

LEE  
TECH  
DOOR

# LeeTech DOOR

Data Object Open Replication



***LeeTech Software Inc.***

*Nobody provides better service than we do.*



# LeeTech DOOR Reference Manual

Data Object Open Replication



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*Released 01/03/01*



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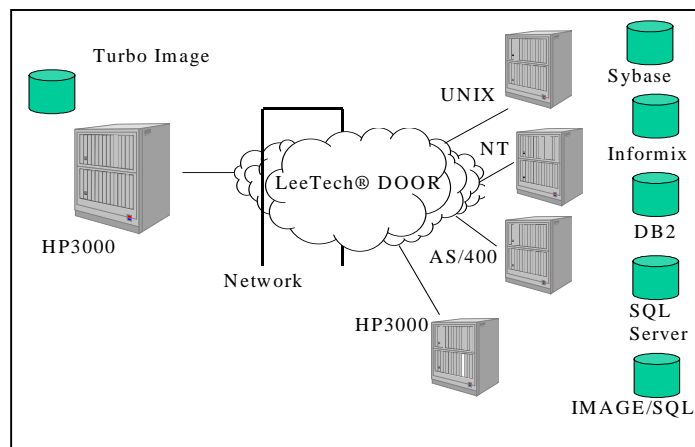
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# 1. Overview

Data Object Open Replication (LeeTech DOOR ) is an innovative member of the LeeTech product family. As its name implies, DOOR provides a door that allows data stored on an HP e3000 system to be replicated to SQL-based relational database management systems (RDBMS) of Oracle, Sybase, Informix and Microsoft.

The majority of HP e3000 systems store data in non-relational IMAGE databases. The non-relational nature of these legacy databases makes them unusable with today's popular SQL-based RDBMS. This incompatibility makes it difficult — if not impossible — for companies to provide their legacy data to users of such mainstream applications as Oracle, SQL Server, Informix, DB2, Sybase and other SQL-based applications. Consequently, a mechanism is needed to help make legacy data available to SQL-based RDBMS. DOOR provides that facility to convert data to new database systems.

DOOR streamlines and tightly couples HP e3000's legacy data to RDBMS by providing a real-time conversion facility between the two environments. Using a Windows-based interface, a system administrator can simply point and click to select data-flow mapping, source and destination servers and other parameters governing the transmission of information between the two environments.



**Figure 1-1. Overview of LeeTech DOOR**



DOOR uses the powerful OLTP portion of LeeTech Software's AIM middleware to create multiple pipelines that deliver real-time data replication. Moreover, DOOR does not limit the number of destination servers that will receive the converted legacy data, nor does it restrict the number of source servers from which the legacy data is replicated. This means, replication is performed in real time, making the replicated data available immediately for Web and other users who require instant access to mission-critical data.

DOOR uses a message-queuing approach to replicate data. This approach is important because, should the destination server go down, the originating server still retains data integrity until the requester is available.

## **Real World Examples**

### **A Stock Brokerage Firm**

A stock brokerage house has been running its IT systems on HP e3000s with non-relational IMAGE databases since the mid '80s. With the ever-changing face of technology, the brokerage house wants to make certain data available to its customers through the Web and to brokers at remote sites over its Intranet. Concurrently, the IT staff has acquired a UNIX based HP e9000 system containing a relational Oracle database. The company realizes that it may have to move the data on the HP e3000 system to the relational database on the new HP e9000 system in order to make the data accessible on the Web. At the same time, the company has no desire to eliminate the HP e3000 system or the well-tuned applications running on them. In effect, they want to have two databases one relational and the other non-relational, both with identical data at all instances.

Ultimately, the company's goal is to make data from both systems available in real-time to the end-user.

DOOR provides the perfect solution, allowing the brokerage house to continue using their existing HP e3000 and its installed base of application software, while making the data in the IMAGE databases available to relational database and Web users.

### **A Managed Healthcare Organization**

An HMO has been running their legacy healthcare administration system on HP e3000s with the venerable non-relational IMAGE database. Yet now

they would like to begin feeding data to new, ancillary applications utilizing relational databases as well as make subsets of the IMAGE data available in real time to new, Web-based, applications like a Web-based eligibility verification process. At the same time, the company is not ready to replace the legacy system which they currently run on. Fortunately the company has a UNIX based HP e9000 with Oracle available, though a NT server with SQL Server or Oracle or even another HP e3000 with Oracle or ALLBASE/SQL would also be usable.

With the LeeTech DOOR® product, the company can replicate their IMAGE healthcare data to one or more of these relational database environments in real-time making the data available to the new applications all without impacting their legacy system.

---

## 2. Quick Start

This chapter walks through a simple list of tasks to quickly start the data replication process with LeeTech DOOR.

- Installing the software

Install the software on PC and on all kind of database servers involved in data replication. Please refer to section 3.

- Starting the listener

The “LISTNER” is a daemon to serve any data transaction requests through the network. It acts as a gateway that allows communication between HP e3000 systems and other servers. Therefore it is important to be sure that a listener is started for both source and destination servers. Please refer to section 3-4.

- Configuring the data mapping

With its friendly user interface, the LeeTech DOOR Administration tool can help configure the data mapping with a simple click, drag and drop. The final mapping configuration file is stored in the DOOR account of the HP MPE/iX machine where the source TurboIMAGE database resides. Please refer to sections 4 and 5.

- Running DOOR

After the data mapping configuration file has been successfully saved in the source machine, the command DOOR.PUB.DOOR launches the program. The program will automatically intercept the data changes in TurboIMAGE and replicate to the desired remote sites.

### Example

In this example, a TurboIMAGE database, ORDERS.DB1.DOORSRC, resides in a HP e3000 machine. The goal is to replicate the data to multiple remote databases on different platforms such as ALLBASE/SQL on HP e3000 and Oracle on HP-UNIX.

### Starting the Listener

#### HP e3000

Log into the LeeTech DOOR account on HP e3000.

```
:HELLO USER,MGR.DOOR
```

## Quick Start

---

Stream the job of listener.

```
:STREAM JDOOR.PUB.DOOR
```

Verify whether the listener is running successfully.

```
:LANUTIL.PUB.DOOR
```

```
LT928A: MGR.DOORSRC(7): LANUTIL.PUB.DOOR
```

```
LANUTIL (A.05.02.00) LeeTech Software Inc.
```

```
Copyright 1993-, All Rights Reserved.
```

```
HOST:[127.0.0.1] APPLICATION:[door]
```

```
Commands: LIST - shows all connected users.
```

```
KILL id - kills the specified user.
```

```
STOPALL - terminates listener and all  
users.
```

```
HOST id - sets to new host node name.
```

```
APPL id - sets to new application name.
```

```
SETQ qname #servers
```

```
- sets # of standby servers for  
a queue
```

```
EXIT - ends the LANUTIL.
```

```
LANUTIL>> LIST
```

```
NO USER CONNECTION.
```

## HP-UNIX

Log into the system as “root” user with the appropriate Oracle environment setup.

Start the listener.

```
:/opt/door/lbin/listner 32700
```

or

```
:/opt/door/lbin/listner DOOR
```

(where DOOR is the TCP/IP service name).

Verify whether the listener is running successfully.

```
:/opt/door/bin/lanutil 32700
```

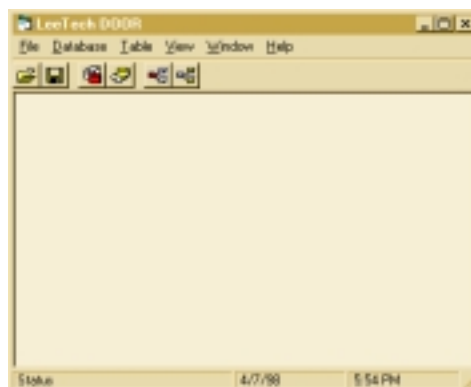
```
HOST:[127.0.0.1] APPLICATION:[door]
```

```
Commands: LIST      - shows all connected users.
          KILL id   - kills the specified user.
          STOPALL  - terminates listener and all
                   users.
          HOST id   - sets to new host node name.
          APPL id   - sets to new application name.
          SETQ qname #servers
                   - sets # of standby servers for
                   a queue
          EXIT      - ends the LANUTIL.
LANUTIL>> LIST
```

NO USER CONNECTION.

