Infrastructure at your Service.

Oracle GoldenGate 12c Tips and Tricks
Infrastructure at your Service.

About me

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Who we are

dbi services

Experts At Your Service
> Over 45 specialists in IT infrastructure
> Certified, experienced, passionate

Based In Switzerland
> 100% self-financed Swiss company
> Over CHF6 mio. turnover

Leading In Infrastructure Services
> More than 120 customers in CH, D, & F
> Over 40 SLAs dbi FlexService contracted

dbi services is hiring in Basel & Zürich (career@dbi-services.com)
Agenda

1. Introduction
2. Tips for starting with Oracle GoldenGate
3. Implementation best practices
4. Monitoring best practices
5. What to know about Oracle GoldenGate 12.2
6. Conclusion
Introduction

Involvement & Infrastructure at your service.

- Oracle GoldenGate implementation area
- Oracle GoldenGate 12c
- Oracle GoldenGate new features
- Oracle GoldenGate usual implementation
Replicate OLTP data to ODS (Operational Data Store)
> Interim logical area for a Datawarehouse
> Database designed to integrate data from multiple sources for additional operations on the data
> Data can be scrubbed, resolved for redundancy and checked for compliance according to the business rules

Datawarehouse/BI (Business Intelligence)
> Analytical reports on current or historical data
> Long term reporting or archiving

Near Zero Downtime Migration
> very minimal application switchover downtime (stop/start)
> Allow migration with failback capability
Heterogeneous database replication

- From Oracle to MS SqlServer for example
- Less replication capability as from Oracle to Oracle
  - Not for all source data types
  - No DDL
  - Etc.

Active/Active Replication

- Long distance between different office
- Data available on each system locally (High Availability)
This presentation is focused for Oracle GoldenGate implementation between Oracle Databases.
Why Oracle GoldenGate 12c?

- Can replicate data from any database rdbms (heterogeneous)
- Low impact on production database
  - Read transaction directly from memory (Integrated Capture)
  - Otherwise the reads are done from the redo or archive files only
- Real-Time replication solution
  - Allows reporting with live data
- Supported with other Oracle products
- Fast recovery with low performance impact (Integrated Replicate)
- Most of the object types are supported (Oracle to Oracle)
- Possibility to extract from a Downstream Mining Database
- Allow transformation and filtering
What's new with Oracle GoldenGate 12.1?

> First Release installed over the Oracle Universal Installer

> Read transaction directly from memory (Integrated Capture *)

> Fast recovery with low performance impact (Integrated Replicat *)

> **Transparent Support with other Oracle database products**
  > Oracle RMAN / ASM
  > Oracle Active Data Guard
  > Oracle Grid Infrastructure resource management / ODA / Exadata

> **More object types are supported** (Oracle to Oracle)

* Available starting GoldenGate 11.2
What’s new with Oracle GoldenGate 12.2?

- **Metadata Encapsulation** (DEFGEN and the parameters SOURCEDEFS/ASSUMETARGETDEFS are no longer needed)

- **End to End Replication Lag** with new HEARTBEATTABLE parameter

- Integrated capture supported with Oracle Active Data Guard

- **Oracle GoldenGate Studio (new fmw Java software)**
  - Start replicating data with minimal effort (GUI)
  - Access to GoldenGate’s advanced replication options

- **Parameter Simplification** (INFO PARAM, GETPARAMINFO, CHECKPRM)
Introduction
Oracle GoldenGate usual implementation

Data Center

Server 1
ARGUSDB
GoldenGate EXTRACT

Server 2
ODSDB
GoldenGate REPLICAT

GoldenGate Trail files
Local/Remote
EXTRACT example with one additional column

EXTRACT SCOTT
USERIDALIAS gg12
DBOPTIONS ALLOWUNUSEDCOLUMN
EXTTRAIL /u01/ggtrail/DB1/dirdat/sa
TABLE scott.*, TOKENS ( TRANSACTION_DATE = @GETENV ('GGHEADER', 'COMMITTIMESTAMP'));
REPLICAT example with keeping the deleted rows

```
REPLICAT SCOTT
ASSUMETARGETDEFS
USERIDALIAS gg12
DISCARDFILE /u01/app/goldengate/discard/SCOTT1_discard.txt, append,
megabytes 10
ALLOWDUPTARGETMAP

GETINSERTS
GETUPDATES
IGNOREDELETES
MAP SCOTT.*, TARGET SCOTT1.*, COLMAP (USEDEFAULTS, transaction_date=@token ('TRANSACTION_DATE'));

IGNOREINSERTS
IGNOREUPDATES
GETDELETES
UPDATEDELETES
MAP SCOTT.*, TARGET SCOTT1.*, COLMAP (USEDEFAULTS, transaction_date=@token ('TRANSACTION_DATE'), is_deleted = 'Y');
```
Tips for starting with Oracle GoldenGate
Which GoldenGate version can you use?
> Different versions can be used on source and target, we recommend to use the most recent release and patch for the source and target database
> For older database releases, ask Oracle support to get the latest available patch

