

# **INFORMIX<sup>®</sup>-Universal Server**

## Guide to the High-Performance Loader

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Documentation Team: Twila Booth, Evelyn Eldridge-Diaz, Katherine Schaefer

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# Table of Contents

## Introduction

About This Manual . . . . .	3
Organization of This Manual . . . . .	3
Types of Users . . . . .	5
Software Dependencies . . . . .	5
Assumptions About Your Locale. . . . .	5
Demonstration Database . . . . .	6
Major Features . . . . .	6
Documentation Conventions . . . . .	7
Typographical Conventions . . . . .	7
Icon Conventions . . . . .	9
Command-Line Conventions . . . . .	10
Screen-Illustration Conventions . . . . .	12
Additional Documentation . . . . .	13
On-Line Manuals . . . . .	13
Printed Manuals . . . . .	13
On-Line Help . . . . .	14
Error Message Files . . . . .	14
Documentation Notes, Release Notes, Machine Notes . . . . .	15
Compliance with Industry Standards . . . . .	15
Informix Welcomes Your Comments . . . . .	16

## Chapter 1

### High-Performance Loader Overview

Overview of Features of the HPL . . . . .	1-3
Data Load . . . . .	1-4
Data Unload . . . . .	1-6
Loading Modes . . . . .	1-7
Deluxe Mode . . . . .	1-7
Express Mode . . . . .	1-7
The HPL Utilities . . . . .	1-8
The onpload Utility . . . . .	1-8
The ipload Utility . . . . .	1-9

The onpload Database . . . . .	1-9
The Relationship Among the Parts of the HPL. . . . .	1-10
Environment Variables . . . . .	1-12
The DBONPLOAD Environment Variable . . . . .	1-12
The PLCONFIG Environment Variable . . . . .	1-13
The Architecture of the onpload Utility . . . . .	1-13
Deluxe Mode Loads . . . . .	1-14
Express-Mode Loads . . . . .	1-16
Unloads . . . . .	1-18

## Chapter 2   **Getting Started**

Data-Load Example . . . . .	2-3
Start Universal Server . . . . .	2-4
Create a File of Data. . . . .	2-4
Create a Database . . . . .	2-4
The ipload Utility . . . . .	2-5
Start the ipload Utility . . . . .	2-5
Choose a Project . . . . .	2-6
Check Your Defaults . . . . .	2-6
The Load Job Windows . . . . .	2-7
The Load Job Select Window. . . . .	2-7
The Load Job Window . . . . .	2-10
The Device-Array Windows . . . . .	2-10
The Device Array Selection Window . . . . .	2-11
The Device-Array Definition Window . . . . .	2-12
The Format Windows . . . . .	2-13
The Format Views Window . . . . .	2-13
The Record Formats Window . . . . .	2-15
The Format-Definition Window. . . . .	2-17
The Filter, Discard Records, and Logfile Boxes . . . . .	2-19
The Filter Text Box . . . . .	2-19
The Discard Records Text Box . . . . .	2-19
The Logfile Text Box. . . . .	2-19
The Map Windows . . . . .	2-20
The Map Views Window . . . . .	2-20
The Load Record Maps Window . . . . .	2-23
The Map Definition Window. . . . .	2-23
The Load Options Window . . . . .	2-28
The Run Option . . . . .	2-29
The Active Job Window . . . . .	2-30
Verify the Data Transfer . . . . .	2-31
Perform a Level-0 Backup. . . . .	2-31

	Generate Example . . . . .	2-31
	Start the Example . . . . .	2-32
	Prepare the Unload Job Window . . . . .	2-32
	Perform the Unload . . . . .	2-37
<b>Chapter 3</b>	<b>Using the High-Performance Loader Windows</b>	
	Using the HPL User Interface . . . . .	3-3
	Starting the User Interface . . . . .	3-4
	The HPL Main Window . . . . .	3-4
	The Component-Selection Windows . . . . .	3-7
	The Component-Definition Windows . . . . .	3-10
	The Load Job and Unload Job Windows . . . . .	3-14
	The Views Windows . . . . .	3-15
	The Selection-List Windows . . . . .	3-19
	The Message Windows . . . . .	3-20
	Using the HPL Buttons . . . . .	3-20
	Toolbar Buttons . . . . .	3-21
	Icon Buttons . . . . .	3-29
	Buttons . . . . .	3-31
	Using the On-Line Help . . . . .	3-33
	Using UNIX Keyboard Commands to Move the Cursor . . . . .	3-33
<b>Chapter 4</b>	<b>Defining Projects</b>	
	The Project Organization . . . . .	4-3
	The Projects Window . . . . .	4-6
	Creating a New Project . . . . .	4-7
	Selecting a Project . . . . .	4-7
<b>Chapter 5</b>	<b>Configuring the High-Performance Loader</b>	
	Configuring the ipload Utility . . . . .	5-3
	Selecting a Database Server . . . . .	5-3
	Using the Connect Server Window . . . . .	5-4
	Creating the onpload Database . . . . .	5-5
	Modifying the onpload Defaults . . . . .	5-5
	The Defaults Window . . . . .	5-5
	Changing the onpload Defaults . . . . .	5-7
	Selecting a Driver . . . . .	5-8
	The Drivers Window . . . . .	5-8
	Using the Drivers Window . . . . .	5-10
	Modifying the Machine Description . . . . .	5-10
	The Machines Window . . . . .	5-11
	Using the Machines Window . . . . .	5-12

