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Informatica® Multidomain MDM
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Zero Downtime Installation Guide for IBM Db2

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Preface

Follow the instructions in the Informatica® *Multidomain MDM Zero Downtime Installation Guide* to set up a zero downtime environment for Multidomain MDM. Zero Downtime is an optionally licensed feature that enables you to minimize disruptions while you upgrade Multidomain MDM. In addition to the installation steps, the guide also includes pre-installation and post-installation requirements.

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CHAPTER 1

Configure Zero Downtime

This chapter includes the following topics:

Zero Downtime Overview

When you need to ensure uninterrupted access to master data, implement a zero downtime environment. In a zero downtime environment, you can maintain access to data in the MDM Hub Store while you upgrade Multidomain MDM. You need a source database in a production environment and a target database in a secondary environment. When the data changes in the source database, the changes are replicated to the target database.

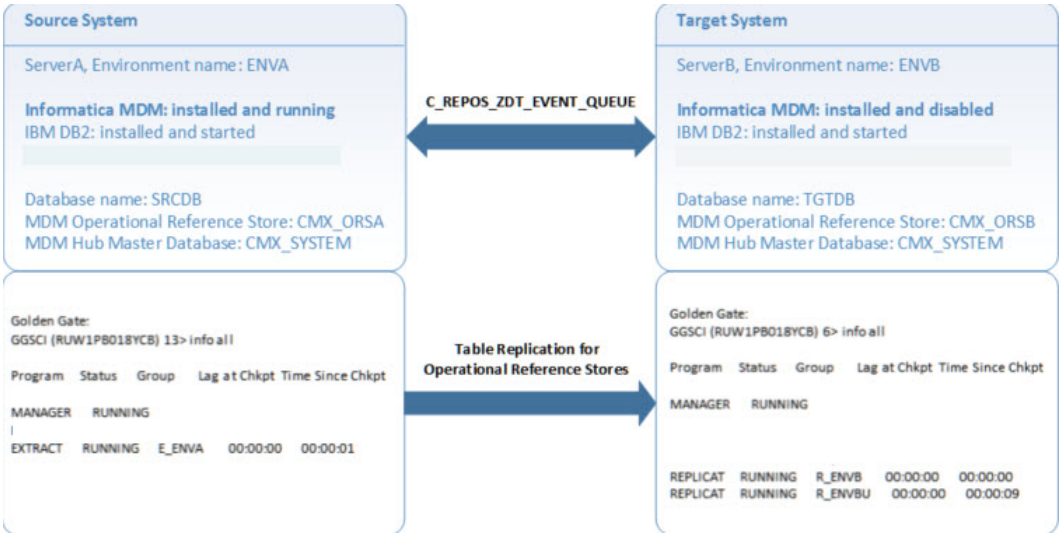
When you need to upgrade Multidomain MDM, you make the target database active. After you finish updating Multidomain MDM, you can replicate the changes that occurred in the target database to the source database.

You use Oracle GoldenGate to configure and manage a zero downtime environment for Multidomain MDM. For more information about Oracle GoldenGate, visit the Oracle website.

Zero Downtime Replication with Two Systems

When an organization maintains parallel environments, you run Multidomain MDM on two systems. Data is replicated from the source system to the target system.

The following image shows an example of a source system and a target system:



Oracle GoldenGate replicates the tables in Operational Reference Store, from the source system to the target system.

Other Replication Scenarios

Other types of replications scenarios are possible.

Replication of multiple Operational Reference Store schemas

If you have multiple Operational Reference Store (ORS) schemas within the same Oracle instance, each ORS requires its own set of Oracle GoldenGate processes. Set up the processes for each additional ORS schema in the same way that you set up the first schema.

Replication of schemas that are not ORS schemas

You can replicate other types of schemas by using Oracle GoldenGate. Follow the Oracle GoldenGate documentation to set up replication processes for these schemas.

