

# HP NonStop Enscribe to NonStop SQL/MP

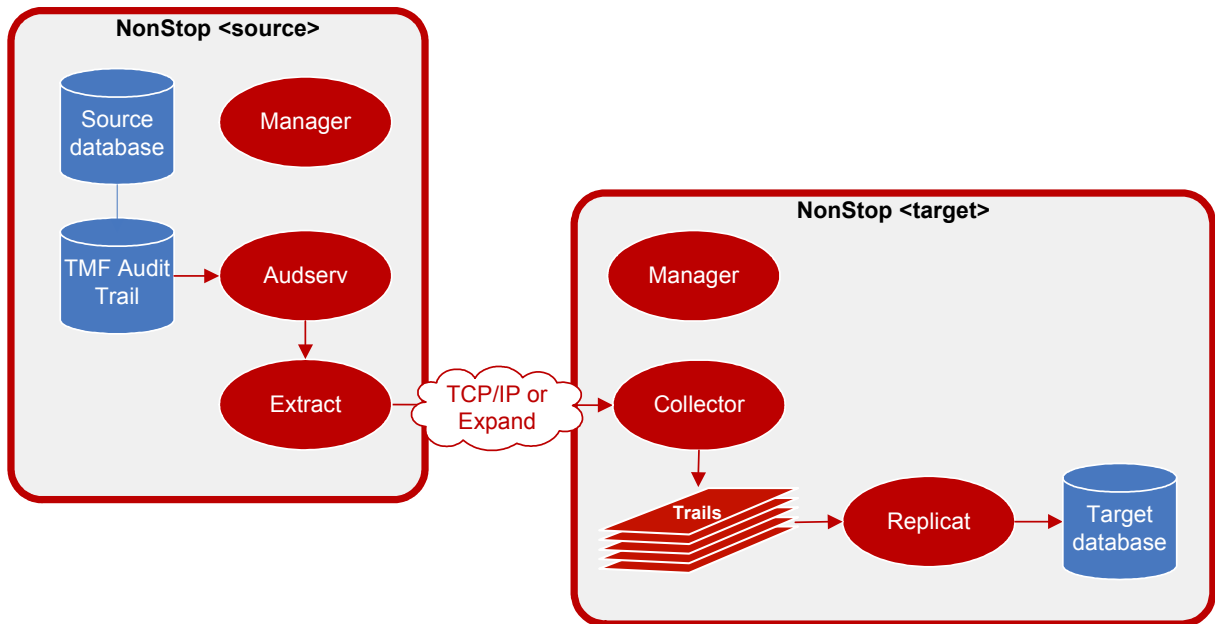
## Objective

Upon completion of this lesson, you will be able to keep two NonStop Enscribe databases synchronized.

- Prepare your environment to configure the GoldenGate processes
- Configure and start the change capture of database operations
- Configure and execute the initial data synchronization
- Configure and start the change delivery of database operations

## NonStop audited configuration

The following diagram illustrates GoldenGate installed on two NonStop systems connected by either TCP/IP or Expand. The source data is TMF audited.



## Overview of Tasks

### Prepare the Environment

In order to execute this lesson, the GoldenGate application must be installed on both the source and target systems. The installation includes a sample database and scripts to generate initial data as well as subsequent update operations. The source files and target tables are created and loaded with initial data. The GoldenGate Manager processes are also started so that other processes may be configured and started.