<b>Chapter 6</b>	<b>Defining Device Arrays</b>	
	Device Arrays . . . . .	6-3
	Using Multiple Devices in a Device Array . . . . .	6-3
	Using the Device Array Selection Window . . . . .	6-4
	Using the Device-Array Definition Window . . . . .	6-6
<b>Chapter 7</b>	<b>Defining Formats</b>	
	Formats . . . . .	7-3
	Fixed-Length Records . . . . .	7-4
	Creating a Fixed Format . . . . .	7-5
	Editing a Format . . . . .	7-9
	Creating a Fixed Format That Uses Carriage Returns . . . . .	7-11
	Creating a Format That Includes Ext Type or Simple LO Data . . . . .	7-12
	Delimited Records . . . . .	7-16
	Creating a Delimited Format . . . . .	7-16
	Creating a Delimited Format That Includes Simple LOs . . . . .	7-17
	Creating a Delimited Format That Includes Ext Types . . . . .	7-18
	COBOL Records . . . . .	7-19
	Creating a COBOL Format . . . . .	7-20
	The Picture and Usage Descriptions . . . . .	7-20
	Other Formats . . . . .	7-21
	Fast Format. . . . .	7-21
	Fast Job . . . . .	7-21
	Format Options . . . . .	7-22
	Modifying Fixed and COBOL Formats . . . . .	7-22
	Modifying Delimited Format Options . . . . .	7-24
	The Format Views Window . . . . .	7-26
<b>Chapter 8</b>	<b>Defining Queries</b>	
	Queries . . . . .	8-3
	Creating a Query . . . . .	8-4
	Using the Table Button . . . . .	8-7
	Editing a Query . . . . .	8-13
	Exporting and Importing Queries . . . . .	8-13
	Importing a Query . . . . .	8-13
	Exporting a Query . . . . .	8-15
	The Database Views Window . . . . .	8-17
<b>Chapter 9</b>	<b>Defining Maps</b>	
	Maps . . . . .	9-3
	Load Maps . . . . .	9-4

	Using the Map-Definition Window . . . . .	9-4
	Creating a Load Map . . . . .	9-7
	Unload Maps . . . . .	9-10
	Creating an Unload Map . . . . .	9-10
	Mapping Options . . . . .	9-14
	Using Mapping Options . . . . .	9-14
	Setting the Mapping Options . . . . .	9-16
	Editing Options . . . . .	9-18
	Using the Delete Button . . . . .	9-18
	Using the Find Button . . . . .	9-18
	Using the Specs Button . . . . .	9-20
	The Map Views Window . . . . .	9-21
<b>Chapter 10</b>	<b>Defining Filters</b>	
	Using a Filter . . . . .	10-3
	Creating a Filter . . . . .	10-5
	Editing a Filter . . . . .	10-8
	Filter Views . . . . .	10-10
	Filters with Code-Set Conversion . . . . .	10-11
<b>Chapter 11</b>	<b>Unloading Data from a Database</b>	
	Components of the Unload Job . . . . .	11-3
	Choosing the Database Server . . . . .	11-4
	Running Multiple Jobs . . . . .	11-4
	The Unload Job Windows . . . . .	11-5
	Creating an Unload Job . . . . .	11-6
	Running the Unload Job . . . . .	11-8
	Using the Command-Line Information . . . . .	11-10
	Changing the Unload Options . . . . .	11-11
	Editing an Unload Job . . . . .	11-12
	The Generate Options . . . . .	11-13
<b>Chapter 12</b>	<b>Loading Data to a Database Table</b>	
	Components of the Load Job . . . . .	12-3
	Choosing the Database Server . . . . .	12-4
	Running Multiple Jobs . . . . .	12-4
	Preparing User Privileges and the Violations Table . . . . .	12-4
	The Load Job Windows . . . . .	12-7
	Creating a Load Job . . . . .	12-8
	Running the Load Job . . . . .	12-10
	Using the Command-Line Information . . . . .	12-12
	Changing the Load Options . . . . .	12-13