Replication of non-Informatica tables within the ORS schema

Tables that are not natively part of an ORS are not replicated through Zero Downtime. Follow the Oracle GoldenGate documentation to set up replication processes for these tables.

Review the Requirements

Install the required software on the source system and on the target system. Ensure that you install the same versions of the required software on both systems.

Port Numbers Used by Oracle GoldenGate

When the source database and target database reside on different servers, you must open the ports that are used by Oracle GoldenGate. You need one port for Oracle GoldenGate Manager plus one port for each process you run.

For Zero Downtime, you run Oracle GoldenGate Manager and five processes in each environment. Therefore, you need six open ports on the active environment and six open ports on the passive environment. By default, the Oracle GoldenGate port range is 7809-7820.

For information about specifying ports for remote network communications, see the following topics in the *Oracle® GoldenGate Administering Oracle GoldenGate for Windows and UNIX*:

- Maintaining Ports for Remote Connections through Firewalls: https://docs.oracle.com/goldengate/1212/gg-winux/GWUAD/wu_manager.htm#GWUAD142
- Creating the Manager Parameter File: https://docs.oracle.com/goldengate/1212/gg-winux/GWUAD/wu_manager.htm#GWUAD145

CHAPTER 2

Prepare the Environment for IBM Db2 Databases

This chapter includes the following topics:

Create a User for Oracle GoldenGate on Windows

Create a dedicated user for Oracle GoldenGate on both the source system and the target system. You can use the same user name on both systems or different user names. Assign the user to the groups DB2ADMINS and DB2USERS. A database administrator must grant DBA permissions to this user.

The following steps describe how to set up a user on a Windows system. The steps might vary based on the version of Windows that you use.

1. On the source system, open **Control Panel**, and click **Administrative Tools**.
2. Double-click **Computer Management**.
3. In the Computer Management window, expand **Local Users and Groups**.
4. Right-click **Users** and select **New User**.
5. In the New User dialog box, type a user name, such as `GG`.
6. Clear the **User must change password at next login** check box.
7. Select the **User cannot change password** check box.
8. Select the **Password never expires** check box.
9. Click **Create**.

   The New User dialog box closes, and the GG user appears in the list.

10. Assign the user to user groups.
    a. In the **Computer Management** window, right-click the **GG** user.
    b. In the **GG Properties** dialog box, click **Member Of**.
    c. Click **Add**.
    d. In the **Select Groups** dialog box, specify the following groups: **DB2USERS** and **DB2ADMNS**.
    e. Click **OK**.

       The dialog box closes.
    f. In the **GG Properties** dialog box, click **OK**.
11. Repeat all steps on the target system.
12. A database administrator must grant DBA privileges to this user on both systems.

    ```
    GRANT DBADM ON DATABASE TO USER GG
    ```

    The user can now use stored procedures and the db2readlogAPI.

Prepare the IBM Db2 Databases

Back up the IBM Db2 source database that contains the MDM Hub Store. Then copy and restore the backup on the target database. When you restore the database, the target database has the same tablespaces as the source database.

1. Connect to the source Db2 database by running the following command:

   ```
   CONNECT TO <Source database> USER <Db2 administrator> USING <Password>
   ```
2. Grant DBA privileges to the GoldenGate user on both the source and target systems by running the following command:

   ```
   GRANT DBADM ON DATABASE TO <GoldenGate user>
   ```
3. To reset the connection, run the following command:

   ```
   CONNECT RESET
   ```
4. Set the configuration parameters for the source database by running the following command:

   ```
   UPDATE DB CFG FOR <Source database> USING LOGRETAIN OFF
   ```
5. To specify the directory in which Db2 stores the archive log files, run the following command:

   ```
   UPDATE DB CFG FOR <Source database> USING LOGARCHMETH1 <Directory path>
   ```
6. To set the automatic maintenance database configuration parameters to OFF, run the following command:

   ```
   UPDATE DB CFG FOR <Target database> USING AUTO_MAINT OFF
   ```
7. To backup the source database, run the following command:

   ```
   BACKUP DB <Source database> COMPRESS
   ```
8. To stop the command-line processor, run the following command:

   ```
   QUIT
   ```
9. To disconnect the database connection, run the following command:

   ```
   FORCE APPLICATIONS ALL
   ```

Install Oracle GoldenGate for IBM Db2

Install Oracle GoldenGate on the source system. Repeat the installation on the target system.