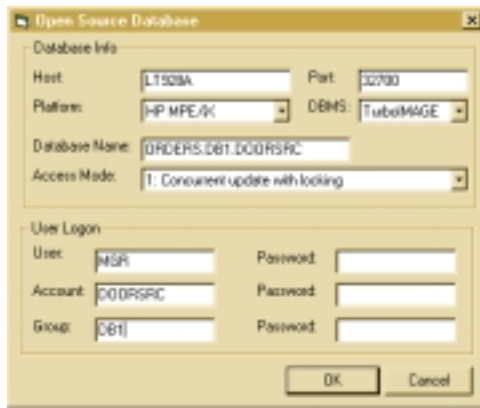
## Configuring the Data Mapping for Windows

Start the PC mapping administration tool. The main screen displays:



**Figure 2-1. The Mapping Tool Main Screen**

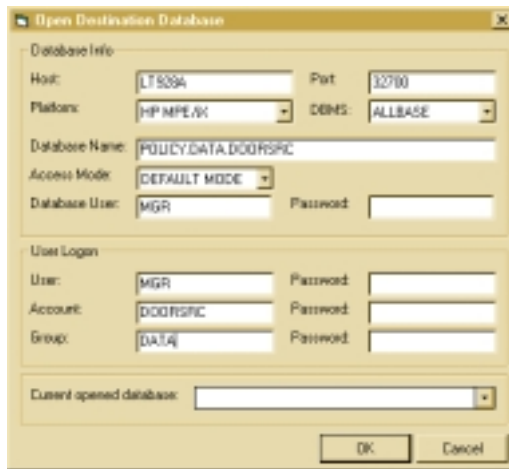
Connect to the source TurboIMAGE database from the screen menu. Select the **Open Source DB** command from the **Database** menu. Enter the required information.



**Figure 2-2. The Open Source Database Dialog Box**

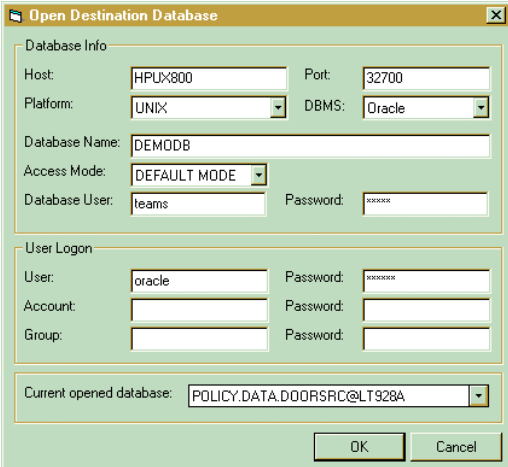
Connect to the target RDBMS. From the **Database** screen menu, select the **Open Destination DB** command. Connect to:

**ALLBASE/SQL on HP e3000**



**Figure 2-3. Dialog Box for ALLBASE/SQL as the Target Database**

## Oracle on HP-UNIX



**Figure 2-4. Dialog Box for Oracle as the Target Database**

After successful database connection, the mapping sequences to follow are Select a source data set, Select a target data table and Assign the source data item to target data column.

## Quick Start

Choose the source data set CUSTOMER, a target table MGR@DOORSRC.CUSTOMER from ALLBASE and another target table DOOR.CUSTOMER from Oracle.

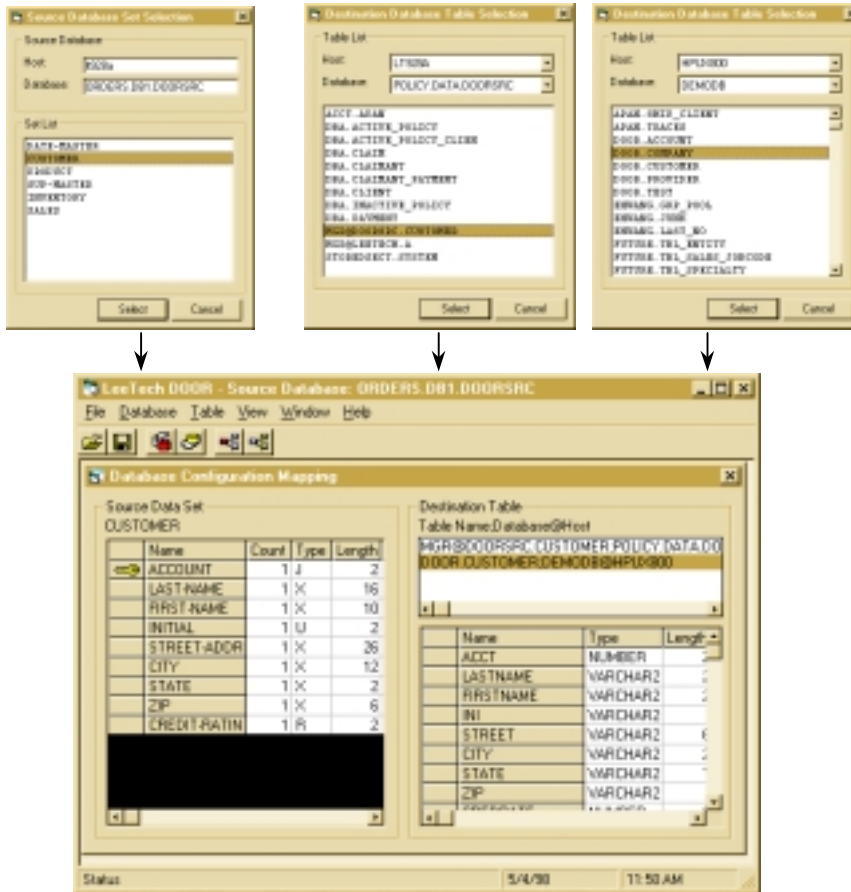


Figure 2-5. Selecting a Source Data Set and Target Tables

For each mapped Source Data Set, there is a Database Configuration Mapping window associated to it. Double-click on the Source Data Set grid to bring up the mapping assignment window displaying the Source Set and Target Database fields. Double click on the target data table grid to bring up the mapping relationship displaying the target database table. Assign a combination key to the target database table for later data replication use.



The key will affect whether LeeTech DOOR updates or deletes the correct record in the target table.

**Note:** LeeTech DOOR will have no knowledge about the key information.

After completing the mapping relationship, save the configuration file(s) to the HP e3000 machine where the source database resides. To do so, click on the **File** menu and select the **Save** command.

## Starting the DOOR Replication Engine

After the configuration file has been successfully saved in the source HP e3000 machine, running the DOOR replication engine is possible. The command script DOOR.PUB.DOOR controls the engine. Before using the example DOOR.PUB.DOOR script, modification of the user-defined section variables FIFO, LOGFILE, DATABASE, MODE and BYPASS\_FLAG is required to suit the needs of the TurboIMAGE database operation environment. Please refer to section 6.

---

## 3. Installation

LeeTech DOOR is supplied in three parts, a client, a source server and a destination server component. The client Windows-based mapping administration tool is available on CD-ROM, suitable for installation on a standard PC. HP e3000 and HP-UX for Oracle server components come on a DAT tape. All other Windows server software is on CD-ROM.

The communication between the GUI (Graphical User Interface) Administration tool and DOOR replication engine is based on a TCP/IP protocol and uses a Windows socket (winsock.dll).

