

Advanced Re-Hosting

Advanced Re-Hosting

Document Control

Date	Author	Change References
2005-10-04	신종근	초기 작성함

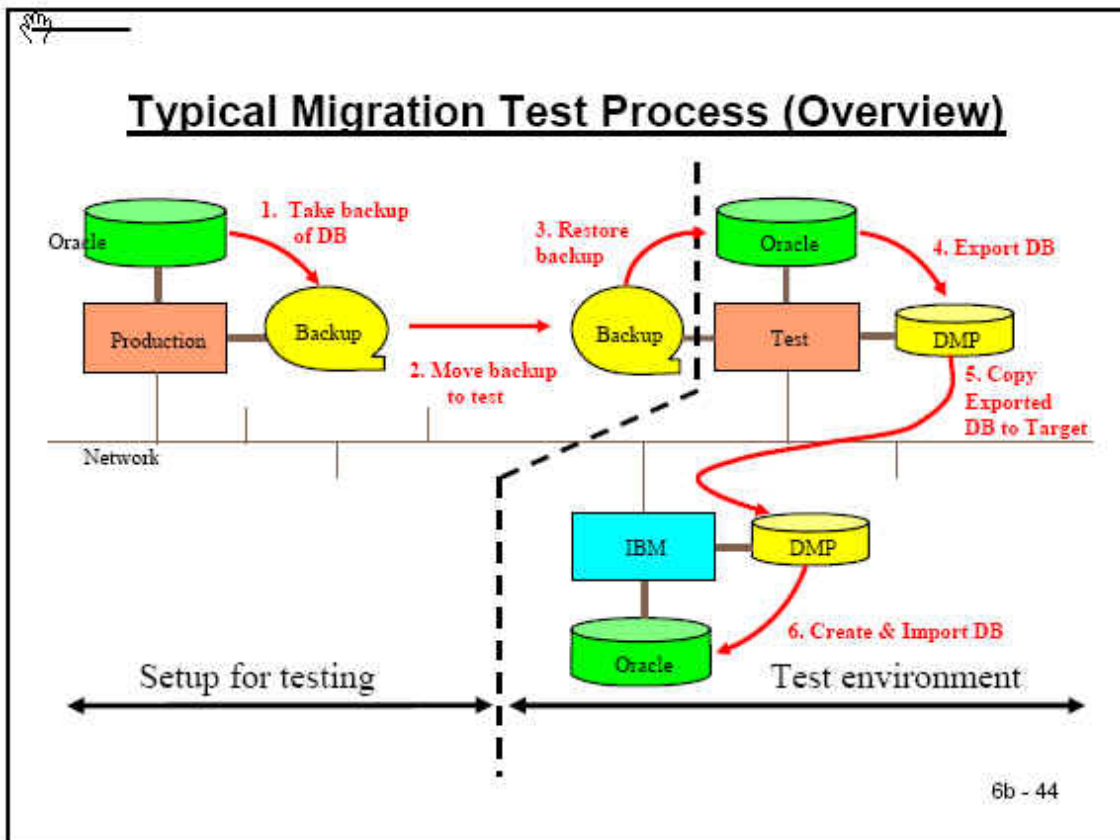
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1. Migration 방법

- 전통적인 방법 (exp → ftp → imp)
- CTAS (Create Table As Select)
- Quest's SharePlex
- By Hand (Unload → Reload , Index, Constraints, Grants... Manually)

