# GoldenGate Database Initial Setup

This document details the steps needed to migrate the MOL database from 10g to 12c.  
It also details the final steps needed to setup and start the GoldenGate replication.

Source Host and Database: and-hsk-rac10inta1 / MOLINTA (molint1/2)  
 Oracle RAC Database 10.2.0.5

Target Host and Database: mol-dbtest1 / molintpc (molintpc1/2)  
 Oracle RAC Database 12.1.0.2

## Configure Storage / Networking

Use the following document to setup the 12c database servers correctly.  
<https://docs.oracle.com/database/121/CWSOL/toc.htm>

## Install / Configure 12.1.0.2 Grid Infrastructure

Use the following document to install and configure 12.1.0.2 Grid Infrastructure.  
[https://docs.oracle.com/database/121/CWSOL/crsunix.htm#CWSOL315](https://docs.oracle.com/database/121/CWSOL/crsunix.htm%23CWSOL315)

## Install Grid Infrastructure 12.1.0.2.160119 Patch

* Install latest OPatch in GI Home for 12.1.0.2 (Patch 6880880)
* Download patch 22191676 from Oracle Support and unzip as grid user
* Ensure that grid infrastructure is up on both nodes and login as root user.
* export PATH=/u01/grid/12.1.0/bin:$PATH:/u01/grid/12.1.0/OPatch:/usr/ccs/bin
* opatchauto apply <UNZIPPED\_PATCH\_LOCATION>/22191676 -oh /u01/grid/12.1.0 -ocmrf /u01/source/ocs.rsp
* Install on both hosts separately

## Install 12.1.0.2 Database Home

* Install latest OPatch in DB Home for 12.1.0.2 (Patch 6880880)
* Install patch 20466628 (1995415.1) to avoid ORA-38802 during upgrade to 12c.
* Do NOT install the latest PSU yet, this has to be done after the upgrade has completed.

## Run 12c Pre-Upgrade Scripts on 10g Database

* @preupgrd.sql
* Take any recommended action and run fixup scripts
* @emremove.sql

## Backup 10g Database

For production skip this step and use one of the scheduled overnight backups.

run {  
 allocate channel c1 type disk;  
 backup database format '/tempbackup/bkp\_full.%U' filesperset 1;  
 backup archivelog all not backed up format '/tempbackup/bkp\_arch.%U';  
 release channel c1;  
 }

## Password File / Parameter File

Copy password file to nodes 1 and 2, rename to orapwmolintpc1 and orapwmolintpc2 respectively.  
These are values for integration, change the values if installing a production database.

On node 1 create the following initialisation parameter file in $ORACLE\_HOME/dbs

\*.audit\_file\_dest='/u01/app/oracle/admin/molintpc/adump'  
 \*.cluster\_database\_instances=2  
 \*.cluster\_database=TRUE  
 \*.compatible='12.1.0.2.0'  
 \*.control\_files='+ORADATA','+ORAFRA'  
 \*.db\_block\_size=8192  
 \*.db\_create\_file\_dest='+ORADATA'  
 \*.db\_create\_online\_log\_dest\_1=’+ORAFRA’  
 \*.db\_file\_multiblock\_read\_count=16  
 \*.db\_name='molinta'  
 \*.db\_recovery\_file\_dest='+ORAFRA'  
 \*.db\_recovery\_file\_dest\_size=900G  
 \*.db\_unique\_name='molintpc'  
 \*.enable\_goldengate\_replication=TRUE  
 molintpc1.instance\_number=1  
 molintpc2.instance\_number=2  
 \*.job\_queue\_processes=100  
 \*.log\_archive\_format='%t\_%s\_%r.dbf'  
 \*.log\_archive\_max\_processes=10  
 \*.log\_archive\_min\_succeed\_dest=1  
\*.log\_file\_name\_convert='/u05/orafra/MOLINTA','+ORAFRA/molintpc','/u06/oradata/MOLINTA','+ORADATA/molintpc'  
 \*.nls\_language='ENGLISH'  
 \*.nls\_territory='UNITED KINGDOM'  
 \*.open\_cursors=1000  
 \*.parallel\_execution\_message\_size=4096  
 \*.pga\_aggregate\_target=1800M  
 \*.processes=4000  
 \*.remote\_login\_passwordfile='EXCLUSIVE'  
 \*.sessions=4405  
 \*.sga\_target=1700M  
 \*.standby\_file\_management='AUTO'  
 molintpc1.thread=1  
 molintpc2.thread=2  
 \*.undo\_management='AUTO'  
 \*.undo\_retention=3600  
 molintpc1.undo\_tablespace='UNDOTBS1'  
 molintpc2.undo\_tablespace='UNDOTBS2'