After completing the installation, the listener process needs to be brought up on every machine participating in the data replication flow, including the source HP e3000 machine and any destination platforms with the target RDBMS.

### Installing the Mapping Administration Tool

System Requirements:

- IBM or compatible PC
- 80486 or above
- Hard drive with at least 3 megabytes free
- VGA or SVGA monitor
- Mouse
- Windows 95/98/NT

**Note:** Installation on Windows NT server is possible but not recommended.

The following procedures assume installation is started from the CD-ROM drive of a computer.

1. If not already running, load Windows.
2. Insert the DOOR media into the appropriate drive for installation.
3. Autorun will automatically begin installation or click on SETUPEX.EXE command and follow the directions on the screen.
4. Select Compact Setup for the installation of just the DOOR Administration Mapping Tool.
5. Custom Setup allows manual choosing of the components to be installed.

## Installing the Server

### Installing on MPE/iX

1. Log on as system manager:  
**:MANAGER.SYS**
2. Restore the tape as follows:  
**:File T;Dev=Dat or Device Number**  
**:Restore \*T;@.@.DOOR;CREATE**
3. After the tape has been restored, execute the command file  
**:DOORINST.PUB.DOOR**

This sets the proper security for the account and groups. This command will also prompt for permission to stream some standard Listener jobs used to demonstrate the product.

### Starting the MPE/iX Server

The listener is a server daemon that should be launched before any mapping configuration and data replication. To start the listener, refer to section 3-6.

### Installing on HP-UX

1. "Root" authority is necessary to restore the server files with correct attributes.
2. Mount the DOOR tape and place the drive online.
3. Restore the DOOR files INSTALL and LEETECH.0 as follows:  
**\$tar xvf /dev/rmt/0m (device name)**
4. Run INSTALL. It will create the following directories if they do not already exist:  
  
\$/opt/door/bin  
\$/opt/door/lbin  
\$/etc/opt/door
5. Delete the files INSTALL and LEETECH.0 upon successful completion of the DOOR installation:  
**:rm INSTALL LEETECH.0**

### Starting the HP-UX Server

The listener is a server daemon that should be launched before any mapping configuration and data replication. To start the listener, refer to section 3-4.

## **Installing on Windows NT Server**

System Requirements:

IBM or compatible PC  
80486 or above  
Hard drive with at least 3 megabytes free  
VGA or SVGA monitor  
Mouse  
Windows 95/98/NT

**Note:** Installation on Windows NT Server 4.0 or above is highly recommended.

1. Insert the media into the appropriate drive for installation.
2. Autorun will automatically begin installation or click on SETUPEX.EXE command and follow the directions on the screen.
3. Select Typical Setup for the installation of both the NT SQL Server 7.0 Engine and the NT Listener Utility.
4. Custom Setup allows manual choosing of the components to be installed.
5. When setup is completed click on the NT Listener Utility icon and the opening screen should appear.
6. To work with the NT Listener Utility, refer to section 3-5.

## **Configuring the LAN**

Please consult a network system administrator for this section.

### **SERVICES file**

1. Find the SERVICES file on the PC and insert the line:

**DOOR 32700/tcp door**

DOOR is the port name used by the program. The “32700/tcp” portion of the entry is the port ID, which must be identical to the server’s SERVICES file.

2. The SERVICES file on the PC is located in:



## UNIX Listener - /opt/door/lbin/listner

Start the listener from the root user login. To start a listener insert:  
`/opt/door/lbin/listner "port_ID"`

The port ID could be a TCP/IP port number or a port alias name.

```
LISTNER:   - /opt/door/lbin/listner
HOSTS:     - /etc/hosts
SERVICES:  - /etc/services
```

## Windows NT Listener

LeeTech AIM Service Manager will allow the user to install the service daemon for LeeTech DOOR. To start the DOOR Listener/Service, log in as a system administrator.

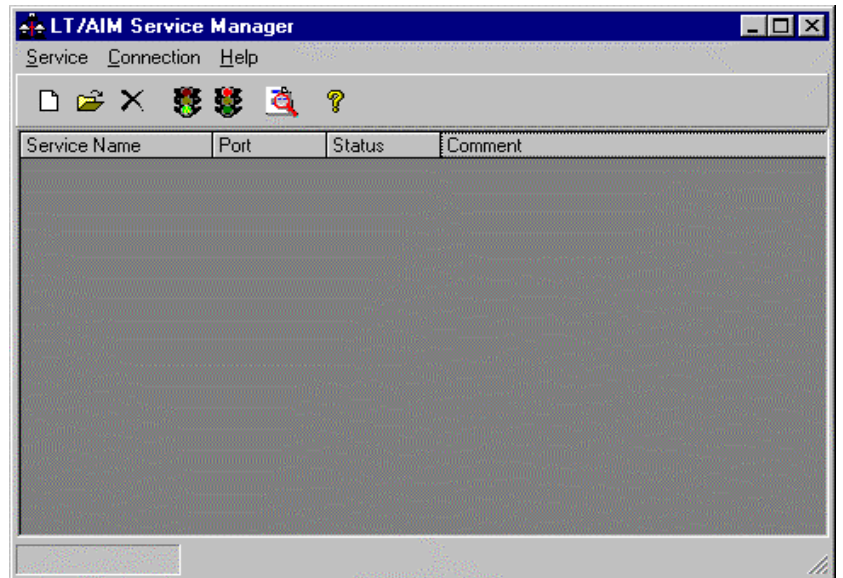


Figure 3-1. Opening Screen of LeeTech AIM Service Manager

### Parameters

**Service Name**      The name of the listener. The user can create a new service for DOOR, i.e. a listener for DOOR.

- Port** The TCP/IP Port where the listener is waiting when the client program wants to connect to the server program.
- Status** This informs whether the listener is active or inactive.
- Comment** This could be any comment about a specific listener program.

### Creating the DOOR Listener

Click on **service** and then click on **new**, or use the toolbar icon for *new service*. The screen below will appear. Type in the parameter values:

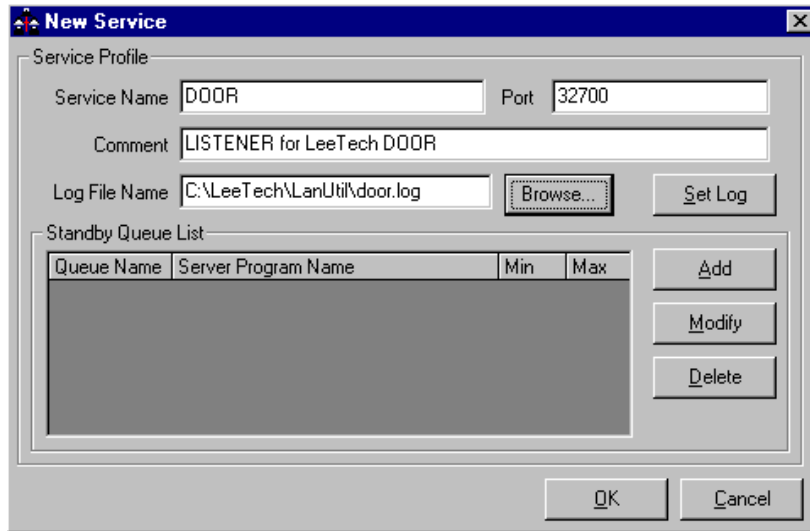


Figure 3-2. NT Service Manager New Service Screen

### Parameters

- Service Name** The Service Name is the name the LeeTech AIM listener is labeled for each new service. For LeeTech DOOR, type in **DOOR**.
- Port** The TCP/IP port is where the listener waits when the client program wants to connect to the server program. The default port number for DOOR is 32700.

