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How to Copy an Oracle Instance (NT)



Recreating the control files is one method for copying an Oracle instance.

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Introduction

Oracle Export provides a simple way for you to transfer data objects between Oracle databases, even if they reside on platforms with different hardware and software configurations. Export extracts the object definitions and table data from an Oracle database and stores them in an Oracle binary-format Export dump file located typically on disk or tape.

Such files can then be transferred using FTP or physically transported (in the case of tape) to a different site. The files can then be used with the Import utility to transfer data between databases that are on machines not connected through a network. The files can also be used as backups in addition to normal backup procedures.

The downside is speed. It takes a long time to import all of that data and if you're sharing resources on a production system, users will definitely notice. As an alternative, you can copy the entire instance in a fraction of the time it takes to export and import data. For example, you can copy a 4G database in 10 minutes. Exporting and then importing this same amount of data can consume more than 12 hours of time.

Outline

The following steps outline the process for copying an instance.

1. Backup the control file – dump out the current contents of the control file so we can make changes using the new instance name.
2. Edit the control file. (ARCHIVELOG & NOARCHIVELOG)
3. Shutdown the SRC and TRG instances.
4. Copy the files into the new instance area.
5. Startup the SRC instance.
6. Startup the TRG instance (startup mount).
7. Create the new TRG control files.
8. Shutdown and startup of the TRG instance.

Assumptions

The following assumptions have been made to facilitate this process.

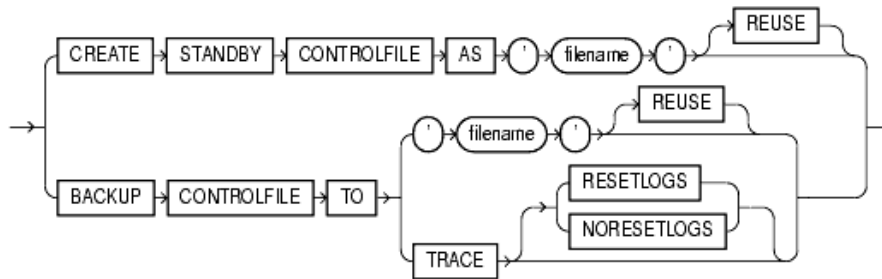
1. The TRG services have already been created. In most cases they have been previously created because we are replacing an “old” copy of TRG with a new copy of SRC.
2. Your server manager commands may vary depending on the version of Oracle being used. For example, Oracle 8.0.5 uses “svrmgr30” while Oracle 8.1.7.4 uses “svrmgr1”. You should consult you manual for the version installed on your system.
3. The account your using to copy the instance has the required permissions to copy files and work with services.
4. The names and quantity of your log and data files may vary from the examples shown below. Please use the instructions as a guide and not as literal statements.

Step 1 – Backup the control file

Lets say we want to make a copy of an instance named SRC and name the newly copied instance TRG. First we must create a new set of control files. This must be performed when the SRC database is running.

We connect to the SRC instance using SQLplus and issue the command “alter database backup controlfile to trace”. This will create a short dump file that we can edit and modify to create our new TRG instance.

```
$ svrmgr1
SVRMGR> connect internal
SVRMGR> alter database backup controlfile to trace;
SVRMGR> exit
```



Sample of an Oracle trace file

```
Dump file E:\oracle\admin\SRC\udump\ORA03632.TRC
Mon Sep 16 09:08:28 2002
ORACLE V8.1.7.4.1 - Production vsnsta=0
vsnsql=f vsnxtr=3
Windows 2000 Version 5.0 Service Pack 2, CPU type 586
Oracle8i Release 8.1.7.4.1 - Production
JServer Release 8.1.7.4.1 - Production
Windows 2000 Version 5.0 Service Pack 2, CPU type 586
Instance name: SRC
```