	Editing a Load Job . . . . .	12-15
	The Generate Options . . . . .	12-15
<b>Chapter 13</b>	<b>Generate Options</b>	
	Types of Generate Tasks . . . . .	13-3
	Generating from the Load Job Window . . . . .	13-4
	Using the Autogenerate Load Components Window . . . . .	13-4
	Generating from the Unload Job Window . . . . .	13-6
	Using the Autogenerate Unload Components Window . . . . .	13-6
	Generating from the Components Menu . . . . .	13-10
	The Generate Window . . . . .	13-10
	Generating Load and Unload Components . . . . .	13-13
	Using the No Conversion Job Option . . . . .	13-14
<b>Chapter 14</b>	<b>Browsing</b>	
	The Browsing Options . . . . .	14-3
	Previewing Data-File Records . . . . .	14-3
	Reviewing Records That the Conversion Rejected . . . . .	14-6
	Viewing the Violations Table . . . . .	14-7
	Viewing the Status of a Load Job or Unload Job . . . . .	14-9
<b>Chapter 15</b>	<b>Managing the High-Performance Loader</b>	
	Modes . . . . .	15-3
	Deluxe Mode . . . . .	15-4
	Express Mode . . . . .	15-4
	Violations . . . . .	15-9
	Rejected Records from the Input File . . . . .	15-9
	Constraint Violations . . . . .	15-10
	Viewing Error Records . . . . .	15-10
	Performance . . . . .	15-10
	Configuration Parameters . . . . .	15-11
	Mode . . . . .	15-12
	Devices for the Device Array . . . . .	15-12
	Usage Models . . . . .	15-13
	Performance Hints . . . . .	15-16
<b>Chapter 16</b>	<b>The onpload Utility</b>	
	Understanding the onpload Utility . . . . .	16-3
	Starting the onpload Utility . . . . .	16-3
	Using the onpload Utility . . . . .	16-4
	Syntax . . . . .	16-4



<b>Appendix A</b>	<b>The onpload Database</b>	
	The formats Table . . . . .	A-8
	The mapoption Table . . . . .	A-11
	The query Table . . . . .	A-14
<b>Appendix B</b>	<b>The High-Performance Loader Configuration File</b>	
<b>Appendix C</b>	<b>Picture Strings</b>	
<b>Appendix D</b>	<b>Match Condition Operators and Characters</b>	
<b>Appendix E</b>	<b>Custom Conversion Functions</b>	
<b>Appendix F</b>	<b>Custom Drivers</b>	
<b>Appendix G</b>	<b>The onstat -j Option</b>	
<b>Appendix H</b>	<b>HPL Log-File and Pop-Up Messages</b>	
	<b>Index</b>	



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# Introduction

About This Manual . . . . .	3
Organization of This Manual . . . . .	3
Types of Users . . . . .	5
Software Dependencies . . . . .	5
Assumptions About Your Locale . . . . .	5
Demonstration Database . . . . .	6
Major Features . . . . .	6
Documentation Conventions . . . . .	7
Typographical Conventions . . . . .	7
Icon Conventions . . . . .	9
Comment Icons . . . . .	9
Feature Icons . . . . .	9
Command-Line Conventions . . . . .	10
How to Read a Command-Line Diagram . . . . .	12
Screen-Illustration Conventions . . . . .	12
Additional Documentation . . . . .	13
On-Line Manuals . . . . .	13
Printed Manuals . . . . .	13
On-Line Help . . . . .	14
Error Message Files . . . . .	14
Documentation Notes, Release Notes, Machine Notes . . . . .	15
Compliance with Industry Standards . . . . .	15
Informix Welcomes Your Comments . . . . .	16



**R**ead this introduction for an overview of the information provided in this manual and for an understanding of the documentation conventions used.

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## About This Manual

The *Guide to the High-Performance Loader* describes how to use the High-Performance Loader (HPL) to efficiently load and unload large quantities of data to or from an Informix database.

This manual includes two tutorial examples that take you through the process of loading and unloading data.

## Organization of This Manual

This manual includes the following chapters:

- This Introduction provides an overview of the manual and describes the documentation conventions used.
- [Chapter 1, “High-Performance Loader Overview,”](#) describes the architecture of the HPL and gives a general overview of the HPL and the tasks that it performs. It also explains the relationships and functions of the three parts of the HPL.
- [Chapter 2, “Getting Started,”](#) uses two tutorials to introduce the user interface of the HPL and the **ipload** utility.
- [Chapter 3, “Using the High-Performance Loader Windows,”](#) describes the basic graphical features of the user interface and the mechanics of how to use them. It includes information on basic features of the windows, buttons, on-line help, and keyboard commands.

