

TWIN ADMINISTRATOR'S GUIDE



Attachmate®

**DATABridge™**



# DATABridge Twin

Version 6.2



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# About This Guide

This guide contains instructions for installing and configuring Attachmate DATABridge Twin. This preface includes information to help you use this guide.

To install, configure, and run this program, you should be a system administrator familiar with the following:

- Standard Unisys® operations for MCP-hosted mainframes such as the CS7xxx series, Libra series, ClearPath® NX/LX or A Series
- DMSII databases and Data And Structure Definition Language (DASDL)

## Conventions

This guide uses the following conventions and terms.

<b>Convention or Term</b>	<b>Used to indicate</b>
<code>this type style</code>	text you type filenames and folder names onscreen messages
<i>italic</i>	emphasis document titles variables
[square brackets]	command options For example, [ true   false ]. (Do not type the brackets.)
UPPERCASE	DMSII data set and data item names
<i>MCP server host mainframe</i> (terms)	Unisys ClearPath NX, LX or A Series mainframe
<i>DBEnterprise</i> (term)	DATABridge Enterprise Server
<i>DBServer</i> (term)	DATABridge Server

## Abbreviations

The following abbreviations are used throughout this guide and are provided here for quick reference.

<b>Abbreviation</b>	<b>Name</b>
AA	Absolute Address
ABSN	Audit Block Serial Number
AFN	Audit File Number

<b>Abbreviation</b>	<b>Name</b>
API	Application Programming Interface
DASDL	Data and Structure Definition Language
DMSII	Data Management System II
IDX	Index
MCP	Master Control Program
RPC	Remote Procedure Call
SEG	Segment
WFL	Work Flow Language

## Related Documentation

The following is a list of the documentation you might need to consult when using DATABridge Twin.

DATABridge Host	Before you can use DATABridge Twin, the DATABridge Host database replication software must be installed and operating on the primary system. Complete instructions are in the <i>DATABridge Installation Guide</i> , which is located in the DOCS folder on the DATABridge installation image or DVD.
DATABridge Plus	DATABridge Plus is a system library that offers near real-time access to DMSII audit files by enabling DATABridge to access the current audit file. It works with all DATABridge Accessories. You can find it and its documentation in the DOCS folder on DATABridge installation image or DVD.
Unisys Mainframe	You should have available documentation for the Unisys ClearPath NX/LX series or A Series, DMSII, WFL, and CANDE. This guide lists only general instructions. If you are not completely familiar with DMSII configuration, for example, you may need to refer to the Unisys documentation.

# CHAPTER 1

## Introduction

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## Introducing DATABridge Twin

DATABridge Twin is a mainframe program that replicates (clones and then updates) a DMSII database as another DMSII database.

The original DMSII database is called the primary database, and it is typically a production database. The clone of the primary DMSII database is called the secondary database, and it typically resides on a development or departmental mainframe. Updates to the primary database are applied to the secondary database as DMSII audit becomes available.

**Primary System** The primary system is the mainframe that contains the original DMSII database. The primary system must contain the DATABridge database replication software. (For an explanation of the DATABridge Accessories, see *Accessories* (page [49](#)) or refer to the *DATABridge Host Administrator's Guide*.)

If you have only one mainframe, the primary system is distinguished by the usercode under which the original DMSII database resides.

**Secondary System** The secondary system is the mainframe that contains the clone of the DMSII primary database. The secondary system does not require a DATABridge database replication software installation. It does, however, require the DATABridge Twin software. For a list of software components, see *DATABridge Twin Components* (page [10](#)).

If you have only one mainframe, the secondary system is distinguished by the usercode under which the secondary DMSII database resides.

**Primary Database** The primary database is always the original DMSII database.

**Secondary Database**

The secondary database is a clone or copy of the primary database except that it may or may not contain the entire contents of the primary database. In all other respects, however, it is a complete DMSII database with its own CONTROL, DESCRIPTION, and audit files.

The secondary database is typically used only for queries and not updates. Some of the query workload can be offloaded from the primary system to the secondary system. Only the DATABridge Twin Engine updates the secondary database, and the audit files reflect the replication updates from the primary database.

## How DATABridge Twin Works

Following is a simplified description of the flow of data between the primary and secondary DMSII databases. This description starts after all of the necessary DATABridge database replication software and DATABridge Twin components are correctly installed and configured.

1. The DATABridge Twin program (secondary system) calls DATABridge Server (primary system).
2. DATABridge Server initiates DATABridge Engine to retrieve updated information from the audit trail. DATABridge Server then sends the updated information to the DATABridge Twin Engine.

---

Note: By default, DATABridge Engine processes only closed audit files. However, if you set the Read Active Audit option to true in the DATABridge Engine parameter file, DATABridge Engine can also process the current audit file. Refer to the *DATABridge Plus Administrator's Guide* for more information about DATABridge Plus.

To determine how long DATABridge Twin waits before checking for available audit files, use the RETRY and MAXWAIT options in the DATABridge Twin parameter file. Also note that you can use the DBAuditTimer utility (primary system) to close the current audit file periodically. The DBAuditTimer utility is explained in the *DATABridge Host Administrator's Guide*.

---

3. When the DATABridge Twin Engine receives the audit file data, it does the following:
  - Updates the secondary database (LOCK, STORE, and DELETE).
  - Prior to commits, updates either the restart data set or the DBTWINCONTROL data set (whichever is in use) in the secondary database.

To avoid recompiling the DATABridge Twin Engine when the primary database layout changes, LOCK, STORE, and DELETE are not the actual verbs. Instead, they are calls to the same routines in the Accessroutines that a COBOL program would call. Therefore, all of the usual operations apply to DATABridge Twin, such as the possibility for DEADLOCKS, auditing all updates, etc.

The following DATABridge Twin features are available:

- REDUNDANT UPDATES, a configuration parameter, specifies whether updates already present in the secondary database should be applied anyway, or discarded.

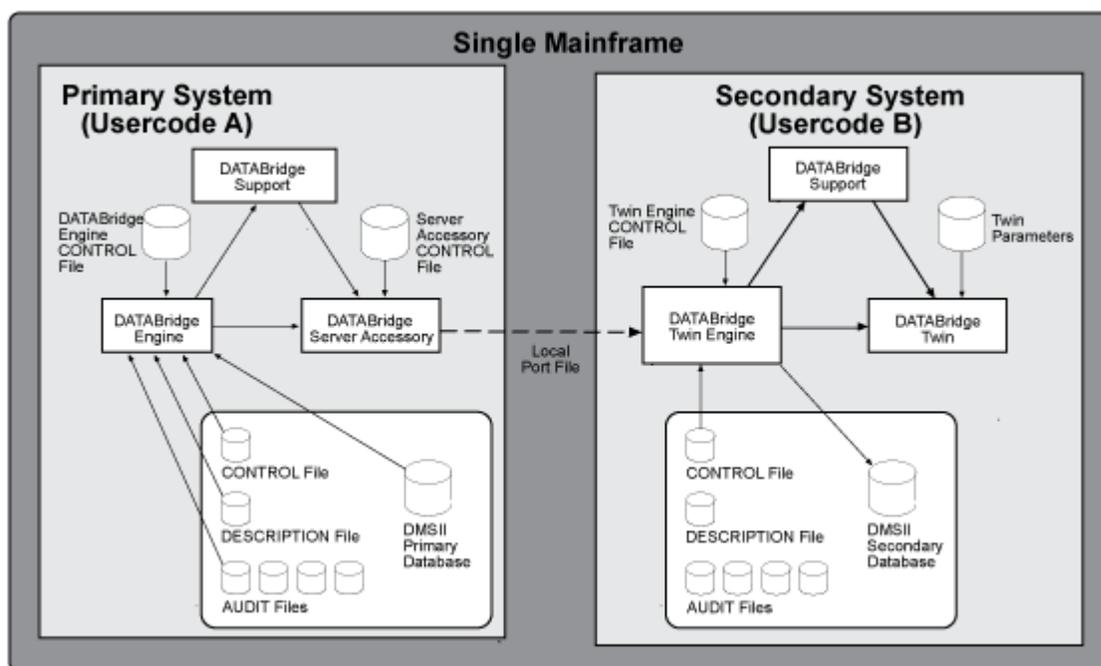
See the *Sample DATABridge Twin Parameter File* (page [30](#)) for details.

- The tailored support library on the secondary database will apply reformatting specified in an ALTER command. Reformatted data items must be the same size and type as the original item, and virtual items are not allowed.
- DATABridge Twin writes the audit location and record contents to the report file for any record it cannot find in the client database. By default, DATABridge Twin writes report files to the DBBD/RUN/TWIN directory on the normal printer backup disk.