Note: For system requirements and alternative installation instructions, see the Oracle GoldenGate documentation on the Oracle website.

1. Copy the downloaded Oracle GoldenGate .zip file to the system.
2. Extract the .zip file to a local directory named `GGS`.
3. From a command prompt, navigate to the `GGS` directory.
4. Start the Oracle GoldenGate Command Interpreter for DB2.

   ```
   C:/GGS > start ggsci.exe
   ```
5. In the **Oracle GoldenGate Command Interpreter for DB2** window, edit global parameters.
   a. At the `GGSCI` prompt, enter the following command:

      ```
      GGSCI > EDIT PARAM ./GLOBALS
      ```

      An editor opens.
   b. Click **Yes** to create a file named `GLOBALS`.
   c. In the file, type one of the following lines of text:
      - For the source system, type: `MGRSERVNAME SRCGGSMGR`
      - For the target system, type: `MGRSERVNAME TGTGGSMGR`
   d. Save and close the file.
6. Create subdirectories.

   ```
   GGSCI> CREATE SUBDIRS
   ```

   The command creates the following files and directories under the `GGS` directory:

Files	Directory Name
Parameter files	`dirprm`
Report files	`dirrpt`
Checkpoint files	`dirchk`
Process status files	`dirpcs`
SQL script files	`dirsql`
Database definitions files	`dirdef`
Extract data files	`dirdat`
Temporary files	`dirtmp`
Stdout files	`dirout`

7. Create a parameters file.
   a. Enter the following command:
      ```
      GGSCI > EDIT PARAM MGR
      ```
      An editor opens.
   b. Click **Yes** to create a file named `mgr.prm`.
   c. In the file, type `PORT` and then specify the port number that Oracle GoldenGate uses. You can use a different port number on the source system and on the target system.
      ```
      PORT 7800
      ```
   d. Save and close the file.
8. Start the Oracle GoldenGate Manager.
   ```
   GGSCI > start mgr
   ```
   The **Oracle GoldenGate Manager for DB2** window opens. A message confirms that the Manager is started on the specified port.
9. Repeat all steps on the other system.

Install Oracle GoldenGate as a Windows Service

You can install Oracle GoldenGate as a Windows service on the source system and on the target system. The service name comes from the `GLOBALS` file.

1. On the source system, if the Oracle GoldenGate Manager is running, shut down the server by closing the **Oracle GoldenGate Manager for DB2** window.
2. At a command prompt, navigate to the GGS directory and enter the following command:
   ```
   C:/GGS > INSTALL.EXE ADDEVENTS ADDSERVICE MANUALSTART
   ```
3. Start the Oracle GoldenGate Command Interpreter for DB2.
   ```
   C:/GGS > start ggsci.exe
   ```
4. In the **Oracle GoldenGate Command Interpreter for DB2** window, start the Oracle GoldenGate Manager.
   ```
   GGSCI > start mgr
   ```
5. In Task Manager, verify that the `SRCGGSMGR` service is running.
6. Repeat all steps on the target system. In Task Manager, the service name is `TGTGGSMGR`.

Install Informatica MDM Zero Downtime

You can install MDM ZDT on a separate host or on the source or target system. The ZDT installation process installs the Oracle GoldenGate command files. The command files contain a list of commands that you can use with the Oracle GoldenGate Software Command Interface (GCSCI).