Which release is your source database?
> GoldenGate 12.2 is supported starting with Oracle Database 11.2
> GoldenGate 12.1 is supported starting with Oracle Database 11.1
> GoldenGate 11.2 is supported starting with Oracle Database 10.2.0.4
> Check the GoldenGate limitations against your source database
Should you use INTEGRATED or CLASSICAL replication?

- If you can use Oracle GoldenGate 12c on all sides, we highly recommend to use INTEGRATED; if you are working with other Oracle products like ASM it’s easier to run with INTEGRATED, too.

What do you want to replicate (Table, Schema or Database Level)?

- Everything is possible, but for Database level replication validate what you really have to replicate with the application owner; do only replicate what is required.
Which Object types are supported?

- Use the provided scripts from Oracle Support, to validate the content of your database

**Classical & Integrated Extract**

- Oracle GoldenGate database **Schema Profile check script** for Oracle DB (Doc ID 1296168.1)
- Oracle GoldenGate database **Complete Database Profile check script** for Oracle DB (All Schemas) (Doc ID 1298562.1)

**Integrated Extract only**

- GoldenGate **Integrated Capture and Integrated Replicat Healthcheck Script** (Doc ID 1448324.1)
- Now for each Oracle Database version a specific health check script exists (11.2.0.3, 11.2.0.4, 12.1.0.1, 12.1.0.2)
Are all rows uniquely identifiable?
> Check the output of the Classical profile script

```
SQL> @full-DB_CheckOracle_07082015.sql
...
- Tables With No Primary Key or Unique Index
...
```

> For tables without unique keys the uniqueness must be guaranteed over all columns; otherwise the replication will ABEND(ED)

```
SQL> select empno,ename,count(*) from scott.emp
       group by empno,ename
       having count(*) > 1

No rows selected
```
Do you want to replicate DDL?

- Carefully validate this with the Application owner because some application use “TRUNCATE TABLE, DROP TABLE, CREATE TABLE” for their daily business.
- Starting with GoldenGate 12.1 TRUNCATE can be supported without enabling DDL support using the parameter GETTRUNCATES.
- If you use INTEGRATED EXTRACT/REPLICAT processes it’s easy to activate DDL replication, just add “DDL” in the configuration files; otherwise more scripts must be installed which create a trigger to replicate the DDL.

Do you have sequences to replicate?

- You need to run the @sequence.sql script on the source and target database.
- Add the “SEQUENCE” parameter to the extract configuration files.

Do you have db_links?

- Take care with the database links; only configure them if required on the target.
Tips for starting with Oracle GoldenGate

Implementation considerations

Do you have triggers, deferred constraints?
> Until GoldenGate 11.2 the triggers and deferred constraints must be deactivated manually in the configuration file

```
DBOPTIONS SUPPRESSTRIGGERS DEFERRERFCONST
```

Do you have database jobs?
> Take care that database jobs are not running twice (source and target)
> Only create them if needed
> For a migration this point must be added to the checklist of the live migration

Do you have lobs ?
> Take care Oracle GoldenGate 12.1 introduced a new DEFAULT mechanism to apply the LOBS; which doesn’t use anymore a temporary LOB
> but it doesn’t work with the first 12.1 releases

```
DBOPTIONS NOSKIPTEMPLOB
```

Oracle GoldenGate 12c Tips and Tricks
Do the source and the target have compatible character sets?

- Use CSSCAN or DMU to check for any incompatibilities between the source and the target database.
- CSSCAN is only available until 11.2.
- DMU must be installed separately (GUI only, Java based).

Can a proof of concept be implemented using live data?

