

Data Pump i praksis...

Ingemar Jansson Haverstad

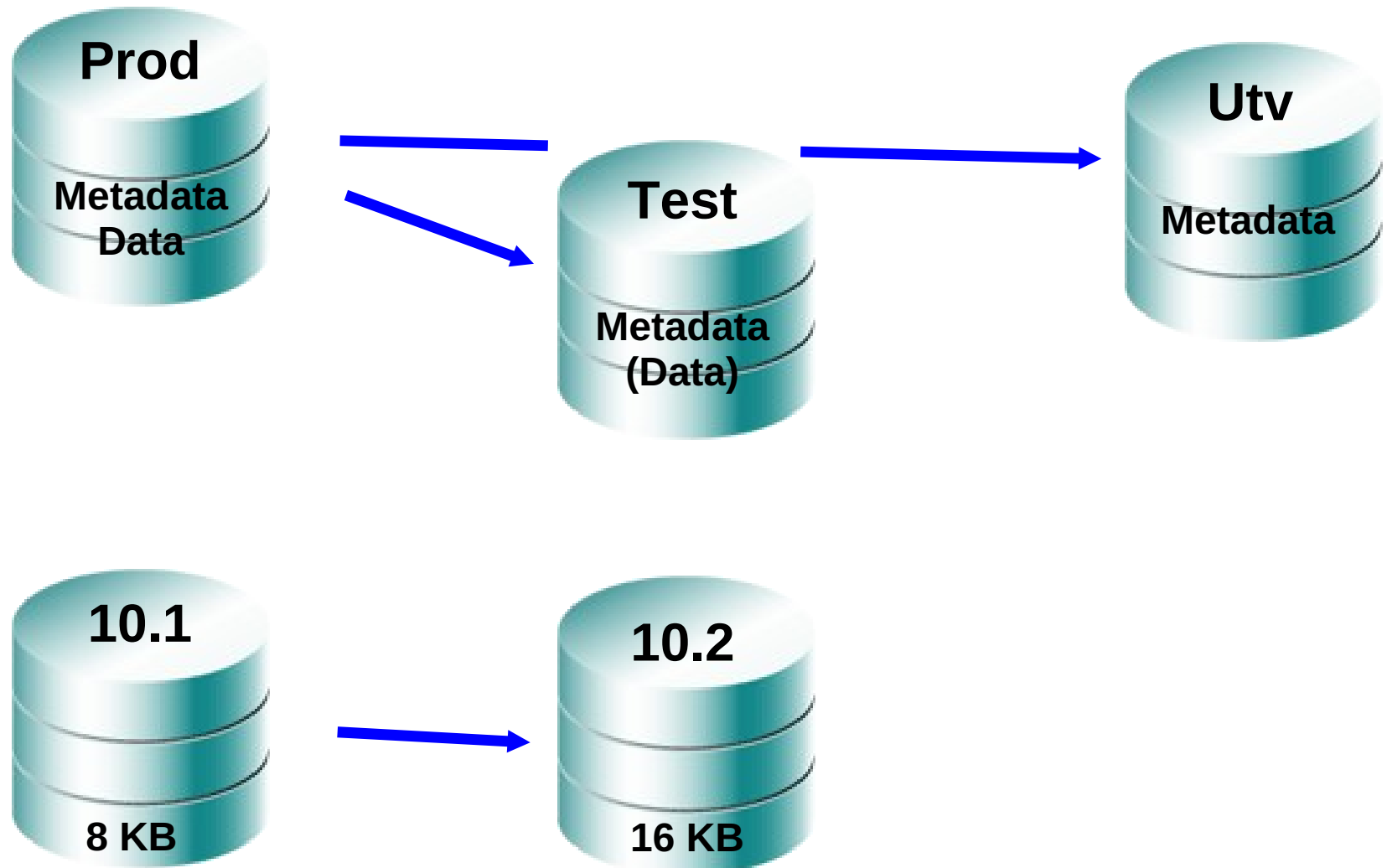
ingemar@oraklet.no

www.oraklet.no/foredrag

Bakgrunn

- **Datavarehus på Skatteetaten**
- **IBM/AIX Unix maskin**
 - 16 CPU
 - 72 GB internminne
- **Oracle10g R1 og R2**
- **Største tabellen 5.000.000.000 rader**
- **Temporary tablespace 1 TB**