- [Chapter 4, “Defining Projects,”](#) describes the project as the primary organizational feature for organizing load and unload jobs and their respective components. It also describes how to create and manipulate a project.
- [Chapter 5](#) through 10 describe the various components that make up a load or unload job: device arrays, formats, queries, maps, and filters. Each chapter also describes how to create and modify the featured component.
- [Chapter 11](#) through 12 explain the process of performing an unload job and a load job. Each chapter describes the job window and the components that you must define before you can unload or load data.
- [Chapter 13, “Generate Options,”](#) describes the generate feature, which you can use to quickly create the components of a load or unload job. It describes how to create the components using the Generate window.
- [Chapter 14, “Browsing,”](#) describes the browsing options that you can use to examine files that the HPL creates.
- [Chapter 15, “Managing the High-Performance Loader,”](#) discusses three aspects of managing the work you do with the HPL: modes, violations, and performance.
- [Chapter 16, “The onpload Utility,”](#) describes the syntax of the **onpload** utility.
- [Appendix A](#) describes the tables of the **onpload** database.
- [Appendix B](#) describes the HPL configuration file.
- [Appendix C](#) describes the two classes of picture strings that the HPL uses.
- [Appendix D](#) describes the match conditions available in the HPL.
- [Appendix E](#) and [Appendix F](#) describe how to build and integrate custom functions and drivers.
- [Appendix G](#) describes the **-j** option (of the **onstat** utility) that provides special information about the status of an **onpload** job.
- [Appendix H](#) provides explanatory notes and corrective actions for nonnumbered messages.

## Types of Users

This manual is written for database administrators and Universal Server administrators who must load and unload large quantities of data in situations that require the following activities:

- Loading external data or unloading data from a database
- Moving data to a different computer or configuration
- Altering the schema of a table

If you have limited experience with relational databases, SQL, or your operating system, refer to [Getting Started with INFORMIX-Universal Server](#) for a list of introductory texts.

## Software Dependencies

This manual assumes that you are using INFORMIX-Universal Server, Version 9.1, as your database server.

In this manual, all instances of Universal Server refer to INFORMIX-Universal Server.

## Assumptions About Your Locale

Informix products can support many languages, cultures, and code sets. All culture-specific information is brought together in a single environment, called a GLS (Global Language Support) locale.

This manual assumes that you are using the default locale, **en\_us.8859-1**. This locale supports U.S. English format conventions for dates, times, and currency. In addition, this locale supports the ISO 8859-1 code set, which includes the ASCII code set plus many 8-bit characters such as é, è, and ñ.

If you plan to use nondefault characters in your data or your SQL identifiers, or if you want to conform to the nondefault collation rules of character data, you need to specify the appropriate nondefault locale(s). For instructions on how to specify a nondefault locale, additional syntax, and other considerations related to GLS locales, see the [Guide to GLS Functionality](#).

## Demonstration Database

The DB-Access utility, which is provided with your Informix database server products, includes a demonstration database called **stores7** that contains information about a fictitious wholesale sporting-goods distributor. Sample command files are also included.

Many examples in Informix manuals are based on the **stores7** demonstration database. The **stores7** database is described in detail and its contents are listed in Appendix A of the [Informix Guide to SQL: Reference](#).

The script that you use to install the demonstration database is called **dbaccessdemo7** and is located in the **\$INFORMIXDIR/bin** directory. For a complete explanation of how to create and populate the demonstration database on your database server, refer to the [DB-Access User Manual](#).

---

## Major Features

The HPL for Universal Server, Version 9.1, supports loading and unloading the following new Informix data types: INT8, LVARCHAR, SERIAL8, BLOB, BOOLEAN, CLOB, collection data types, distinct data types, opaque data types, and row types.

The Introduction to each Version 9.1 product manual contains a list of major features for that product. The Introduction to each manual in the Version 9.1 *Informix Guide to SQL* series contains a list of new SQL features.

Major features for Version 9.1 Informix products also appear in release notes.



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## Documentation Conventions

This section describes the conventions that this manual uses. These conventions make it easier to gather information from this and other Informix manuals.

The following conventions are covered:

- Typographical conventions
- Icon conventions
- Command-line conventions
- Screen-illustration conventions

### Typographical Conventions

This manual uses the following standard set of conventions to introduce new terms, illustrate screen displays, describe command syntax, and so forth.