- dbi services highly recommends to setup a "Proof of Concept"; where the data will be extracted: from the current production database or from a physical standby database.
- Otherwise you will never be able to guarantee that your replication will run successfully.
Implementation best practices

- Directory layout
- Trandata configuration
- Manager configuration
- EXTRACT/REPLICAT configuration
Separate the Trail files destination from GG_HOME

GG_HOME = /u01/app/ogg/product/12.1.2.1.9/<SID>/
TRAIL_HOME = /u02/ogg/data/<SID>

Separate the Source/Target directories if you have several replications on the same server

GG_HOME = /u01/app/ogg/source/product/12.1.2.1.9/<SID>/
TRAIL_HOME = /u02/ogg/source/data/<SID>

GG_HOME = /u01/app/ogg/target/product/12.1.2.1.9/<SID>/
TRAIL_HOME = /u02/ogg/target/data/<SID>
Take care that TRANDATA is successfully configured for all your tables

> The command below do not report an error in case the TRANDATA fails

```sql
GGSCI> ADD TRANDATA SCOTT.*
GGSCI> ADD SCHEMATRANDATA SCOTT
```

> With this SQL you can generate a script for adding the missing trandata

```sql
SQL>
select 'add trandata ''' || owner || '''.' || table_name from dba_tables where owner in ('SCOTT')
Minus
select 'add trandata ''' || owner || '''.' || table_name from dba_log_groups where owner in ('SCOTT');
```
Manager process is responsible for the management of the different EXTRACT/REPLICAT processes

> Don’t underestimate the configuration of this file

```shell
PORT 15011
USERIDALIAS <SID> DOMAIN admin
AUTORESTART REPLICAT REPPROD, RETRIES 3, WAITMINUTES 1, RESETMINUTES 60
AUTOSTART REPLICAT REPPROD
PURGEDDLHISTORY MINKEEPDAYS 5, MAXKEEPDAYS 10, FREQUENCYMINUTES 60
PURGEMARKERHISTORY MINKEEPDAYS 5, MAXKEEPDAYS 10, FREQUENCYMINUTES 60
PURGEOLDEXTRACTS /u01/app/ogg/data/<SID>/dirdat/ro, USECHECKPOINTS,
MINKEEPDAYS 5
CHECKMINUTES 5
```
Update the frequency of the Checkpoint
> otherwise a checkpoint occurs each minute

```
CHECKPOINTSECS 300
```

Configure a discard file for each processes
> Provides more information in case an error occurs

```
DISCARDFILE /u01/app/ogg/data/<SID>/dirdsc/repprod.dsc, append,
megabytes 10
```

Replicate the TRUNCATE only
> Starting 12c

```
GETTRUNCATES
```
> Before 12c
> Configure DDL replication with the scripts

```
DDL INCLUDE MAPPED INCLUDE OPTYPE TRUNCATE OBJNAME scott.*
```
For tables where no UNIQUE or PRIMARY key exists

> But uniqueness can be guaranteed over one or more columns

```
MAP SCOTT.EMP, TARGET SCOTT.EMP, KEYCOLS(EMPNO);
```

> Take Care: An index is needed on the KEYCOLS columns to avoid performance issues for the replicat on the target database

For CharacterSet conversion problems

> When a character is not readable on the source or on the target database

> You can pass through the data without checking the content using PASSTHRU

```
MAP SCOTT.EMP, TARGET SCOTT.EMP, COLCHARSET(PASSTHRU, COLUMN_NAME_1, COLUMN_NAME_2);
```
Monitoring best practices

Hints
Troubleshooting an ABENDED process
Replication statistics
Monitoring best practices

Hints

Monitoring can be configured in several ways
- Cloud Control 12c (CC Plugins and JAGENT)
- WebLogic GoldenGate Monitor
- Custom scripts

dbi services highly recommends to use custom scripts
- In addition you might use Cloud Control or WebLogic Monitoring

Take care: JAGENT can core dump your GoldenGate processes!
- Without any clear error message

Check the ggserr.log file under the GoldenGate Home
Check the content of the generated discard file
> Most important information will be available there
If the GoldenGate processes Core dump
> Create the below XML file to get more information

OGG_HOME/gglog-<OGG EXTRACT/REPLICAT NAME>.xml =>
<?xml version="1.0"?>
<configuration reset="true">
<appender name="myAppender" class="RollingFileAppender">
<param name="File" value="gglog-%1.log"/>
<param name="MaxBackupIndex" value="9"/>
<param name="BufferedIO" value="false"/>
...