Redo thread mounted by this instance: 1

Oracle process number: 45

Windows thread id: 3632, image: ORACLE.EXE

```

*** SESSION ID:(35.7905) 2002-09-16 09:08:28.687
*** 2002-09-16 09:08:28.687
# The following commands will create a new control file and use it
# to open the database.
# Data used by the recovery manager will be lost. Additional logs may
# be required for media recovery of offline data files. Use this
# only if the current version of all online logs are available.
STARTUP NOMOUNT
CREATE CONTROLFILE REUSE DATABASE "SRC" NORESETLOGS NOARCHIVELOG
    MAXLOGFILES 32
    MAXLOGMEMBERS 2
    MAXDATAFILES 254
    MAXINSTANCES 1
    MAXLOGHISTORY 226
LOGFILE
GROUP 1 'E:\ORACLE\ORADATA\SRC\REDO01.LOG' SIZE 100M,
GROUP 2 'E:\ORACLE\ORADATA\SRC\REDO02.LOG' SIZE 100M,
GROUP 3 'E:\ORACLE\ORADATA\SRC\REDO03.LOG' SIZE 100M,
GROUP 4 'E:\ORACLE\ORADATA\SRC\REDO04.LOG' SIZE 100M
DATAFILE
'E:\ORACLE\ORADATA\SRC\SYSTEM01.DBF',
'E:\ORACLE\ORADATA\SRC\RBS01.DBF',
'E:\ORACLE\ORADATA\SRC\USERS01.DBF',
'E:\ORACLE\ORADATA\SRC\TEMP01.DBF',
'E:\ORACLE\ORADATA\SRC\TOOLS01.DBF',
'E:\ORACLE\ORADATA\SRC\INDX01.DBF',
'E:\ORACLE\ORADATA\SRC\PROD.ORA',
'E:\ORACLE\ORADATA\SRC\TEST.ORA'
CHARACTER SET WE8ISO8859P1
;
# Recovery is required if any of the datafiles are restored backups,
# or if the last shutdown was not normal or immediate.
RECOVER DATABASE
# Database can now be opened normally.
ALTER DATABASE OPEN;
# No tempfile entries found to add.
#

```

Step 2 - Edit the control file (ARCHIVELOG)

*If your database is running in ARCHIVELOG mode, you'll need to follow the instructions in this section. If you are **not** using archiving, please jump down to the NOARCHIVELOG section below.*

We now need to modify the trace file to turn it into an SQL script to create a new set of control files for our TRG instance.

1. Save the newly created trace file as an SQL script. Use the name "create_trg.sql".
2. Remove all of the lines from the beginning of the file up to the line starting with "# The following commands will create a new control file and use it". It should now look like the following file.

```

# The following commands will create a new control file and use it
# to open the database.
# Data used by the recovery manager will be lost. Additional logs may
# be required for media recovery of offline data files. Use this
# only if the current version of all online logs are available.
STARTUP NOMOUNT
CREATE CONTROLFILE REUSE DATABASE "SRC" NORESETLOGS ARCHIVELOG
    MAXLOGFILES 32
    MAXLOGMEMBERS 2
    MAXDATAFILES 254
    MAXINSTANCES 1
    MAXLOGHISTORY 226
LOGFILE

```

```

GROUP 1 'E:\ORACLE\ORADATA\SRC\REDO01.LOG' SIZE 100M,
GROUP 2 'E:\ORACLE\ORADATA\SRC\REDO02.LOG' SIZE 100M,
GROUP 3 'E:\ORACLE\ORADATA\SRC\REDO03.LOG' SIZE 100M,
GROUP 4 'E:\ORACLE\ORADATA\SRC\REDO04.LOG' SIZE 100M
DATAFILE
'E:\ORACLE\ORADATA\SRC\SYSTEM01.DBF',
'E:\ORACLE\ORADATA\SRC\RBS01.DBF',
'E:\ORACLE\ORADATA\SRC\USERS01.DBF',
'E:\ORACLE\ORADATA\SRC\TEMP01.DBF',
'E:\ORACLE\ORADATA\SRC\TOOLS01.DBF',
'E:\ORACLE\ORADATA\SRC\INDX01.DBF',
'E:\ORACLE\ORADATA\SRC\PROD.ORA',
'E:\ORACLE\ORADATA\SRC\TEST.ORA'
CHARACTER SET WE8ISO8859P1
;
# Recovery is required if any of the datafiles are restored backups,
# or if the last shutdown was not normal or immediate.
RECOVER DATABASE
# Database can now be opened normally.
ALTER DATABASE OPEN;
# No tempfile entries found to add.
#