## Primary and Secondary Database Locations

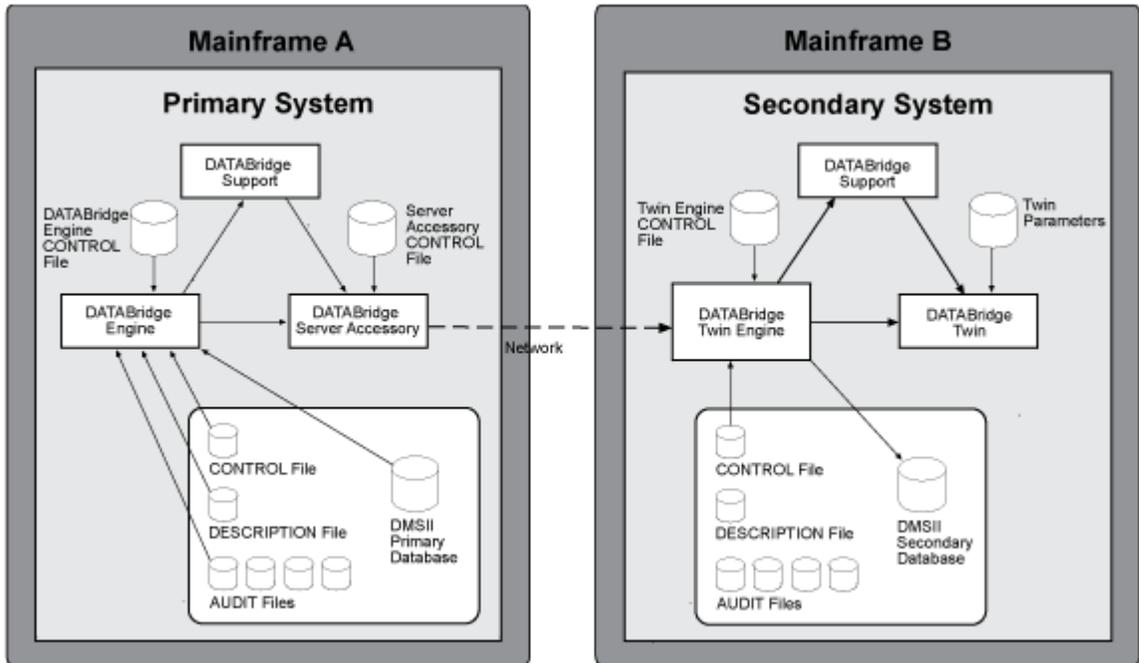
The primary database and the secondary database can reside on the same mainframe or on separate mainframes. If the databases are on the same mainframe, they are differentiated by their usercodes. The primary and secondary systems communicate via a port file.

The following diagram shows a typical installation of the DATABridge Host and DATABridge Twin software on a single mainframe.



If the databases are on separate mainframes, the two mainframes communicate via port files over a BNA, HLCN, or TCP/IP network. Further, the DMSII levels must match on both mainframes.

The following diagram shows a typical installation of the DATABridge Host and DATABridge Twin software on separate mainframes.



When the databases are on separate mainframes, the primary and secondary databases must use the same pack names. Even though the primary and secondary databases physically reside on separate mainframes, the secondary database pack name *must be the same as that on the primary system*.

The following table summarizes the usercode and pack requirements:

**Primary and Secondary Databases on Same Mainframe**

Use a different usercode for each database. For example, the primary database might be under usercode (PRIMARY), and the secondary database might be under (SECONDARY).

Use the same physical pack for both databases. For example, both databases might reside ON DBPACK.

**Primary and Secondary Databases on Separate Mainframes**

You can use the same usercode or a different one for the primary and secondary databases.

Use the same pack names, even though the databases are on physically different mainframes. For example, if the primary database pack is named PRODUCTS, then the secondary database must also reside on a pack named PRODUCTS.

## DATABridge Twin Components

As shown in the previous diagrams, DATABridge Twin consists of the following components:

Component	Description
DATABridge Server (on the mainframe)	The DATABridge Server program calls the DATABridge Engine (also on the mainframe), which reads the CONTROL and audit files on the primary system. When requested, DATABridge Server sends the updates to the DATABridge Twin Engine running on the secondary system.
DATABridge Twin	The DATABridge Twin program reads the database dump and creates the secondary database. It is also a shell for calling the DBUPDATETWIN entry point in the DATABridge Twin Engine, which updates the secondary database.
DATABridge Twin Engine	The DATABridge Twin Engine is a subset of the full DATABridge Engine. The DATABridge Twin Engine has the same file name as the full DATABridge Engine (OBJECT/ DATABRIDGE/ENGINE). It does not require registration as an SL.
DATABridge Support Library (on the mainframe)	The Support Library on the secondary system is the same as the Support Library on the primary system, except that you cannot use column filtering, complex ALTERs, or VIRTUALs. You can use the Support Library to filter the records coming from the primary system so that only certain records are replicated.
DATABridge Plus	(Not shown) DATABridge Plus can be used with DATABridge Twin through Server Accessory to supply updates at near real-time from the current primary audit file. Refer to the <i>DATABridge Plus Administrator's Guide</i> for more information about DATABridge Plus.



## CHAPTER 2

# Installing DATABridge Twin

### In this Chapter

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This chapter explains how to install or upgrade DATABridge Twin. DATABridge Twin must be installed on both the primary and secondary systems.

## Installation Requirements

Installing DATABridge Twin may require that you bring down the primary DMSII database one time. Therefore, it is essential that you plan the installation for a time when this is possible.

You must install the DATABridge Host 6.2 software to your primary system before you install DATABridge Twin 6.2. Refer to the *DATABridge Host Administrator's Guide* for installation instructions.

DATABridge Twin runs on all Unisys MCP-hosted mainframes.

For DATABridge Twin to work properly, your primary and secondary system must have MCP level SSR 49.1 or later.

If you plan to use DATABridge Twin on separate mainframes:

- It is recommended that both mainframes use the same MCP level.
- Both mainframes must be running the same DMSII level.
- DATABridge Twin does not support embedded data sets. Any embedded data sets will be empty in the secondary database.
- DATABridge Twin does not support data sets with an RSN (Record Serial Number) data item. In general, a record's RSN in the secondary database will differ from the same record's RSN in the primary database. Any sets that use the RSN data item as a key item will return a different record in the secondary database than in the primary database. If a data item in a data set contains the RSN of another record it will, in general, refer to a different record in the primary database than in the secondary database.
- DATABridge Twin will not return an error if a data set has a visible RSN data item, but the results are unpredictable.

## Installation Overview

Part of the planning for installation involves determining the usercodes and packs to which you will install DATABridge Twin. Use the following table as a guide:

<b>If...</b>	<b>Then...</b>
The primary and secondary database will reside on the same mainframe	<p>You must have two separate usercodes—one for the primary database and one for the secondary database.</p> <p>Plan to use the same pack for both the primary and secondary database.</p>
The primary and secondary database will reside on separate mainframes	<p>You can use the same usercode or a different one for the primary and secondary databases.</p> <p>Use the <i>same pack names</i>, even though the databases are on different mainframes. For example, if the primary database pack is named PRODUCTS, then the secondary database must also reside on a pack named PRODUCTS.</p>

Plan the installation so that you can take the primary database down once during the installation if you need to add the DBTWINCONTROL data set or if you are using a new logical database. The installation process can take several hours, especially if you perform the initial clone immediately after the installation.

Keep in mind that the amount of time required depends on several factors, including the size of the DMSII database you are replicating and the type of mainframes you are using.

## Before You Upgrade

If you made changes to any of the following files, note those changes now. The installation WFL overwrites these files; therefore, when the installation WFL finishes, you may want to update the new files to match the settings in the previous ones.

### Secondary System

WFL/DATABRIDGE/TWIN

Option	Your Setting
QUEUE =	
STARTTIME =	
BDNAME =	

DATA/GENFORMAT/SAMPLE/CONTROL—Most sites will not be using this file. If you are, make sure that you keep a record of all of the changes you have made because the file will be overwritten. After the upgrade installation, you must recompile your SUPPORT libraries. This procedure is explained in the *DATABridge Host Administrator's Guide*.

## Upgrade DATABridge Twin

If you have a previous version of DATABridge Twin installed, use the following procedure to upgrade it to version 6.2.

### To upgrade

- If you made any changes to the following files, note the changes:
  - WFL/DATABRIDGE/COMP
  - WFL/DATABRIDGE/TWIN
  - DATA/GENFORMAT/SAMPLE/CONTROL

See *Before You Upgrade* (page [15](#)).
- On the primary system, configure the options in the DATABridge Server parameter file. For instructions, refer to the *DATABridge Host Administrator's Guide*. The CLONE command requires the Source settings for DATABridge Server to include the following:
 

```
TRANSFORM=RAWFORMAT
```
- If it is not already running, run DATABridge Server under the usercode that contains the DATABridge database replication software, as follows:
 

```
START WFL/DATABRIDGE/SERVER
```

### Complete the following steps on the secondary system

- Bring down DATABridge Twin, as follows:
 

```
mixnumber AX QUIT
```

where *mixnumber* is the mix number of OBJECT/DATABRIDGE/ TWIN.

- 2 Copy the installation WFL from the installation image, as follows:

If you are installing from the DVD, use the following command:

```
WFL UNWRAP *WFL/DATABRIDGE/INSTALL AS WFL/DATABRIDGE/INSTALL OTOF *INSTALL
FROM DATABRIDGE (CD) TO DISK (RESTRICTED = FALSE)
```

*It is recommended that you install to a privileged usercode.* If you install from DVD to a nonprivileged usercode, all object files will be marked as restricted, which causes the installation WFL to pause (step 6).

- 3 Start the installation WFL, as follows:

```
START WFL/DATABRIDGE/INSTALL ("SECONDARY", "familyname")
```

where *familyname* is the name of the pack where the existing DATABridge Twin software resides.

- 4 When prompted, enter the access code (same as license key) located on the DATABridge Host installation package.