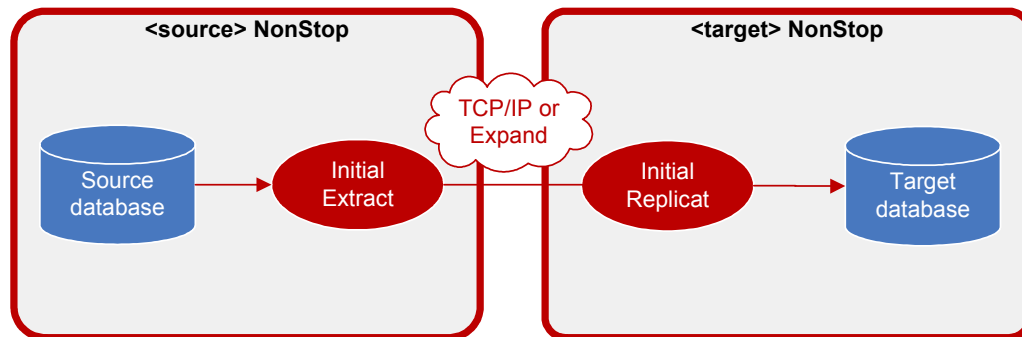
### Configure Change Capture

For audited files, the capture process is configured to capture change data directly from the TMF audit trails and buffers the data into queues known as GoldenGate trails.

### Configure Initial Data Load

To initially load data between Enscribe and NSK SQL, you don't many options besides using GoldenGate. GoldenGate provides the ability to send data to the remote system while the application remains active.

This lesson demonstrates using GoldenGate to capture data directly from the source files and queue the data into files, which is then loaded by GoldenGate on the target system.



### Configure Change Delivery

Once the tables have been initially loaded with data and the Extract process is capturing all operations, the Replicat is configured to deliver the captured operations to the target database.

# GOLDENGATE™

## Exercise 1. Prepare the Environment



### Objective

The goals of this exercise are to:

- Configure and start the Manager processes.
- Prepare the source and target sample databases.

### Prepare the source NSK environment

#### 1. Configure a GLOBALS parameter file on the source

A GLOBALS parameter can be used to uniquely identify each GoldenGate instance when multiple environments exist on single NSK node. Use the two-character <prefix> that was defined in the Lab Preparation.

Execute the following commands on the <source> system if a prefix is needed for your installation.

```
TACL> VOLUME <install vol>.<install subvol>  
TACL> TEDIT GLOBALS
```

```
ADD DEFINE =GGS_PREFIX, CLASS MAP, FILE $<prefix>
```

#### 2. Configure the Manager process on the source system

Execute the following commands on the <source> system.

The Manager process is responsible for starting and monitoring all of the other GoldenGate processes. You will always have one manager process per GoldenGate instance.

```
TACL> VOLUME <install vol>.<install subvol>  
TACL> RUN GGSCI  
GGSCI> TEDIT PARAMS MGRPARAM
```

```
-- GoldenGate Manager Parameter file  
TCPIPPROCESSNAME <tcpip process>  
PORT <port>
```

```
GGSCI> START MANAGER, CPU 1, PRI 180
```



Verify the results:

```
GGSCI> INFO MANAGER
```

### 3. Create and load source files

Execute the following commands on the <source> system.

The installation includes scripts to create sample tables and generate initial data. Note that your <prefix> may need to be substituted for the GG in subvolume GGSSOU used in this section.

- Create the files

```
TACL> VOLUME <install vol>.GGSSOU
TACL> FUP /IN <install vol>.<install subvol>.DEMOFUPS/
```

- Turn audit on

```
TACL> FUP ALTER ECUSTMER, AUDIT
TACL> FUP ALTER ECUSTORD, AUDIT
```

- Load the files

```
TACL> RUN <install vol>.<install subvol>.DEMOLDEO
```

Within DEMOLDEO the following prompts and replies are issued:

```
To perform an initial load enter (I), to update
the database enter (U) or to exit the program enter (E).
?I
```

```
To perform an initial load enter (I), to update
the database enter (U) or to exit the program enter (E).
?E
```

- Verify the results:

```
TACL> FUP COPY ECUSTMER
TACL> FUP COPY ECUSTORD
```

### 4. Generate source definitions

Execute the following commands on the <source> system.

