

# 11

## Moving Data

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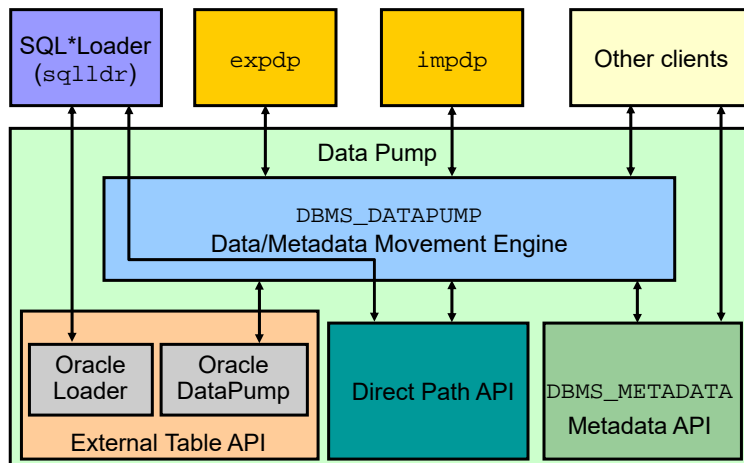
### Objectives

After completing this lesson, you should be able to:

- Describe ways to move data
- Explain the general architecture of Oracle Data Pump
- Create and use directory objects
- Use Data Pump Export and Import to move data between Oracle databases
- Use SQL\*Loader to load data from a non-Oracle database (or user files)
- Use external tables to move data via platform-independent files

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## Moving Data: General Architecture



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## Oracle Data Pump: Overview

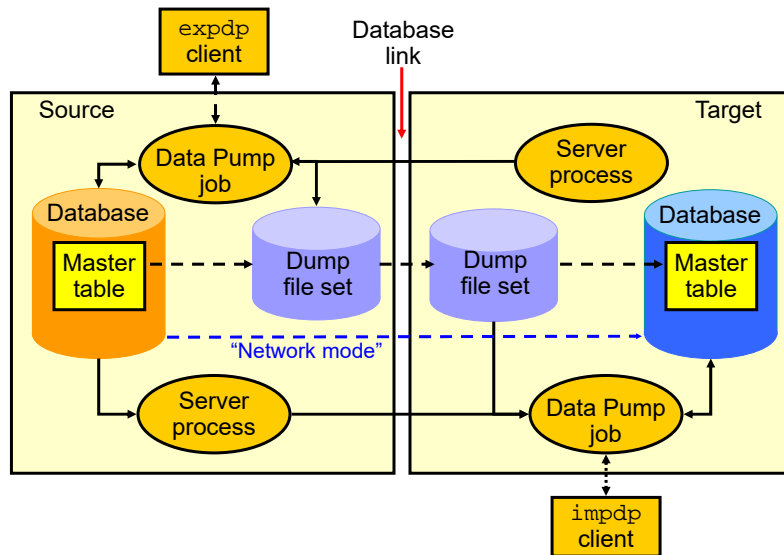
As a server-based facility for high-speed data and metadata movement, Oracle Data Pump:

- Is callable via DBMS\_DATAPUMP
- Provides the following tools:
  - expdp
  - impdp
  - GUI interface in Enterprise Manager Cloud Control

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## Data Pump Export and Import Clients: Overview



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## Directory Objects for Data Pump