If the installation WFL pauses, continue with step a. *Otherwise, proceed to step 7.*

If you installed from DVD to a nonprivileged usercode and the installation WFL is paused, you must unrestrict OBJECT/DATABRIDGE/KEYENTRY, as in this example:

```
RESTRICT -FILE (ENGR)OBJECT/DATABRIDGE/KEYENTRY ON PRODUCTION
```

- a) After you have unrestricted OBJECT/DATABRIDGE/KEYENTRY, transmit mixnumberOK to the install WFL job.

OBJECT/DATABRIDGE/KEYENTRY now runs.

- b) When prompted, enter the access code (same as license key) located on the DATABridge host installation package.
- c) After the installation WFL completes, mark all of the DATABridge object files as unrestricted by entering the following from either the ODT or from a privileged usercode in MARC:

```
RESTRICT -FILE objectfilename
```

- 5 If you changed options in the following files on the secondary system, update the new files to match your original settings.

```
WFL/DATABRIDGE/COMP
WFL/DATABRIDGE/TWIN
DATA/GENFORMAT/SAMPLE/CONTROL
```

- 6 Get the DATABridge Twin parameter file using CANDE, as follows:

```
GET DATA/TWIN/SAMPLE/CONTROL AS DATA/TWIN/databasename/CONTROL
```

where *databasename* is the name of the secondary database. If you are using a logical database, enter the logical database name in place of *databasename*.

- 7 Modify and then save the DATABridge Twin parameter file (DATA/TWIN/databasename/CONTROL) to reflect settings for your site. See *DATABridge Twin Parameter File* (page [30](#)) for more information.

- 8 If you previously created tailored support libraries for filtering, recompile the support libraries. Instructions are in the *DATABridge Host Administrator's Guide*.

- 9 Start DATABridge Twin, as follows:

```
START WFL/DATABRIDGE/TWIN ("secondarydatabasename" [,
"logicaldatabasename"])
```

<b>Where</b>	<b>Is</b>
<i>secondarydatabasename</i>	The replicated DMSII database.
<i>logicaldatabasename</i>	The DMSII logical database you are replicating. If you are not replicating a logical database, do not enter text for <i>logicaldatabasename</i> . This is an optional parameter and if omitted defaults to an empty string.

You can now use DATABridge Twin.

## Install DATABridge Twin to the Primary System

Use this procedure to install DATABridge Twin to the primary system.

### To install

- 1 Sign on to the primary database.
- 2 Determine if your restart data set has a non-key data item that is least 18 bytes long and includes both of the following:
  - One data item (either key or nonkey) at least 6 bytes long.
  - Two nonkey data items each at least 6 bytes long OR one nonkey data item at least 12 bytes long.

If...	Then...
Yes and you do <i>not</i> want to add any new logical databases for DATABridge Twin to use	Go to step 8.
Yes and you do want to add a new logical database for DATABridge Twin to use	Go to step 3.
No	Complete the remainder of this step.

If your restart data set does not meet the above requirements, then you must place `PATCH/DATABRIDGE/TWIN/DASDL` into the primary database DASDL source (the patch defines a data set called `DBTWINCONTROL` and is explained in *DBTWINCONTROL Data Set* (page [20](#))).

Place the patch file into your DASDL as you would any other data set, using one of the following techniques:

- Use the `CANDE INSERT` command to insert the text.
  - Put `$INCLUDE "PATCH/DATABRIDGE/TWIN/DASDL"` in the DASDL source.
- 3 (Optional) If you want to replicate only part of the primary database, declare a logical database that lists the data sets you want to replicate.

If you previously defined a logical database in the DASDL, you can use that DASDL in step 4. However, if you included the `DBTWINCONTROL` patch, make sure you enter the data set name `DBTWINCONTROL` in the data sets list for the logical database.

- 4 Compile the DASDL for an UPDATE.

Follow the procedures you normally use at your site, such as backing up the `DESCRIPTION/databasename`, `DMSUPPORT/databasename`, and `databasename/CONTROL` files. Then compile the DASDL. Here's an example using `CANDE`:

```
COMPILE AS $databasename WITH DASDL
```

A new `DESCRIPTION` file is created.

---

Important: This is an update, not a reorganization. You do not have to recompile any other applications that use this database.

---

- 5 Check your DASDL for ZIP and DMCONTROL settings.

If they are both set, skip to step 6. Otherwise, use the following table to determine what you must do. Note that you must do the following manually.

<b>If your DASDL contains...</b>	<b>Enter this</b>
\$ RESET ZIP	START DATABASE/WFL/COMPILEACR ("DB= <i>databasename</i> AUDIT=SET")
\$ RESET DMCONTROL	RUN *SYSTEM/DMCONTROL ("DB= <i>databasename</i> UPDATE");

At this point, your DASDL is compiled and you have new software for your database and a new DMSII CONTROL file. Next, if your DASDL does not contain \$ SET INITIALIZENEW, you must run DMUTILITY to initialize the DBTWINCONTROL data set.

- 6 Bring down the primary database. Do this as you normally would at your site.
- 7 Complete this step only if you added the DBTWINCONTROL data set, and your DASDL does not contain \$ SET INITIALIZENEW; otherwise skip to step 8. Run DMUTILITY by entering the following:

```
RUN $SYSTEM/DMUTILITY ("DB=databasename INITIALIZE DBTWINCONTROL");
```

where *databasename* is the name of the primary database.

DMUTILITY inserts the DBTWINCONTROL data set into the primary database. The next time a program opens the database for updating, DMSII will open a new audit file.

At this point, you can allow application programs to use the primary database as usual.

- 8 Copy the DASDL source and DESCRIPTION/*databasename* file to the usercode and pack of the secondary system.
- 9 Modify the DATABridge Server parameter file (DATA/SERVER/CONTROL) to reflect the settings for your site. The Source to which DATABridge Twin connects must not include any of the following options:

NOTIFY

AUDIT JOB

FILTER

STOP

PREFILTERED

**Important:** The Source setting in the DATABridge Server parameter file (DATA/SERVER/CONTROL) must include the following option:

```
TRANSFORM=RAWFORMAT
```

Confirm this setting, modify any other part of the file to reflect the settings for your installation, and SAVE the file.

Refer to DATABridge Server in the *DATABridge Host Administrator's Guide* for more instructions.

- 10 If DATABridge Server is not already running, enter the following CANDE command to start it:

START WFL/DATABRIDGE/SERVER

When installation is complete, proceed with the installation process on the secondary system. See *Install DATABridge Twin to the Secondary System* (page 20).

## DBTWINCONTROL Data Set

The information in this section explains the DBTWINCONTROL data set as mentioned in step 2.

DBTWINCONTROL contains audit locations that are maintained on a structure-by-structure basis. Ultimately, the DBTWINCONTROL data set will reside in both the primary and the secondary databases, although the DBTWINCONTROL data set is always empty in the primary database. In the secondary database, it can contain a record for each data set you clone from the primary database to the secondary database.

DBTWINCONTROL keeps track of the respective audit locations for each data set cloned from the primary database. Typically, one global record keeps track of all of the data sets that are in normal mode (indicated by the number 2 in DBTWIN-MODE) and up-to-date.

Data sets that are not in normal mode have their own record that reflects their mode (for example, 3 for reorganization or 4 for purged). This situation is rare, however. The majority of the time, DBTWINCONTROL will have only the global record. (For an explanation of normal and other modes, see the *DATABridge Host Administrator's Guide*.)

```
% DATABRIDGE TWIN ADDITIONS
DBTWINCONTROL DATASET
(
DBTWIN-STRNUM REAL (S11) INITIALVALUE 0;
DBTWIN-RECTYPE REAL (S11) INITIALVALUE 0;
DBTWIN-AFN REAL (S11) INITIALVALUE 0;
DBTWIN-ABSN REAL (S11) INITIALVALUE 0;
DBTWIN-SEG REAL (S11) INITIALVALUE 0;
DBTWIN-INX REAL (S11) INITIALVALUE 0;
DBTWIN-TIME REAL INITIALVALUE 0;
DBTWIN-MODE REAL (S11) INITIALVALUE 0;
DBTWIN-FORMAT-LVL REAL (S11) INITIALVALUE 0;
DBTWIN-TABLE-LVL REAL (S11) INITIALVALUE 0;
DBTWIN-ITEM-COUNT REAL (S11) INITIALVALUE 0;
), BLOCKSIZE = 30 RECORDS;
DBTWINSET          SET OF DBTWINCONTROL
KEY (DBTWIN-STRNUM,
      DBTWIN-RECTYPE)
NO DUPLICATES;
```

## Install DATABridge Twin to the Secondary System

Use this procedure to install DATABridge Twin to the secondary system.

**Caution:** If you run DATABridge Twin and the DATABridge Host software on the same mainframe, the usercode from which you run DATABridge Twin must be different than the usercode where the DATABridge Host software resides.

## To install

- 1 Complete *Install DATABridge Twin to the Primary System* (page [18](#)).
- 2 Sign on to the secondary system.
- 3 Copy the DATABridge Twin installation WFL from the release medium to the usercode and pack from which you plan to run DATABridge Twin. Installing from the DVD, use the following command:

```
WFL UNWRAP *WFL/DATABRIDGE/INSTALL AS      WFL/DATABRIDGE/INSTALL OUTF
*INSTALL FROM      DATABRIDGE (CD) TO DISK (RESTRICTED = FALSE)
```

*It is recommended that you install to a privileged usercode.* If you install from DVD to a nonprivileged usercode, all object files will be marked as restricted, which causes the installation WFL to pause (step 4).