---

Convention	Meaning
KEYWORD	All keywords appear in uppercase letters in a serif font.
<i>italics</i>	Within text, new terms and emphasized words appear in italics. Within syntax diagrams, values that you are to specify appear in italics.
<b>boldface</b>	Identifiers (names of classes, objects, constants, events, functions, program variables, forms, labels, and reports), environment variables, database names, filenames, table names, column names, icons, menu items, command names, and other similar terms appear in boldface.
monospace	Information that the product displays and information that you enter appear in a monospace typeface.

---

(1 of 2)

Convention	Meaning
KEYSTROKE	Keys that you are to press appear in uppercase letters in a sans serif font.
◆	This symbol indicates the end of feature-, product-, platform-, or compliance-specific information.
→	This symbol indicates a menu item. For example, “Choose <b>Tools→Options</b> ” means choose the <b>Options</b> item from the <b>Tools</b> menu.

(2 of 2)






***Tip:** When you are instructed to “enter” characters or to “execute” a command, immediately press RETURN after the entry. When you are instructed to “type” the text or to “press” other keys, no RETURN is required.*

## Icon Conventions

Throughout the documentation, you will find text that is identified by several different types of icons. This section describes these icons.


### *Comment Icons*

Comment icons identify warnings, important notes, or tips. This information is always displayed in italics.

Icon	Description
	The <i>warning</i> icon identifies vital instructions, cautions, or critical information.
	The <i>important</i> icon identifies significant information about the feature or operation that is being described.
	The <i>tip</i> icon identifies additional details or shortcuts for the functionality that is being described.

### *Feature Icons*

Feature icons identify paragraphs that contain feature-specific information.

Icon	Description
	Identifies information that relates to the Informix Global Language Support (GLS) feature.

These icons can apply to a row in a table, one or more paragraphs, or an entire section. A ♦ symbol indicates the end of the feature-specific information.

## Command-Line Conventions

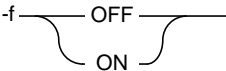
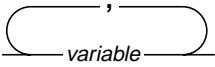
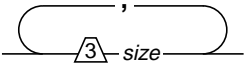
This section defines and illustrates the format of commands that are available in Informix products. These commands have their own conventions, which might include alternative forms of a command, required and optional parts of the command, and so forth.

Each diagram displays the sequences of required and optional elements that are valid in a command. A diagram begins at the upper-left corner with a command. It ends at the upper-right corner with a vertical line. Between these points, you can trace any path that does not stop or back up. Each path describes a valid form of the command. You must supply a value for words that are in italics.

You might encounter one or more of the following elements on a command-line path.

Element	Description
command	This required element is usually the product name or other short word that invokes the product or calls the compiler or preprocessor script for a compiled Informix product. It might appear alone or precede one or more options. You must spell a command exactly as shown and use lowercase letters.
<i>variable</i>	A word in italics represents a value that you must supply, such as a database, file, or program name. A table following the diagram explains the value.
-flag	A flag is usually an abbreviation for a function, menu, or option name or for a compiler or preprocessor argument. You must enter a flag exactly as shown, including the preceding hyphen.
.ext	A filename extension, such as <b>.sql</b> or <b>.cob</b> , might follow a variable that represents a filename. Type this extension exactly as shown, immediately after the name of the file. The extension might be optional in certain products.
(., ; + * - /)	Punctuation and mathematical notations are literal symbols that you must enter exactly as shown.

(1 of 2)

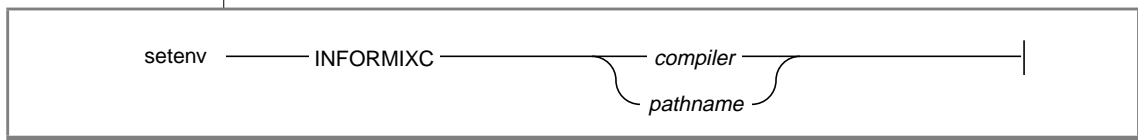
Element	Description
' '	Single quotes are literal symbols that you must enter as shown.
<div style="border: 1px solid black; padding: 2px; display: inline-block; margin-bottom: 5px;">Privileges p. 5-17</div> <div style="border: 1px solid black; padding: 2px; display: inline-block;">Privileges</div>	A reference in a box represents a subdiagram. Imagine that the subdiagram is spliced into the main diagram at this point. When a page number is not specified, the subdiagram appears on the same page.
— ALL —	A shaded option is the default action.
→ → →	Syntax within a pair of arrows indicates a subdiagram.
└	The vertical line terminates the command.
	A branch below the main path indicates an optional path. (Any term on the main path is required, unless a branch can circumvent it.)
	A loop indicates a path that you can repeat. Punctuation along the top of the loop indicates the separator symbol for list items.
	A gate ( $\sqrt{3}$ ) on a path indicates that you can only use that path the indicated number of times, even if it is part of a larger loop. Here you can specify <i>size</i> no more than three times within this statement segment.