## Register Database with Server Control

srvctl add database -d molintpc –o /u01/app/oracle/product/12.1.0/dbhome\_1  
srvctl add instance -d molintpc -i molintpc1 -n mol-dbtest1  
srvctl add instance -d molintpc -i molintpc2 -n mol-dbtest2  
srvctl modify database -d molintpc -a "ORADATA,ORAFRA"

## Create spfile on ASM and pfile on local hosts

SQL> CREATE SPFILE='+ORADATA/spfilemolintpc.ora' from pfile='inittemp.ora';  
$ cd $ORACLE\_HOME/dbs  
$ echo “SPFILE='+ORADATA/spfilemolintpc.ora'” > initmolintpc1.ora  
$ scp initmolintpc1.ora mol-dbtest2:$ORACLE\_HOME/dbs/initmolintpc2.ora

## Start Database nomount, restore control file and mount

srvctl start database -d molintpc -o nomount  
RMAN> restore controlfile from '/intbackup/<AUTOBACKUP\_NAME>';  
srvctl stop database -d molintpc  
srvctl start database -d molintpc -o mount

## Check GoldenGate Extracts are working correctly

On 10g Database Server …  
$ cd $GGHOME  
$ ./ggsci  
GGSCI> info extract EXTMOL01, detail  
GGSCI> info extract EXTRDC01, detail  
GGSCI> info extract EXTREG01, detail  
GGSCI> info extract EXTOTH01, detail

## Catalog Backup on 12c Database and Restore

RMAN> catalog start with '/intbackup';  
RMAN> run {  
 SET NEWNAME FOR DATABASE TO '+ORADATA';  
 SET NEWNAME FOR TEMPFILE 1 TO '+ORADATA';  
 SET NEWNAME FOR TEMPFILE 2 TO '+ORADATA';  
 restore database;  
 switch datafile all;  
 switch tempfile all;  
 }

## Discover the “Next SCN” value from the Archive Log Backup

RMAN> list backup of archivelog all;  
Looking at list find the last logs for both threads and choose the lowest “Next SCN” value of the 2 threads.

## Recover Database until SCN Value from last section

RMAN> run {  
 allocate channel c1 type disk;  
 set until scn <SCN\_NUMBER>;  
 recover database;  
 }

## Configure Database State for Upgrade

$ sqlplus / as sysdba  
SQL> alter system set cluster\_database=false scope=spfile sid=’\*’;  
$ srvctl stop database –d molintpc  
$ sqlplus / as sysdba  
SQL> startup mount  
SQL> alter database open resetlogs upgrade

For confirmation of the SCN number to use for replication, check alert log.  
Check for line: RESETLOGS after incomplete recovery UNTIL CHANGE <SCN\_NUMBER>

SQL> shutdown immediate  
SQL> startup upgrade

## Run Catalogue Upgrade Script on 12c Database

$ cd $ORACLE\_HOME/rdbms/admin  
$ mkdir /export/home/oracle/12c\_Upgrade  
$ORACLE\_HOME/perl/bin/perl catctl.pl -n 4 -l /export/home/oracle/12c\_Upgrade catupgrd.sql

This process took approximately 5 hours on the integration proof of concept database.  
Once complete review log file and check for errors.

## Restart Database in Normal Read/Write Mode

SQL> shutdown immediate  
SQL> startup nomount  
SQL> alter system set cluster\_database=true scope=spfile;  
SQL> shutdown immediate;  
$ srvctl start database -d molintpc

## Compile Invalid Objects

$ cd $ORACLE\_HOME/rdbms/admin  
$ sqlplus / as sysdba  
SQL> @utlrp.sql  
May have to re-run DDL scripts for GoldenGate if there are any GGATE related errors  
SQL> @utluiobj.sql

## Install Database 12.1.0.2.160119 Patch

* Unzip patch 22191676 as oracle user
* Ensure that database instances are up on both nodes and login as root user.
* export PATH=/u01/app/oracle/product/12.1.0/dbhome\_1/bin:$PATH:/u01/app/oracle/ product/12.1.0/dbhome\_1/OPatch:/usr/ccs/bin
* opatchauto apply 22191676 -oh /u01/app/oracle/product/12.1.0/dbhome\_1 -ocmrf /u01/source/ocm.rsp
* Install on both hosts separately

## Post-Installation Tasks

SQL> exec dbms\_scheduler\_jobs.disable(‘MO\_NIGHTLY\_CHAIN\_1\_JOB’);  
SQL> exec dbms\_scheduler\_jobs.disable(‘VIDEO\_MAINTENANCE’);  
SQL> exec dbms\_autotask\_admin.enable;  
SQL> BEGIN  
 DBMS\_AUTO\_TASK\_ADMIN.enable(  
 client\_name => 'auto optimizer stats collection',  
 operation => NULL,  
 window\_name => NULL);  
 END;  
 /

## Create Access Control List

$ cd /export/home/andracintbackup/goldengate/12.2/db\_1/dirsql  
SQL> @acl\_12c.sql

