

Preparing Oracle GoldenGate Environment

by Ahmed Baraka

Introduction to Oracle Data Guard

In this lecture, we are going to talk about the basic concepts of Oracle Data Guard

Objectives

By the end of this lecture, you should be able to:

- Understand the roadmap to configure Oracle GoldenGate
- Implement the procedure to Prepare an environment or Oracle GoldenGate
- Understand the Supplemental Logging options
- Create Manager process
- Understand when and how to use Source Definitions



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Configuring Oracle GoldenGate Roadmap

1. Prepare the environment
2. Configure Initial Load
3. Configure the Change Synchronization:
 - a) Configure the Extract (Change Capture)
 - b) Configure the Replicate (Delivery)



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Prepare the environment

- Verify primary key values uniqueness among the databases
- Study the NLS settings
- Study the mixed-case object name issues
- Set up a GoldenGate database user
- Enable supplemental logging
- Configure and start the Manager process
- Create the source definitions (if needed)



Verify Primary Key Uniqueness in the Databases

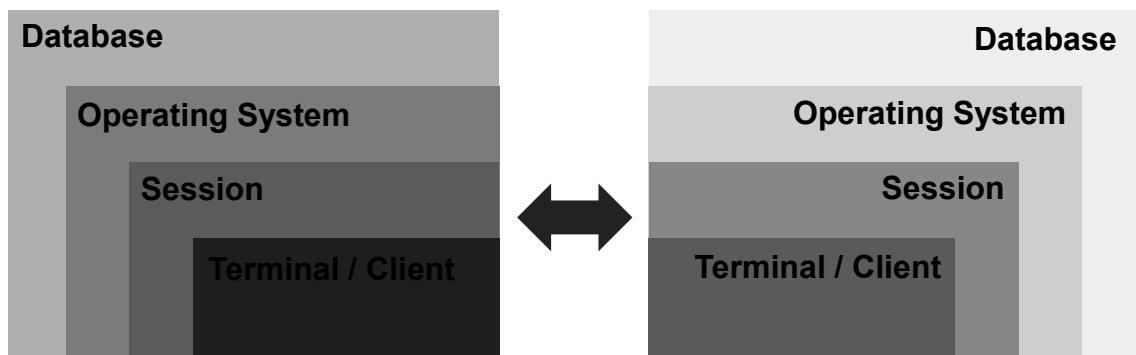
- If the primary key values are also generated in the target databases, study the mechanism of generating the primary key values
- For automatic sequential numbers, possible solutions:
 - Different ranges to each database
 - Unique database character suffixed or prefixed



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Study the NLS settings

- Study the character set mismatch



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Mixed-Case and Special Characters in Object Names

- Object names can be stored in mixed case or upper case
- Object names can have special characters
- Supported special characters: / * ? @ # \$ % ^ () _ - [space]
- Non-supported Special Characters: { } [] = + ! ~ | & : ; , ' " . < >
- GoldenGate: specify object names in double quote marks

```
SELECT "EmployeeName"  
FROM "Employees" WHERE  
"Employee_ID" = '12345' ;
```



Set up a Database User

- Create a database user for Oracle GoldenGate
- Required Privileges

CREATE SESSION, ALTER SESSION	RESOURCE	CONNECT
SELECT ANY DICTIONARY	FLASHBACK ANY TABLE	SELECT ANY TABLE
EXECUTE on DBMS_FLASHBACK	CREATE TABLE	INSERT, UPDATE, DELETE ON <target tables>

- As SYS:

```
DBMS_GOLDENGATE_AUTH.GRANT_ADMIN_PRIVILEGE('GGUSER');
```

Enable Minimal Supplemental Logging

- Database must be running in archivelog mode.

```
SELECT LOG_MODE FROM V$DATABASE ;
```

- Enable “minimal supplemental logging” and “forced logging”
- At the source database:

```
SELECT SUPPLEMENTAL_LOG_DATA_MIN, FORCE_LOGGING FROM V$DATABASE;
```

```
ALTER DATABASE ADD SUPPLEMENTAL LOG DATA;
```

```
ALTER DATABASE FORCE LOGGING; (recommended)
```

```
ALTER SYSTEM SWITCH LOGFILE;
```



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Enable GoldenGate Replication

- For Oracle databases, enable GoldenGate replication:

```
SQL> ALTER SYSTEM SET  
ENABLE_GOLDENGATE_REPLICATION=TRUE;
```



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About Table-level Supplemental Logging