- 4 Run the DATABridge Twin installation WFL as follows:

```
START WFL/DATABRIDGE/INSTALL
      ("SECONDARY"[, "familyname"])
```

where *familyname* is an optional parameter that specifies the name of the pack to which you want to install DATABridge Twin. If you use this parameter, do not type the [brackets], but do type the quotation marks. If you do not specify a family name, the default is DISK.

Depending on your family substitution statement, however, the files may be copied to a pack with a name different from DISK.

- 5 When prompted, enter the access code (same as license key) located on your DATABridge Host DVD package. (If you want to install an evaluator copy, enter the evaluation code located on your DATABridge Host DVD package.)

If the installation WFL pauses, continue with step a. *Otherwise, proceed to step 5.*

- a) If you installed from DVD to a nonprivileged usercode and the installation WFL is paused, you must unrestrict OBJECT/DATABRIDGE/KEYENTRY, as in this example:

```
RESTRICT -FILE (ENGR)OBJECT/DATABRIDGE/KEYENTRY ON PRODUCTION
```

- b) After you have unrestricted OBJECT/DATABRIDGE/KEYENTRY, transmit `mixnumberOK` to the install WFL job.

OBJECT/DATABRIDGE/KEYENTRY now runs.

- c) When prompted, enter the access code (same as license key) located on your DATABridge Host DVD package.

- d) After the installation WFL completes, mark *all* of the DATABridge object files as unrestricted by entering the following from either the ODT or from a privileged usercode in MARC:

```
RESTRICT -FILE objectfilename
```

- 6 Modify the DASDL source file you copied from the primary system (step 8), as follows:

- Set the INDEPENDENTTRANS option if it is not already set.
- Reset the DMCONTROL \$ option if it is not already reset.
- If the secondary database will have a different usercode than the primary database, change the usercode to match the secondary database. Do this in the CONTROL file physical attributes section of the secondary database DASDL, as in the following CONTROL file excerpt:

```
CONTROL FILE ATTRIBUTES
(
USERCODE = secondarydatabaseusercode
);
```

- If the DASDL is set to INITIALIZE, change it to UPDATE.
- If you are using guardfiles to protect the database, change the guardfile titles as necessary for the secondary database. This is recommended so that no program other than DATABridge Twin updates the database.
- If the DASDL specifies a usercode in the title for DMSUPPORT, change it to the usercode of the secondary database.
- If the DASDL specifies a usercode in the title for RECONSTRUCT, change it to the usercode of the secondary database.

7 Compile the DASDL for an UPDATE.

Follow the procedures you normally use at your site. Here's an example using CANDE:

```
COMPILE AS $databasename WITH DASDL
```

A new DESCRIPTION file is created.

8 If the DASDL contains \$ RESET ZIP, then compile the DMSUPPORT and RECONSTRUCT programs using the following command:

```
START DATABASE/WFL/COMPILERACR ("DB=databasename AUDIT=SET")
```

where *databasename* is the name of the database.

9 Verify that all of the secondary system files were installed. For a list of these files, see *Installation Results for the Secondary System* (page [22](#)).

When installation is complete, proceed to *Configure DATABridge Twin on the Secondary Database* (page [25](#)).

## Installation Results for the Secondary System

The following is a list of files that are installed on the secondary system. These files are copied to the secondary system via the DATABridge Twin installation WFL:

<b>File Name</b>	<b>Description</b>
OBJECT/DATABRIDGE/ENGINE	<b>Required.</b> This is the object file for the DATABridge Twin Engine, which is a subset of the full DATABridge Engine.
DATA/ENGINE/SAMPLE/CONTROL	<b>Required.</b> This data file contains the keys to run the DATABridge Twin Engine.
WFL/DATABRIDGE/TWIN	<b>Required.</b> These are the WFL and object files for the DATABridge Twin program. DATABridge Twin is a shell for calling the DATABridge Twin Engine. The WFL starts the DATABridge Twin program.
OBJECT/DATABRIDGE/TWIN	

OBJECT/DATABRIDGE/SUPPORT	<b>Required.</b> This object file filters records coming from the primary system so that only certain records are replicated.
OBJECT/DATABRIDGE/DBINFO	DBInfo creates reports about your DMSII database. For DATABridge Twin Engine, only the DBInfo normal mode is supported because the DATABridge Twin Engine does not provide access to the audit file.  For instructions on DBInfo, see the <i>DATABridge Host Administrator's Guide</i> .
DATA/TWIN/SAMPLE/CONTROL	<b>Required.</b> This DATABridge Twin parameter file provides information to the DATABridge Twin program on where and how to locate the Server Accessory SOURCE for the primary database.
WFL/DATABRIDGE/COMP	<b>Optional.</b> These files are needed for compiling the Support Library.
SYMBOL/DATABRIDGE/SUPPORT	
OBJECT/DATABRIDGE/ GENFORMAT	
DATA/GENFORMAT/SAMPLE/ CONTROL	
SYMBOL/DATABRIDGE/INTERFACE	<b>Optional.</b> This file supplies the API for the DATABridge Engine. It is required for compiling the Support Library.
WFL/DATABRIDGE/INCLUDE/ DBTITLE	<b>Required.</b> This WFL source file is required for running any DATABridge WFL. It parses the database name you enter when you start the WFL
PATCH/DATABRIDGE/TWIN/DASDL	<b>Optional.</b> This file is required if you use the INCLUDE statement in your DASDL instead of inserting the contents of this patch file into the DASDL.  If you use an INCLUDE statement to include this file in the DASDL, you must copy this file to both the primary and the secondary systems.
WFL/DATABRIDGE/TWININITIALIZE	If you run this WFL, it starts WFL/ DATABRIDGE/TWIN with the LOAD command. <hr/> <hr/> <b>Note:</b> This feature is deprecated, but still operates to support legacy use. <hr/>
WFL/DATABRIDGE/INSTALL	<b>Required.</b> This WFL is required for installing DATABridge Twin.
DATA/TWIN/README	<b>Optional.</b> This file is a CANDE text file that lists important notices and last minute information about DATABridge Twin.

After you have verified the files, you are ready to configure DATABridge Twin for the secondary database and then perform the initial clone of the primary database. You can do this immediately after installation, or you can wait until you are ready for the replication process.

To replicate the primary database, see *Replicating a Database* (page [33](#)).

## CHAPTER 3

# Configuring DATABridge Twin

### In this Chapter

Configure DATABridge Twin for the Secondary Database	<a href="#">25</a>
DATABridge Twin Parameters	<a href="#">26</a>
Sample DATABridge Twin Parameter File	<a href="#">30</a>

This chapter explains how to configure DATABridge Twin.

## Configure DATABridge Twin for the Secondary Database

Use this procedure to configure DATABridge Twin. When configuring the DATABridge Twin parameter file, note the following:

- You can list the options in the parameter file in any order.
- You can list multiple options on a single line.
- You can split options across multiple lines.
- If you name any entry the same as a parameter file keyword, enclose the name in quotation marks. For example, if you create a filter named SUPPORT (which is also the name of a keyword in the DATABridge Twin parameter file), enclose SUPPORT in quotation marks as follows:

```
FILTER "SUPPORT"
```

### To configure Twin

- 1 On the secondary system, get the DATABridge Twin parameter file using CANDE, as follows:

```
GET DATA/TWIN/SAMPLE/CONTROL AS DATA/TWIN/databasename/CONTROL
```

where *databasename* is the name of the secondary database. If you are using a logical database, enter the logical database name in place of *databasename*.

- 2 Modify the DATABridge Twin parameter file (`DATA/TWIN/databasename/CONTROL`) to reflect settings for your site. For a sample configuration file, see *Sample DATABridge Twin Parameter File* (page [30](#)).
- 3 Save the DATABridge Twin parameter file.

## DATABridge Twin Parameters

Each parameter in the DATABridge Twin parameter file is explained, as follows.

### SOURCE

**Required.** The SOURCE parameter is a four-part parameter that enables DATABridge Twin to link up with DATABridge Server. The syntax of the SOURCE parameter is as follows:

```
SOURCE sourcename AT host VIA protocol PORT portnumber
```

Where	Is
<i>sourcename</i>	Your entry for the SOURCE option in the DATABridge Server parameter file. The SOURCE option in the DATABridge Server parameter file is a unique name that is assigned to the primary database.
<i>host</i>	One of the following for the mainframe where DATABridge Server resides: <ul style="list-style-type: none"> <li>▪ TCP/IP—The host name or the IP address</li> <li>▪ BNA—The host name</li> <li>▪ HLCN—The net access point</li> </ul>
<i>protocol</i>	Your network protocol, TCPIP, BNA, or HLCN.
<i>portnumber</i>	The DATABridge Server port number (if using TCP/IP) or name (if using BNA or HLCN).

### SUPPORT

**Optional.** Enter the name of the Support library you want to use for replicating the primary database. The default support library is OBJECT/DATABRIDGE/SUPPORT. If you create a tailored support library for the secondary database, however, enter that file name instead. For an explanation of the Support Library and instructions on creating your own tailored support library, refer to the *DATABridge Host Administrator's Guide*.

