❁ 114. Table Level Pump

Oracle Data Pump: 이점

Data Pump는 이전 데이터 이동 도구에 비해 다음과 같은 여러 이점 및 새로운 기능을 제공합니다.

- 하위단계(Fine-grained) 객체 및 데이터 선택
- 데이터베이스 버전의 명시적 지정
- 병렬 실행
- 엑스포트 작업 공간 소비량 예측
- 분산 환경의 네트워크 모드
- 재매핑 기능
- 데이터 샘플링 및 메타 데이터 압축
- Data Pump 엑스포트 중 데이터 압축
- 암호화(encryption)를 통한 보안
- XMLType 데이터를 CLOB로 엑스포트하는 기능
- 이전 임포트 및 엑스포트 파일을 지원하는 기존 모드

Data Pump 임포트: 변형

다음을 재매핑할 수 있습니다.

- REMAP_DATAFILE을 사용하여 데이터 파일 재매핑
- REMAP_TABLESPACE를 사용하여 테이블스페이스 재매핑
- REMAP_SCHEMA를 사용하여 스키마 재매핑
- REMAP_TABLE을 사용하여 테이블 재매핑
- REMAP_DATA을 사용하여 데이터 재매핑

```
REMAP_TABLE = 'EMPLOYEES':'EMP'
```

export/import보다 더 업그레이드 되어진 data pump

실습 1. table level 펌프 실습 (PROD --------------> psh2)
1. PROD 쪽에서 directory를 생성한다. (펌프 파일을 생성할 디렉토리)
(PROD sys)
select * from dba_directories;