** Re-Hosting 이란? 타 Platform 으로의 Data Migration 을 뜻함.

2. Migration Overview



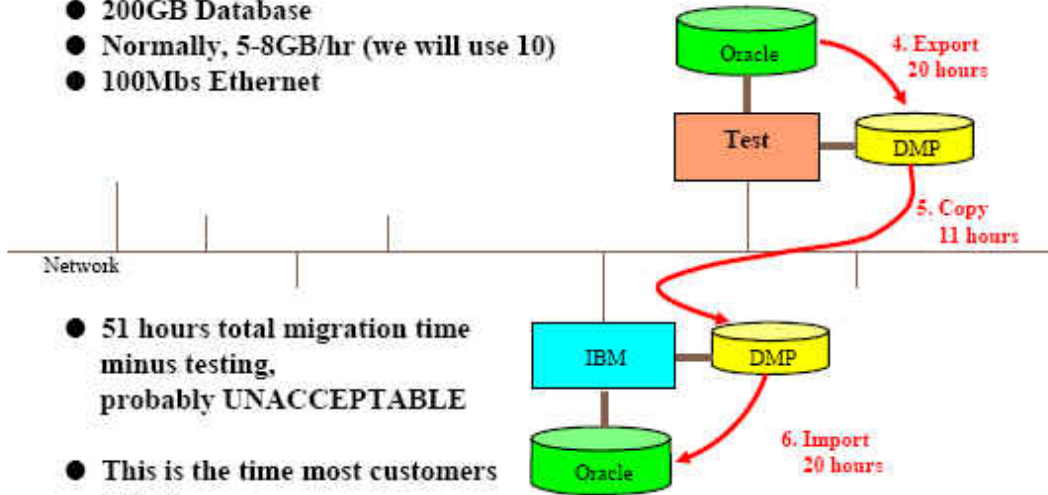
3. Migration 별 소요시간 비교

- Data Size : 200 GB
- Exp/imp :: 51 시간
- Using Named-Pipe :: 20 시간
- Using Named-Pipe & Multi-Thread :: 4 시간

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Typical Migration Process

- 200GB Database
- Normally, 5-8GB/hr (we will use 10)
- 100Mbs Ethernet



- 51 hours total migration time minus testing, probably UNACCEPTABLE
- This is the time most customers expect

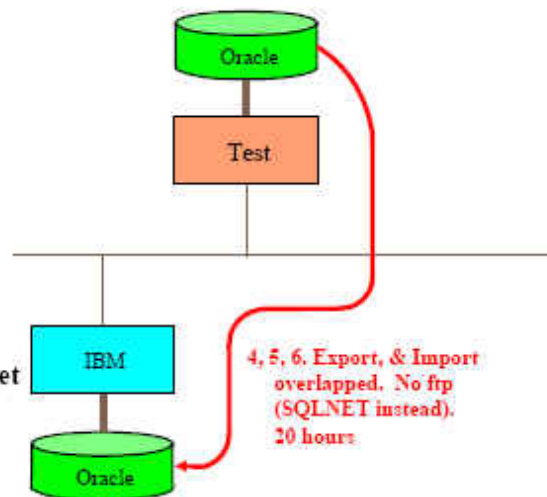
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Migration Process Using "Named Pipes"

- Named Pipe
 - Standard UNIX tool (mknod)
 - Used with SQLNET
 - Familiar to most DBAs
 - Generally used differently

- Upgrade to Gigabit Ethernet

- Export and import both run on target 20 hours total, better, maybe acceptable, probably not
- Many DBA's don't know this technique



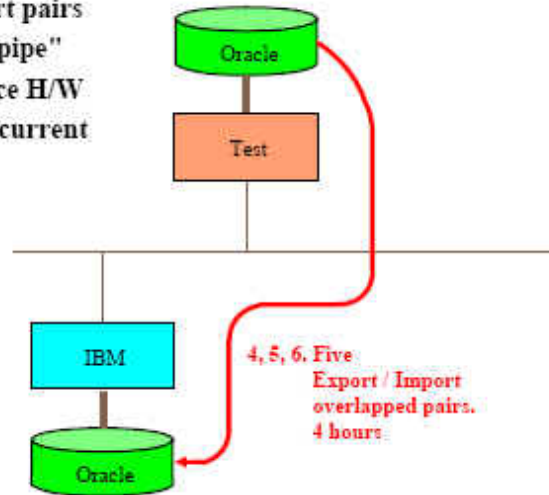
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Migration Using "Named Pipes" & Multi-Threading

- Multiple concurrent export / import pairs
- Each pair have their own "named pipe"
- Generally limited by speed of source H/W
- For this example, we will use 5 concurrent export/import pair of processes