### FILTER

**Optional.** Enter the name of the filter you want to use. The filter prohibits replication of certain records into the secondary database. (Note that DATABridge Twin ignores any column filtering.) You must create and name a filter and compile it in the tailored support library before you can enter a filter here. For instructions, refer to the *DATABridge Host Administrator's Guide*.

### RETRY

**Required.** The default is 60 seconds. Enter the number of seconds you want DATABridge Twin to wait before it retries its audit check. If more audit is unavailable, DATABridge Twin will wait this many seconds before it tries to read more audit again.

## MAXWAIT

**Required.** The default is 0 seconds. Enter the maximum number of seconds you want DATABridge Twin to wait for more audit to become available. Since DATABridge Twin is designed to run continuously, you can enter 0 (zero, which is the default) to indicate there is no limit to the waiting time.

When you enter a value, DATABridge Twin will try to access more audit every *nn* seconds, where *nn* is the value of the RETRY option. If the MAXWAIT time expires before more audit becomes available, DATABridge Twin terminates on the secondary system. Once DATABridge Twin terminates, you must restart it manually. See *DATABridge Twin Commands* (page 42) for instructions.

## STOP

**Optional.** Use this command when you want to run DATABridge Twin for limited times or at specific times (versus running it continuously).

You can stop DATABridge Twin at a specified quiet point. The quiet point can be before or after a specified time, day, or program. For example, if you wanted to limit daily transactions to only those processed before 4:00 P.M., you would configure the STOP command to stop processing at the last quiet point before 4:00 P.M. Once DATABridge Twin terminates, you must restart it manually. See *DATABridge Twin Commands* (page 42) for instructions.

---

Note: Time in the STOP command refers to the time the update occurred on the primary system, not the current time of day.

The “+/- days” are in relation to the DATABridge Twin start date. For example, when DATABridge Twin starts, it calculates an Audit location STOP date based on the current date plus or minus the “+/- days” parameter. DATABridge Twin stops when it reaches an Audit location from the primary system with this calculated date.

---

Syntax:

Use one of the following examples of syntax when entering a STOP command:

```
STOP before_or_after timedate
STOP [before_or_after "taskname" OR] before_or_after timedate
```

where *before\_or\_after* is either the word BEFORE or AFTER and *timedate* or *taskname* is a value from the following table. If you specify a *taskname*, you must also specify a *timedate*.

<i>timedate</i> or <i>taskname</i> Value	Sample Entry
<i>hh:mm</i>	STOP BEFORE 22:30  This command informs DATABridge Twin to stop processing at the last quiet point before 10:30 P.M.
<i>hh:mm AM</i>	STOP AFTER 10:30 AM  This command informs DATABridge Twin to stop processing at the first quiet point after 10:30 A.M.

## DATABridge Twin

<i>hh:mm</i> PM	STOP BEFORE 9:45 PM  This command informs DATABridge Twin to stop processing at the last quiet point before 9:45 P.M.
<i>hh:mm + days</i>	STOP BEFORE 22:30 + 1  This command informs DATABridge Twin to stop processing at the last quiet point before 10:30 P.M. tomorrow.
<i>hh:mm - days</i>	STOP AFTER 22:30 - 1  This command informs DATABridge Twin to stop processing at the first quiet point after 10:30 P.M. yesterday.
<i>hh:mm</i> AM + <i>days</i>	STOP BEFORE 10:30 AM + 1  This command informs DATABridge Twin to stop processing at the last quiet point before 10:30 A.M. tomorrow.
<i>hh:mm</i> PM - <i>days</i>	STOP AFTER 10:30 PM - 1  This command informs DATABridge Twin to stop processing at the first quiet point after 10:30 P.M. yesterday.
<i>hh:mm</i> ON <i>mm/dd/yyyy</i>	STOP BEFORE 13:30 ON 12/9/2012  This command informs DATABridge Twin to stop processing at the last quiet point before 1:30 P.M. on December 9, 2012.
<i>hh:mm</i> AM ON <i>mm/dd/yyyy</i>	STOP BEFORE 10:30 AM ON 12/9/2012  This command informs DATABridge Twin to stop processing at the last quiet point before 10:30 A.M. on December 9, 2012.
<i>hh:mm</i> PM ON <i>mm/dd/yyyy</i>	STOP AFTER 9:30 PM ON 12/9/2012  This command informs DATABridge Twin to stop processing at the first quiet point after 9:30 P.M. on December 9, 2012.
" <i>taskname</i> " or <i>timedate</i>	STOP AFTER "OBJECT/SAVINGS/POSTING" OR BEFORE 8:15 PM  This command informs DATABridge Twin to stop processing at the first quiet point after the EOT of task name "OBJECT/SAVINGS/POSTING" or at the last quiet point before 8:15 P.M., whichever occurs first.

Keep in mind the following when using the STOP command:

- The STOP command terminates DATABridge Twin (it takes DATABridge Twin out of the mix). To get DATABridge Twin back into the mix, you must manually start DATABridge Twin. See *Start DATABridge Twin* (page [33](#)).

- If a STOP BEFORE "*taskname*" command is specified, DATABridge Twin will stop at the quiet point *before* the task did an OPEN UPDATE on the database. If the task opened the database more than once, DATABridge Twin will stop at the last quiet point before the first open.
- If a STOP AFTER "*taskname*" command is specified, DATABridge Twin will stop at the quiet point *after* the task closed the database. If the task opened the database more than once, DATABridge Twin will stop at the first quiet point after the first close.
- If more than one "*taskname*" is specified, only the last one specified is used. Similarly, if more than one *timedate* is specified, only the last *timedate* specified is used.

## FIND

**Optional.** Normally, DATABridge Twin uses the set that does not allow duplicates and contains the fewest number of key elements to find a data set record to update. In situations where a data set has subsets but no sets, you can use this option to tell DATABridge Twin which subsets to use to locate records.

Enter the subsets to use when searching for a data set record when there is no set available. Use the following syntax when entering a FIND command:

```
FIND dataset USING subsetlist
```

where *dataset* is the data set DATABridge Twin is searching for, and *subsetlist* is the list of subsets you want DATABridge Twin to search.

For example, to search the POSTDAY, POSTUSR, and POSTBATCH subsets for a data set called EVENT, you would enter the following command:

```
FIND EVENT USING POSTDAY, POSTUSR, POSTBATCH;
```

When searching for a data set record, DATABridge Twin will try the listed subsets in the order specified until it finds the record. List the subsets that most likely contain the data set record first in the subset list. If DATABridge Twin does not find the data set record using the listed subsets, it displays an error and the data set record will not be updated.

## UPDATERS

**Optional.** The default is DENIED. Use this parameter to specify if the database should open for exclusive updating by DATABridge Twin (recommended) or if it should open to allow other programs to update the database concurrently with DATABridge Twin. Add one of the following to UPDATERS:

- DENIED - Only DATABridge Twin can update the database.
- ALLOWED - One or more programs can update the database at the same time as DATABridge Twin.

## REDUNDANT UPDATES

**Optional.** The REDUNDANT UPDATES parameter tells DATABridge Twin how to handle redundant operations, such as a create operation for an existing record, or updates for records that have already been updated.

Syntax:

```
REDUNDANT UPDATES [ APPLIED | DISCARDED ]
```

- APPLIED is the default setting if no optional keyword appears.

- When set to DISCARDED, DATABridge Twin skips redundant operations. When set to APPLIED, DWTwin perform redundant operations.

**Warning:** If you have implemented bidirectional replication, where changes to either database are sent to the other, you must set this feature to DISCARDED to avoid endless replication of updates.

## Sample DATABridge Twin Parameter File

DATABridge Twin uses a SEQDATA file for its parameter file (DATA/TWIN/*dbname*/CONTROL). This file provides information to the DATABridge Twin program on where and how to locate the DATABridge Server SOURCE of the primary database.

Each parameter in this file is explained in *DATABridge Twin Parameters* (page [26](#)).

```

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
%           DATABridge Twin Parameter File           %
%                                                    %
%   Source: DATA/TWIN/SAMPLE/CONTROL                %
%                                                    %
%   Version: 6.2                                     %
%                                                    %
%   Copyright (C) 1998-2012 by Attachmate Corporation %
%           All Rights reserved                       %
%                                                    %
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
% How to locate the DBServer SOURCE ...

SOURCE <sourcename>    % SOURCE name in DBServer parameter file
AT <host>              % DBServer hostname or IP address
VIA <protocol>        % network protocol, e.g.
TCPIP PORT <portnumber> % DBServer port number, e.g. 3000

% example: SOURCE BANKDB AT PRODHOST VIA TCPIP PORT 3000

% Filter in the Support Library selects which records ...

SUPPORT OBJECT/DATABRIDGE/SUPPORT % title of the Support Library
FILTER DBFILTER                   % filter entrypoint name in "

% When waiting for an audit file ...

RETRY 60                          % seconds delay between retries
MAXWAIT 0                          % max total seconds to wait
                                      % (0 means 'forever')

% When to stop processing ...

% STOP AFTER "<program name>" OR BEFORE hh:mm PM ON mm/dd/yyyy

% How to find records using subsets if no sets
% FIND data set USING subset1, subset2, ...

% Allow other update programs ...

UPDATERS DENIED                  % DENIED - no other updaters (default)
                                  % ALLOWED - other programs can update
                                  % the client database while Twin
                                  % is running

REDUNDANT UPDATES DISCARDED      % DISCARDED - skip Update if already in
                                  % secondary database. Required for
                                  % bidirectional updates, i.e. Twin
                                  % running on both primary and
                                  % secondary system.
                                  % APPLIED - apply all updates

```



## CHAPTER 4

# Replicating a Database

### In this Chapter

Start DATABridge Twin	<a href="#">33</a>
Choose a Cloning Method	<a href="#">34</a>
Tracking	<a href="#">39</a>
Audit File Numbers Won't Match	<a href="#">39</a>

This chapter discusses the replication process, which involves two processes: performing the initial clone and then tracking updates to the database.

