_use\_flash | Use for the RMAN Backup the Flash Recovery Parameter  If false the Location under db\_backup\_dest will be used only for meta data and user exports | true | false |
|  | backup\_flash\_to\_disk | If „ true”, save the complete Flash Recovery Area ( ASM Disk!) to the File system location (Parameter db\_backup\_dest ) | true | false |
|  | db\_backup | If true, save the DB | true | false |
|  | db\_backup\_count\_of | Count of Backups, to store on disk | [1…9] |
|  | db\_backup\_incremental\_policy | EE feature, if EE you can implement a incremental policy  The pattern have 7 positions, one position for each day, first position is Monday. | [0|1|2], [0|1|2], [0|1|2], [0|1|2], [0|1|2], [0|1|2], [0|1|2]  For each day of the week. incremental level from 0 until 2 |
|  | db\_backup\_channels | Amount of channels (only if EE edition ) | [1…9] |
|  | db\_backup\_section\_size | EE feature to read in parallel Big Table spaces | For example 5M |
|  | db\_backup\_compress | EE feature : Compress the backup | true | false |
|  | db\_meta\_info | Save the meta data of the DB like the control file and spfile  Attribute:  **use\_dot\_net**  if true use .net connection to the db  if true:  **dot\_net\_orcle\_home**  Oracle Home Directory with the .net library (only the Home Path!) | true | false  true | false  Oracle Home Path |
|  |  |  |  |
|  | db\_check\_alert\_log | check the Alert log for errors  Attributes:  **listner\_summary**  if true create also a summary of entries in the listener log | true | false |
|  |  |  |  |
|  | db\_archive | If the main backup script is called with the parameter „ARCHIVE „the backup for the archives will be done.  Used for hourly archive backup | true | false |
|  | archive\_use\_flash | Use the flash recovery area for the backup | true | false |
|  | archive\_backup\_dest | Location for the Archives if archive\_use\_flash is false. | <path> |
|  | **db\_user\_export** |  |  |
|  | export | Export the schemata’s from the database | true | false |
|  | compress\_export | Zip the export (if zip is installed!) | true | false |
|  | export\_dir\_db | DB Directory Name for the DataPump Export | <NAME> |
|  | export\_dir\_os | Directory in the operation system (Path) to that the pointer export\_dir\_db | <Path> |
|  | export\_policy | Pattern has 7 positions, one Position for the week day. First position is Monday.  The no. will be added to the name of the export. | [0..7], [0..7], [0..7], [0..7], [0..7], [0..7], [0..7]  Example:  0,1,0,1,0,1,2 |
|  | user | Attribute:  Attribute:  **password**  Use this password to write down the password  **encrypt**  if „false“ the password will be encrypted by the first call of the script  **certificate**  if „ true“ the s SQL\*Net Feature „Certificate autorisierung“ will be used.  **use\_sys\_account**  Not use the schema owner (Parameter username ) us the SYS Account or the backup user  **tns\_alias**  use this connection | <Schema owner>  The Schema that hast to be exported. |
| files | copyfiles | Copy the files if „true“ | true | false |
|  | **pair** | Tuple of directory |  |
|  | source\_dir | Source Dir. | <Path> |
|  | target\_dir | Target Dir | <Path> |
|  | robocopy\_parameter | Feature set for robocopy | Like: <![CDATA[/S /W:0 /R:0 /NP]]> |

#### Step 2 – register the event log source

If you like to monitor the execution of the script in the event log you have to register the event source in an administrative session.

* Start the PowerShell in administrative modus
* Change to the directory d:\scripts\backup\lib
* Call .\ registerEventSource.ps1
* Close the PowerShell

#### Step 3 – Create first backup of the shell

To test the configuration start the script the first time over the console window

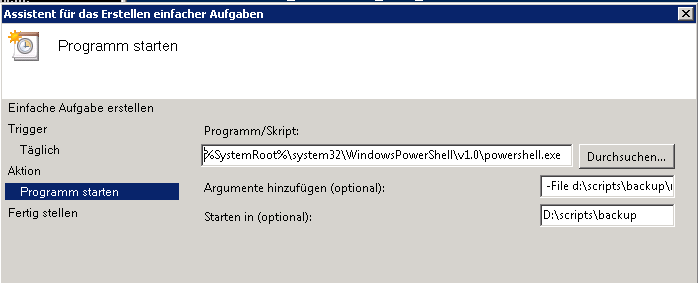
* Start the PowerShell
* Change to the directory d:\scripts
* Call „.\ runOracleBackup.ps1 DB“

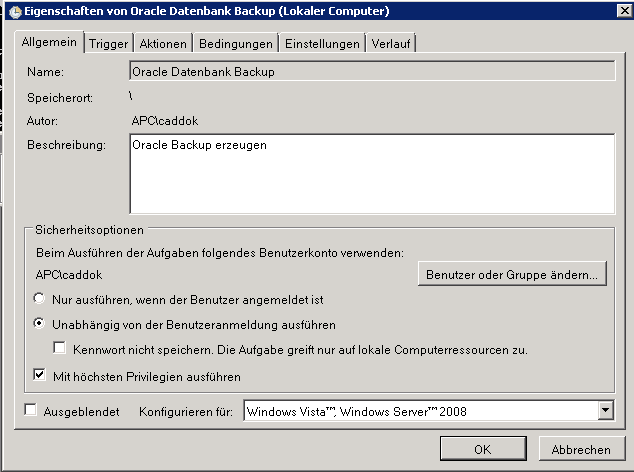
#### Step 4 – Create the Windows Job

The backup script will be started with:

%SystemRoot%\system32\WindowsPowerShell\v1.0\powershell.exe -File d:\scripts\backup\runBackup.ps1 DB

As working directory the directory “d:\scripts\backup” must be set.