- 4 hours total, probably good enough (remember there are multiple additional tasks to complete prior to bringing this up in production).
- Requires work to setup and dependent on table size skew (more on that later)



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4. Named Pipe & Multi-Thread 순서

** 준비물

- exp_imp.pl - Perl Script
- indexfile.sql
- dmp file (Only Objects not Data)
(File의 내용은 6.참고자료를 참고할 것)

** Solaris 의 UFS 인 경우 반드시 forcedirectio Option 을 사용할 것!!
기타 다른 Platform 에서도 최고의 Disk I/O 향상을 위해 Tuning 후 진행한다.

** 실행방법

- Run exp_imp.pl
- cd to the exe directory
- Execute "master.sh"

** Test Scenario

1. Target System 에 Oracle S/W, Patchset Install
 - 기본적인 CRDB 를 생성한다.
2. 기존 System 과 복제처럼 할려면...
 - cr-crdb1.sql → CREATE DATABASE ...
 - cr-crdb2.sql → Catalog, Catproc, Undo 는 수동으로 편집할 것 !!
 - cr-crdb3.sql → 각종 Tablespace 생성 Script. Dmp file(Only Objects not Data) 를 이

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용하여 Tablespace를 생성하는 구문을 추출. 예를들어 Dmp File의 이름이 nodata.dmp일 경우 다음과 같은 Command를 이용

```
% strings nodata.dmp |grep "CREATE TABLESPACE" >cr-crdb3.sql
```

** 신규 System 에 새로운 DB 를 생성한 경우에는 아래 3번부터 실행하면 된다.
Dump file, crdb4.lst , exp_imp.pl 파일은 신규 System 으로 ftp

3. Table 생성 정보 Generate

- cr-crdb4.sql → Table 명, Size list 가 생성 됨 !!

4. indexfile.sql 파일 생성하기

- 원본 DB 에서 exp system/PWD file=full.dmp full=y rows=n statistics=none
- imp system/PWD file=full.dmp indexfile=indexfile.sql full=y

5. Build DDL , Parfiles on perl_exp_imp.pl

- 각 Platform 에 따라 CPU 개수를 정하는 131 line 을 수정한다.

← System Dictionary 를 제외한 일반유저의 Object 만 옮기는 경우라면
cr_crdb4.sql 파일을 수정하여 일반 Object 만 Query 할 수 있도록 한다.
해당 Tablespace, user 는 생성후에 imp 를 시작한다.

```
% perl exp_imp.pl
```

```
...
```

```
Enter the SID of target database: ITA
```

```
Enter the number of parallel exp/imp to be created [4]:
```

```
Enter then name of the cr_crdb4 output file [crdb4.lst]:
```

```
Enter name used for the indexfile option of the import [indexfile.sql]:
```

```
Enter source SID or desired TNSNAMES alias [ITA]:
```

← tnsnames.ora 에 ITA 이름 설정

```
Enter the password for the "system" ID on source DB[manager]: xxxxxxxx
```

```
Enter the password for the "system" ID on target DB[welcome]: xxxxxxxx
```

```
Loading initial data from cr_crdb4.sql
```

```
Done with initial load
```

```
Starting to calculate a weighted size for the files
```

```
(This takes into account LOBs and indexes plus data size)
```

```
Done weighting file sizes
```

```
Heavy table size skewed algorithm will be used
```

```
Setup the multiple exp/imp threads that will be created
```

```
Done initializing threads
```

```
Determine type of parfile creation
```

```
(Required to handle databases with highly skew table sizes  
versus those with more uniform table sizes)
```

```
Done with algorithm determination process
```

```
Starting initial parfile load of largest tables
```

```
Largest tables loaded to parfiles, one each
```

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Loading index build DDL
Done with index DDL load

Loading table build DDL
(This is not used but is created if manual table creation or
recovery of tables is required)
Done with table DDL load

Loading table build DDL
(This is not used but is created if manual table creation or
recovery of tables is required)
Done with alter DDL load

Loading parfile threads with rest of tables
(This process also creates the DDL for the indexes)
Done loading parfile threads