```

3. We now need to replace the old file locations and instance name with new file locations and instance name. Use your favorite text editor to replace the string “src” with “trg”. You should also inspect each file path and make sure it points to the new location(s). It should now look like the following.

```

# The following commands will create a new control file and use it
# to open the database.
# Data used by the recovery manager will be lost. Additional logs may
# be required for media recovery of offline data files. Use this
# only if the current version of all online logs are available.
STARTUP NOMOUNT
CREATE CONTROLFILE REUSE DATABASE "TRG" NORESETLOGS ARCHIVELOG
    MAXLOGFILES 32
    MAXLOGMEMBERS 2
    MAXDATAFILES 254
    MAXINSTANCES 1
    MAXLOGHISTORY 226
LOGFILE
GROUP 1 'E:\ORACLE\ORADATA\TRG\REDO01.LOG' SIZE 100M,
GROUP 2 'E:\ORACLE\ORADATA\TRG\REDO02.LOG' SIZE 100M,
GROUP 3 'E:\ORACLE\ORADATA\TRG\REDO03.LOG' SIZE 100M,
GROUP 4 'E:\ORACLE\ORADATA\TRG\REDO04.LOG' SIZE 100M
DATAFILE
'E:\ORACLE\ORADATA\TRG\SYSTEM01.DBF',
'E:\ORACLE\ORADATA\TRG\RBS01.DBF',
'E:\ORACLE\ORADATA\TRG\USERS01.DBF',
'E:\ORACLE\ORADATA\TRG\TEMP01.DBF',
'E:\ORACLE\ORADATA\TRG\TOOLS01.DBF',
'E:\ORACLE\ORADATA\TRG\INDX01.DBF',
'E:\ORACLE\ORADATA\TRG\PROD.ORA',
'E:\ORACLE\ORADATA\TRG\TEST.ORA'
CHARACTER SET WE8ISO8859P1
;
# Recovery is required if any of the datafiles are restored backups,
# or if the last shutdown was not normal or immediate.
RECOVER DATABASE
# Database can now be opened normally.
ALTER DATABASE OPEN;
# No tempfile entries found to add.
#

```

4. Now we change the beginning of the create statement. This tells Oracle to create the new control files and reset the counters.

Change “CREATE CONTROLFILE REUSE DATABASE “TRG” NORESETLOGS NOARCHIVELOG” to read “CREATE CONTROLFILE REUSE SET DATABASE “TRG” RESETLOGS NOARCHIVELOG”.

5. Next we comment out the “RECOVER DATABASE” line.
6. Now we modify how the database is opened. We change the command “ALTER DATABASE OPEN;” to “ALTER DATABASE OPEN RESETLOGS;”.

Your finished file should now look like the following.

```
# The following commands will create a new control file and use it
# to open the database.
# Data used by the recovery manager will be lost. Additional logs may
# be required for media recovery of offline data files. Use this
# only if the current version of all online logs are available.
STARTUP NOMOUNT
CREATE CONTROLFILE REUSE SET DATABASE "TRG" RESETLOGS ARCHIVELOG
    MAXLOGFILES 32
    MAXLOGMEMBERS 2
    MAXDATAFILES 254
    MAXINSTANCES 1
    MAXLOGHISTORY 226
LOGFILE
GROUP 1 'E:\ORACLE\ORADATA\TRG\REDO01.LOG' SIZE 100M,
GROUP 2 'E:\ORACLE\ORADATA\TRG\REDO02.LOG' SIZE 100M,
GROUP 3 'E:\ORACLE\ORADATA\TRG\REDO03.LOG' SIZE 100M,
GROUP 4 'E:\ORACLE\ORADATA\TRG\REDO04.LOG' SIZE 100M
DATAFILE
'E:\ORACLE\ORADATA\TRG\SYSTEM01.DBF',
'E:\ORACLE\ORADATA\TRG\RBS01.DBF',
'E:\ORACLE\ORADATA\TRG\USERS01.DBF',
'E:\ORACLE\ORADATA\TRG\TEMP01.DBF',
'E:\ORACLE\ORADATA\TRG\TOOLS01.DBF',
'E:\ORACLE\ORADATA\TRG\INDX01.DBF',
'E:\ORACLE\ORADATA\TRG\PROD.ORA',
'E:\ORACLE\ORADATA\TRG\TEST.ORA'
CHARACTER SET WE8ISO8859P1
;
# Recovery is required if any of the datafiles are restored backups,
# or if the last shutdown was not normal or immediate.
# RECOVER DATABASE
# Database can now be opened normally.
ALTER DATABASE OPEN RESETLOGS;
```

Step 2 - Edit the control file (NOARCHIVELOG)

We now need to modify the trace file to turn it into an SQL script to create a new set of control files for our TRG instance.