The DEFGEN utility is an interactive program that generates a source definition file describing the layouts of the files/tables that are to be replicated.

```
TACL> VOLUME <install vol>.<install subvol>
TACL> RUN DEFGEN
```

Within DEFGEN, the following prompts and replies are issued:

```
Enter definitions filename (or Exit):          <install vol>.GGSDEF.ECUSTDEF
```



```
File/Table to create definition for (or Exit): <install vol>.GGSSOU.ECUSTMER  
Definition retrieved.  
File/Table to create definition for (or Exit): <install vol>.GGSSOU.ECUSTORD  
Definition retrieved.
```

```
File/Table to create definition for (or Exit): EXIT
```

## 5. Move the source definitions to the target

After exiting, FTP the file <install-vol>.GGSDEF.ECUSTDEF in ASCII format to the target installation location.

**Note:** If your system is local or communicating over Expand, you may be sharing a GGSDEFS subvolume for your source and target. If so, you can skip this step, otherwise you can simply FUP DUP ECUSTDEF to the target GGSDEF subvolume.

## Prepare your HP NonStop target environment

### 4. Configure a GLOBALS parameter file on the target

A GLOBALS parameter can be used to uniquely identify each GoldenGate instance when multiple environments exist on single NSK node. Use the two-character <prefix> that was defined in the Lab Preparation.

Execute the following commands on the <target> system if your installation needs a prefix.

```
TACL> VOLUME <install vol>.<install subvol>  
TACL> TEDIT GLOBALS
```

```
ADD DEFINE =GGS_PREFIX, CLASS MAP, FILE $<prefix>
```

If you have an active GGSCI session you must exit it and re-enter so that it will read the change to the GLOBALS parameters.

### 5. Configure the Manager process on the target system

Execute the following commands on the <target> system.

- Start the command interface

```
TACL> VOLUME <install vol>.<install subvol>  
TACL> RUN GGSCI
```

- Specify the port that the Manager should use.

```
GGSCI> EDIT PARAMS MGRPARAM
```

```
-- GoldenGate Manager Parameter file  
TCPIPPROCESSNAME <tcpip process>  
PORT <port>
```

○ Start Manager

```
GGSCI> START MANAGER, CPU 1, PRI 180
```

Verify the results:

```
GGSCI> INFO MANAGER
```

## 6 Create target tables

Execute the following commands on the <target> system to run the script that creates the tables.

Execute the following commands on the <target> system.

```
TACL> SQLCI
>> VOLUME <install vol>.GGSTAR;
>> CREATE CATALOG;
>> OBEY <install vol>.<install subvol>.DEMOSQL;
```

Verify the results:

```
>> select * from tcustmer;
>> select * from tcustord;
>> exit
```

## Discussion points

### 1. TCPIPPROCESSNAME

Whether the Manager needs TCPIPPROCESSNAME depends on the type of communication you are using and whether the default process should be used. Do you need this parameter? Why or why not?

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## Exercise 2.

# Initial Data Load

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## Objective

The goal of this exercise is to load the initial data using Extract and Replicat processes.

**Note:** The parameters in this lab are set for TCP/IP. If your system is local or communicating over Expand, do not use the RMTHOST parameter.

## Configure initial load

### 1. Add the initial load capture batch task group

Execute the following commands on the <source> system to add an Extract group named EINI<unique id><sup>1</sup>.

- Start the command interface.

```
TACL> VOLUME <install vol>.<install subvol>
TACL> RUN GGSCI
```

- Add the Extract batch task.

```
GGSCI> ADD EXTRACT EINI<unique id>, SOURCEISTABLE
```

- Verify the results:

```
GGSCI> INFO EXTRACT *, TASKS
```

### 2. Configure the initial load capture parameter file

Execute the following commands on the <source> system.

```
GGSCI> EDIT PARAMS EINI<unique id>
```

```
--
-- GoldenGate Initial Data Capture
-- for ECUSTMER and ECUSTORD
--
EXTRACT EINI<unique id>
```

<sup>1</sup> The process names used in lab exercises, for example EINIBD1, are made up of 1) one character to identify the type of process (E for Extract, R for Replicat); 2) three characters to describe the type of process (INI for initial data load, ORA for capture from or delivery to an Oracle database, etc.) and 3) three characters usually made up of the student's initials plus a sequential number to uniquely identify multiple occurrences of that type of process.