Directory Objects		
Search		
Object Name	<input type="text"/>	<input type="button" value="Go"/>
By default, the search returns all uppercase matches beginning with the string you entered. To run an exact or case-sensitive match, double quote the search string.		
Selection Mode	Single	
<input type="button" value="Edit"/>	<input type="button" value="View"/>	<input type="button" value="Delete"/>
<input type="button" value="Actions"/>	<input type="button" value="Create Like"/>	<input type="button" value="Go"/>
Select	Name	Path
<input checked="" type="radio"/>	DATA_FILE_DIR	/u01/app/oracle/product/12.1.0/dbhome_1/demo/schema/sales_history/
<input type="radio"/>	DATA_PUMP_DIR	/u01/app/oracle/admin/orcl/dpdump/
<input type="radio"/>	LOG_FILE_DIR	/u01/app/oracle/product/12.1.0/dbhome_1/demo/schema/log/
<input type="radio"/>	MEDIA_DIR	/u01/app/oracle/product/12.1.0/dbhome_1/demo/schema/product_media/
<input type="radio"/>	OPATCH_LOG_DIR	/u01/app/oracle/product/12.1.0/dbhome_1/QOpatch
<input type="radio"/>	OPATCH_SCRIPT_DIR	/u01/app/oracle/product/12.1.0/dbhome_1/QOpatch
<input type="radio"/>	ORACLE_OCM_CONFIG_DIR	/u01/app/oracle/product/12.1.0/dbhome_1/ccr/hosts/EDRSR11P1/state
<input type="radio"/>	ORACLE_OCM_CONFIG_DIR2	/u01/app/oracle/product/12.1.0/dbhome_1/ccr/state
<input type="radio"/>	SS_OE_XMLDIR	/u01/app/oracle/product/12.1.0/dbhome_1/demo/schema/order_entry/
<input type="radio"/>	SUBDIR	/u01/app/oracle/product/12.1.0/dbhome_1/demo/schema/order_entry/2002/Sep
<input type="radio"/>	XMLDIR	/u01/app/oracle/product/12.1.0/dbhome_1/rdbms/xml
<input type="radio"/>	XSDDIR	/ade/b/4061261185/oracle/rdbms/xml/schema

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## Creating Directory Objects

Directory Objects > Create Directory Object

**Create Directory Object**

General Privileges

\* Name

\* Path  [Test File System](#)

General Privileges

This page shows the list of users who have privileges for this directory

[Remove](#) [Add](#)

Select All | Select None

Select	User Name	Read Access	Write Access
<input type="checkbox"/>	HR	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Directory Objects > Create Directory Object > Show SQL

**Show SQL**

```
CREATE DIRECTORY "EXT_TAB_LOGDIR" AS '/home/oracle/labs/extab1'
GRANT READ ON DIRECTORY "EXT_TAB_LOGDIR" TO "HR"
GRANT WRITE ON DIRECTORY "EXT_TAB_LOGDIR" TO "HR"
```

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## Performing a Data Pump Export by Using Enterprise Manager Cloud Control

Schema Administration

- Users
- Database Objects
- Programs
- Materialized Views
- User Defined Types
- Database Export/Import
- Change Management
- Data Discovery and Modeling

Transport Tablespace...

**Export to Export Files...**

**Export: Export Type**

Database orcl

☒ Database  
Exports the entire database.

☐ Schemas  
Allows you to choose one or more schemas and to export the objects in those schemas.

☐ Tables  
Allows you to choose one or more tables to export from a selected schema.

☐ Tablespace  
Allows you to export the tables from one or more tablespaces. Note: only the tables will be exported, not the tablespaces themselves.

**Host Credentials**

Supply operating system login credentials to access the target database.

Credential ☒ Preferred ☐ Named ☐ New

Preferred Credential Name

Credential Details Default preferred credentials are not set.

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## Performing a Data Pump Import

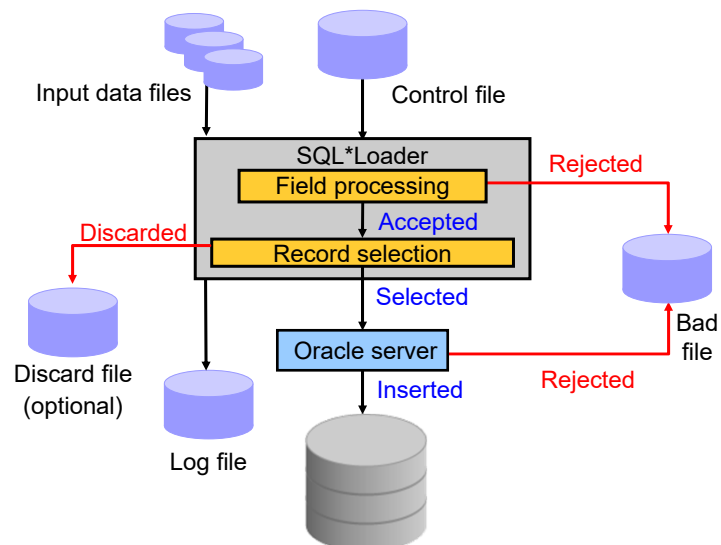
Data Pump can be invoked on the command line:

```
$ impdp hr DIRECTORY=DATA_PUMP_DIR \  
DUMPFILE=HR_SCHEMA.DMP \  
PARALLEL=1 \  
CONTENT=ALL \  
TABLES="EMPLOYEES" \  
LOGFILE=DATA_PUMP_DIR:import_hr_employees.log \  
JOB_NAME=importHR \  
TRANSFORM=STORAGE:n
```