1. In the command prompt, navigate to the following directory:
   ```
   <MDM Hub installation directory>/hub/server/resources/zdt
   ```
2. Extract the `zdt.zip` file to a local directory.
3. In the command prompt, go to the following directory:

```
<Extracted zdt.zip files>/zdt_utility/bin
```

4. To install MDM ZDT, enter the following command:

```
sip_ant.bat install_utility
```

5. To generate and validate the Oracle GoldenGate command files, enter the following command:

```
sip_ant.bat generate_zdt
```

Populate the Schemas

The `deploy_zdt` command automatically updates the C_REPOS_ZDT_STATUS repository table in the source and target systems.

The following table summarizes the columns updated in the C_REPOS_ZDT_STATUS repository table:

Column Name	Source Schema Value	Target Schema Value
REPLICATION TARGET IND	0	1
LOCAL ENVIRONMENT NAME	ENVA	ENVB
LOCAL SCHEMA NAME	cmx_ors_a	cmx_ors_b
LOCAL TRAIL PATH	D:/ggs/dirdat/ENVA/	D:/ggs/dirdat/ENVB/
PUMP RMTHOST	[target host name]	[source host name]
PUMP MGRPORT	[target goldengate mgr port, such as 9999]	[source goldengate mgr port, such as 9999]
REMOTE TRAIL PATH	D:/ggs/dirdat/ENVB	D:/ggs/dirdat/ENVA
REMOTE ENVIRONMENT NAME	ENVB	ENVA
REMOTE SCHEMA NAME	cmx_ors_b	cmx_ors_a
REGULAR_STREAM_ID	C	C
EVENT_QUEUE_ID	Q	Q
EXTRACT_PREFIX	E	E
REPLICAT_PREFIX	R	R

Note: The default values from the inserts for the ENVA and ENVB directory for C_REPOS_ZDT_STATUS must be sufficient for most environments.

Configure and Deploy the Data Stream

Configure and deploy the data stream on both systems.

1. In the command prompt, go to the following directory

   ```
   zdt_utility\bin
   ```

2. To deploy the ZDT setup, run the following command.

   ```
   sip_ant.bat deploy_zdt
   ```

3. From the ggsci prompt, run the `info all` command.

4. Verify that the `info all` summary displays four processes including the MGR process, each with a status of RUNNING.

   - Data extract processes have the prefixes E_. These processes extract data from the source system.
   - Data replication processes have the prefix R_. These processes replicate data on the target system.

   The following sample output shows that one replication process does not run:

   ```
   GGSCI (hostname) 13> info all

   Program     Status      Group       Lag           Time Since Chkpt

   MANAGER     RUNNING
   EXTRACT     RUNNING     E_ENVA       00:00:00      00:00:08
   REPLICAT    ABENDED     R_ENVB       169:25:21     00:00:02
   REPLICAT    RUNNING     R_ENVBU      00:00:00      00:00:07
   ```

If a process does not run, see the log files in the `ggs/dirrpt` directory. You have separate .dsc and .rpt files for each process. For more information about troubleshooting process errors, see the Oracle GoldenGate documentation for administrators.

CHAPTER 3

Removing ZDT Replication

This chapter includes the following topic:

Remove ZDT Replication on IBM Db2

You can remove Zero Downtime from your environment.

1. On the source sytsem, connect to GGSCI.
2. Log in and stop all processes. Substitute source system values for the example values.

```
GGSCI> DBLOGIN SOURCEDB srcdb USERID gg PASSWORD password
GGSCI> STOP *
```

3. Verify that all EXTRACT and REPLICAT processes are stopped.

```
GGSCI> INFO ALL
GGSCI> DELETE *
GGSCI> DELETE CHECKPOINTTABLE MDM_SAMPLE.GGS_EVENT_CHECKPOINT
GGSCI> DELETE CHECKPOINTTABLE MDM_SAMPLE.GGS_CHECKPOINT
GGSCI> STOP MGR
GGSCI> EXIT
```