Oracle GoldenGate 12c Tips and Tricks
To monitor the replication of one schema/table

- STATS command deliver detailed information (but the process must be running)

```
GGSCI (servname) 9> stats REPPROD table SCOTT.EMP

Replicating from SCOTT.EMP to SCOTT.EMP:

*** Total statistics since 2016-05-10 15:01:07 ***

    Total inserts                755660.00
    Total updates                3686.00
    Total deletes                754832.00
    Total discards               0.00
    Total operations             1514178.00

...
What to know about Oracle GoldenGate 12.2

- GoldenGate Studio
- Add column on Target Table
- HEARTBEAT table
- ALLOWOUTPUTDIR
- CHECK PARAMS
What to know about Oracle GoldenGate 12.2

GoldenGate Studio

With GoldenGate 12.2, Oracle has released a graphical tool to manage the configuration.
What to know about Oracle GoldenGate 12.2
GoldenGate Studio

Requirements
> Java JDK version 8 (1.8) or later
> Installation of GoldenGate Agent on both side (JAGENT)
> Creation of a repository into a database to store the project
  > Oracle advice a Character Set AL32UTF8

GoldenGate Studio allows to
> Manage a new replication
> Update a existing replication
> Deploy a replication

GoldenGate Studio is not a monitoring solution
Navigation in the solution

To create a new replication
Management of database and GoldenGate instance

Databases configuration

GoldenGate instances configuration
Graphical representation of the replication
Configuration of the parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>OggInstanceResource</td>
<td>gg1</td>
</tr>
<tr>
<td>User Alias</td>
<td></td>
</tr>
<tr>
<td>Domain</td>
<td></td>
</tr>
<tr>
<td>Sysdba</td>
<td></td>
</tr>
<tr>
<td>Userid</td>
<td></td>
</tr>
<tr>
<td>Password</td>
<td></td>
</tr>
<tr>
<td>Algorithm</td>
<td></td>
</tr>
<tr>
<td>Encrypt Key</td>
<td></td>
</tr>
<tr>
<td>Sysid</td>
<td></td>
</tr>
<tr>
<td>Comment</td>
<td></td>
</tr>
<tr>
<td>Port</td>
<td>7890</td>
</tr>
<tr>
<td>Dynamic Port List</td>
<td></td>
</tr>
<tr>
<td>Process Management</td>
<td></td>
</tr>
<tr>
<td>AutoStart</td>
<td>On</td>
</tr>
<tr>
<td>Extract</td>
<td></td>
</tr>
<tr>
<td>Extract/Replicat</td>
<td></td>
</tr>
<tr>
<td>Replicat</td>
<td></td>
</tr>
<tr>
<td>Auto Restart</td>
<td></td>
</tr>
<tr>
<td>Extract</td>
<td></td>
</tr>
<tr>
<td>Extract/Replicat</td>
<td></td>
</tr>
<tr>
<td>Replicat</td>
<td></td>
</tr>
<tr>
<td>Retries</td>
<td></td>
</tr>
<tr>
<td>Resume Time (mins)</td>
<td></td>
</tr>
<tr>
<td>Wait Time (mins)</td>
<td></td>
</tr>
<tr>
<td>Auto Restart Interval</td>
<td></td>
</tr>
<tr>
<td>Auto Restart Minimum Time</td>
<td></td>
</tr>
</tbody>
</table>

Oracle GoldenGate 12c Tips and Tricks

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Configuration of the mapping between the source and the target

![Configuration diagram showing mapping between source and target tables.](image)
Notification

2016-05-09 11:36:50.152 NOTIFICATION inactive connection timeout timer scheduled
2016-05-09 11:36:51.768 NOTIFICATION EclipseLink, version: Eclipse Persistence Services - 2.6.1.v20150916-55dc7c3
2016-05-09 11:36:51.817 NOTIFICATION master-session login successful
2016-05-09 11:36:51.827 NOTIFICATION work-session login successful
2016-05-09 11:36:52.421 NOTIFICATION login successful
2016-05-09 11:36:52.646 NOTIFICATION Created Odi:Instance instance id=1
2016-05-09 11:36:52.845 WARNING Refreshing static component type cache.
2016-05-09 11:36:52.849 NOTIFICATION Successfully set the current thread authentication
2016-05-09 11:36:55.566 NOTIFICATION Cannot find AgentETLHelper.
2016-05-09 11:36:55.566 NOTIFICATION Loading PIG custom KMs is not needed.
2016-05-09 11:36:55.616 NOTIFICATION Loading SPARK_PYTHON custom KMs is not needed.
2016-05-09 11:36:56.268 NOTIFICATION Successfully set the current thread authentication
2016-05-09 11:36:57.465 NOTIFICATION bundle oracle.adf-share-ca@12.2.1 started
2016-05-09 11:36:57.995 NOTIFICATION bundle oracle.adf-share-support@12.2.1 started
Warning: Check inflated data as checksum does not match
2016-05-09 11:37:07.820 ERROR Modeler preference defaults not initialized for: solution-group-container
2016-05-09 11:37:07.820 ERROR Modeler preference defaults not initialized for: process-shape
2016-05-09 11:37:07.822 ERROR Modeler preference defaults not initialized for: complex-shape
2016-05-09 11:37:08.720 NOTIFICATION bundle oracle.external.batik@12.2.1 started
2016-05-09 11:37:27.599 NOTIFICATION bundle oracle.external.commons-lang@12.2.1 started