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```

RMTHOST <target>, MGRPORT <port>
RMTTASK REPLICAT, GROUP RINI<unique id>
TABLE <install vol>.GGSSOU.ECUSTMER;
TABLE <install vol>.GGSSOU.ECUSTORD;

```

### 3. Add the initial load delivery batch task group

Execute the following commands on the <target> system.

```
GGSCI> ADD REPLICAT RINI<unique id>, SPECIALRUN
```

Verify the results:

```
GGSCI> INFO REPLICAT *, TASKS
```

### 4. Configure the initial load delivery parameter file

Execute the following commands on the <target> system.

```
GGSCI> EDIT PARAMS RINI<unique id>
```

```

--
-- GoldenGate Initial Load Delivery
--
REPLICAT RINI<unique id>
ASSUMETARGETDEFS
DISCARDFILE <install vol>.GGSDISC.RINI<unique id>, PURGE
MAP <source>.<install vol>.GGSSOU.ECUSTORD,
    TARGET <target>.<install vol>.GGSTAR.TCUSTORD;
MAP <source>.<install vol>.GGSSOU.ECUSTMER,
    TARGET <target>.<install vol>.GGSTAR.TCUSTMER;

```

### 5. Execute the initial load process

Execute the following commands on the <source> system.

```
GGSCI> START EXTRACT EINI<unique id>
```

Verify the results:

Execute the following commands on the <source> system.

```
GGSCI> VIEW REPORT EINI<unique id>
```

Execute the following commands on the <target> system.

```
GGSCI> VIEW REPORT RINI<unique id>
```



## Exercise 3.

# Configure Change Capture

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## Objective

The goals of this exercise are to:

- Configure and add the Extract process that will capture changes for audited tables.
- Add the trail that will store the changes.
- Start the capture process.

**Note:** This lab configures change capture writing to a remote trail over TCP/IP. If your system is local or communicating over Expand make the following changes:

- Do not use the RMTHOST or TCPIPPROCESSNAME parameters in the Extract file
- Add an EXTTRAIL instead of an RMTTRAIL.

## Configure change capture

### 1. Create the Extract parameter file

Execute the following commands on the <source> system to define an Extract named EENS<unique id> to pull data from the Enscribe TMF audit trails and route these changes to GoldenGate trails.

```
GGSCI> EDIT PARAMS EENS<unique id>
```

```
--
-- Extract parameter file to capture
-- ECUSTMER and ECUSTORD Changes
--
EXTRACT EENS<unique id>
TCPIPPROCESSNAME <tcpip process>
RMTHOST <target >, MGRPORT <port>
RMTTRAIL <install vol>.GGSDAT.<trail id>
FILE <install vol>.GGSSOU.ECUSTMER;
FILE <install vol>.GGSSOU.ECUSTORD;
```

**Note:** Record the two characters selected for your <trail id>: \_\_\_\_\_. You will need this defining the remote trail and for identifying the trail to be read by Replicat.

### 2. Add the Extract group

Execute the following commands on the <source> system.

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```
GGSCI> ADD EXTRACT EENS<unique id>, BEGIN NOW, CPU 1, PRI 160
```

Verify results:

```
GGSCI> INFO EXTRACT EENS<unique id>
```

### 3. Define the GoldenGate trail

Execute the following commands on the <source> system to add the trail declared in the EENS<unique id>Extract parameters. This will be located on the target system.

```
GGSCI> ADD RMTTRAIL <install vol>.GGSDAT.<trail id>, EXTRACT  
EENS<unique id>, MEGABYTES 5
```

### 4. Start the capture process

Execute the following commands on the <source> system.

```
GGSCI> START EXTRACT EENS<unique id>
```

Verify results:

```
GGSCI> INFO EXTRACT EENS<unique id>
```

## Discussion points

### 1. Identifying a remote system

What parameter is used to identify the remote target system?

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### 2. Sizing the GoldenGate trail

Where do you set how large a GoldenGate trail file may get before it rolls to the next file?  
What option do you use?

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## Exercise 4.