⇒ default값으로 이미 있지만 새로 하나 더 만들기

```
PROD(SYS) > select * from dba_directories;

OWNER                          DIRECTORY_NAME
------------------------------ ------------------------
DIRECTORY_PATH
------------------------------------------------------------
SYS                            ORACLE_OCM_CONFIG_DIR
/u01/app/oracle/product/11.2.0/dbhome_1/ccr/state

SYS                            DATA_PUMP_DIR
/u01/app/oracle/product/11.2.0/dbhome_1/rdbms/log/
```

```
exit
mkdir /home/oracle/pump_prod

ss

create directory datapump_dir
as '/home/oracle/pump_prod';

2. export pump/ import pump 를 수행항 유저(scott, sh2) 에서 directory 엑세스 권한을 부여
(PROD sys)
grant read,write on directory datapump_dir to scott;
grant read,write on directory datapump_dir to sh2;

3. table level로 export pump를 수행한다.
(PROD)
expdp scott/tiger directory=datapump_dir tables=emp dumpfile=emp_pump.dmp
```

```
[PROD:~]$ expdp scott/tiger directory=datapump_dir tables=emp dumpfile=emp_pump.
dmp

Export: Release 11.2.0.1.0 - Production on Thu Feb 22 14:10:55 2024

Copyright (c) 1982, 2009, Oracle and/or its affiliates.  All rights reserved.

Connected to: Oracle Database 11g Enterprise Edition Release 11.2.0.1.0 - Produc
tion
With the Partitioning, OLAP, Data Mining and Real Application Testing options
Starting "SCOTT"."SYS_EXPORT_TABLE_01":  scott/******** directory=datapump_dir t
ables=emp dumpfile=emp_pump.dmp
Estimate in progress using BLOCKS method...
Processing object type TABLE_EXPORT/TABLE/TABLE_DATA
Total estimation using BLOCKS method: 64 KB
Processing object type TABLE_EXPORT/TABLE/TABLE
Processing object type TABLE_EXPORT/TABLE/AUDIT_OBJ
Processing object type TABLE_EXPORT/TABLE/STATISTICS/TABLE_STATISTICS
Processing object type TABLE_EXPORT/TABLE/STATISTICS/USER_PREF_STATISTICS
. . exported "SCOTT"."EMP"                               9.132 KB      28 rows
Master table "SCOTT"."SYS_EXPORT_TABLE_01" successfully loaded/unloaded
******************************************************************************
Dump file set for SCOTT.SYS_EXPORT_TABLE_01 is:
  /home/oracle/pump_prod/emp_pump.dmp
Job "SCOTT"."SYS_EXPORT_TABLE_01" successfully completed at 14:11:11
```

```
(문제 1.) scott 계정의 dept 테이블을 export pump 하시오.
expdp scott/tiger directory=datapump_dir tables=dept dumpfile=dept_pump.dmp
```

```
[PROD:~]$ expdp scott/tiger directory=datapump_dir tables=dept dumpfile=dept_pum
p.dmp

Export: Release 11.2.0.1.0 - Production on Thu Feb 22 14:14:01 2024

Copyright (c) 1982, 2009, Oracle and/or its affiliates.  All rights reserved.

Connected to: Oracle Database 11g Enterprise Edition Release 11.2.0.1.0 - Produc
tion
With the Partitioning, OLAP, Data Mining and Real Application Testing options
Starting "SCOTT"."SYS_EXPORT_TABLE_01":  scott/******** directory=datapump_dir t
ables=dept dumpfile=dept_pump.dmp
Estimate in progress using BLOCKS method...
Processing object type TABLE_EXPORT/TABLE/TABLE_DATA
Total estimation using BLOCKS method: 64 KB
Processing object type TABLE_EXPORT/TABLE/TABLE
Processing object type TABLE_EXPORT/TABLE/AUDIT_OBJ
Processing object type TABLE_EXPORT/TABLE/STATISTICS/TABLE_STATISTICS
Processing object type TABLE_EXPORT/TABLE/STATISTICS/USER_PREF_STATISTICS
. . exported "SCOTT"."DEPT"                              6.023 KB       8 rows
Master table "SCOTT"."SYS_EXPORT_TABLE_01" successfully loaded/unloaded
******************************************************************************
Dump file set for SCOTT.SYS_EXPORT_TABLE_01 is:
  /home/oracle/pump_prod/dept_pump.dmp
Job "SCOTT"."SYS_EXPORT_TABLE_01" successfully completed at 14:14:07
```

```
4. psh2로 접속해서 directory를 생성한다.
mkdir /home/oracle/pump_psh2

ss

create directory psh2_dir
as '/home/oracle/pump_psh2';

5. jones라는 유저를 생성하시오.
(psh2 sys)
create user jones identified by tiger;
grant dba to jones;

6. export pump/ import pump 를 수행항 유저에서 directory 엑세스 권한을 부여
grant read,write on directory psh2_dir to jones;

7. ts450이라는 테이블 스페이스를 생성한다.
(psh2 sys)
create tablespace ts450
datafile '/home/oracle/ts450.dbf' size 100m;

8. PROD 쪽에서 export 받은 pump 파일을 psh2에 copy 한다.
                PROD ---------------------------------------> psh2
위치:   /home/oracle/pump_prod                          /home/oracle/pump_psh2
디렉토리 명: datapump_dir                                 psh2_dir
테이블:           emp                                        emp
유져:             scott                                     jones
테이블 스페이스:  example                                   ts450

-> 테이블 스페이스 확인하기
select table_name, tablespace_name from user_tables; (PROD scott에서 실행)
```

```
PROD(SCOTT) > select table_name, tablespace_name from user_tables;

TABLE_NAME                     TABLESPACE_NAME
------------------------------ ------------------------------
EMP_INSA                       INSA02
CHAINED_ROWS                   EXAMPLE
EMP8100                        TS8100
EMP7100                        TS7100
BONUS                          EXAMPLE
PRODUCTS                       EXAMPLE
SALES100                       EXAMPLE
DEPT_NEW                       EXAMPLE
SALGRADE                       EXAMPLE
EMP                            EXAMPLE
DEPT                           EXAMPLE

TABLE_NAME                     TABLESPACE_NAME
------------------------------ ------------------------------
EMP800                         TS800
EMP_PSH                        PSH
EMP1000                        TS100
ORDERS                         EXAMPLE
EMP100                         TEST100
EMP10                          SYSTEM
```

```
(PROD)
cp /home/oracle/pump_prod/emp_pump.dmp /home/oracle/pump_psh2/emp_pump.dmp

9. psh2에 pump 파일을 import 한다.
(psh2)
impdp jones/tiger directory=psh2_dir dumpfile=emp_pump.dmp remap_schema=scott:jones remap_tables
```

```
[psh2:~]$ impdp jones/tiger directory=psh2_dir dumpfile=emp_pump.dmp remap_schem
a=scott:jones remap_tablespace=example:ts450

Import: Release 11.2.0.1.0 - Production on Thu Feb 22 14:36:35 2024

Copyright (c) 1982, 2009, Oracle and/or its affiliates.  All rights reserved.

Connected to: Oracle Database 11g Enterprise Edition Release 11.2.0.1.0 - Produc
tion
With the Partitioning, OLAP, Data Mining and Real Application Testing options
Master table "JONES"."SYS_IMPORT_FULL_01" successfully loaded/unloaded
Starting "JONES"."SYS_IMPORT_FULL_01":  jones/******** directory=psh2_dir dumpfi
le=emp_pump.dmp remap_schema=scott:jones remap_tablespace=example:ts450
Processing object type TABLE_EXPORT/TABLE/TABLE
Processing object type TABLE_EXPORT/TABLE/TABLE_DATA
. . imported "JONES"."EMP"                               9.132 KB      28 rows
Processing object type TABLE_EXPORT/TABLE/AUDIT_OBJ
Processing object type TABLE_EXPORT/TABLE/STATISTICS/TABLE_STATISTICS
Processing object type TABLE_EXPORT/TABLE/STATISTICS/USER_PREF_STATISTICS
Job "JONES"."SYS_IMPORT_FULL_01" successfully completed at 14:36:50
```

```
문제 1. PROD 쪽의 dept 테이블의 pump 파일인 dept_pump.dmp를 psh2에 import pump 하시오.
(PROD)
cp /home/oracle/pump_prod/dept_pump.dmp /home/oracle/pump_psh2/dept_pump.dmp
(psh2)
impdp jones/tiger directory=psh2_dir dumpfile=dept_pump.dmp remap_schema=scott:jones remap_table
```

```
[psh2:~]$ impdp jones/tiger directory=psh2_dir dumpfile=dept_pump.dmp remap_sche
ma=scott:jones remap_tablespace=example:ts450;

Import: Release 11.2.0.1.0 - Production on Thu Feb 22 14:59:50 2024

Copyright (c) 1982, 2009, Oracle and/or its affiliates.  All rights reserved.

Connected to: Oracle Database 11g Enterprise Edition Release 11.2.0.1.0 - Produc
tion
With the Partitioning, OLAP, Data Mining and Real Application Testing options
Master table "JONES"."SYS_IMPORT_FULL_01" successfully loaded/unloaded
Starting "JONES"."SYS_IMPORT_FULL_01":  jones/******** directory=psh2_dir dumpfi
le=dept_pump.dmp remap_schema=scott:jones remap_tablespace=example:ts450
Processing object type TABLE_EXPORT/TABLE/TABLE
Processing object type TABLE_EXPORT/TABLE/TABLE_DATA
. . imported "JONES"."DEPT"                              6.023 KB       8 rows
Processing object type TABLE_EXPORT/TABLE/AUDIT_OBJ
Processing object type TABLE_EXPORT/TABLE/STATISTICS/TABLE_STATISTICS
Processing object type TABLE_EXPORT/TABLE/STATISTICS/USER_PREF_STATISTICS
Job "JONES"."SYS_IMPORT_FULL_01" successfully completed at 14:59:53
```