2016-05-09 11:37:40.250 NOTIFICATION bundle oracle.db-plsql@12.2.1 started
What to know about Oracle GoldenGate 12.2
Add column on Target Table

Up to GoldenGate 12.1, Oracle uses the column’s position
> We have a table on source and target with one column

<table>
<thead>
<tr>
<th>Source:</th>
<th>Target:</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENAME</td>
<td>ENAME</td>
</tr>
<tr>
<td>Smith</td>
<td>Smith</td>
</tr>
<tr>
<td>Allen</td>
<td>Allen</td>
</tr>
<tr>
<td>Ward</td>
<td>Ward</td>
</tr>
</tbody>
</table>

Oracle GoldenGate 12c Tips and Tricks
What to know about Oracle GoldenGate 12.2
Add column on Target Table

Up to GoldenGate 12.1, Oracle uses the column’s position

- We have a table on source and target with one column
- We add a column BONUS on the target database

<table>
<thead>
<tr>
<th>Source</th>
<th>Target</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENAME</td>
<td>ENAME</td>
</tr>
<tr>
<td>Smith</td>
<td>Smith</td>
</tr>
<tr>
<td>Allen</td>
<td>Allen</td>
</tr>
<tr>
<td>Ward</td>
<td>Ward</td>
</tr>
</tbody>
</table>
Up to GoldenGate 12.1, Oracle uses the column’s position

- We have a table on source and target with one column
- We add a column BONUS on the target database
- On the source database we add a column CITY

### Source:

<table>
<thead>
<tr>
<th>ENAME</th>
<th>CITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smith</td>
<td></td>
</tr>
<tr>
<td>Allen</td>
<td></td>
</tr>
<tr>
<td>Ward</td>
<td></td>
</tr>
</tbody>
</table>

### Target:

<table>
<thead>
<tr>
<th>ENAME</th>
<th>BONUS</th>
<th>CITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smith</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Allen</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ward</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Up to GoldenGate 12.1, Oracle uses the column’s position

> We have a table on source and target with one column
> We add a column BONUS on the target database
> On the source database we add a column CITY
> On the source database we update the CITY column

<table>
<thead>
<tr>
<th>Source</th>
<th>Target</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENAME</td>
<td>BONUS</td>
</tr>
<tr>
<td>Smith</td>
<td>London</td>
</tr>
<tr>
<td>Allen</td>
<td>Basel</td>
</tr>
<tr>
<td>Ward</td>
<td>Madrid</td>
</tr>
</tbody>
</table>
With GoldenGate 12.2 and the metadata encapsulation, GoldenGate knows which column, he has to update.

<table>
<thead>
<tr>
<th>Source:</th>
<th>Target:</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENAME</td>
<td>BONUS</td>
</tr>
<tr>
<td>Smith</td>
<td></td>
</tr>
<tr>
<td>Allen</td>
<td></td>
</tr>
<tr>
<td>Ward</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Smith</td>
</tr>
<tr>
<td></td>
<td>Allen</td>
</tr>
<tr>
<td></td>
<td>Ward</td>
</tr>
</tbody>
</table>
GoldenGate 12.2 integrate it own heartbeat table

> It's very simple, you only need to be connected to the target database

GGSCI (gg as ggadmin@DB2) 2> DBLOGIN USERIDALIAS ggadmin
GGSCI (gg as ggadmin@DB2) 2> ADD HEARTBEATTABLE

2016-05-09 15:10:46 INFO OGG-14001 Successfully created heartbeat seed table ["GG_HEARTBEAT_SEED"].
2016-05-09 15:10:46 INFO OGG-14000 Successfully created heartbeat table ["GG_HEARTBEAT"].
2016-05-09 15:10:46 INFO OGG-14016 Successfully created heartbeat history table ["GG_HEARTBEAT_HISTORY"].
2016-05-09 15:10:46 INFO OGG-14023 Successfully created heartbeat lag view ["GG_LAG"].
2016-05-09 15:10:46 INFO OGG-14024 Successfully created heartbeat lag history view ["GG_LAG_HISTORY"]

...
What to know about Oracle GoldenGate 12.2
HEARTBEAT table

To enable the heartbeat table
> add the parameter ENABLE_HEARTBEAT_TABLE in the GLOBALS or EXTRACT/REPLICAT parameter files

GGSCI (gg as ggadmin@DB2) 3> view params ./GLOBALS

checkpointtable ggadmin.ogg_checkpoint
enablemonitoring
allowoutputdir /u05/ggtrail/DB2
ENABLE_HEARTBEAT_TABLE
GGSCHEMA GGADMIN
What to know about Oracle GoldenGate 12.2

HEARTBEAT table

GoldenGate heartbeat is composed of

<table>
<thead>
<tr>
<th>Tables</th>
<th>Views</th>
</tr>
</thead>
<tbody>
<tr>
<td>GG_HEARTBEAT_SEED</td>
<td>GG_LAG</td>
</tr>
<tr>
<td>GG_HEARTBEAT</td>
<td>GG_LAG_HISTORY</td>
</tr>
<tr>
<td>GG_HEARTBEAT_HISTORY</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Stored Procedures</th>
<th>Scheduler Jobs</th>
</tr>
</thead>
<tbody>
<tr>
<td>GG_UPDATE_HB_TAB</td>
<td>GG_UPDATE_HEARTBEATS</td>
</tr>
<tr>
<td>GG_PURGE_HB_TAB</td>
<td>GG_PURGE_HEARTBEATS</td>
</tr>
</tbody>
</table>
To see information about the lag, there are two manner

> With the GGSCI command `lag`