- Table-level or schema-level supplemental logging levels:
 - Unconditional supplemental logging of the primary key
 - Conditional supplemental logging of unique key(s) and foreign key(s) (*scheduling columns*)
 - Unconditional supplemental logging of specific columns of the table
 - Unconditional supplemental logging of all of the columns of the table



Enable Table-level Supplemental Logging

- Enable supplemental logging of key values:

```
ADD TRANDATA <schema.table>
[, NOSCHEDULINGCOLS | ALLCOLS ]
[, COLS (columns)]
```

```
GGSCI> DBLogin UserID <login>, Password <pswd>
GGSCI> Add TranData HR.*
```



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Table-level Supplemental Logging Examples

```
Add TranData HR.EMPLOYESS, NOSCHEDULINGCOLS
```

```
Add TranData HR.EMPLOYESS
```

```
Add TranData HR.EMPLOYESS, COLS(hire_date)
```

```
Add TranData HR.EMPLOYESS, ALLCOLUMNS
```



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Enabling Schema-level Supplemental Logging

- Enable schema-level supplemental logging on:
 - The entire schema-data included in the replication
 - DDL Replication is used

```
ADD SCHEMATRANSACTIONAL <schema>
[ALLCOLS | NOSCHEDULINGCOLS]
```

```
GGSCI> Add TranData HR.*  
GGSCI> ADD SCHEMATRANSACTIONAL hr
```



Configure and Start the Manager process

- The Manager process must be running before Extract or Replicat can be started.
- Create the parameter file:
`GGSCI> Edit Params Mgr`
- Start the Manager by using GGSCI:
`GGSCI> Start {Mgr | Manager}`
- Verify:
`GGSCI> Info Mgr`



Configure and Start the Manager process (cont)

- To stop the Manager process:

```
GGSCI> stop { Mgr | Manager } [!]
```

- To start the Manager process from the OS command shell:

```
mgr paramfile <parameter_file>
```

- On Windows, you can also start and stop the Manager through the standard Windows services
- In a Windows cluster, you should stop Manager from the Cluster Administrator.

Manager Process Parameters

Parameter	Description
Port	port number used by Manager to interact with remote processes
PurgeOldExtracts	purge trail files
USECHECKPOINTS	purge only checkpointed transactions
MINKEEPHOURS MINKEEPDAYS MINKEEPFILES	keep an inactive file for at least the specified number of hours/days/files
AUTOSTART	start Extract and Replicat processes automatically when Manager starts
AUTORESTART	start Extract and Replicat processes automatically after they fail



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Sample Manager Parameter File

```
-- Mgr Configuration
Port 7809
DynamicPortList 8001, 8002, 9500-9520
PurgeOldExtracts ./dirdat/*, UseCheckpoints,
MinKeepDays 5
Autostart ER *
AutoRestart Extract *, WaitMinutes 2, Retries 5
```



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Source Definitions Overview

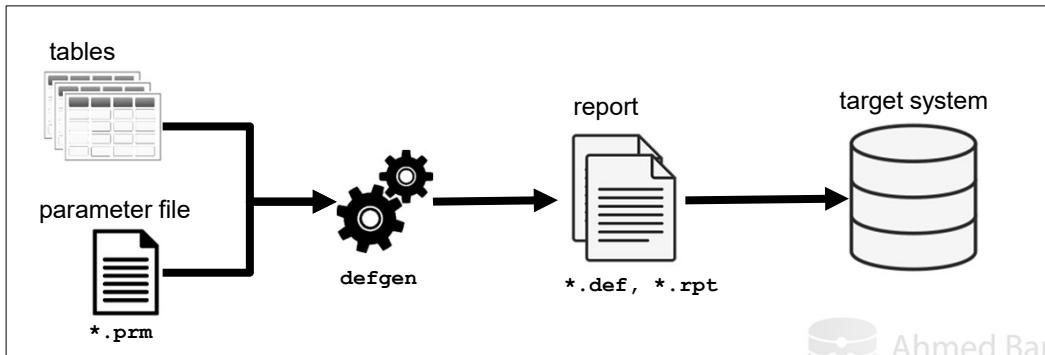
- Source Definitions file has information about the definitions of the source tables or files.
- It is generated by `defgen` utility
- At startup, Replicat reads the definition file specified with the `SourceDefs` parameter.
- Not applicable if you are using self-describing trail files (12.2)



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Generating Source Definitions File

```
defgen paramfile <paramfile> [ reportfile <reportfile> ]
```



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- Not applicable if you are using self-describing trail files

Summary

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