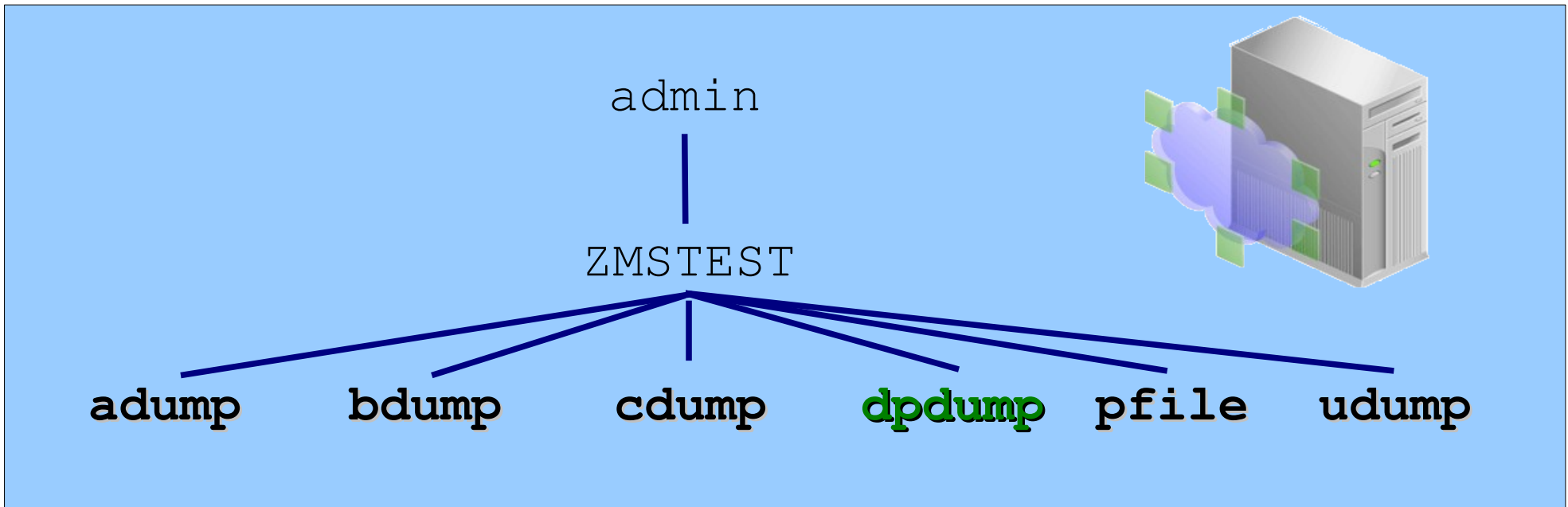
Produksjon – Utvikling - Test



Data Pump katalog

```
SYS@ZMSTEST SQL> SELECT * FROM dba_directories;
```

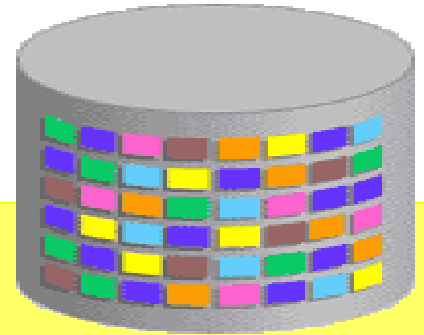
OWNER	DIRECTORY_NAME	DIRECTORY_PATH
SYS	DATA_PUMP_DIR	/oracle/admin/ZMSTEST/dpdump/



```
SYS@ZMSTEST SQL> CREATE or REPLACE DIRECTORY data_pump_dir AS
'/oradatapump/ZMSTEST/';
```

- Rollene *EXP_FULL_DATABASES* og *IMP_FULL_DATABASES* gir adgang.

Data Pump Export - I



```
oracle@xps:~$ expdp help=y
```

```
Export: Release 10.2.0.4.0 - Saturday, 21 June, 2008 9:01:13
```

The Data Pump export utility provides a mechanism for transferring data objects between Oracle databases. The utility is invoked with the following command:

```
Example: expdp scott/tiger DIRECTORY=dmpdir DUMPFILE=scott.dmp
```

You can control how Export runs by entering the 'expdp' command followed by various parameters. To specify parameters, you use keywords:

```
Format: expdp KEYWORD=value or KEYWORD=(value1, value2,...)
```

```
Example: expdp hr/hr DUMPFILE=hr.dmp DIRECTORY=dir SCHEMAS=hr  
         or TABLES=(T1:P1,T1:P2), if T1 is partitioned table
```

USERID must be the first parameter on the command line.