Parfile: exp_0_0 Effective Size: 3096.00 MB Tables: 1
Parfile: exp_0_1 Effective Size: 3095.50 MB Tables: 234
Parfile: exp_0_2 Effective Size: 3016.00 MB Tables: 37
Parfile: exp_0_3 Effective Size: 2147.88 MB Tables: 4
Parfile: exp_0_4 Effective Size: 1880.00 MB Tables: 1
Parfile: exp_1_0 Effective Size: 3096.00 MB Tables: 1
Parfile: exp_1_1 Effective Size: 3095.50 MB Tables: 234
Parfile: exp_1_2 Effective Size: 3081.75 MB Tables: 56
Parfile: exp_1_3 Effective Size: 2682.00 MB Tables: 8
Parfile: exp_1_4 Effective Size: 1880.00 MB Tables: 1
Parfile: exp_2_0 Effective Size: 3095.75 MB Tables: 234
Parfile: exp_2_1 Effective Size: 3095.88 MB Tables: 234
Parfile: exp_2_2 Effective Size: 3092.25 MB Tables: 86
Parfile: exp_2_3 Effective Size: 3076.00 MB Tables: 18
Parfile: exp_2_4 Effective Size: 1606.00 MB Tables: 1
Parfile: exp_2_5 Effective Size: 1900.00 MB Tables: 1
Parfile: exp_3_0 Effective Size: 3095.75 MB Tables: 234
Parfile: exp_3_1 Effective Size: 3094.75 MB Tables: 234
Parfile: exp_3_2 Effective Size: 3091.75 MB Tables: 234
Parfile: exp_3_3 Effective Size: 2982.75 MB Tables: 29
Parfile: exp_3_4 Effective Size: 1606.00 MB Tables: 1
Parfile: exp_3_5 Effective Size: 1900.00 MB Tables: 1

Total Data Size: 58713 MB in 1884 tables
*** Left over tables: 0 ***

Create the shell scripts that will execute the exp/imp threads
Migration creation process completed

6. Execute **master.sh**

- Import 하는 쪽의 @TNS 는 생략하여서 Local 에서 진행하도록 한다.
- Imp_0_0.pf 의 direct=y Option 제거

5. Error 내용 및 기타내용

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```
1. Exp / Imp client Compatible Mismatch (Metalink : #132904.1)
EXP-00056: ORACLE error 6550 encountered
ORA-06550: line 1, column 41:
PLS-00302: component 'SET_NO_OUTLINES' must be declared
ORA-06550: line 1, column 15:
PL/SQL: Statement ignored
EXP-00000: Export terminated unsuccessfully
```

2. Exp / Imp Tool Matrix 가 지원되지 않을 경우

rsh + emote dd 환경으로 구성하도록 한다.

. 원본 DB ::

```
dd if= exp_pipe bs=8192 | rsh sc2 "dd of=/ora10g/work/imp_pipe bs=8192" &
exp scott/tiger FILE=exp_pipe feedback=100 tables=ec_zip, zipcode
```

. Target DB ::

```
imp scott/tiger FILE=/ora10g/work/imp_pipe feedback=100 log=imp.log
```

. remote_dd.sh - 원본 DB 쪽에서 실행 후 master.sh 실행한다.

```
mknod pipe0.dmp p ← Thread 개수 만큼 생성,
dd if=pipe0.dmp bs=8192
| rsh TARGET "dd of=/ora10g/work/goodus/exe/pipe0.dmp bs=8192" &
exp system/PWD parfile=exp_0_0.pf file=pipe0.dmp
```

. thread_0_new.sh

```
imp system/PWD parfile=imp_0_0.pf file=/ora10g/work/goodus/exe/pipe0.dmp
```

6. 참고자료

1. master.sh

```
thread_0.sh &
thread_1.sh &
thread_2.sh &
thread_3.sh &
thread_4.sh &
```

2. thread_0.sh