```
GGSCI (gg as ggadmin@DB2) 24> lag

Lag Information From Heartbeat Table

<table>
<thead>
<tr>
<th>LAG</th>
<th>AGE</th>
<th>FROM</th>
<th>TO</th>
<th>PATH</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.50s</td>
<td>1m 9.08s</td>
<td>DB1</td>
<td>DB2</td>
<td>SCOTTN ==&gt; SCOTTND ==&gt; REPLISC</td>
</tr>
<tr>
<td>6.65s</td>
<td>9.08s</td>
<td>DB1</td>
<td>DB2</td>
<td>SCOTT ==&gt; DPSCOTT ==&gt; REPSCOTT</td>
</tr>
</tbody>
</table>
```

> Directly on the view

```
SQL> select LOCAL_DATABASE, CURRENT_LOCAL_TS, REMOTE_DATABASE, INCOMING_HEARTBEAT_AGE, INCOMING_PATH, INCOMING_LAG
from   GGADMIN.GG_LAG;

<table>
<thead>
<tr>
<th>LOCAL_DB</th>
<th>CURRENT_LOCAL_TS</th>
<th>REMOTE_DB</th>
<th>INCOMING_HEAR</th>
<th>INCOMING_PATH</th>
<th>INCOMING_LAG</th>
</tr>
</thead>
<tbody>
<tr>
<td>DB2</td>
<td>11-MAY-16 11.39.14.129740 AM</td>
<td>DB1</td>
<td>70.618221</td>
<td>SCOTTN ==&gt; SCOTTND ==&gt; REPLISC</td>
<td>6.144849</td>
</tr>
<tr>
<td>DB2</td>
<td>11-MAY-16 11.39.14.129740 AM</td>
<td>DB1</td>
<td>10.619735</td>
<td>SCOTT ==&gt; DPSCOTT ==&gt; REPSCOTT</td>
<td>5.099704</td>
</tr>
</tbody>
</table>
Since version 12.2 Oracle GoldenGate uses the directories in the product’s home by default