# Configure Change Delivery

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## Objective

The goal of this exercise is to configure and start the delivery process.

## Configure change delivery

### 1. Create Replicat parameter file

Execute the following commands on the <target> system to define a Replicat named RENS<unique id> to pull data from the GoldenGate trails and apply it to the target Enscribe files.

```
GGSCI> TEDIT PARAM RENS<unique id>
```

```
--
-- REPLICAT parameter file to synchronize
-- ECUSTORD and ECUSTMER changes
--
REPLICAT RENS<unique id>
HANDLECOLLISIONS
PURGEOLDEXTRACTS
ASSUMETARGETDEFS
DISCARDFILE <install vol>.GGSDISC.RENS<unique id>, PURGE
MAP <source>.<install vol>.GGSSOU.ECUSTORD,
    TARGET <target>.<install vol>.GGSTAR.RCUSTORD;
MAP <source>.<install vol>.GGSSOU.ECUSTMER,
    TARGET <target>.<install vol>.GGSTAR.RCUSTMER;
```

### 2. Add the Replicat group

Execute the following commands on the <target> system.

```
GGSCI> ADD REPLICAT RENS<unique id>, EXTTRAIL <install
vol>.GGSDAT.<trail id>
```

Verify the results:

```
GGSCI> INFO REPLICAT RENS<unique id>
```

### 3. Start the Replicat process

Execute the following commands on the <target> system.

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```
GGSCI> START REPLICAT RENS<unique id>
```

Verify results:

```
GGSCI> INFO REPLICAT RENS<unique id>
```

## Discussion points

Search in the *GoldenGate for HP NonStop Reference Guide* for the following parameters that were included in the delivery parameter file.

### 1. When to use HANDLECOLLISIONS

For which stage of GoldenGate processing – change capture, initial data load, or change delivery – would you use HANDLECOLLISIONS?

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### 2. What is the advantage of using the Manager to PURGEOLDEXTRACTS?

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### 3. When to use ASSUMETARGETDEFS

What should be the same on the source and target when ASSUMETARGETDEFS is used?

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## Exercise 5.

# Generate Activity and Verify Results



## Objective

The goals of this exercise are to:

- Execute miscellaneous update, insert, and delete operations on the source system.
- Verify the delivery of the changes to the target

## Generate database operations

### 1. Execute miscellaneous update, insert, and delete operations

Execute the following commands on the <source> system.

```
TACL> VOLUME <install vol>.GGSSOU  
TACL> RUN <install vol>.<install subvol>.DEMOLDEO
```

Within **DEMOLDEO** the following prompts and replies are issued:

```
To perform an initial load enter (I), to update  
the database enter (U) or to exit the program enter (E).  
?U
```

```
To perform an initial load enter (I), to update  
the database enter (U) or to exit the program enter (E).  
?E
```

## Verify change capture and delivery

### 2. Verify the results on your source system

Execute the following commands on the <source> system to view the contents of the source Enscribe files.

```
TACL> FUP COPY <install vol>.GGSSOU.ECUSTMER  
TACL> FUP COPY <install vol>.GGSSOU.ECUSTORD
```

### 3. Verify your results on the target system

Execute the following commands on the <target> system to verify the target data.

```
TACL> SQLCI
```



```
>> VOLUME <target>.<install vol>.GGSTAR;  
>> SELECT * FROM TCUSTMER;  
>> SELECT * FROM TCUSTORD;  
  
SQL> exit  
  
TACL> RUN GGSCI  
GGSCI> SEND REPLICAT RSQL<unique id>, REPORT  
GGSCI> VIEW REPORT RSQL<unique id>
```

## Turn off error handling

### 4. Turn off initial load error handling for the running delivery process

```
TACL> VOLUME <install vol>.<install subvol>  
TACL> RUN GGSCI  
GGSCI> SEND REPLICAT RSQL<unique id>, NOHANDLECOLLISIONS
```

### 5. Remove initial load error handling from the parameter file

```
GGSCI> EDIT PARAMS RSQL<unique id>
```

Remove the HANDLECOLLISIONS parameter.