## Recommended: Upgrade Timezone Version

See My Oracle Support Document 1509653.1 for full details

sqlplus / as sysdba  
purge dba\_recyclebin;  
EXEC DBMS\_APPLICATION\_INFO.SET\_CLIENT\_INFO('upg\_tzv');  
alter session set "\_with\_subquery"=materialize;  
alter session set "\_simple\_view\_merging"=TRUE;

exec DBMS\_DST.BEGIN\_PREPARE(18);  
TRUNCATE TABLE SYS.DST$TRIGGER\_TABLE;  
TRUNCATE TABLE sys.dst$affected\_tables;  
TRUNCATE TABLE sys.dst$error\_table;  
set serveroutput on  
BEGIN  
DBMS\_DST.FIND\_AFFECTED\_TABLES  
(affected\_tables => 'sys.dst$affected\_tables',  
log\_errors => TRUE,  
log\_errors\_table => 'sys.dst$error\_table');  
END;  
/

SELECT \* FROM sys.dst$affected\_tables;  
SELECT \* FROM sys.dst$error\_table;  
EXEC DBMS\_DST.END\_PREPARE;

alter system set cluster\_database=false scope=spfile;  
srvctl stop database -d molintpc  
sqlplus / as sysdba  
startup upgrade;  
set serveroutput on  
SELECT PROPERTY\_NAME, SUBSTR(property\_value, 1, 30) value  
FROM DATABASE\_PROPERTIES  
WHERE PROPERTY\_NAME LIKE 'DST\_%'  
ORDER BY PROPERTY\_NAME;

EXEC DBMS\_APPLICATION\_INFO.SET\_CLIENT\_INFO('upg\_tzv')  
alter session set "\_with\_subquery"=materialize;  
alter session set "\_simple\_view\_merging"=TRUE;

EXEC DBMS\_DST.BEGIN\_UPGRADE(18);

alter system set cluster\_database=true scope=spfile;  
shutdown immediate  
srvctl start database -d molintpc  
sqlplus / as sysdba  
alter session set "\_with\_subquery"=materialize;  
alter session set "\_simple\_view\_merging"=TRUE;

set serveroutput on  
VAR numfail number  
BEGIN  
DBMS\_DST.UPGRADE\_DATABASE(:numfail,  
parallel => TRUE,  
log\_errors => TRUE,  
log\_errors\_table => 'SYS.DST$ERROR\_TABLE',  
log\_triggers\_table => 'SYS.DST$TRIGGER\_TABLE',  
error\_on\_overlap\_time => FALSE,  
error\_on\_nonexisting\_time => FALSE);  
DBMS\_OUTPUT.PUT\_LINE('Failures:'|| :numfail);  
END;  
/

VAR fail number  
BEGIN  
DBMS\_DST.END\_UPGRADE(:fail);  
DBMS\_OUTPUT.PUT\_LINE('Failures:'|| :fail);  
END;  
/

SELECT PROPERTY\_NAME, SUBSTR(property\_value, 1, 30) value  
FROM DATABASE\_PROPERTIES  
WHERE PROPERTY\_NAME LIKE 'DST\_%'  
ORDER BY PROPERTY\_NAME;

SELECT \* FROM v$timezone\_file;  
update registry$database set TZ\_VERSION = (select version FROM v$timezone\_file);

## Useful Scripts

### Check on progress of RMAN backup/restore

SELECT inst\_id, SID, SERIAL#, CONTEXT, SOFAR, TOTALWORK, ROUND(SOFAR/TOTALWORK\*100,2) "%\_COMPLETE"  
FROM GV$SESSION\_LONGOPS  
WHERE OPNAME LIKE 'RMAN%'  
AND OPNAME NOT LIKE '%aggregate%'  
AND TOTALWORK != 0  
AND SOFAR <> TOTALWORK;

### Check ASM disks to see datafiles restored

Log on as grid user and sqlplus / as sysasm

select name   
from v$asm\_alias a, v$asm\_file f  
where a.group\_number = (select group\_number   
 from v$asm\_diskgroup   
 where name = 'ORADATA')  
and a.file\_number = f.file\_number;

Can also "asmcmd -p", cd +oradata/molinpc/datafiles, ls –ls

### Data File Sizes

set linesize 160 pagesize 100  
col file\_name format a65  
select file\_id, file\_name, round(bytes/1024/1024/1024,2) SIZE\_GB   
from dba\_data\_files  
order by 1;

### Redo Logs

select THREAD#, GROUP#, ARCHIVED, STATUS FROM V$LOG;  
alter database drop logfile group n;  
alter database add logfile thread n group n size 300m;  
ALTER DATABASE BACKUP CONTROLFILE TO TRACE AS '/export/home/oracle/control.sql';  
ALTER DATABASE ADD LOGFILE THREAD 2 GROUP 4 SIZE 300M,  
 GROUP 5 SIZE 300M,  
 GROUP 6 SIZE 300M;