(2 of 2)

### How to Read a Command-Line Diagram

Figure 1 shows a command-line diagram that uses some of the elements that are listed in the previous table.

**Figure 1**  
Example of a Command-Line Diagram



To construct a command correctly, start at the top left with the command. Then follow the diagram to the right, including the elements that you want. The elements in the diagram are case sensitive.

Figure 1 diagrams the following steps:

1. Type the word `setenv`.
2. Type the word `INFORMIXC`.
3. Supply either a compiler name or pathname.  
After you choose *compiler* or *pathname*, you come to the terminator.  
Your command is complete.
4. Press RETURN to execute the command.

### Screen-Illustration Conventions

The illustrations in this manual are generic renditions of various windowing environments. The details of specific dialog boxes, controls, and windows are deleted or redesigned to provide this generic look. Therefore, the illustrations in this manual depict the windowing environment a little differently than the way it appears on your screen.

To familiarize yourself with this generic appearance, compare the generic windows and controls shown in [Chapter 3, “Using the High-Performance Loader Windows,”](#) to the windows and controls of the windowing environment in which you are operating the **ipload** utility.

---

## Additional Documentation

For additional information, you might want to refer to the following types of documentation:

- On-line manuals
- Printed manuals
- On-line help
- Error message files
- Documentation notes, release notes, and machine notes

### On-Line Manuals

A CD that contains Informix manuals in electronic format is provided with your Informix products. You can install the documentation or access it directly from the CD. For information about how to install, read, and print on-line manuals, see either the installation guide for your product or the installation insert that accompanies the documentation CD.

The documentation set that is provided on the CD describes Universal Server, its implementation of SQL, and its associated application-programming interfaces. For an overview of the manuals in the Universal Server documentation set, see [Getting Started with INFORMIX-Universal Server](#).

### Printed Manuals

The Universal Server documentation set describes Universal Server, its implementation of SQL, and its associated application-programming interfaces. For an overview of the manuals in the Universal Server documentation set, see [Getting Started with INFORMIX-Universal Server](#).

To order printed manuals, call 1-800-331-1763 or send email to [moreinfo@informix.com](mailto:moreinfo@informix.com).

Please provide the following information:

- The documentation that you need
- The quantity that you need
- Your name, address, and telephone number

## On-Line Help

The HPL on-line help facility provides a detailed, context-sensitive explanation of program functions. To invoke the on-line help, click **Help** in any window for window-specific help or choose options from the **Help** menu on the HPL main window. The **Help** menu lets you choose **Glossary** to view definitions that are related to the HPL or choose **Contents** to search for specific topics.

## Error Message Files

Informix software products provide ASCII files that contain all the Informix error messages and their corrective actions. To read the error messages in the ASCII file, Informix provides scripts that let you display error messages on the screen (**finderr**) or print formatted error messages (**rofferr**). For a detailed description of these scripts, see the Introduction to the [Informix Error Messages](#) manual.

The HPL log file stores nonnumbered messages that are returned by **onpload** during a data load or unload. For explanatory notes for the messages that appear in the log file, refer to [Appendix H](#).



## Documentation Notes, Release Notes, Machine Notes

In addition to printed documentation, the following on-line files, located in the `$INFORMIXDIR/release/en_us/0333` directory, supplement the information in this manual.

---

On-Line File	Purpose
<b>HPLDOC_9.1</b>	The documentation-notes file describes features that are not covered in this manual or that have been modified since publication.
<b>SERVERS_9.1</b>	The release-notes file describes feature differences from earlier versions of Informix products and how these differences might affect current products. This file also contains information about any known problems and their workarounds.
<b>IUNIVERSAL_9.1</b>	The machine-notes file describes any special actions that are required to configure and use Informix products on your computer. Machine notes are named for the product described.

---

Please examine these files because they contain vital information about application and performance issues.

---

## Compliance with Industry Standards

The American National Standards Institute (ANSI) has established a set of industry standards for SQL. Informix SQL-based products are fully compliant with SQL-92 Entry Level (published as ANSI X3.135-1992), which is identical to ISO 9075:1992, on INFORMIX-Universal Server. In addition, many features of Universal Server comply with the SQL-92 Intermediate and Full Level and X/Open SQL CAE (common applications environment) standards.