```
#!/bin/ksh

if [ ! -p pipe0.dmp ]
then
mknod pipe0.dmp p
fiecho "Job step 0 started for thread 0 at`date`"

exp system/welcome@ITA parfile=exp_0_0.pf file=/ora10g/work/goodus/exe/pipe0.dmp &
imp system/welcome parfile=imp_0_0.pf file=/ora10g/work/goodus/exe/pipe0.dmp

if [ `grep -E "^ORA|^EXP" /ora10g/work/goodus/logs/exp_0_0.log | wc -l` -gt 0 ]
then
echo " Export Errors found in /ora10g/work/goodus/logs/exp_0_0.log"
echo " This thread will be stopped"
exit
```

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```
fi
if [ `grep -E "^ORA|^IMP" /ora10g/work/goodus/logs/imp_0_0.log | wc -l` -gt 0 ]
then
echo " Import Errors found in /ora10g/work/goodus/logs/imp_0_0.log"
echo " This thread will be stopped"
exit
fi
echo "Job step 0 finished for thread 0 at `date`"

export $ORACLE_SID=HUB
$ORACLE_HOME/bin/sqlplus "/" as sysdba" @../sql/idx_0_0.d0l >/dev/null &
echo "Job step 1 started for thread 0 at
`date`"

exp system/welcome@ITA parfile=exp_0_1.pf file=/ora10g/work/goodus/exe/pipe0.dmp &
imp system/welcome parfile=imp_0_1.pf file=/ora10g/work/goodus/exe/pipe0.dmp

if [ `grep -E "^ORA|^EXP" /ora10g/work/goodus/logs/exp_0_1.log | wc -l` -gt 0 ]
then
echo " Export Errors found in /ora10g/work/goodus/logs/exp_0_1.log"
echo " This thread will be stopped"
exit
fi
if [ `grep -E "^ORA|^IMP" /ora10g/work/goodus/logs/imp_0_1.log | wc -l` -gt 0 ]
then
echo " Import Errors found in /ora10g/work/goodus/logs/imp_0_1.log"
echo " This thread will be stopped"
exit
fi
echo "Job step 1 finished for thread 0 at `date`"

export $ORACLE_SID=HUB
$ORACLE_HOME/bin/sqlplus "/" as sysdba" @../sql/idx_0_1.d0l >/dev/null &
echo "Job step 2 started for thread 0 at
`date`"

exp system/welcome@ITA parfile=exp_0_2.pf file=/ora10g/work/goodus/exe/pipe0.dmp &
imp system/welcome parfile=imp_0_2.pf file=/ora10g/work/goodus/exe/pipe0.dmp

if [ `grep -E "^ORA|^EXP" /ora10g/work/goodus/logs/exp_0_2.log | wc -l` -gt 0 ]
then
echo " Export Errors found in /ora10g/work/goodus/logs/exp_0_2.log"
echo " This thread will be stopped"
exit
fi
if [ `grep -E "^ORA|^IMP" /ora10g/work/goodus/logs/imp_0_2.log | wc -l` -gt 0 ]
then
echo " Import Errors found in /ora10g/work/goodus/logs/imp_0_2.log"
echo " This thread will be stopped"
exit
fi
echo "Job step 2 finished for thread 0 at `date`"

export $ORACLE_SID=HUB
```


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```
$ORACLE_HOME/bin/sqlplus "/" as sysdba" @../sql/idx_0_2.d0l >/dev/null &
echo "Job step 3 started for thread 0 at `date`"

exp system/welcome@ITA parfile=exp_0_3.pf file=/ora10g/work/goodus/exe/pipe0.dmp &
imp system/welcome parfile=imp_0_3.pf file=/ora10g/work/goodus/exe/pipe0.dmp

if [ `grep -E "^ORA|^EXP" /ora10g/work/goodus/logs/exp_0_3.log | wc -l` -gt 0 ]
then
echo " Export Errors found in /ora10g/work/goodus/logs/exp_0_3.log"
echo " This thread will be stopped"
exit
fi
if [ `grep -E "^ORA|^IMP" /ora10g/work/goodus/logs/imp_0_3.log | wc -l` -gt 0 ]
then
echo " Import Errors found in /ora10g/work/goodus/logs/imp_0_3.log"
echo " This thread will be stopped"
exit
fi
echo "Job step 3 finished for thread 0 at `date`"