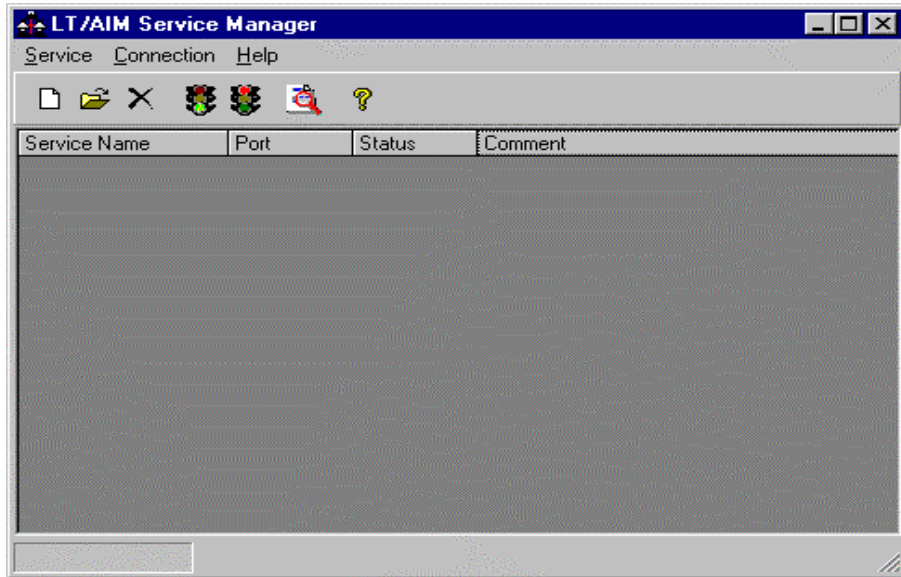
**Comment** This allows adding in any comments that will assist in quick referencing a specific function or explanation the listener brings up on the screen.

**Log File Name** This is the file name to store the system log and debug trace.

**Standby Queue List** This is the list of queues the selected listener monitors. This serves no purpose for DOOR.

### Modifying and Deleting Service

To modify a service, highlight the service name and click on the *modify* icon (the folder) in the tool bar. This will bring up the Modify Service screen. To modify a service, simply input the new information into the proper fields.



**Figure 3-3. NT Screen for Deleting/Modifying Service**

To delete a service, highlight the service name and click on the *delete* icon (the X) in the tool bar. This will delete the service highlighted.



## Starting and Stopping Service

To start a service, highlight the service name to start and click on the *start service* icon (the green light) in the tool bar. The highlighted service name will start.

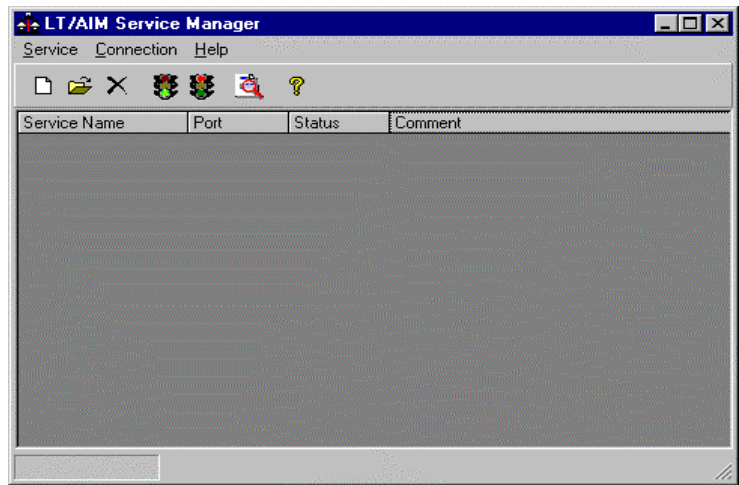


**Figure 3-4. NT Screen for Starting/Stopping Service**

To stop a service, highlight the service name to stop and click on the *stop service* icon (the red light) in the tool bar. The highlighted service will cease.

## Listing Connections to Listener

To list connections, highlight the service name desired and click on the *list connections* icon (the magnifying glass). A list of server programs will appear in a data box.



**Figure 3-5. NT Screen for Checking and Listing Connections to the Listener**

## 4. Starting the Mapping Administration Tool

This chapter describes how to start DOOR's mapping administration tool. This application allows data to be mapped between non-relational and relational databases. This chapter also describes the components of the application's main screen.

### Starting the Mapping Administration Tool

After installing the mapping administration tool, it can be started by using the **Start** button in the Windows taskbar or by double clicking on an icon in the DOOR program group.

#### Taskbar Method

To start the Administration tool from the Taskbar:

1. Click on the **Start** button in the Taskbar.
2. Choose **Programs, LeeTech Door** and **LeeTech Door**.

The main screen in Figure 4-1 appears.

#### Icon Method

To start the administration application from an icon in the DOOR program group:

1. Double-click on the DOOR application icon.

The main screen in Figure 4-1 appears.

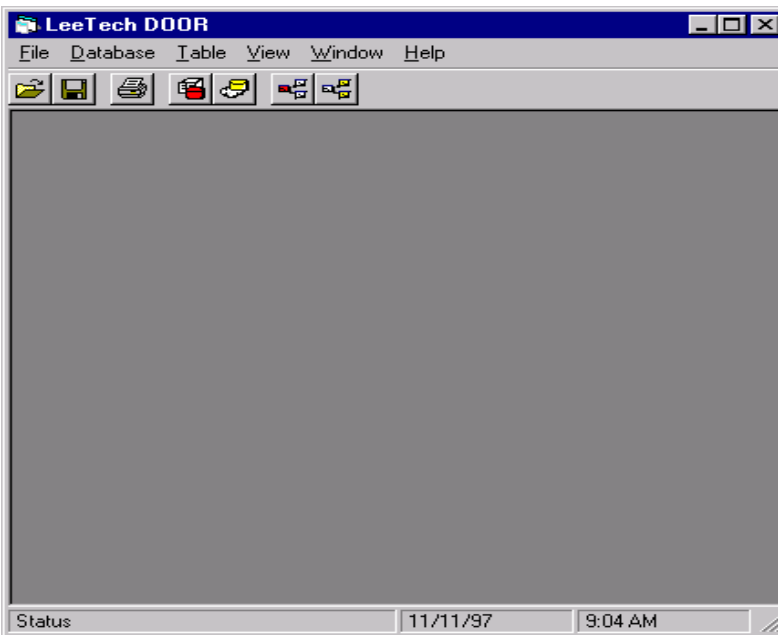


Figure 4-1. DOOR Main Screen

## Understanding the Main Screen

All administration application activities are started from the main screen. The main screen contains the following components (refer to Figure 4-2):

- A title bar appears at the top of the main screen. Initially, the title bar displays LeeTech DOOR. Upon opening source and destination databases, the database names appear in the title bar.
- A menu bar appears below the title bar. The menu bar contains drop-down menus. When one of these menus is clicked, a list of commands appears.
- A toolbar appears below the menu bar. The toolbar contains buttons for executing frequently performed activities. When the pointer is moved to a button, an explanation of the button appears at the pointer location. Each toolbar button has a corresponding command in a drop-down menu. The **View** menu has a **Toolbar** command that displays or hides the toolbar. The toolbar is displayed as part of the default setting.

- The display area appears below the toolbar. When database information is mapped between the source and the destination databases, the screen displays the databases in this area.
- A status bar at the bottom of the main screen provides status information. The **View** menu has a **Status Bar** command that displays or hides the status bar. The status bar is displayed as part of the default setting.