Data pump extract parameters

```
GGSCI (gg as ggadmin@DB1) 5> view params DPSCOTT
extract dpscott
useridalias ggadmin
DBOPTIONS ALLOWUNUSEDCOLUMN
rmthost 192.168.56.109, MGRPORT 7809
RMTTRAIL /u05/ggtrail/DB2/tc
TABLE scott.emp;
```

Error during the start of process (ggserr.log)

Oracle GoldenGate Capture for Oracle, dpscott.prm: There is a problem in network communication, a remote file problem, encryption keys for target and source do not match (if using ENCRYPT) or an unknown error. (Reply received is Output file /u05/ggtrail/DB2/tc000000 is not in any allowed output directories.).
To allow using other directories

> set the parameter ALLOWOUTPUTDIR

**GLOBALS parameters on the target side**

```
GGSCI (gg as ggadmin@DB2) 3> view params ./.GLOBALS

GGSHEMA ggadmin
CHECKPOINTTABLE ggadmin.checkpoint
ALLOWOUTPUTDIR /u05/ggtrail/DB2/
```

**This parameter permits**

> The usage of sub-directories
> You can set more than one folder
What to know about Oracle GoldenGate 12.2
CHECK PARAMS

There are three new manner to check the Oracle GoldenGate configuration files and parameters

- **checkprm** utility
  - Located under the GG_HOME directory

- **INFO PARAM**
  - New ggsci command

- **GETPARAMINFO**
  - New ggsci command
What to know about Oracle GoldenGate 12.2
CHECK PARAMS

Check of a configuration file

```
oracle@gg:/u04/app/goldengate/product/12.2.0.0/DB1/ [DB1] checkprm
dirprm/scott.prm
2016-01-19 15:56:18 INFO OGG-10139 Parameter file
dirprm/scott.prm:   Validity check: PASS.
Runtime parameter validation is not reflected in the above check.
```

Check of a bad configuration file

```
oracle@gg:/u04/app/goldengate/product/12.2.0.0/DB1/ [DB1] checkprm
dirprm/scott_bad.prm
(scott_bad.prm) line 1: Fatal error in parser [Command 'TABLE' not terminated by semi-colon].
(scott_bad.prm) line 2: Parameter [userdalias] is unrecognized and will be ignored. No parameter definition with that name could be found.
2016-01-19 16:38:39 INFO OGG-10139 Parameter file
dirprm/scott_bad.prm:   Validity check: FAIL.
```

This tool provides meaningful details
GGSCI > INFO PARAM

> Can be used to obtain information about the parameter of manager process and the globals file

GGSCI (gg) 2> info param ALLOWOUTPUTDIR

param name : allowoutputdir
description : Allow the output trail files to be saved in the given directory or its sub directories.
argument : string
default : no default
options :
component(s) : GLOBALS
mode(s) : none
platform(s) : all platforms
versions :
   min ver : 12.2.0.1
database(s) : all supported databases (on the supported platforms).
status : current
mandatory : false
dynamic : false
relations : none
GGSCI > GETPARAMINFO
> Can only be used when the process is running

GGSCI (goldengate122) 13> send mgr getparaminfo

Sending GETPARAMINFO request to MANAGER ...

GLOBALS
  ggschema : ggadmin
  checkpointtable : ggadmin.checkpoint
  allowoutputdir : /u05/ggtrail/DB2/

  /u04/app/goldengate/product/12.2.0.0/DB1/dirprm/mgr.prm

  port : 7809
  Default Values
  checkminutes : 10
Conclusion
Many parameter exist to fix your replication
Is well integrated with other Oracle database products
Resync of replication gap is very fast if the right indexes exist
Oracle GoldenGate 12.2 brings an important new feature (Metadata Encapsulation)
Oracle GoldenGate Studio helps to easily setup a replication

JAGENT can core dump your configuration, use it only if necessary (GoldenGate Studio, ODI, Cloud Control)
To stabilize a replication several days up to several weeks are required to fix all issues which might occur
Test carefully your GoldenGate upgrades, because of new default parameters and new features introduction
Infrastructure at your Service.

Any questions? Please do ask

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Principal Consultant

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We look forward to working with you! http://blog.dbi-services.com