---

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# High-Performance Loader Overview

Overview of Features of the HPL . . . . .	1-3
Data Load . . . . .	1-4
Data Unload . . . . .	1-6
Loading Modes . . . . .	1-7
Deluxe Mode . . . . .	1-7
Express Mode . . . . .	1-7
The HPL Utilities . . . . .	1-8
The onpload Utility . . . . .	1-8
The ipload Utility . . . . .	1-9
The onpload Database . . . . .	1-9
The Relationship Among the Parts of the HPL . . . . .	1-10
Distinctions Among the Parts of the HPL . . . . .	1-11
Environment Variables . . . . .	1-12
The DBONPLOAD Environment Variable . . . . .	1-12
The PLCONFIG Environment Variable . . . . .	1-13
The Architecture of the onpload Utility . . . . .	1-13
Deluxe Mode Loads . . . . .	1-14
Threads That the onpload Utility Uses . . . . .	1-15
Threads That Universal Server Uses . . . . .	1-16
Express-Mode Loads . . . . .	1-16
Unloads . . . . .	1-18



**T**his chapter introduces the High-Performance Loader (HPL), provides a general overview of the tasks that the HPL performs, and describes the architecture of the HPL. The chapter covers the theory of the HPL, but it does not attempt to describe how to use the HPL.

[Chapter 2](#) introduces the user interface, the **ipload** utility, that you can use to set the parameters for the HPL. Subsequent chapters provide details about the user interface.

---

## Overview of Features of the HPL

The HPL is a feature of the INFORMIX-Universal Server that allows you to efficiently load and unload very large quantities of data to or from an Informix database. The HPL lets you exchange data with tapes, data files, and programs and converts data from these sources into a format compatible with an Informix database. The HPL also allows you to manipulate and filter the data as you perform load and unload operations.

The HPL includes the following features:

- The HPL supports COBOL, ASCII, multibyte, delimited, or binary data. You can add custom drivers to support other data types.
- The HPL can load and unload data of a different GLS locale from that of the database server.
- The client/server architecture of the HPL lets you use the **ipload** utility, a graphical user interface, on any computer on your network.
- The **ipload** utility provides a Generate option that lets you automatically generate the HPL components that are required for a load or unload job.

- The database-load feature lets you update your databases with data from any of the supported file types, while allowing you to control the format and selection of records from the input files. Data can be loaded from or unloaded to files, tapes, or application pipes, or to any combination of these three device types.
- The HPL provides synonym support for tables that are valid for the local database server. You can use synonyms for both the load and unload operations.
- The HPL provides support for unloading data with a query that accesses a view in its SELECT statement.
- The load and unload operations run in the background of your multitasking UNIX system. Once the operation begins, you can continue to use **ipload** to perform other functions.
- The HPL provides context-sensitive on-line help. The on-line help also includes a glossary.
- Any Universal Server on your network can use the **onpload** database, which contains parameters and controls that the HPL uses. This accessibility allows centralized management of your load and unload controls. These parameters and controls include the HPL components such as formats, maps, and projects.

---

## Data Load

The *data-load* process reads a source data file, converts the data to a different format, and inserts the converted data into a database table. The source data can come from one or more of the following sources:

- Files
- Tapes
- Pipes (application-generated data)

During conversion, the source data is often manipulated so that the converted data displays different characteristics. Examples of this manipulation include:

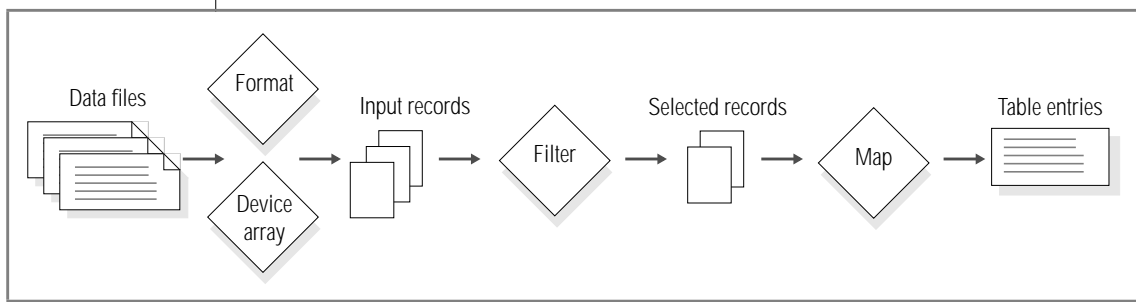
- changing lowercase letters to uppercase letters.
- loading default values, loading certain table columns, or replacing nulls.
- masking the data to include only part of a value.
- converting from one data type to another, such as conversion of a numeric string to a float.
- converting from the code set of one locale to the code set of another locale. ♦

When you prepare to run a data load using the HPL, you describe the actions that the HPL must take by defining a set of meta-data *components*. The components describe different aspects of the load process. Figure 1-1 illustrates the data load process. The HPL uses information from:

- the device array to find the set of the source-data files.
- the format to define the data types and layout of the source data.
- the filter to select the records from the source data that should be written to the database table.
- the map to modify and reorganize the data.