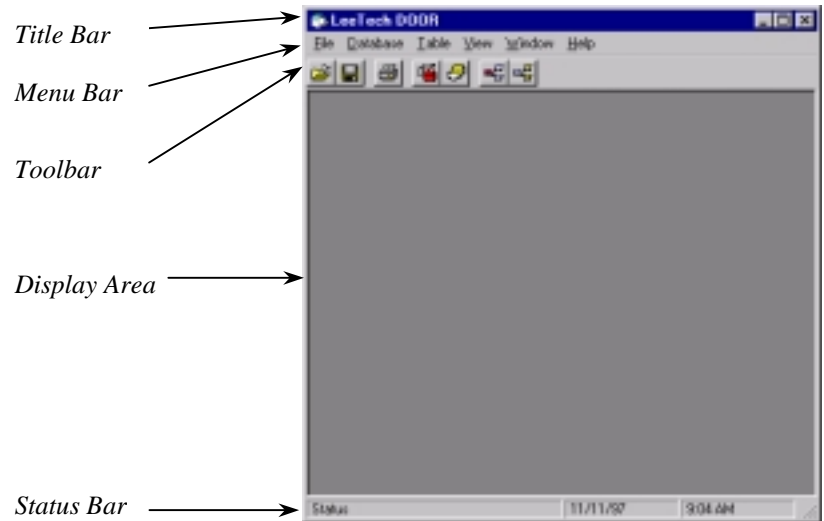


Figure 4-2. DOOR Main Screen Components

## Summary of Menus and Commands

Table 4-1 summarizes the menus and commands in the DOOR main screen. For more information about a command, refer to the section denoted by the See Page column.








Table 4-1. Summary of DOOR Menus and Commands

Menu	Command	Description	See Page
<b>File</b>	<b>Open</b>	Opens a configuration.	—
	<b>Save</b>	Saves a configuration.	—
	<b>Exit</b>	Exits from the DOOR application.	—
<b>Database</b>	<b>Open Source DB</b>	Opens a source database that contains the data to be mapped.	5-1
	<b>Open Destination DB</b>	Opens a destination database where the data will be mapped to from the source.	5-4
<b>Table</b>	<b>Select Source Set</b>	Allows selection of a source data set.	5-6
	<b>Select Destination Table</b>	Allows selection of a destination table.	5-8
<b>View</b>	<b>Toolbar</b>	Displays or hides the toolbar.	4-5
	<b>Status Bar</b>	Displays or hides the status bar.	4-3
<b>Window</b>	<b>Cascade</b>	Cascades multiple screens on the monitor to simplify viewing.	—
	<b>Tile Horizontal</b>	Tiles multiple screens horizontally on the monitor.	—
	<b>Tile Vertical</b>	Tiles multiple screens vertically on the monitor.	—
	<b>Arrange Icons</b>	Arranges icons on the Windows desktop.	—
<b>Help</b>		Provides on-line help for performing DOOR-related tasks.	—

## Summary of Toolbar Buttons

Table 4-2 summarizes the toolbar buttons in the DOOR main screen. For more information about a toolbar button, refer to the section denoted by the See Page column.

Table 4-2. Summary of DOOR Toolbar Buttons

Toolbar Button	Description	See Page
	Opens a configuration.	—
	Saves a configuration.	—
	Prints the displayed configuration information.	—
	Opens a source database that contains the data to be mapped.	5-1
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	Selects a data set in the source database.	5-6
	Selects a table in the destination database.	5-8

---

---

## 5. Mapping Data Between Databases

This chapter describes how to use the administration application to map data from a source database that contains non-relational data to a destination database that contains relational data. The procedure involves the following steps:

1. Opening a source database. The source database contains the data that will be mapped to the destination database. See section 5-1.
2. Opening one or more destination databases. The destination database will contain the data mapped from the source database. See section 5-4.
3. Selecting one or more source data sets in the source database. The source data set contains the data that will be mapped to one or more destination tables. See section 5-6.
4. Selecting one or more destination tables from the destination database(s). The destination table(s) will contain data mapped from the source data sets. See section 5-8.
5. Mapping the data from the source data set(s) to the destination table(s). See section 5-9.

### Opening a Source Database

The first step when mapping data from a non-relational database to a RDBMS is to open a source database. The source database contains the non-relational data that will be mapped to the destination database.

To open a source database:

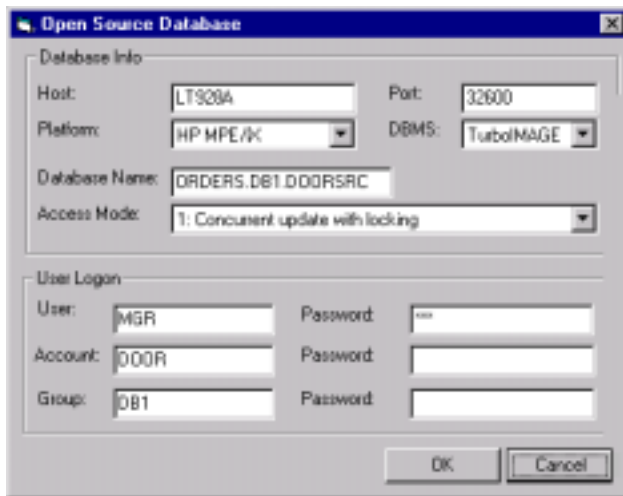
1. Either choose **Open Source DB** from the **Database** menu.

OR

Click on the **Open Source Database** button in the toolbar .

Either step displays an Open Source Database dialog box similar to the one in Figure 5-1.





**Figure 5-1. Open Source Database Dialog Box**

2. Complete the following fields in the Open Source Database dialog box.
  - **Database Info** parameters:

**Table 5-1. Open Source Database Info Parameters**

<b>Host</b>	Enter the name or IP address of the host where the source database resides.
<b>Port</b>	Enter the TCP/IP port number or name of the host where the source database resides.
<b>Platform</b>	From this drop-down list, select the source database platform.
<b>DBMS</b>	From this drop-down list, select the DBMS type (vendor) associated with the source database.
<b>Database Name</b>	Enter the full path where the source database resides.
<b>Access Mode</b>	<p>From this drop-down list, select an access mode for the source database. The access mode defines the type of database activities available. The drop-down list provides 8 access modes.</p> <ul style="list-style-type: none"> <li>• Access modes 5, 6, 7 and 8 are read-access modes and allow finding and reading of data entries.</li> </ul>

**Table 5-1. Open Source Database Info Parameters (continued)**

<b>Access Mode</b>	<ul style="list-style-type: none"> <li>Access mode 2 is an update-access mode that allows read access and replacing of values in all data entries except master data set key items and detail data set search and sort items.</li> <li>Access modes 1, 3 and 4 are modify-access modes that allow updates and allow addition and deletion of entries.</li> </ul> <p>For a summary of these modes, see Table 5-3 in section 5-3.</p>
--------------------	---

- User Logon parameters:

**Table 5-2. Open Source Database User Logon Parameters**

<b>User</b>	Enter user name.
<b>Password</b>	If a password is associated with the user name, enter the password here.
<b>Account</b>	Enter account information here.
<b>Password</b>	If a password is associated with the account, enter the password here.
<b>Group</b>	Enter group name here.
<b>Password</b>	If a password associated is with the group, enter the password here.

- Click on **OK**. The name of the source database appears in the title bar to indicate that the database is open.
- Proceed to Opening Destination Databases in section 5-4.

**Table 5-3. Summary of Database Access Modes**

Access Mode	Type of Access Mode Granted	Concurrent Access Modes Allowed	Notes
1	Modify	1, 5    Modify (with locking)	Locking must be used for updating or modifying.
2	Update	2, 6    Update	—
3	Modify	None	Exclusive access.
4	Modify	4, 6    Read	—

**Table 5-3. Summary of Database Access Modes (continued)**

Access Mode	Type of Access Mode Granted	Concurrent Access Modes Allowed	Notes
5	Read	1, 5 Modify (with locking)	Locking can be used to coordinate access with users who are modifying the database.
6	Read	2, 4, 6, 8 Modify	—
7	Read	None	Exclusive access.
8	Read	6, 8 Read	

## Opening Destination Databases

After opening a source database, one or more destination databases can be opened. The destination database will contain the data mapped from the source database opened in the previous section. For convenience, DOOR allows the opening of one or more destination databases.