#### Step 5 – Backup the DB Backup!

The main backup folder must be saved to tape.

If you like to copy the complete backup location to a separate location you have the option to copy files as last step of the backup process, see the <files> at the end of the xml configuration.

## Examples for Oracle backup strategies

If your database is an Oracle Standard Edition, always a full hot backup of the database will be generated. Most of the parameters are not used in such environment.

### Oracle Standard Edition Default Strategy

You need the to start the script runOracleBackup.ps1 and the configure the file “conf/backup\_config.xml”

* Each Night at xx call runOracleBackup.ps1 with the option DB
  + With the parameter db\_backup\_count\_of you can deside how many backup you like to have on dis before RMan delete the old backups
  + Create Job to call the script
  + Full backup on local disk
* Export the main user of the database and zip the export
  + With the numbering policy you can decide how long you keep the old exports on disk, parameter “export\_policy” in the export section
* After the Backup copy the generated files to a tape drive or NAS
  + You can use the file copy feature of the DB script, see section “files” in the configuration
* Every two hours backup the archive logs and copy this files to a remote destination
  + You can use the parameter “archivelog\_destination” to define the location
  + If the location is a network share/UNC path, the oracle server process must be able to read the share! In a default installation the Oracle runs as system process and is not able to see shares!

### Oracle Enterprise Edition Default Strategy

Over the EE parameter , db\_backup\_incremental\_policy, db\_backup\_channels, db\_backup\_section\_size, db\_backup\_compress you can enable the EE rman features.

### implement incremental backup policy

Example:

FULL

**Day of week**

1 2 3 4 5 6 7

Pattern for the parameter db\_backup\_incremental\_policy = 0,1,1,2,1,1,2

## Setup the VSS Backup – runVSSBackup.ps1

With the Volume Shadow Feature of Windows you can backup open files.

Parts of this script:

|  |  |
| --- | --- |
| Script | Explanation |
| conf/backup\_file\_config.xml | Configuration file – edit this file! |
| runVSSBackup.ps1   * lib/backuplib.ps1 | Backup Script – Call runVSSBackup.ps1 to start the backup |
| lib/registerEventSource.ps1 | Setup to register the event source in the windows event log (please use for that an administrative session). |
|  |  |

You can also copy only these files to work with this script.

#### Step 1 – Configuration of the file backup\_file\_config.xml

Copy the example file conf/backup\_file\_config\_template.xml to the file conf/backup\_file\_config.xml and edit the file.

|  |  |  |  |
| --- | --- | --- | --- |
| Section | Parameter | Description | Values |
| volume | name | Name oft the volume | like DDATA |
|  | driveletter | Drive letter of the volume | Like d: |
|  | vss\_driveletter | Drive letter to use to adresse the shadow copy | Like x: |
|  | use\_vss | Use the VSS Option | true | false |
|  | **Folder** |  |  |
|  | source | Source Dir | Directory |
|  | target | Target Dir | Directory |
|  | target\_share | Share to connect | Like [\\servername\](file:///\\servername\) |
|  | robocopy\_parameter | Featureset for robocopy | Like: <![CDATA[/S /W:0 /R:0 /NP]]> |

## Setup the File Backup – runSimpleFileBackup.ps1

With the Volume Shadow Feature of Windows you can backup open files.

Parts of this script:

|  |  |
| --- | --- |
| Script | Explanation |
| conf/backup\_file\_config.xml | Configuration file – edit this file!  (same file as for VSS Backup!) |
| runVSSBackup.ps1   * lib/backuplib.ps1 | Backup Script – Call runSimpleFileBackup.ps1 to start the backup |
| lib/registerEventSource.ps1 | Setup to register the event source in the windows event log (please use for that an administrative session). |
|  |  |

You can also copy only these files to work with this script.

#### Step 1 – Configuration of the file backup\_file\_config.xml

Copy the example file conf/backup\_file\_config\_template.xml to the file conf/backup\_file\_config.xml and edit the file.

See section vss backup, both scripts use the same configuration file.

## Setup the Mail Alerting

Before you can use the e-mail feature you have to test if your environment can use the .Net class for sending e-mails. The mail class use the FQDN Name of the backup host, if your mail server expect for the helo command a valid FQDN name from the client you cannot send mails!

See: <http://social.msdn.microsoft.com/forums/en-US/netfxnetcom/thread/77f45c5f-76be-400c-a529-a1e49d6d8e62> and <http://support.microsoft.com/kb/957497>

#### Configuration

|  |  |  |  |
| --- | --- | --- | --- |
| Section | Parameter | Description | Values |
| mail | use\_mail | Use E-Mail Alerting | true | false |
|  | smtpServer | Name oft he Server | Hostname |
|  | port | Port oft he Server |  |
|  | smpt\_server\_needs\_fqdn | See remarks about FQDN if true you telnet must be used (not jet implemented) | true | false |
|  | use\_credential | If true login with username and password is required | true | false |
|  | Username | Attribute:  **password**  Use this password to write down the password  **encrypt**  if „false“ the password will be encrypted by the first call of the script |  |
|  | to | Recipient | Valid E-mail Address |
|  | from | Sender | Valid E-mail Address |