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## SQL\*Loader: Overview



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## SQL\*Loader Control File

The SQL\*Loader control file instructs SQL\*Loader about:

- Location of the data to be loaded
- Data format
- Configuration details:
  - Memory management
  - Record rejection
  - Interrupted load handling details
- Data manipulation details



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## Loading Data by Using Enterprise Manager Cloud Control

**Load Data: Generate Or Use Existing Control File**  
Database: orcl

☐ Automatically Generate Control File  
A control file will be generated after you define the structure of the data file.

☒ Use Existing Control File  
Allows you to use an existing control file that defines the structure of the data file.

**Host Credentials**

Credential: ☐ Preferred ☐ Named ☒ New

\* Username: oracle

\* Password: \*\*\*\*\*

\* Confirm Password: \*\*\*\*\*

☒ Save As: NC\_ORCL\_2012-11-28-130014

☐ Set As Preferred Credentials

Control File Data File Load Method Options Schedule Review

**Load Data: Control File**  
Database: orcl

A control file is used to describe what will be loaded and how. Specify the full path and name of the control file on the database server machine.

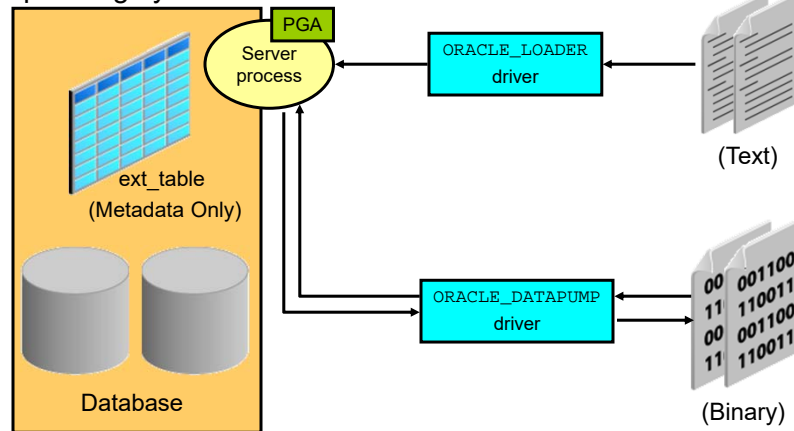
||u01/app/oracle/oradata/orcl/LOAD.CTL

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## External Tables

External tables are read-only tables stored as files on the operating system outside of the Oracle database.



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## External Table: Benefits

- Data can be used directly from the external file or loaded into another database.
- External data can be queried and joined directly in parallel with tables residing in the database, without requiring it to be loaded first.
- The results of a complex query can be unloaded to an external file.
- You can combine generated files from different sources for loading purposes.

From Oracle Database



From external file

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## Defining an External Tables with ORACLE\_LOADER

```
CREATE TABLE extab_employees
    (employee_id      NUMBER(4),
     first_name       VARCHAR2(20),
     last_name        VARCHAR2(25),
     hire_date        DATE)
ORGANIZATION EXTERNAL
    ( TYPE ORACLE_LOADER DEFAULT DIRECTORY extab_dat_dir
      ACCESS PARAMETERS
        ( records delimited by newline
          badfile extab_bad_dir:'empxt%a_%p.bad'
          logfile extab_log_dir:'empxt%a_%p.log'
          fields terminated by ','
          missing field values are null
          ( employee_id, first_name, last_name,
            hire_date char date_format date mask "dd-mon-yyyy"))
        LOCATION ('empxt1.dat', 'empxt2.dat') )
    PARALLEL REJECT LIMIT UNLIMITED;
```

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## Using External Tables

- Querying an external table:

```
SQL> SELECT * FROM extab_employees;
```

- Querying and joining an external table with an internal table:

```
SQL> SELECT e.employee_id, e.first_name, e.last_name,
d.department_name FROM departments d, extab_employees e
WHERE d.department_id = e.department_id;
```

- Appending data to an internal table from an external table:

```
SQL> INSERT /*+ APPEND */ INTO hr.employees SELECT *
FROM extab_employees;
```

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## Summary

In this lesson, you should have learned how to:

- Describe ways to move data
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