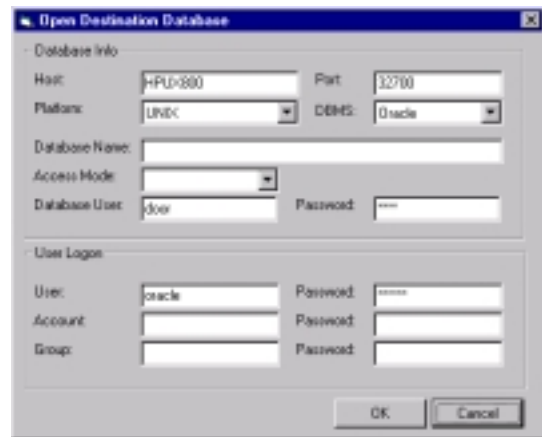
To open one or more destination databases:

1. Either choose **Open Destination DB** from the **Database** menu.

OR

Click on the **Open Destination Database** button in the toolbar .

Either step displays an Open Destination Database dialog box similar to the one in Figure 5-2.



**Figure 5-2. Open Destination Database Dialog Box**

2. Complete the following fields in the Open Source Database dialog box.
  - **Database Info** parameters (these parameters refer to database-specific information):

**Table 5-4. Open Destination Database Info Parameters**

<b>Host</b>	Enter the name of the host where the destination database resides.
<b>Port</b>	Enter the physical port of the host that is used to access the destination database.
<b>Platform</b>	From this drop-down list, select the destination database platform.
<b>DBMS</b>	From this drop-down list, select the DBMS type (vendor) associated with the destination database.
<b>Database Name</b>	Enter the full path where the destination database resides.
<b>Access Mode</b>	From this drop-down list, select an access mode for the destination database (access mode differs by vendor).
<b>Database User</b>	Enter the name of the database user who has access to the destination database.
<b>Password</b>	Enter the password here if one exists.

- **User Logon** parameters (these parameters refer to operating systems-related logon information):

**Table 5-5. Open Destination Database User Logon Parameters**

<b>User</b>	Enter user name.
<b>Password</b>	If a password is associated with the user name, enter the password here.
<b>Account</b>	Enter account information here.
<b>Password</b>	If a password is associated with the account, enter the password here.
<b>Group</b>	Enter group name here.
<b>Password</b>	If a password associated is with the group, enter the password here.

2. Click on **OK**.
3. To open additional destination databases, repeat steps 1 through 3 (If more than one destination database is opened, data can be mapped from the single source database opened in the previous section to each destination database opened).
4. When finished with opening the desired destination database(s), proceed to Selecting Source Data Sets in section 5-6.

## Selecting Source Data Sets

After opening a source database and one or more destination databases, select one or more source data sets. The data set is a collection of data items in the source database. For example, a CUSTOMER data set can contain entries composed of ACCOUNT, LAST NAME, FIRST NAME, STREET ADDRESS, CITY, STATE, ZIP and CREDIT RATING.

To select a source data set:

1. Either choose **Select Source Set** from the **Table** menu.

OR

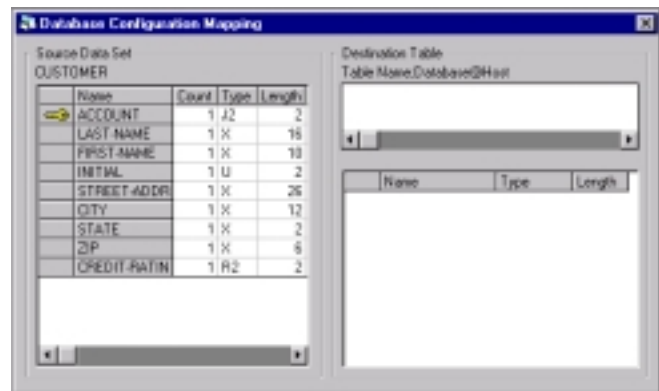
Click on the **Select a Data Set** button in the toolbar .

Either step displays a Source DB Set Selection dialog box for the source database opened. Figure 5-3 shows an example of a Source DB Set Selection dialog box. The Host and DataBase fields show the host and database locations of the source database.



**Figure 5-3. Source DB Set Selection Dialog Box**

2. Double-click on the set list item that contains the data to be mapped, or select an item and click on **Select**. The Database Configuration Mapping dialog box appears. The source data set selected appears below Source Data Set. Figure 5-4 shows how the Database Configuration Mapping dialog box looks when CUSTOMER is selected from the Set List column in the Source DB Set Selection dialog box.



**Figure 5-4. Database Configuration Mapping Screen**

3. To select additional source data sets, repeat steps 1 and 2. Each additional source data set selected appears in its own Database

Configuration Mapping dialog box. If more than one source data set is opened, data can be mapped from each source data set.

4. Proceed to Selecting Destination Tables in section 8.


## Selecting Destination Tables

After selecting a data set in the source database, select one or more destination tables. The destination tables will contain the data mapped from the source data set(s) selected in the previous section. When data in the source database is mapped, the data will be placed in the table selected in this procedure.

To select one or more destination tables:

1. Either choose **Select Destination Table** from the **Table** menu.

OR

Click on the **Select a Table** button in the toolbar .

Either step displays a Destination Database Table Selection dialog box similar to the one in Figure 5-5.



Figure 5-5. Destination Database Table Selection Dialog Box

2. If there is access to more than one host, use the **Host** drop-down list to choose the host that contains the destination data desired. If more than one destination database has been opened, use the **Database** drop-down list to select the database whose data is to be mapped from the source data set.
3. In the list, double-click on the table whose data will be mapped from the source data set, or select a table and click on **Select**. The selected table appears in the Destination Table field in the Database Configuration Mapping dialog box.
4. Repeat steps 1 through 3 to select additional tables. Figure 5-6 shows a Database Configuration Mapping dialog box that has a single source data set called CUSTOMER and two destination tables (ACCOUNT and CUSTOMER) that both reside on a host called HPUX800.

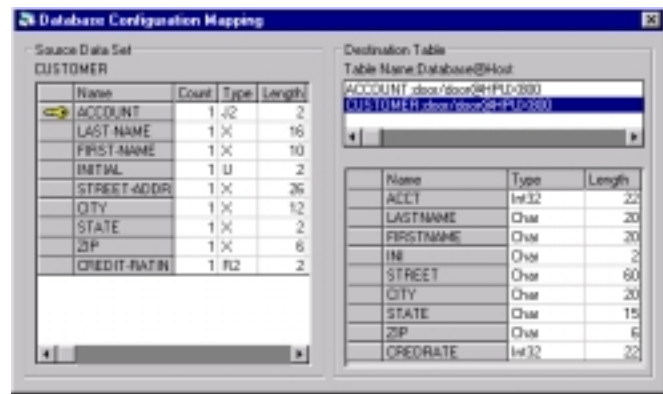


Figure 5-6. Selecting a Table

5. With the source data set(s) and destination table(s) displayed in the Database Configuration Mapping dialog box, mapping data from the source data set(s) to the destination table(s) can begin. Proceed to Mapping Data in section 5-9.