Data Pump Export - II

Keyword	Description (Default)
ATTACH	Attach to existing job, e.g. ATTACH [=job name].
COMPRESSION	Reduce size of dumpfile contents where valid keyword values are: (METADATA_ONLY) and NONE.
CONTENT	Specifies data to unload where the valid keywords are: (ALL), DATA_ONLY, and METADATA_ONLY.
DIRECTORY	Directory object to be used for dumpfiles and logfiles.
ENCRYPTION_PASSWORD	Password key for creating encrypted column data.
ESTIMATE	Calculate job estimates where the valid keywords are: (BLOCKS) and STATISTICS.
EXCLUDE	Exclude specific object types, e.g. EXCLUDE=TABLE:EMP.
FLASHBACK_SCN	SCN used to set session snapshot back to.
FLASHBACK_TIME	Time used to get the SCN to the specified time.

Data Pump Export - III

INCLUDE	Include specific object types, e.g. INCLUDE=TABLE_DATA.
JOB_NAME	Name of export job to create.
NETWORK_LINK	Name of remote database link to the source system.
PARALLEL	Change the number of active workers for current job.
QUERY	Predicate clause used to export a subset of a table.
SAMPLE	Percentage of data to be exported.
SCHEMAS	List of schemas to export (login schema).
STATUS	Frequency (secs) job status is to be monitored where the default (0) will show new status when available.
TABLESPACES	Identifies a list of tablespaces to export.
VERSION	Version of objects to export where valid keywords are: (COMPATIBLE), LATEST, or any valid database version.

Data Pump

Eksempel

```
oracle@xps:~$ impdp system \  
  network_link=drlu_datapump \  
  schemas=OWBRT_SYS,XOXHFL,OWB_DOKUMENTASJON,PROD_OWB_REPOSITORY \  
  parallel=4 \  
  status=0 \  
  job_name=PROD_OWB_REPOSITORY \  
  logfile=PROD_OWB_REPOSITORY.log \  
  exclude=TABLESPACE \  
  exclude=STATISTICS
```

```
Import: Release 10.2.0.3.0 - 64bit Torsdag, 08 Mars, 2007 7:46:33
```

```
With the Partitioning, OLAP and Data Mining options  
FLASHBACK automatically enabled to preserve database integrity.  
Starting "SYSTEM"."PROD_OWB_REPOSITORY": system/*****  
Total estimation using BLOCKS method: 6.448 GB  
...
```

```
Job "SYSTEM"."PROD_OWB_REPOSITORY" completed with 76 error(s)
```

Exclude eller Include

Parameterfil:

```
network_link=dv1p_datapump
full=Y
parallel=16
status=0
job_name="02_DV10"
logfile="02_DV10.log"
content=METADATA_ONLY
exclude=TABLESPACE
exclude=DIRECTORY
exclude=STATISTICS
exclude=SCHEMA:"='ANONYMOUS'"
exclude=SCHEMA:"='DBSNMP'"
exclude=SCHEMA:"='DM1P_RUNT_REP'"
exclude=TABLE:"LIKE 'HELGE%'"
exclude=TABLE:"LIKE 'INGUNN%'"
exclude=TABLE:"LIKE 'LEIF%'"
exclude=TABLE:"LIKE 'MARIT%'"
exclude=TABLE:"LIKE 'OLAV%'"
```

Data Pump Loggfil

Loggfil:

```

Import: Release 10.2.0.3.0 - 64bit Torsdag, 08 Mars, 2007 7:46:33

FLASHBACK automatically enabled to preserve database integrity.
Starting "SYSTEM"."PROD_OWB_REPOSITORY":
  system/***** parfile=PROD_OWB_REPOSITORY.par
Estimate in progress using BLOCKS method...
Processing object type SCHEMA_EXPORT/TABLE/TABLE_DATA
Total estimation using BLOCKS method: 6.448 GB
Processing object type SCHEMA_EXPORT/USER
Processing object type SCHEMA_EXPORT/SYSTEM_GRANT
Processing object type SCHEMA_EXPORT/ROLE_GRANT
Processing object type SCHEMA_EXPORT/DEFAULT_ROLE
Processing object type SCHEMA_EXPORT/TABLESPACE_QUOTA
Processing object type SCHEMA_EXPORT/TYPE/TYPE_SPEC
Processing object type SCHEMA_EXPORT/TYPE/GRANT/OBJECT_GRANT
Processing object type SCHEMA_EXPORT/DB_LINK
Processing object type SCHEMA_EXPORT/SEQUENCE/SEQUENCE
Processing object type SCHEMA_EXPORT/SEQUENCE/GRANT/OBJECT_GRANT
Processing object type SCHEMA_EXPORT/TABLE/TABLE
. . imported "PROD_OWB_REPOSITORY"."PCTREEESTORAGE"          3817957 rows
. . imported "PROD_OWB_REPOSITORY"."INTERLINKSTORAGE"        1412838 rows
...