4. If you installed Oracle GoldenGate as a Windows service, delete the service.

```
 INSTALL.EXE DELETEEVENTS DELETESERVICE
```

5. To reduce transaction log space use, run the following script:

```
--#SET TERMINATOR ~
CONNECT TO SRCDB USER gg USING password
~
SET SCHEMA MDM_SAMPLE
~
SET PATH MDM_SAMPLE, CURRENT PATH
~
SET SERVEROUTPUT ON
~
CALL DBMS_OUTPUT.ENABLE(1024000)
~
BEGIN
   DECLARE stmt VARCHAR(1000);
   FOR f1 AS c1 CURSOR WITH HOLD FOR
       SELECT
           TABSCHEMA,TABNAME,DATACAPTURE
       FROM
           SYSCAT.TABLES
       WHERE
           TABSCHEMA = CURRENT SCHEMA
           AND TYPE = 'T'
```

```
          AND DATACAPTURE <> 'N'
   DO
      SET stmt = 'ALTER TABLE '||TRIM(CURRENT SCHEMA)||'.'||f1.TABNAME||' DATA
CAPTURE NONE';
      CALL DBMS_OUTPUT.PUT_LINE(stmt);
      COMMIT;
   END FOR;
END
~
COMMIT
~
```

CHAPTER 4

Troubleshooting

This chapter includes the following topics:

Troubleshooting the installation

If you encounter issues while installing Zero Downtime (ZDT), clean your environment and try again. If the problem persists, contact Informatica Global Customer Support.

1. In the command line, run the `sip_ant.bat undeploy_zdt` command to clean the environment, uninstall the ZDT baseline, and remove ZDT replication.
2. To clean the passive environment, perform the following manual tasks:
   a. Remove all the files related to the environment.

```
<GoldenGate install directory>/dirchk
del *

<GoldenGate install directory>/dirdat
del enva/*
del envb/*

<GoldenGate install directory>/dirrpm
del e_env*.prm*
del *.def

<GoldenGate install directory>dirrpt
del *.dsc
del e_env*.rpt
del r_env*.rpt
del rqenv*.rp
```

   b. Remove the ZDT event queue in the environment.
3. Install ZDT.

Metadata validation fails

If the metadata validation fails, check all the tables ending in _STRP. If `NOLOGGING` is set to `1`, change it to `0`.

Replication is not working

If the deploy_zdt call does not complete, the ZDT replication might not work between the source and target databases.

1. Check that all the Oracle GoldenGate processes are running. Restart any processes that are not in the RUNNING state.
   In this example, ENVA contains the source database and ENVB contains the target database.

   ```
   EXTRACT RUNNING E_ENVA
   REPLICAT ABENDED R_ENVB
   REPLICAT RUNNING R_ENVBU
   ```

   In this example, the R_ENVB process is in the ABENDED state. Try restarting the process.
2. Insert an event directly into the C_REPOS_ZDT_EVENT_QUEUE table in the source database. Open the same table in the target database. If the event appears in the target database table, replication is working in this direction. Repeat the verification process from the target database to ensure that the replication works in the other direction as well.

   For example, the following code adds an event to the table on ENVA:
3. If the Oracle GoldenGate processes are running without errors, but the message queue replication is not working, you need to troubleshoot your environment. Navigate to the Oracle GoldenGate directory `dirrpt` and check the .rpt files for information about potential problems.
   For more information about replication issues, see the following Oracle articles on Metalink:
   1. Main Note - Oracle GoldenGate - Troubleshooting (Doc ID 1306476.1)
   2. Master Note - Oracle GoldenGate: Initial Load Techniques and References (Doc ID 1311707.1)
   3. DB Transactions Missing from Oracle GoldenGate Trail Files (Doc ID 1364852.1)
   4. POC for golden gate