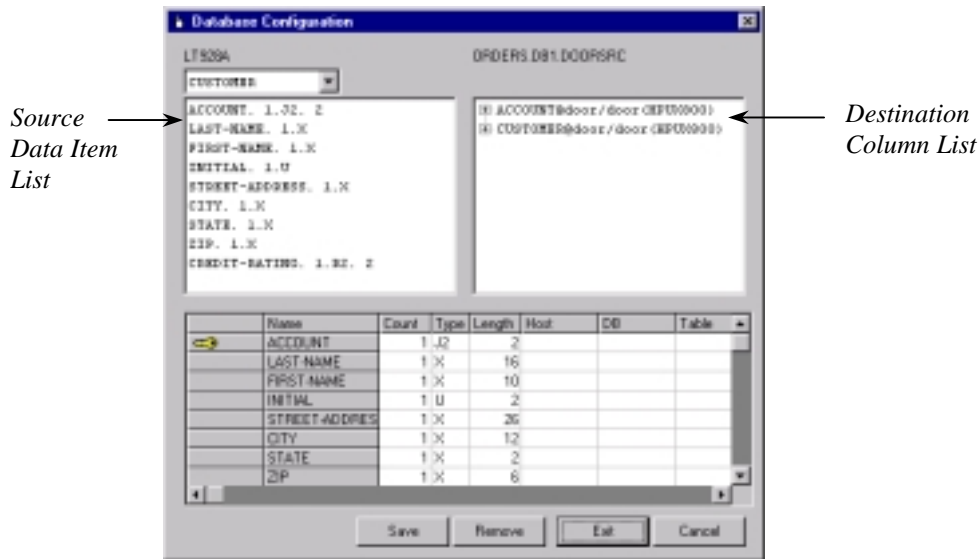
## Mapping Data

The following steps describe how to map data from the source data set(s) to the destination table(s) in the Database Configuration mapping dialog box.

To map data:



1. In the Database Configuration mapping dialog box, double-click on the source data item list. In Figure 5-6, for example, it is possible to double-click anywhere in the CUSTOMER source data set. A Database Configuration dialog box similar to the one in Figure 5-7 appears. Map data by dragging and dropping entries from the source data item list on the left to entries in the destination column list on the right. The table at the bottom of the dialog box displays information about the entries in the currently selected source data set and shows which entries have been mapped between the two lists.

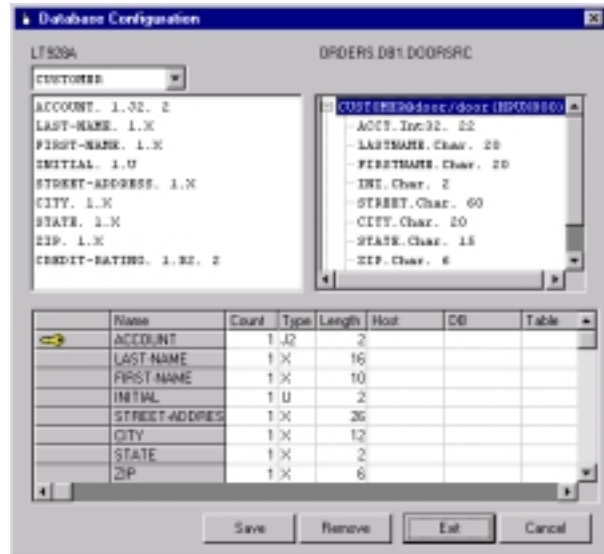


**Figure 5-7. Database Configuration Dialog Box**

2. If the currently selected source data set is not the one desired, use the drop-down list at the top-left of the dialog box to select one of the other open source data sets.  
**Note:** If a source data set that is not open is desired, use the procedure in section 5-6 to open the desired source data set with the Database Configuration dialog box displayed. Then use the drop-down list in Figure 5-7 to select that source data set.
3. If the destination column list displays only the names of the destination tables (as shown in Figure 5-7), click on the plus sign (+) next to the

name of the table that is to be mapped to. The column entries appear in the list (see Figure 5-8).

**Note:** If a destination table that has not been selected is desired, use the procedure in section 5-8 to select the desired destination table with the Database Configuration dialog box displayed (the table appears in the Database Configuration dialog box automatically).



**Figure 5-8. Displaying Column Entries**

4. In the source data item list on the left, click on the first entry to map and drag it over the appropriate entry in the destination column list on the right (the pointer changes to a finger as dragging occurs), then release the left mouse button. The Confirm Assignment dialog box appears (see Figure 5-9).



**Figure 5-9. Confirm Assignment Dialog Box**

- To map the selected source entry to the destination entry, click on **OK**, (or click on **Cancel** to cancel this mapping). If **OK** is clicked on, the mapping is reflected in the table at the bottom of the Database Configuration dialog box. Refer to Figure 5-7.
- Repeat steps 4 and 5 to map additional source and destination entries.
- If a different decision is made about a mapping, click on the mapping in the table at the bottom of the Database Configuration dialog box to remove, then click on the **Remove** button. The mapping is removed from the destination, as indicated in the table at the bottom of the Database Configuration dialog box.
- When mapping is finished, click on **Save** to save the mappings.
- Click on **Exit** to exit the Database Configuration dialog box.  
**Note:** If **Exit** is clicked on without clicking on **Save**, a message asks whether to save the mappings or not. Click on **Yes** to save them or on **No** to discard them. Click on **Cancel** to exit the dialog box without saving the mappings.
- To assign a key to an entry in the destination table, proceed to Assigning a Key in section 5-13. Otherwise, close the Database Configuration Mapping dialog box. If there is a prompt stating that the set has changed, click on **Yes** to save the changes or on **No** to discard them.

## Assigning a Key

The Database Configuration Mapping dialog box allows for assigning of a key to a column in a destination table. A key allows for fast, accurate and efficient updates and deletions to data records on destination tables by determining the location of a unique data entry.

Using the administration application one or more keys can be defined in the destination table. These keys can be the same as the ones used in the source data or they can be different.

**Note:** If there is failure to use a key, all the old values of the mapped data will be used as key values when updating or deleting records in the destination table.

To assign a key to a column in a destination table:

1. If the appropriate destination table appears in the Database Configuration Mapping dialog, skip to step 2. Otherwise, use the procedure listed in Selecting Destination Tables in section 5-8 to display the appropriate destination table in the Configuration Mapping dialog box. Refer to Figure 5-6.
2. In the columns below Destination Table on the right side of the Database Configuration Mapping dialog box, double-click on the leftmost column. The Database Mapping Viewer appears (see Figure 5-10).

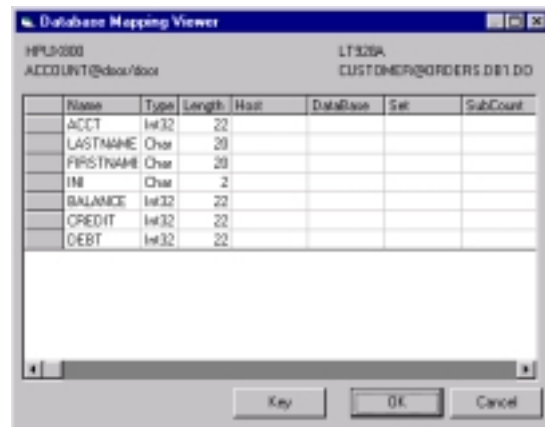
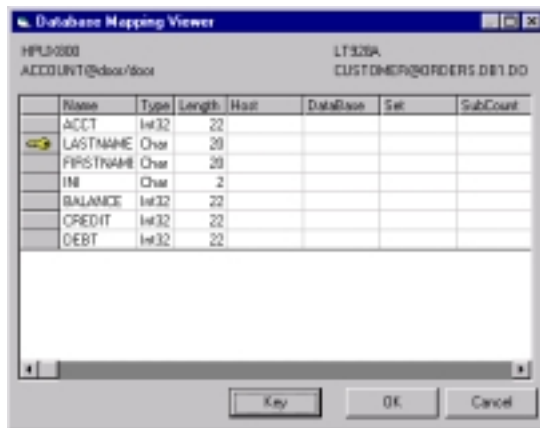


Figure 5-10. Database Mapping Viewer

3. In the leftmost column, click on the table entry desired to be designated as the key, then click on the **Key** button. A key icon appears next to the selected column (see Figure 5-11).