```

Data Pump SQL-fil

- Alle DDL-setninger vises med SQLFILE parameter.

```
oracle@xps$ impdp system dumpfile=TEST.dump sqlfile=TEST.sql
```

```
...
```

```
oracle@xps$ more TEST.dump
```

```
-- CONNECT SYSTEM
```

```
-- new object type path is: DATABASE_EXPORT/TABLESPACE
```

```
CREATE UNDO TABLESPACE "UNDOTBS1" DATAFILE
```

```
  '/oradata/TEST/TEST_undotbs_01.dbf' SIZE 209715200
```

```
  AUTOEXTEND ON NEXT 5242880 MAXSIZE 32767M
```

```
  BLOCKSIZE 8192
```

```
  EXTENT MANAGEMENT LOCAL AUTOALLOCATE;
```

```
...
```

```
CREATE USER "OUTLN" IDENTIFIED BY VALUES '4A3BA55E08595C81'
```

```
  TEMPORARY TABLESPACE "TEMP"
```

```
  PASSWORD EXPIRE
```

```
  ACCOUNT LOCK;
```

```
...
```

```
CREATE TABLE "OUTLN"."OL$"
```

```
  ( "OL_NAME" VARCHAR2(30),
```

```
...
```

Restriksjoner

Størrelse på parameterfilen

- Begrensning på størrelse på parameterfilen

```
Import: Release 10.2.0.3.0 - 64bit Torsdag, 20 Mars, 2008 8:04:59
Starting "SYSTEM"."02_DM10": system/***** parfile=02_DM10.par
Estimate in progress using BLOCKS method...
Processing object type DATABASE_EXPORT/SCHEMA/TABLE/TABLE_DATA

ORA-39125: Worker unexpected fatal error in
  KUPW$WORKER.GET_TABLE_DATA_OBJECTS
while calling DBMS_METADATA.FETCH_XML_CLOB [ ]

ORA-06502: PL/SQL: numerisk feil eller verdifeil:
  tegnstrengbuffer er for liten
ORA-06512: ved "SYS.DBMS_METADATA", line 1535
ORA-06512: ved "SYS.DBMS_METADATA", line 1572
ORA-06512: ved "SYS.DBMS_METADATA", line 1879
ORA-06512: ved "SYS.DBMS_METADATA", line 3802
```



- Løsning: Legge inn i tabell, lese ved hjelp av SQL...

Restriksjoner

UTF-8

- **Note: 460267.1**

Applies to:

Oracle Server - Enterprise Edition - Version: 10.2.0.1.0 to 10.2.0.3.0

This problem can occur on any platform.

Symptoms:

You created a wrapped procedure/function in source database.

Cause:

Bug 5581731 WRAPPED PACKAGES WITH TRAILING BLANK LINES GIVES PLS-103.

Solution:

1. Use original exp/imp utilities, or:
2. Request a backport for Bug 5581731 for your Oracle version and affected platform.

Restriksjoner

Dat typer

- **Melding når importen starter.**

```
Import: Release 10.2.0.3.0 - 64bit Torsdag, 19 Juni, 2008 11:52:40
```

```
FLASHBACK automatically enabled to preserve database integrity.
```

```
Starting "SYSTEM"."02a_DV10": system/***** parfile=02a_DV10.par
```

```
Estimate in progress using BLOCKS method...
```

```
Processing object type DATABASE_EXPORT/SCHEMA/TABLE/TABLE_DATA
```

```
ORA-39139: Data Pump does not support XMLSchema objects.
```

```
TABLE_DATA:"EKSTERN_MOTTAK"."avviklingsregnskap" will be skipped.
```