1. Save the newly created trace file as an SQL script. Use the name “create_trg.sql”.
2. Remove all of the lines from the beginning of the file up to the line starting with “# The following commands will create a new control file and use it”. It should now look like the following file.

```
# The following commands will create a new control file and use it
# to open the database.
# Data used by the recovery manager will be lost. Additional logs may
# be required for media recovery of offline data files. Use this
# only if the current version of all online logs are available.
STARTUP NOMOUNT
CREATE CONTROLFILE REUSE DATABASE "SRC" NORESETLOGS ARCHIVELOG
    MAXLOGFILES 32
    MAXLOGMEMBERS 2
    MAXDATAFILES 254
```

```

MAXINSTANCES 1
MAXLOGHISTORY 226
LOGFILE
GROUP 1 'E:\ORACLE\ORADATA\SRC\REDO01.LOG' SIZE 100M,
GROUP 2 'E:\ORACLE\ORADATA\SRC\REDO02.LOG' SIZE 100M,
GROUP 3 'E:\ORACLE\ORADATA\SRC\REDO03.LOG' SIZE 100M,
GROUP 4 'E:\ORACLE\ORADATA\SRC\REDO04.LOG' SIZE 100M
DATAFILE
'E:\ORACLE\ORADATA\SRC\SYSTEM01.DBF',
'E:\ORACLE\ORADATA\SRC\RBS01.DBF',
'E:\ORACLE\ORADATA\SRC\USERS01.DBF',
'E:\ORACLE\ORADATA\SRC\TEMP01.DBF',
'E:\ORACLE\ORADATA\SRC\TOOLS01.DBF',
'E:\ORACLE\ORADATA\SRC\INDX01.DBF',
'E:\ORACLE\ORADATA\SRC\PROD.ORA',
'E:\ORACLE\ORADATA\SRC\TEST.ORA'
CHARACTER SET WE8ISO8859P1
;
# Recovery is required if any of the datafiles are restored backups,
# or if the last shutdown was not normal or immediate.
RECOVER DATABASE
# Database can now be opened normally.
ALTER DATABASE OPEN;
# No tempfile entries found to add.
#

```

3. We now need to replace the old file locations and instance name with new file locations and instance name. Use your favorite text editor to replace the string **"src"** with **"trg"**. You should also inspect each file path and make sure it points to the new location(s). It should now look like the following.

```

# The following commands will create a new control file and use it
# to open the database.
# Data used by the recovery manager will be lost. Additional logs may
# be required for media recovery of offline data files. Use this
# only if the current version of all online logs are available.
STARTUP NOMOUNT
CREATE CONTROLFILE REUSE DATABASE "TRG" NORESETLOGS NOARCHIVELOG
MAXLOGFILES 32
MAXLOGMEMBERS 2
MAXDATAFILES 254
MAXINSTANCES 1
MAXLOGHISTORY 226
LOGFILE
GROUP 1 'E:\ORACLE\ORADATA\TRG\REDO01.LOG' SIZE 100M,
GROUP 2 'E:\ORACLE\ORADATA\TRG\REDO02.LOG' SIZE 100M,
GROUP 3 'E:\ORACLE\ORADATA\TRG\REDO03.LOG' SIZE 100M,
GROUP 4 'E:\ORACLE\ORADATA\TRG\REDO04.LOG' SIZE 100M
DATAFILE
'E:\ORACLE\ORADATA\TRG\SYSTEM01.DBF',
'E:\ORACLE\ORADATA\TRG\RBS01.DBF',
'E:\ORACLE\ORADATA\TRG\USERS01.DBF',
'E:\ORACLE\ORADATA\TRG\TEMP01.DBF',
'E:\ORACLE\ORADATA\TRG\TOOLS01.DBF',
'E:\ORACLE\ORADATA\TRG\INDX01.DBF',
'E:\ORACLE\ORADATA\TRG\PROD.ORA',
'E:\ORACLE\ORADATA\TRG\TEST.ORA'
CHARACTER SET WE8ISO8859P1
;
# Recovery is required if any of the datafiles are restored backups,
# or if the last shutdown was not normal or immediate.
RECOVER DATABASE
# Database can now be opened normally.
ALTER DATABASE OPEN;
# No tempfile entries found to add.
#

```

4. Now we change the beginning of the create statement. This tells Oracle to create the new control files and reset the counters.

Change “CREATE CONTROLFILE REUSE DATABASE “TRG” NORESETLOGS NOARCHIVELOG” to read “CREATE CONTROLFILE REUSE SET DATABASE “TRG” RESETLOGS NOARCHIVELOG”.

5. Next we comment out the “RECOVER DATABASE” line.
6. Now we modify how the database is opened. We change the command “ALTER DATABASE OPEN;” to “ALTER DATABASE OPEN RESETLOGS;”.