문제 2. 테이블을 export pump/import pump를 하면 관련 인덱스도 같이 export/import 되는지 테스트 하시오.

1. PROD 쪽의 scott의 emp 테이블과 똑같은 구조와 데이터로 emp612로 생성한다.

```
create table emp612
as
select * from emp ;
```

2. emp612 테이블에 월급과 직업의 각각 인덱스를 생성하시오.

```
create index emp612_sal on emp612(sal);
create index emp612_job on emp612(job);
```

3. emp612 테이블을 export pump 한다.

```
expdp scott/tiger directory=datapump_dir tables=emp612 dumpfile=emp612_pump.dmp
```

⇒ index도 같이 넘어갔다.

```
[PROD:~]$ expdp scott/tiger directory=datapump_dir tables=emp612 dumpfile=emp612
_pump.dmp

Export: Release 11.2.0.1.0 - Production on Thu Feb 22 15:08:52 2024

Copyright (c) 1982, 2009, Oracle and/or its affiliates.  All rights reserved.

Connected to: Oracle Database 11g Enterprise Edition Release 11.2.0.1.0 - Produc
tion
With the Partitioning, OLAP, Data Mining and Real Application Testing options
Starting "SCOTT"."SYS_EXPORT_TABLE_01":  scott/******** directory=datapump_dir t
ables=emp612 dumpfile=emp612_pump.dmp
Estimate in progress using BLOCKS method...
Processing object type TABLE_EXPORT/TABLE/TABLE_DATA
Total estimation using BLOCKS method: 64 KB
Processing object type TABLE_EXPORT/TABLE/TABLE
Processing object type TABLE_EXPORT/TABLE/INDEX/INDEX
Processing object type TABLE_EXPORT/TABLE/INDEX/STATISTICS/INDEX_STATISTICS
. . exported "SCOTT"."EMP612"                            9.132 KB      28 rows
Master table "SCOTT"."SYS_EXPORT_TABLE_01" successfully loaded/unloaded
******************************************************************************
Dump file set for SCOTT.SYS_EXPORT_TABLE_01 is:
  /home/oracle/pump_prod/emp612_pump.dmp
Job "SCOTT"."SYS_EXPORT_TABLE_01" successfully completed at 15:08:57
```

4. psh2에 emp612 pump file을 import 한다.