- **Støttet i Oracle11g.**

Restriksjoner

Dat typer

- Meldinger underveis...

```

. . imported "AR_MOTTAK"."CREATE$JAVA$LOB$TABLE"          1 rows
. . imported "AR_MOTTAK"."WB_RT_PLATFORM_PROPERTIES"      3 rows
ORA-31693: Table data object "PROD_RUNT_REP"."VBZ$CHANGE_PLANS"
  failed to load/unload and is being skipped due to error:
ORA-22992: cannot use LOB locators selected from remote tables
. . imported "PROD_RUNT_REP"."WB_RT_SERVICE_QUEUE_TAB"    9 rows
. . imported "DV1_RUNT_REP"."WB_RT_AUDIT_FILES"          2674 rows
. . imported "DVH_TEST"."ADRESSE"                       401 rows
. . imported "PROD_RUNT_REP"."WB_RT_NOTIFY_QUEUE_TAB"     596 rows
ORA-31693: Table data object "DISCO1"."EUL5_DOCUMENTS"
  failed to load/unload and is being skipped due to error:
ORA-06502: PL/SQL: numeric or value error: Bulk Bind: Truncated Bind
. . imported "DISCO1"."EUL5_DOMAINS"                    295 rows

```

- Løsning: exp/imp

Tilbakestillingssegment

```
. . imported "SOFIE_MOTTAK"."WB_RT_PLATFORM_CONFIG"      0 rows
. . imported "SOFIE_MOTTAK"."WB_RT_POSTLOAD_EXCEPTIONS"  0 rows
. . imported "SOFIE_MOTTAK"."WB_RT_TIME_SRC"             0 rows
```

Processing object type

DATABASE_EXPORT/SCHEMA/TABLE/GRANT/DE_S_TABLE_OWNER_OBJGRANT

ORA-39125: Worker unexpected fatal error in

KUPW\$WORKER.UNLOAD_METADATA while calling

DBMS_METADATA.FETCH_XML_CLOB [OBJECT_GRANT:"DVH_MOTTAK"]

ORA-01555: for gammelt situasjonsbilde:

tilbakestillingssegmentet 66 (_SYSSMU66\$) er for lite

ORA-06512: ved "SYS.DBMS_METADATA", line 1535

ORA-06512: ved "SYS.DBMS_METADATA", line 1572

ORA-06512: ved "SYS.DBMS_METADATA", line 1879

ORA-06512: ved "SYS.DBMS_METADATA", line 3877

ORA-06512: at "SYS.DBMS_SYS_ERROR", line 105

ORA-06512: at "SYS.KUPW\$WORKER", line 6234

Endre UNDO_RETENTION i kilde databasen.

```
SYS@DV1U SQL> ALTER SYSTEM SET UNDO_RETENTION=36000
```

```
COMMENT='Datapump jobb krasjer, 12. juni 2008, IJH';
```

Partisjonerte tabeller

- Kan ikke bruke nettverks-link for å laste partisjon.
- Må da gå via en export-fil.

```
z00u038:DV10> cat 01_OPPGAVE_POST-OP_AAR_1999_LEP.par
tables=DVH.OPPGAVE_POST:OP_AAR_1999_LEP
job_name=01_OPPGAVE_POST-OP_AAR_1999_LEP
dumpfile=01_OPPGAVE_POST-OP_AAR_1999_LEP.dmp
logfile=01_OPPGAVE_POST-OP_AAR_1999_LEP.log
```

```
z00u038:DV10> tail -f 01_OPPGAVE_POST-OP_AAR_1999_LEP.log
```

```
Export: Release 10.1.0.4.0 - 64bit Tirsdag, 13 Mai, 2008 13:09
```

```
Starter "SYSTEM"."01_OPPGAVE_POST-OP_AAR_1999_LE":
```

```
  system/***** parfile=01_OPPGAVE_POST-OP_AAR_1999_LEP.par
```

```
Beregning pågår ved hjelp av metoden BLOCKS...
```

```
Behandler objekttypen TABLE_EXPORT/TABLE/TBL_TABLE_DATA/TABLE
```

```
Total beregning ved hjelp av metoden BLOCKS: 827.3 MB
```