## Start DATABridge Twin

Use the following procedure to start DATABridge Twin manually.

### To start DATABridge Twin

- Use the following command:

```
START WFL/DATABRIDGE/TWIN ("secondarydatabasename" [,  
"logicaldatabasename", "taskstring"])
```

<b>Where</b>	<b>Is</b>
<i>secondarydatabasename</i>	The name of the replicated DMSII database.
<i>logicaldatabasename</i>	The name of the DMSII logical database you are replicating. If you are not replicating a logical database, do not enter text for <i>logicaldatabasename</i> . This is an optional parameter; if omitted, it defaults to an empty string.
<i>taskstring</i>	One of the following commands: <ul style="list-style-type: none"><li>STATUS - Prints a report of current audit locations as indicated by the DBTWINCONTROL or restart data set</li><li>UPDATE   TRACK   empty - Causes DATABridge Twin to perform normal tracking. Most of the time, you will run DATABridge Twin in normal tracking mode.</li></ul>

When you run DATABridge Twin with the UPDATE command, it runs continuously until it is interrupted by a STOP command or a MAXWAIT timeout, or the mainframe is rebooted (HALT/LOAD) or returns an unhandled DMSII exception (DEADLOCK).

## Choose a Cloning Method

DATABridge Twin provides three ways to perform an initial clone. After you determine the appropriate method for your site, proceed to the procedure for that method.

Before you can clone, you must have completed installation and configuration on the primary and secondary systems and that the DATABridge Server Source section contains the setting `TRANSFORM = RAWFORMAT`.

Use this method	To
<i>CLONE</i> command (page <a href="#">34</a> )	Clone the primary database, record by record. This method is similar to how the DATABridge Client clones. Choose this method if you have a filter that excludes records from the secondary database.
<i>LOAD</i> command (page <a href="#">35</a> )	Dump the primary database and then load it to the secondary database. Choose this method if you do not have a filter and want the fastest clone time for a large database.
<i>LOCATION</i> command (page <a href="#">38</a> )	Populate the secondary database with user-written programs. Choose this method if the <i>CLONE</i> and <i>LOAD</i> methods are unsuitable for some reason.  The <i>LOCATION</i> command gives DATABridge Twin the audit location in the cloned database so that DATABridge Twin can run in its normal tracking mode.

## Clone Using the CLONE Command

Use this procedure to perform the initial clone using the *CLONE* command.

If you previously cloned the primary database using a method other than the DATABridge Twin *CLONE* or *LOAD* commands, skip this procedure and run DATABridge Twin with the *LOCATION* command (page [38](#)).

### To clone

- 1 On the secondary system, sign on to the usercode.
- 2 Start DATABridge Twin by entering the following on a single line:

```
START WFL/DATABRIDGE/TWIN ("secondarydatabasename", "logicaldatabasename",
"CLONE")
```

Parameter	Description
<i>secondarydatabasename</i>	Name of the DMSII database on the secondary computer. If you also specify a usercode, make sure it is the usercode of the secondary database.

*logicaldatabasename* Name of the DMSII logical database on the primary computer. This is the logical database you want to clone into the secondary computer. If you are not using a logical database, just enter empty double-quotes (“”) for this parameter.

CLONE Required literal.

DATABridge Twin resets any family name overrides found in DMCONTROL and updates DMCONTROL. Then it requests a clone of the datasets via DATABridge Server and DATABridge Engine on the primary system, which sends the requested records.

---

Note: If DATABridge Twin fails for any reason, remove all of the secondary database files, including the database CONTROL file and the audit files, and go back to step 1. (You can leave the DESCRIPTION, DASDL, DMSUPPORT, and RECONSTRUCT files.)

---

When the clone is complete, DATABridge Twin prints a status report with a title such as:

```
(DB62) DBBD/RUN/TWIN/BANKDB/0002241/0002242/000000000000/STATUS
```

The following is a sample report for a database called BANKDB:

```
DBTwin Status Report for BANKDB as of Wednesday, August 29, 2012 @ 22:11:43
Str# Name Mode AFN ABSN Segment Index Host info
-----
-----
(common) normal 1145 31271 200 10
```

Datasets that have a different audit location or a mode other than normal will be printed on a separate line in the report.

DATABridge Twin then switches to the UPDATE command and stays in the mix, replicating any additional updates that occurred on the primary database during and after the clone. The secondary database (named the same as the primary database) is now available for queries. DATABridge Twin runs continuously until interrupted (for example, by a STOP command, MAXWAIT parameter setting, or DEADLOCK).

## Clone Using the LOAD Command

Use the LOAD command with a dump file as an alternative to cloning using the CLONE command. This method is performed in two separate procedures. The first procedure occurs on the primary system; the second occurs on the secondary system.

---

Note: This method bypasses any filters you specified in the DATABridge Twin parameter file. In other words, once the dump file has been loaded, the secondary database will have all of the records that were dumped from the primary database, not just those that satisfy the filter.

---

## Start the Clone on the Primary System

Use this procedure first when performing an initial clone using a LOAD and a Dump file. Complete the process by following the instructions in *Finish the Clone on the Secondary System* (page [36](#)).

## To start the initial clone

- 1 Dump the primary database to tape or to disk:

To	Do this
Dump to tape	<p>Clone the entire database using the following CANDE command:</p> <pre>RUN \$SYSTEM/DMUTILITY ("DB=databasename DUMP = TO dumpname")</pre> <p>-or-</p> <p>Clone a logical database by dumping (at least) the data sets and sets that belong to the logical database. For example, if the logical database contains data sets D1 and D2 in a physical database called MYDB, you would use the following CANDE command:</p> <pre>RUN \$SYSTEM/DMUTILITY ("DB=MYDB DUMP MYDB/D1/=,MYDB/D2/= TO dumpname")</pre>
Dump to disk	<p>Dump the entire database to the primary database usercode by entering:</p> <pre>RUN \$SYSTEM/DMUTILITY ("DB=databasename DUMP = TO dumpname ON packname")</pre> <p>-or-</p> <p>Dump selected data sets to the primary database usercode by entering:</p> <pre>RUN \$SYSTEM/DMUTILITY ("DB=databasename DUMP datasetdirectories TO dumpname ON packname")</pre> <p>Then, change the security of the dump file on the disk to PUBLIC IN so that the secondary usercode can read it, as in the following example:</p> <pre>SEC dumpname PUBLIC IN</pre>

- 2 The primary database can now be used as normal. Run at least one program that does a database OPEN UPDATE before proceeding.
- 3 Preserve the audit files covering the period from the start of the dump to the end of the dump for use on the secondary system.
- 4 If you wrote the dump to tape, move the tape(s) to the secondary system. If you wrote the dump to disk instead of tape, use BNA or whatever is appropriate at your site to copy the dump to the secondary system.

At this point, you have the primary database dump (on tape or disk). Now you are ready to start the cloning process on the secondary system, as described in the next section.

## Finish the Clone on the Secondary System

Use this procedure to complete the initial cloning process started in *Start the Clone on the Primary System* (page [35](#)). In this procedure, you'll create the cloned database using the LOAD command.

## To complete the initial clone

- 1 Do one of the following:

- If you dumped the primary database to tape, mount the tape on the secondary system.
  - If you dumped the primary database to disk, make sure that you copied the dump to the secondary system.
- 2 Sign on to the usercode containing the DATABridge Twin software and enter the following to start DATABridge Twin:

```
START WFL/DATABRIDGE/TWIN
```

```
("secondarydatabasename","logicaldatabasename",
```

```
"LOAD dumpname [ON familyname]")
```

<b>Where</b>	<b>Is</b>
<i>secondarydatabasename</i>	The name of the DMSII database on the secondary system.  Note: If you specify a usercode, make sure it is the usercode of the secondary database.
<i>logicaldatabasename</i>	The name of the DMSII logical database on the primary system. This is the logical database you want to clone on the secondary system. If you are not using a logical database, do <i>not</i> enter text for <i>logicaldatabasename</i> . Instead, enter just the quotation marks (no space in between) as shown in the following example:  <pre>("secondarydatabasename", "", "LOAD dumpname")</pre>
<i>dumpname</i>	The name of the resulting dump(s) from the primary database. If you used the example in <i>Cloning Procedure on the Primary System</i> (page 35), the dump name is DATABridge TwinDUMP.
–or–	You can also specify a comma-delimited list of tape dump names for the dump parameter. This allows partial dumps to be combined into a complete secondary database. The following is an example of a comma-delimited list of tape dumps:  <pre>START WFL/DATABRIDGE/TWIN ("BANKDB", "", "LOAD MONDAYDUMP, THURSDAYDUMP, CUSTDUMP")</pre>
<i>dumpname,</i> <i>dumpname, ...</i>	The default is tape dumps. If you dumped to disk, be certain to include ON familyname in the dump name. If you include the family name, do not type the brackets.
LOAD	A required literal that initializes the secondary database and loads the structures from the dumps taken on the primary system.