export $ORACLE_SID=HUB
$ORACLE_HOME/bin/sqlplus "/" as sysdba" @../sql/idx_0_3.d0l >/dev/null &
echo "Job step 4 started for thread 0 at `date`"

exp system/welcome@ITA parfile=exp_0_4.pf file=/ora10g/work/goodus/exe/pipe0.dmp &
imp system/welcome parfile=imp_0_4.pf file=/ora10g/work/goodus/exe/pipe0.dmp

if [ `grep -E "^ORA|^EXP" /ora10g/work/goodus/logs/exp_0_4.log | wc -l` -gt 0 ]
then
echo " Export Errors found in /ora10g/work/goodus/logs/exp_0_4.log"
echo " This thread will be stopped"
exit
fi
if [ `grep -E "^ORA|^IMP" /ora10g/work/goodus/logs/imp_0_4.log | wc -l` -gt 0 ]
then
echo " Import Errors found in /ora10g/work/goodus/logs/imp_0_4.log"
echo " This thread will be stopped"
exit
fi
echo "Job step 4 finished for thread 0 at `date`"

export $ORACLE_SID=HUB
$ORACLE_HOME/bin/sqlplus "/" as sysdba" @../sql/idx_0_4.d0l >/dev/null &
```

3. exp_0_0.pf

```
bizhub@ora10g:/ora10g/work/goodus/exe]$ more exp_0_0.pf
indexes=n
compress=n
constraints=n
direct=y
grants=y
log=/ora10g/work/goodus/logs/exp_0_0.log
rows=y
buffer=65536
```

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```
tables=(TEST.ATB_01D)
```

4. imp_0_0.pf

```
full=y
indexes=n
grants=n
analyze=n
statistics=none
constraints=n
ignore=y
log=/ora10g/work/goodus/logs/imp_0_0.log
rows=y
#direct=y
commit=n
buffer=65536
recordlength=65536
```

5. idx_0_0.ddl

```
spool /ora10g/work/goodus/logs/idx_0_0.ddl.log
CREATE UNIQUE INDEX "TEST"."XPKATB_01D" ON "TEST"."ATB_01D" ("SAUP_CD" ,
"SLIP_CON" , "SEQ" ) PCTFREE 10 INITRANS 2 MAXTRANS 255 STORAGE(INITIAL
32808960 FREELISTS 1 FREELIST GROUPS 1 BUFFER_POOL DEFAULT) TABLESPACE
"TEST" NOLOGGING PARALLEL (DEGREE 4);
ALTER INDEX "TEST"."XPKATB_01D" NOPARALLEL;
CREATE INDEX "TEST"."AIB_01D_1" ON "TEST"."ATB_01D" ("SAUP_CD" , "SLIP_SEQ" )
PCTFREE 10 INITRANS 2 MAXTRANS 255 STORAGE(INITIAL 12820480 FREELISTS 1
FREELIST GROUPS 1 BUFFER_POOL DEFAULT) TABLESPACE "TEST" NOLOGGING PARALLEL
(DEGREE 4);
ALTER INDEX "TEST"."AIB_01D_1" NOPARALLEL;
CREATE INDEX "TEST"."AIB_01D_3" ON "TEST"."ATB_01D" ("SAUP_CD" , "SLIP_DT" )
PCTFREE 10 INITRANS 2 MAXTRANS 255 STORAGE(INITIAL 17039360 FREELISTS 1
FREELIST GROUPS 1 BUFFER_POOL DEFAULT) TABLESPACE "TEST" NOLOGGING PARALLEL
(DEGREE 4);
ALTER INDEX "TEST"."AIB_01D_3" NOPARALLEL;
CREATE INDEX "TEST"."ATB_01D_4" ON "TEST"."ATB_01D" ("SAUP_CD" , "OK_DT" ,
"SLIP_DS" ) PCTFREE 10 INITRANS 2 MAXTRANS 255 STORAGE(INITIAL 14909440
FREELISTS 1 FREELIST GROUPS 1 BUFFER_POOL DEFAULT) TABLESPACE "TEST"
LOGGING PARALLEL (DEGREE 4);
ALTER INDEX "TEST"."ATB_01D_4" NOPARALLEL;
CREATE INDEX "TEST"."AIB_01D_4" ON "TEST"."ATB_01D" ("SLIP_CON" , "ACC_CD" )
PCTFREE 10 INITRANS 2 MAXTRANS 255 STORAGE(INITIAL 24125440 FREELISTS 1
FREELIST GROUPS 1 BUFFER_POOL DEFAULT) TABLESPACE "TEST" NOLOGGING PARALLEL
(DEGREE 4);
ALTER INDEX "TEST"."AIB_01D_4" NOPARALLEL;
CREATE INDEX "TEST"."AIB_01D_5" ON "TEST"."ATB_01D" ("ACC_CD" , "DAE_AMT" ,
"SAUP_CD" ) PCTFREE 10 INITRANS 2 MAXTRANS 255 STORAGE(INITIAL 20971520
FREELISTS 1 FREELIST GROUPS 1 BUFFER_POOL DEFAULT) TABLESPACE "TEST"
LOGGING PARALLEL (DEGREE 4);
ALTER INDEX "TEST"."AIB_01D_5" NOPARALLEL;
CREATE INDEX "TEST"."AIB_01D_2" ON "TEST"."ATB_01D" ("SAUP_CD" , "PRJ_CD" )
PCTFREE 10 INITRANS 2 MAXTRANS 255 STORAGE(INITIAL 12779520 FREELISTS 1
FREELIST GROUPS 1 BUFFER_POOL DEFAULT) TABLESPACE "TEST" NOLOGGING PARALLEL
(DEGREE 4);
ALTER INDEX "TEST"."AIB_01D_2" NOPARALLEL;
```