Attach - eksempel

```
z00u038:DV10> impdp system attach=02_DV10
```

```
Import: Release 10.2.0.3.0 - 64bit Tirsdag, 17 Juni, 2008 12:11:16
```

```
Job: 02_DV10
```

```
Max Parallelism: 8
```

```
Parameter Name      Parameter Value:
```

```
CLIENT_COMMAND      system/***** parfile=02a_DV10.par
```

```
INCLUDE_METADATA    1
```

```
State: EXECUTING
```

```
Worker 1 Status:
```

```
State: EXECUTING
```

```
Object Schema: DISCO1
```

```
Object Name: EUL5_SB_PK
```

```
Object Type: DATABASE_EXPORT/SCHEMA/TABLE/INDEX/INDEX
```

```
Completed Objects: 1 040
```

```
Worker Parallelism: 8
```

```
Worker 2 Status:
```

```
State: WORK WAITING
```

Koble seg til jobben

Attach

- Kan kontrollere fremdriften direkte.

```
Import> help
```

```
The following commands are valid while in interactive mode.
Note: abbreviations are allowed
```

Command	Description
ADD_FILE	Add dumpfile to dumpfile set.
CONTINUE_CLIENT	Return to logging mode.
EXIT_CLIENT	Quit client session and leave job running.
FILESIZE	Default filesize for subsequent ADD_FILE commands.
HELP	Summarize interactive commands.
KILL_JOB	Detach and delete job.
PARALLEL	Change the number of active workers for current job. PARALLEL=<number of workers>.
START_JOB	Start/resume current job.
STATUS	Frequency (secs) job status is to be monitored. STATUS[=interval]
STOP_JOB	Orderly shutdown of job execution. STOP_JOB=IMMEDIATE performs an immediate shutdown.

Master tabell

```
system@DV10 SQL> describe "SYSTEM"."02_DV10"
```

Name	Null?	Type
PROCESS_ORDER		NUMBER
DUPLICATE		NUMBER
DUMP_FILEID		NUMBER
DUMP_POSITION		NUMBER
DUMP_LENGTH		NUMBER
DUMP_ALLOCATION		NUMBER
COMPLETED_ROWS		NUMBER
ERROR_COUNT		NUMBER
ELAPSED_TIME		NUMBER
OBJECT_TYPE_PATH		VARCHAR2(200)
OBJECT_PATH_SEQNO		NUMBER
OBJECT_TYPE		VARCHAR2(30)
IN_PROGRESS		CHAR(1)
OBJECT_NAME		VARCHAR2(500)
OBJECT_LONG_NAME		VARCHAR2(4000)
OBJECT_SCHEMA		VARCHAR2(30)
PARTITION_NAME		VARCHAR2(30)

...

Alternativer? PCTAS

- **PCTAS – Parallel Create Table As Select...**

```
system@DV10 SQL> COMMIT;

system@DV10 SQL> ALTER SESSION ENABLE PARALLEL DML;

system@DV10 SQL> INSERT /*+ APPEND PARALLEL(10, dv1o_op) */
                    INTO dvh.oppgave_post dv1o_op
                    SELECT /*+ PARALLEL(10, dv1p_op) */ *
                    FROM dvh.oppgave_post@dv1p_datapump dv1p_op
                    WHERE aar = 2007;

system@DV10 SQL> COMMIT;
```

Dokumentasjon

- **Utilities**

1. Overview of Oracle Data Pump
2. Data Pump export
3. Data Pump import

http://download.oracle.com/docs/cd/B19306_01/server.102/b14215/toc.htm

- Ønskelig med noen flere eksempler

Dokumentasjon

Eksempel: Query

QUERY

Syntax and Description

```
QUERY = [schema.][table_name:] query_clause
```

For example, an ORDER BY clause could be used to speed up a migration from a heap-organized table to an index-organized table.

Restrictions

The QUERY parameter cannot be used in conjunction with the following parameters:

- * CONTENT=METADATA_ONLY
- * ESTIMATE_ONLY
- * TRANSPORT_TABLESPACES

Example

```
QUERY=employees:"WHERE department_id > 10 AND salary > 10000"
```

Konklusjon – Data Pump

- 1. valget i mange situasjoner.
- Prøve å feile noen ganger først.
- Svært egnet hvor parallelisering er mulig – datainnlasting.
- Dokumentasjonen ikke veldig fyldig.
- Ikke uten videre egnet til store (partisjonerte) tabeller.
- Mange «barnesykdommer».
- Bra mulighet å laste data vi nettverkslink.
- Bra oversikt over DDLene.