DATABridge Twin resets any family name overrides in DMCONTROL, updates DMCONTROL, and then initiates DMUTILITY to load the dump. In addition, DATABridge Twin will request one or more audit files by displaying a NO FILE message on the terminal and ODT. The messages look similar to the following:

```
NO FILE databasename/AUDITnnnn (MT) #1
```

- 3 Copy the requested audit file from the primary system to the secondary system and usercode.

If you use sectioned audit files, be sure to copy all of the sections. Then give the waiting task an FA command:

```
FA TITLE = databasename/AUDITnnnn ON family
```

- 4 Watch for additional requests for audit files and repeat the previous step if necessary.

If the requested audit file is in use on the primary system because it is the current audit file, either wait for DMSII to switch to the next audit file or force a switch immediately. To force an audit files which, find the mix number of the database by entering the DBS command from the ODT or MARC, and then direct an SM AUDIT CLOSE FORCE command to that mix number.

---

Note: If DATABridge Twin fails for any reason, remove all of the secondary database files, including the database CONTROL file and the audit files. (You can leave the DESCRIPTION,DASDL, DMSUPPORT, and RECONSTRUCT files.) Then, go back to step 1.

---

After the load (or after a successful DATABridge Twin LOCATION command), DATABridge Twin prints a status report. By default, it is a printer file whose internal name is REPORT and external name is STATUS. The printer file would be titled similar to the following:

```
(DB60) DBBD/RUN/TWIN/BANKDB/0002241/0002242/000000000000/STATUS
```

A sample report for a database called BANKDB might look like this:

DBTwin Status Report for BANKDB as of Wednesday, August 29, 2012 @ 22:11:43

Str#	Name	Mode	AFN	ABSN	Segment	Index
Host info						
-----						
(common)		normal	1145	31271	200	10

If any datasets have a mode other than normal or a different audit location, they will be printed on a separate line in the report.

Then, DATABridge Twin stays in the mix (automatically switching to the UPDATE command), replicating any additional updates that occurred on the primary database since the end of the dump. The secondary database (named the same as the primary database) is now available for queries. DATABridge Twin runs continuously until a STOP command, MAXWAIT time, etc., occurs. For information on manually starting DATABridge Twin, see *DATABridge Twin Commands* (page 42).

## Clone Using the LOCATION Command

If you cloned the primary database using a method other than the DATABridge Twin LOAD and CLONE commands, you must specify the audit file location. The LOCATION command provides the audit location in the cloned database so that DATABridge Twin can run in its normal tracking mode.

### To specify the audit file location

- Run DATABridge Twin with the LOCATION command, as follows:

```
START WFL/DATABRIDGE/TWIN ("secondarydatabasename")
```

```
[, "logicaldatabasename", "LOCATION afn absn seg  
inx"])
```

DATABridge Twin stores this audit location in the cloned (client) database as the starting point for tracking. DATABridge does not validate the specified audit location until the next time DATABridge Twin is run in tracking mode.

DATABridge Twin prints a STATUS report after storing the new location.

---

Important: Incorrect use of the LOCATION command can cause the client database to miss the updates that would have occurred before the specified audit location.

---

When you're done, use the primary database as you usually would, using the secondary database only for queries.

## Tracking

After you have performed the initial clone, DATABridge Twin automatically retrieves changes from the audit files and applies them to the replicated database.

If you have set the STOP command to stop DATABridge Twin, or if you have set the MAXWAIT parameter to something other than 0, DATABridge Twin will stop when the STOP or MAXWAIT conditions are met. In this case, you must restart DATABridge Twin as explained in *Start DATABridge Twin* (page [33](#)).

If you find that data in the secondary database is not current enough, you can also set the Read Active Audit option to true in the DATABridge Engine parameter file on the primary system for near real-time access to the audit trail. Alternatively, you might consider adjusting the number of times audit files close on the primary database. You can accomplish this via the DBAuditTimer utility, which is described in the *DATABridge Host Administrator's Guide*.

---

Caution: Programs that update the same records in the secondary database as DATABridge Twin can cause DATABridge Twin to encounter various DMSII errors such as NOTFOUND or DUPLICATES. Some update programs, such as LINC-generated report programs, can generally coexist with DATABridge Twin because they don't actually update the same records as DATABridge Twin.

To prevent these problems, consider using guardfiles. Guardfiles are explained in Unisys mainframe documentation.

## Audit File Numbers Won't Match

In most cases, the audit file numbers on the secondary system will not match those on the primary system. Even though both databases start with the same audit file number, the secondary database may close its audit files more or less frequently than the primary database. Remember that the only program updating the secondary database should be DATABridge Twin. All other secondary database activity should be from queries only.



## CHAPTER 5

# Commands Reference

### In this Chapter

DATABridge Server Commands (Primary System) [41](#)

DATABridge Twin Commands [42](#)

This chapter explains the DATABridge Server commands and the DATABridge Twin commands.

## DATABridge Server Commands (Primary System)

Note that DATABridge Server has a parameter file that you must configure. Refer to the *DATABridge Host Administrator's Guide* for information about configuring the DBServer parameter file.

### Start DATABridge Server

#### To start DATABridge Server

- Enter the following from CANDE or MARC under the usercode containing the DATABridge software:

```
START WFL/DATABRIDGE/SERVER
```

The WFL starts DATABridge Server, which runs continuously.

### Terminate DATABridge Server

In most cases, you do not need to terminate DATABridge Server.

#### To terminate DATABridge Server

- Enter the following from CANDE, MARC, or the ODT under the usercode containing the DATABridge software:

```
mixnumber AX QUIT
```

where *mixnumber* is the task number of OBJECT/DATABRIDGE/ SERVER.

## DATABridge Twin Commands

DATABridge Twin includes the following commands, which are only applicable on the secondary system.

Use this command	To do this
CLONE	Replicate the primary database from the secondary system usercode that will contain the secondary database.
LOAD	Replicate the primary database. For instructions, including syntax, see <i>Clone Using the LOAD Command</i> (page <a href="#">35</a> ).
LOCATION	Give DATABridge Twin the audit location in the cloned database so that DATABridge Twin can run in its normal tracking mode. (For the LOCATION command syntax, see <i>Clone Using the LOCATION Command</i> (page <a href="#">38</a> ).)
STATUS	Print a report of current audit file locations as indicated by the DBTWINCONTROL or restart data set. For syntax, see <i>Start DATABridge Twin</i> (page <a href="#">33</a> ).

Use the following to initiate tracking.

UPDATE or TRACK or no command specified	Cause DATABridge Twin to perform normal tracking. Changes are then retrieved from the audit file and applied to the replicated database. For syntax, see <i>Start DATABridge Twin</i> (page <a href="#">33</a> ).
---	---

## DATABridge Twin AX Commands

The following AX commands are available for DATABridge Twin. Enter them on the secondary system.

Command	Description
<i>mixnumber</i> AX QUIT	Terminates DATABridge Twin at the end of the next transaction group.
<i>mixnumber</i> AX STATUS	Displays DATABridge Twin's location and timestamp in the primary database audit file, as well as the number of records replicated to the secondary database. See the following sample output.

### Sample Output for DATABridge Twin AX STATUS Command

```
DBTwinEngine: Waiting for AFN 41 to become available.
DBTwinEngine: Errors Create:0 Modify:0 Delete:0.
DBTwinEngine: Updates Create:0 Modify:3 Delete:0.
DBTwinEngine: Audit time: month day, year @ 16:42:52.
DBTwinEngine: Audit location: AFN=40 ABSN=3552 (70%).
```

In this example, (70%) means that 70 percent of audit file number (AFN) 40 has been processed.

## AX QUIT

Use AX QUIT to stop DATABridge Twin. In most cases, terminating DATABridge Twin is not necessary.

**Syntax:**

```
mixnumber AX QUIT
```

where *mixnumber* is the task number of OBJECT/DATABRIDGE/ TWIN.



# Troubleshooting

This appendix contains troubleshooting information.

## In this section

General Troubleshooting Procedures	<a href="#">45</a>
Troubleshooting Table	<a href="#">47</a>

## General Troubleshooting Procedures

If you have problems using DATABridge Twin, complete the following steps:

1. Make sure that your system meets the requirements necessary to use the product. See *Installation Requirements* (page [13](#)).
2. If your primary and secondary systems are on separate mainframes, ensure that the mainframes are communicating, as follows:
  - If you are using BNA or HLCN, try copying a file between the two mainframes.
  - If you are using TCP/IP, try the PING function.
3. Check your setup, as follows:
  - Is DATABridge Server running on the primary system? Check the mix to make sure. If it is not running, see *Start DATABridge Server* (page [41](#)).
  - If your restart data set did not meet the criteria in *Install DATABridge Twin to the Primary System* (page [18](#)), did you use the INCLUDE statement or copy the DBTWINCONTROL patch to your DASDL source?
4. Check your configuration options for connecting to the mainframe and the DMSII primary database, as follows:
  - Verify that SOURCE in the DATABridge Twin parameter file is pointed to the correct DATABridge Server and SOURCE on the primary system. For details, see *SOURCE* (page [26](#)). Also check the DBServer parameter file and make sure the entry for SOURCE is correct.
  - Verify that your entries in the DATABridge Twin parameter file match your entries in the DBServer parameter file.
5. Check the status of the DATABridge Twin Engine. For instructions, see *DATABridge Twin AX Commands* (page [42](#)).
6. Resolve any errors that you receive.