Your finished file should now look like the following.

```
# The following commands will create a new control file and use it
# to open the database.
# Data used by the recovery manager will be lost. Additional logs may
# be required for media recovery of offline data files. Use this
# only if the current version of all online logs are available.
STARTUP NOMOUNT
CREATE CONTROLFILE REUSE SET DATABASE "TRG" RESETLOGS NOARCHIVELOG
    MAXLOGFILES 32
    MAXLOGMEMBERS 2
    MAXDATAFILES 254
    MAXINSTANCES 1
    MAXLOGHISTORY 226
LOGFILE
    GROUP 1 'E:\ORACLE\ORADATA\TRG\REDO01.LOG' SIZE 100M,
    GROUP 2 'E:\ORACLE\ORADATA\TRG\REDO02.LOG' SIZE 100M,
    GROUP 3 'E:\ORACLE\ORADATA\TRG\REDO03.LOG' SIZE 100M,
    GROUP 4 'E:\ORACLE\ORADATA\TRG\REDO04.LOG' SIZE 100M
DATAFILE
    'E:\ORACLE\ORADATA\TRG\SYSTEM01.DBF',
    'E:\ORACLE\ORADATA\TRG\RBS01.DBF',
    'E:\ORACLE\ORADATA\TRG\USERS01.DBF',
    'E:\ORACLE\ORADATA\TRG\TEMP01.DBF',
    'E:\ORACLE\ORADATA\TRG\TOOLS01.DBF',
    'E:\ORACLE\ORADATA\TRG\INDX01.DBF',
    'E:\ORACLE\ORADATA\TRG\PROD.ORA',
    'E:\ORACLE\ORADATA\TRG\TEST.ORA'
CHARACTER SET WE8ISO8859P1
;
# Recovery is required if any of the datafiles are restored backups,
# or if the last shutdown was not normal or immediate.
# RECOVER DATABASE
# Database can now be opened normally.
ALTER DATABASE OPEN RESETLOGS;
```

Step 3 - Shutdown the SRC & TRG instances

First we will shutdown the TRG instance and delete all of its data files. This will help cleanup enough room to copy the SRC instance. Just before shutting down the instance, please identify all control and data files used by this instance. If you are unsure where the files are located, use the “alter database backup controlfile to trace” command. The trace file will then contain a listing of all the data files associated with this instance.

Because we are deleting and replacing the TRG files, you can shutdown the database using “shutdown abort”.

```
$ set ORACLE_SID=TRG
$ svrmgrl
SVRMGR> connect internal
SVRMGR> shutdown abort;
SVRMGR> exit
```

Before we can copy the data files, we must cleanly shutdown the source database. The database must be shutdown using a “normal” shutdown. If you have to use a “shutdown immediate” or “shutdown abort”, you must restart the database and shut it down using “shutdown normal”.

```
$ set ORACLE_SID=SRC
$ svrmgrl
SVRMGR> connect internal
SVRMGR> shutdown normal;
SVRMGR> exit
```

Step 4 - Copy the files into the new instance area

Now that we have created a script to “create” the new instance, we can copy all of the database files to their new location.

Step 5 - Startup the SRC instance

Once all of the files have been copied from their source location, you can start the source database back up.

```
$ set ORACLE_SID=SRC
$ svrmgrl
SVRMGR> connect internal
SVRMGR> startup;
SVRMGR> exit
```

Step 6 - Startup the TRG instance (startup mount)

If all of the data files have been copied successfully, we can now startup and create the new target database using the script we created in step 2.

Step 7 - Create the new TRG control files

We will now use the script we have created above to create the new control files and startup the instance. This process should take less than a minute to complete.

- Connect to the new instance using SVRMGR using the following command at a system prompt “svrmgrl”.
- Connect as the internal user using the command “connect internal”. It is possible that you might be prompted for your internal password.
- Run the script using the command “@create_trg.sql”.
- Exit

```
$ set ORACLE_SID=TRG
$ svrmgrl
SVRMGR> connect internal
SVRMGR> @create_trg.sql;
SVRMGR> exit
```

Step 8 - Shutdown and startup of the TRG instance

To make sure that the instance has been created properly, please shutdown the instance normally and restart it. When connecting, you should now find that the target instance is an exact duplicate of the source database.

```
$ set ORACLE_SID=TRG
$ svrmgrl
SVRMGR> connect internal
SVRMGR> shutdown normal;
SVRMGR> startup;
SVRMGR> exit
```

Conclusion

Once you have practiced this process a few times, you'll find that you can copy an instance in as little as 10-15 minutes. This is a vast improvement over the multi-hour process of exporting and importing.