(PROD)

```
cp /home/oracle/pump_prod/emp612_pump.dmp /home/oracle/pump_psh2/emp612_pump.dmp
```

(PROD scott)

```
 select table_name, tablespace_name from user_tables;
```

⇒ emp612의 테이블 스페이스는 ts100이기 때문에 import 할때 ts100을 쓴다.

```
PROD(SCOTT) > select table_name, tablespace_name from user_tables;

TABLE_NAME                     TABLESPACE_NAME
------------------------------ ------------------------------
EMP_INSA                       INSA02
CHAINED_ROWS                   EXAMPLE
EMP612                         TS100
EMP8100                        TS8100
EMP7100                        TS7100
BONUS                          EXAMPLE
PRODUCTS                       EXAMPLE
SALES100                       EXAMPLE
DEPT_NEW                       EXAMPLE
SALGRADE                       EXAMPLE
EMP                            EXAMPLE

TABLE_NAME                     TABLESPACE_NAME
------------------------------ ------------------------------
DEPT                           EXAMPLE
EMP800                         TS800
EMP_PSH                        PSH
EMP1000                        TS100
ORDERS                         EXAMPLE
EMP100                         TEST100
EMP10                          SYSTEM
```

```
(psh2)
impdp jones/tiger directory=psh2_dir dumpfile=emp612_pump.dmp remap_schema=scott:jones remap_tab

6. 인덱스도 잘 import 되었는지 확인한다.
(psh2 jones)
select index_name from user_indexes
where table_name='EMP612';
```

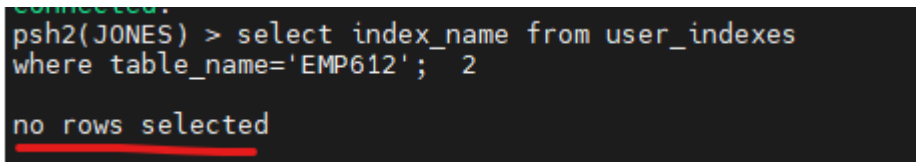
```
psh2(JONES) > select index_name from user_indexes
where table_name='EMP612';  2

INDEX_NAME
------------------------------
EMP612_JOB
EMP612_SAL
```

.

```
※ DB 엔지니어와 DBA를 위한 팁!
실제로 위와 같이 현장에서 import 하다 보면 빅데이터 환경에서는 import 할 때 인덱스를 생성하는
거 때문에 너무 느려서 테이블만 import 하고 인덱스는 따로 생성한다

인덱스 빼고 import 하기
impdp jones/tiger directory=psh2_dir dumpfile=emp612_pump.dmp remap_schema=scott:jones
remap_tablespace=ts100:ts450 indexes=N;
```

```
문제 3. 다시 psh2에서 jones로 접속해서 emp612를 drop을 하고 다시 import를 하는데
 indexes=N을 써서 import 하시오.
(psh2 jones)
drop table emp612;

(psh2)
impdp jones/tiger directory=psh2_dir dumpfile=emp612_pump.dmp remap_schema=scott:jones remap_tab
```

```
(psh2 jones)
select index_name from user_indexes
where table_name='EMP612';

⇒ 인덱스가 따로 들어가지 않았다.
```




```
문제 4. jones 유저에서 인덱스를 따로 생성하는데 다음과 같이 빨리 생성되게 하시오. (특급 dba)
(psh2 jones)
1. 정렬 작업곤간에 대한 사이즈 관리 수동으로 설정하기
alter session set workarea_size_policy=manual;

2. 정렬을 일으킬 메모리 사이즈를 1000000000로 설정하기. (내 세션에서만)
alter session set sort_area_size=1000000000;

3. 인덱스 생성하기
create index emp612_sal on emp612(sal)
nologging parallel 4;

create index emp612_job on emp612(job)
nologging parallel 4;
-> nologging 을 쓰면 log가 생성되지 않아서 빨리 만들어진다.
-> parallel 4 : 병렬 4개의 프로세서 생성

alter index emp612_sal parallel 1;
alter index emp612_job parallel 1;

select index_name, degree from user_indexes;
```