**Figure 5-11. Designating a Key**

4. To designate additional columns as keys, repeat step 3.
5. If a different decision is made about a key, click on the column and on the **Key** button to remove the key designation from that column.
6. When finished with assigning keys, click on **OK**. The Database Mapping Viewer disappears and the key(s) designated appears in the Database Configuration Management dialog box (see Figure 5-12).
7. Exit the Database Configuration Mapping dialog box.

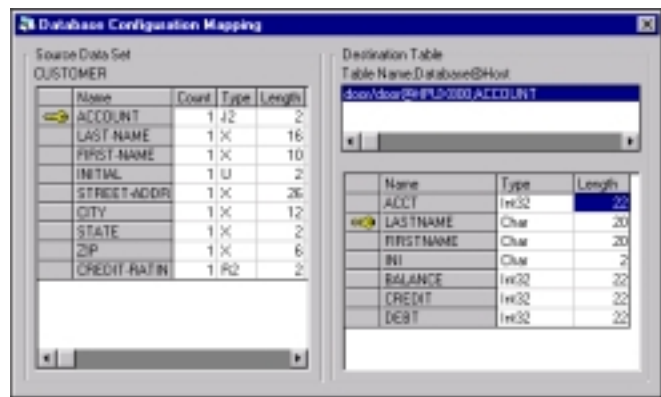


Figure 5-12. Database Configuration Management Dialog Box with Key Example

## 6. Starting the Replication Engine

After the data mapping has been configured and saved in the HP e3000 source machine, the administrator needs to start the DOOR data replication engine. This task could be merged with daily operation routines.

Before using the example DOOR.PUB.DOOR script, modify the user-defined section variables FIFO, LOGFILE, DATABASE, MODE and BYPASS\_FLAG to suit the needs of the TurboIMAGE database.

DOOR utilizes the logging facility of TurboIMAGE to monitor and replicate transactions occurring within a TurboIMAGE database. It is recommended that a new log file be created before the DOOR replication engine is started. This ensures that the data will be synchronized between source and destination databases. Please refer to the 'TurboIMAGE Database Management System Reference Manual' for instructions on how to manage logging with TurboIMAGE. The manual is also available on the Internet accessible at [www.docs.hp.com](http://www.docs.hp.com).

To start the DOOR replication engine, run the modified command script DOOR.PUB.DOOR.

### Example 6-1. Starting the Replication Engine

```
:print door.pub.door
#####
# The following command script demonstrates the procedures
# to use LeeTech DOOR to replicate a source database named
# TESTDB.DATA.DOOR with database logging enabled to log file
# DBLOG.DATA.DOOR.
#####
#####
# Door Example Script
# User defined section
# This section to be defined by user!
#####
#
# Define FIFO name of log message pipe
# Define LOGFILE Image Database transaction log file
```

## Data Type

---

```
# Define DATABASE Image data base name
# Define MODE Image database open mode, normally 1.
# Define BYPASS Door start mode.
#       0 - last record
#       1 - restart
#
setvar FIFO,"logfifo.pub.image"
setvar LOGFILE,"log01.pub.image"
setvar DATABASE,"data.pub.image"
setvar MODE,1
setvar BYPASS_FLAG,1
#####
# End of user defined section.
# Note from this point users should
# Only change LTDBG## debug flags
#####
# Set Door parameter names.
setvar L1,"jdoorint,mgr.door"
setvar L2,"jdoorsht,mgr.door"
setvar P1,"interc"
setvar P2,"shoot"
#####
# Build temporary job card files.
# Note if parms cause rec lengths > 80 use
# & to concatenate commands
#
build j1;rec=-256,16,f,ascii;disc=50000,32;temp
build j2;rec=-256,16,f,ascii;disc=50000,32;temp
# Create Job Card 1 Door Interceptor
echo !!JOB !L1 >>j1
echo !!setvar LTDBGOUT "DOORLOGI.LOG.DOOR" >> j1
# Debug Levels
```



---

```
#echo !!setvar LTDBG1 1 >> j1
#echo !!setvar LTDBG14 1 >> j1
#echo !!setvar LTDBG15 1 >> j1
# Remove previous FIFO file.
echo !!continue >>j1
echo !!purge !FIFO >>j1
# Run Interceptor
echo !!RUN !P1 & >>j1
echo !;info="!LOGFILE !DATABASE !MODE !FIFO !BYPASS_FLAG" >>j1
echo !!EOJ >>j1
#####
# Create Job Card 2 Door Shooter
echo !!JOB !L2 >>j2
echo !!setvar LTDBGOUT "DOORLOGS.LOG.DOOR" >> j2
echo !!setdump >> j2
# Debug Levels
#echo !!setvar LTDBG1 1 >> j2
#echo !!setvar LTDBG14 1 >> j2
#echo !!setvar LTDBG15 1 >> j2
# Wait for FIFO file to be created. Wait 60 seconds try 10
times.
echo !!waitfifo.pub.door !FIFO 60 10 >>j2
# Run shooter
echo !!RUN !P2;info="-d !DATABASE -l !FIFO" >>j2
echo !!EOJ >>j2
#####
# Cleanup Section
#
print j1
print j2
stream j1
stream j2
```

```
purge j1,temp  
purge j2,temp
```

## SQL Statement Trace

LeeTech DOOR provides a SQL statement trace to help understand the source and target database differences and configure the right mapping relationship. If the application was purchased from a third party vendor, from the trace, the related source data sets for a specific application procedure can be conversely constructed

The trace can also help identify data type conversion problems between two different source items and target columns.

In example 6-1, deleting the comment (#) from the statement

```
# echo !!setvar LTDBG16 1 >> j2
```

will turn on the SQL trace and log into the file "DOORLOGS.LOG.DOOR."

## Error Logging

During the mapping configuration, the user can specify whether to stop or continue the data replication if an error occurs. The error logging is turned on by setting the environment variable, LTDBG1, before the replication engine and remote target agent listener are started.

For HP e3000:

```
setvar LTDBG1 1
```

For UNIX:

```
export LTDBG1=1
```

For Windows:

```
Set LTDBG1=1
```

Most errors occur when a unique record already exists in the target database and a duplicate is created. By looking at the error log, the mapping can easily be reconfigured to add appropriate key information for target database tables.

## 7. Customer Support

LeeTech Software Inc. is dedicated to providing the highest quality software products available. In addition, LeeTech believes that high quality, knowledgeable support is an essential element for full utilization of the supplied products. LeeTech has thus structured a complete support package that is available with all supplied products.

All support contracts include telephone or message based support. LeeTech's staff is qualified to assist not only with product use, but also with any database problems customers might have. If problems prove extensive and outside the scope of the maintenance contract, LeeTech can still assist with low cost consulting.

In addition to specific service requests, LeeTech provides users with periodic newsletters, software bulletins and other materials designed to help ensure effective use of LeeTech products. If you wish to be placed on the mailing list simply send your request to LeeTech.

LeeTech customer service can be contacted by any of the following.

### Mail

Please send all inquiries or problems to:

LeeTech Software Inc.  
2085 Hamilton Ave., Suite 200  
San Jose, CA 95125  
U.S.A.

### Telephone Support

All LeeTech customers with a current support services contract can contact LeeTech at the following numbers.

U.S.A.	(800) 995-1987
All Other Countries	(408) 253-1987

## **Fax-Back Service**

LeeTech maintains a 24-hour Fax number for customer input. Questions regarding support services receive immediate attention at the beginning of the following business day. Responses are returned by Fax or by the method designated on the submittal.

Fax Number (408) 558-0802

## **Electronic Messaging**

Questions or input can be made via electronic mail.

- Support needs can be mailed to:

support@leetech.com

- Information inquiries can be mailed to:

info@leetech.com

- All product and sales needs can be mailed to:

sales@leetech.com

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