If you receive error messages or status messages that you don't understand, see the *DATABridge Error Guide* on the installation image for help resolving these messages.
7. If you cannot identify and solve the problem without assistance, contact your product distributor. Call from a location where you have access to the problem mainframe.

8. Troubleshoot the problem using information available from Attachmate Technical Support.

*<http://support.attachmate.com/techdocs>*

This service directly links you to our internal help desk system, 24 hours a day, 7 days a week.

9. Contact Attachmate Technical Support:

<http://support.attachmate.com/contact/>

## Troubleshooting Table

The following table lists common problems and their solutions:

Problem	Resolution
DATABridge Twin fails to execute	Verify that Server Accessory is running on the primary system. If not, see <i>Start Server Accessory</i> (page <a href="#">41</a> ).
DATABridge Twin gets a PORT file I/O error and terminates	Start Server Accessory on the primary system. Server Accessory must be running for DATABridge Twin to contact it. If Server Accessory is not running, DATABridge Twin tries until it eventually gets a PORT file I/O error and terminates.
<p>Any of the following occur:</p> <ul style="list-style-type: none"> <li>▪ Disk crash on the secondary system.</li> <li>▪ Any reorganization of the primary database.</li> <li>▪ Loss of communications between the primary and secondary database for enough time that it is less expensive to recreate the secondary database than it is to process all of the audit files. For example, if the primary database is relatively small but highly volatile, it would most likely be less expensive to recreate the secondary database.</li> </ul>	Reclone the secondary database on the secondary system by removing all of the database and audit files and then repeat the replication procedure as described in <i>Start the Clone on the Primary System</i> (page <a href="#">35</a> ) and <i>Finish the Clone on the Secondary System</i> (page <a href="#">36</a> ).
A message appears stating that the DBTWINCONTROL data set is not defined or is not available.	<p>Check the following:</p> <ul style="list-style-type: none"> <li>▪ Did you compile the DASDL after adding the \$INCLUDE "PATCH/DATABRIDGE/TWIN/ DASDL" statement or after inserting the contents of PATCH/DATABRIDGE/TWIN/DASDL?</li> <li>▪ Did you initialize DBTWINCONTROL using DMUTILITY? For instructions, see step 7 in <i>Install DATABridge Twin to the Primary System</i> (page <a href="#">18</a>).</li> </ul>



# Glossary of Terms

## A

### About this Glossary

This section includes terms that are unique to DATABridge, as well as terms that are standard for DMSII databases.

---

Note: Some of the terms listed here are standard terms for Unisys mainframes. Complete, detailed definitions for these terms can be found in Unisys ClearPath NX, LX or A Series documentation.

---

### Accessories

DATABridge Accessories access the services in DBEngine and DBSupport. Some of the Accessories provided with DATABridge are as follows:

- DBServer, which provides communication and DMSII database replication services to DATABridge Clients.
- DBSpan, which produces a replication of one or more data sets into flat sequential disk files. DBSpan updates the cloned flat files by appending the changes to the end of the flat files (unlike DBSnapshot, which replaces the changed records).
- DBSnapshot, which produces a one-time replication of one or more data sets into flat sequential disk files or tape.
- DBTanker, which provides filtered audit files for the DBSpan and DBServer Accessories.
- DBInfo, which produces a report of your DMSII database timestamps, update levels, DMSII release levels, etc.
- DBLister, which produces a report of the layout of the structures in your DMSII database, including structure numbers and key sets.
- DBAuditTimer, which closes the current audit file when it is older than a specified length of time.

### Accessroutines

The Accessroutines program is a DMSII library program that controls access to the database, reads and writes records, and creates the audit trail.

DATABridge Plus enables DATABridge to perform near real-time replication of DMSII databases by accessing the audit file while the Accessroutines program is creating it.

### audit file

An audit file is created by the DMSII Accessroutines and contains the raw format of changes made to the DMSII database by update programs. Audit file records contain the deletes, creates, and modifies that were made to the various structures. Depending on the frequency of changes made to a database, the information in an audit file can span a few hours or several weeks.

DATABridge uses the audit file for the raw data of each database change to exactly replicate the primary database. DATABridge records the audit location (AFN, ABSN, SEG, IDX) between runs, so it can restart without losing any records.

## audit trail

The audit trail contains all of the audit files generated for a database. The DATABridge Engine reads the audit files to extract updates. It then passes the updates to the Client to be applied to the relational database. After the updates have been successfully extracted, the Client saves the state information, which includes the location in the audit trail from which the last group of updates for the data set were read.

## C

### cloning

Cloning is the one-time process of generating a complete snapshot of a data set to another file. Cloning creates a static picture of a dynamic database. DATABridge uses the DMSII data sets and the audit trail to ensure that the cloned data represents a synchronized snapshot of the data sets at a quiet point, even though other programs may be updating the database concurrently. DATABridge clones only those data sets you specify.

Cloning is one phase of the database replication process. The other phase is tracking (or updating), which is the integration of database changes since the cloning.

### CONTROL file

The DMSII CONTROL file is the runtime analog of the DESCRIPTION file. The DESCRIPTION file is updated only when you compile a modified DASDL. The CONTROL file controls database interlock. It stores audit control information and verifies that all database data files are compatible by checking the database timestamp, version timestamp, and update level. The CONTROL file is updated each time anyone opens the database for updates. The CONTROL file contains timestamps for each data set (when the data set was defined, when the data set was updated). It contains parameters such as how much memory the Accessroutines can use and titles of software such as the DMSUPPORT library (DMSUPPORT/databasename).

DATABridge uses the CONTROL file for the following information:

- Timestamps
- INDEPENDENTTRANS option
- AFN for the current audit file and ABSN for the current audit block
- Data set pack names
- Audit file pack name
- Database user code

## D

## DASDL

Data and Structure Definition Language (DASDL) is the language that defines DMSII databases. The DASDL must be compiled to create a DESCRIPTION file.

## data set

A data set is a file structure in DMSII in which records are stored. It is similar to a table in a relational database. You can select the data sets you want to store in your replicated database.

## DATABridge Engine

The DATABridge Engine (also referred to as DBEngine) is a host library program that provides several entry points for retrieving both data definition and data records from a DMSII database. To provide this information, DBEngine reads the DMSII DESCRIPTION file, the CONTROL file, and the audit trail. DBEngine uses the services of the Accessroutines to retrieve data from the database for the initial cloning.

## DATABridge Plus

DATABridge Plus is an optional program that enables DATABridge to access and retrieve information from the current audit file. If you have not set Read Active Audit = true, the most recent audit file DATABridge can read is the current audit file minus one. For example, if the current audit file number is 23, DATABridge can access audit file number 22 (23 - 1).

## DESCRIPTION file

The DESCRIPTION file contains the structural characteristics of a database, physically and logically. This file is created from the DASDL source by the DASDL compiler and contains the layout (physical description), timestamp, audit file size, update level, logical database definition, and any static information about the database. It contains information about the database, not the data itself.

There is only one current DESCRIPTION file for each DMSII database. DATABridge must have access to the DESCRIPTION file before it can replicate a database. Additionally, DATABridge uses the DESCRIPTION file information for consistency checks between the primary database and the secondary or replicated database.

The DESCRIPTION file corresponds to the schema in a relational database.

## E

### extraction

Extraction is the process of reading through a data set sequentially and writing those records to a file (either a secondary database or flat file).

## F

## **fixup records**

Changes that occur to the DMSII database while a clone is taking place.

## **P**

### **primary database**

This is the original DMSII database that resides on the host. DATABridge replicates from the primary database to one or more client databases. The client databases can be another DMSII database or one of several relational databases. Compare this to the replicated (or secondary) database.

## **Q**

### **quiet point (QPT)**

A quiet point is a point in the audit trail when the DMSII database is quiet and no program is in transaction state. This can occur naturally, or it can be forced by a DMSII sync point.

## **R**

### **replication**

Replication is the ongoing process of cloning and tracking a DMSII database.

## **S**

### **secondary database**

The replicated database. The replicated database is the database that resides on the client and contains all of the records cloned from the DMSII database that you specified for cloning. The replicated database is updated periodically with changes made to the primary (original) DMSII database. The periodic update (or tracking process) is explained later in this section. Compare this to the primary database.

### **set**

An index into a data set. A set has an entry (key + pointer) for every record in the data set.

### **structure**

A data set, set, subset, access, or remap. Each structure has a unique number called the structure number.

## subset

An index into a data set. A subset does not necessarily have an entry (key + pointer) for every record in the data set. Subsets are used to access selected members of a data set and to represent relationships between data set records. Subsets typically contain fewer entries than normal sets.

An automatic subset is any subset that contains a WHERE clause and is maintained by DMSII.

A manual subset is any subset that is maintained by an application.

## Support Library

A library that provides translation, formatting, and filtering to the DATABridge Server (DBServer). After DATABridge Server receives data from the DATABridge Engine, it calls the Support Library to determine if the data should be replicated, and if so, passes the data to the Support Library for formatting.

## T

### tracking

Tracking is an ongoing process for propagating changes made to records in the DMSII primary database to the replicated database. The DATABridge Span accessory and DATABridge Server perform extraction as well as tracking.

Tracking is one phase of the database replication process. The other phase is cloning.



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