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```
spool off
exit
```

6. drop_0_0.ddl

```
DROP TABLE
TEST.ATB_01D CASCADE CONSTRAINTS;
```

7. trunc_drop_0_0.ddl

```
TRUNCATE TABLE
TEST.ATB_01D DROP STORAGE;
```

8. trunc_reuse_0_0.ddl

```
TRUNCATE TABLE
TEST.ATB_01D RESUSE STORAGE;
```

9. tnsnames.ora

```
ITA =
  (DESCRIPTION =
    (ADDRESS = (PROTOCOL = TCP)(HOST = 61.250.123.64)(PORT = 1521))
    (CONNECT_DATA =
      (SERVER = DEDICATED)
      (SERVICE_NAME = ITA)
    )
  )
)
```

10. cr_crdb4.sql

```
SET PAGES 999 TRIMS ON ECHO OFF VERIFY OFF FEEDBACK OFF HEADING OFF
NEWPAGE NONE
```

```
spool crdb4;
select host_name||':'||instance_name from v$instance;
select s.segment_type||' '||s.owner||'.'||s.segment_name||' '||sum(s.bytes)
from dba_segments s, dba_tables t
where s.segment_name = t.table_name
and segment_type = 'TABLE'
and s.owner in ('SCOTT','DEMO','GOOD')
group by s.segment_type, s.owner, s.segment_name;
```

```
select s.segment_type||' '||i.table_owner||'.'||i.table_name||' '||sum(s.bytes)
from dba_segments s, dba_indexes i
where segment_type = 'INDEX'
and s.owner in ('SCOTT','DEMO','GOOD')
and s.segment_name = i.index_name
group by s.segment_type, i.table_owner, i.table_name;
```

```
select 'LOB '||owner||'.'||table_name||' Y'
from dba_tab_columns
where data_type = 'BLOB'
and owner in ('SCOTT','DEMO','GOOD')
or data_type = 'CLOB'
and owner in ('SCOTT','DEMO','GOOD');
```

```
select 'LONG '||owner||'.'||table_name||' Y'
from dba_tab_columns
```

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```
where data_type = 'LONG RAW'  
and owner in ('SCOTT','DEMO','GOOD');  
spool off;
```