The **ipload** utility helps you prepare the components. [Chapter 12, “Loading Data to a Database Table,”](#) addresses the process of loading a file to a database.

**Figure 1-1**  
The Data-Load Process



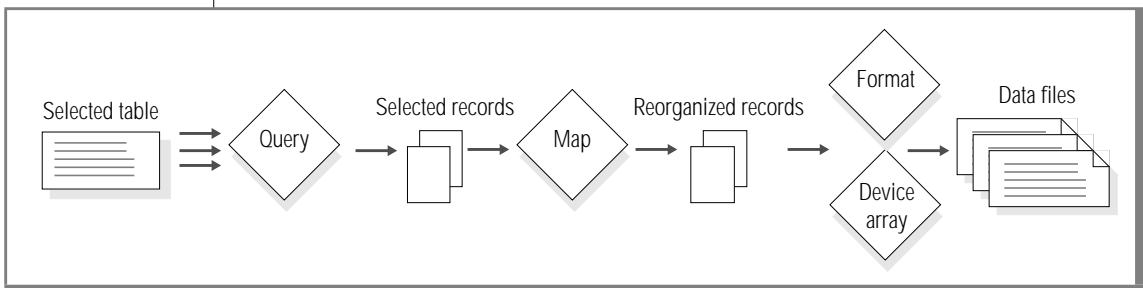
## Data Unload

The *data-unload* process is essentially the same as the load process, but in reverse. The data-unload process extracts the source data from one or more database tables; converts the data to a new format; and writes the converted data to a file, tape, or pipe (application). As in a load, you can manipulate the data from a database table so that the converted data displays different characteristics.

Figure 1-2 illustrates how the components of the HPL affect the data as it moves from an Informix database to data files during the unload process. The HPL uses:

- the query to select records from the database.
- the map to reorganize or modify the selected records.
- the format to prepare the records for writing out to the data files.
- the device array to find the location of the data files.

**Figure 1-2**  
The Data-Unload Process



The HPL uses the same components for an unload as for a load, with one exception. For an unload, the **ipload** utility creates a Structured Query Language (SQL) query that extracts selected data from the table. As with a load, unload components are grouped together into an unload job. Unload jobs can be saved, retrieved, and rerun as many times as necessary. Unload jobs can be grouped together with load jobs in the same project.

For a description of the steps involved in an unload, refer to [Chapter 11, “Unloading Data from a Database.”](#)



---

## Loading Modes

The HPL offers two *load modes*: deluxe and express. Express mode is faster and deluxe mode is more flexible. You can choose the mode that is best suited for your environment. For a detailed comparison between express and deluxe mode, refer to [Chapter 15, “Managing the High-Performance Loader.”](#)

### Deluxe Mode

The deluxe mode updates indexes, performs constraint checking, and evaluates triggers as data is inserted into the table. Deluxe mode does not lock the table, so the loading of data can take place while other users are working. Deluxe mode is not as fast as express mode but allows table access and update during a load.

### Express Mode

The express mode disables indexes, constraints, and triggers during the load. After the load, indexes are rebuilt and reenabled, constraints are evaluated and reenabled if possible, and triggers are reenabled. (The triggers are not evaluated with respect to the loaded data.) Express-mode loads are significantly faster than deluxe loads; however, no one can update the table or read the new data entries until the load is complete.

---

## The HPL Utilities

The major parts of the HPL are as follows:

- The **onpload** utility
- The **ipload** utility
- The **onpload** database

The largest part of this manual discusses the HPL user interface, the **ipload** utility, because the user interface is the part that you see and with which you interact. However, the **ipload** utility is merely the interface that allows you to prepare the parameters (the **onpload** database) that the **onpload** utility uses to perform the data loads and unloads. Theoretically, you could use DB-Access or some other tool to populate the **onpload** database and never use **ipload**. However, **ipload** is a more efficient and accurate way to populate the **onpload** database.

### The onpload Utility

The **onpload** utility performs the actual activity of converting and moving data. The **onpload** utility uses information from the **onpload** database to run the load or unload and to convert the data. The **onpload** utility performs conversion and filtering operations. During a load, **onpload** also records information about data records that do not meet the load criteria.

One of the **ipload** options lets you start the **onpload** utility, so that you do not need to start the **onpload** utility from the command line.

## The ipload Utility

The **ipload** utility is a graphical interface that you use to create and store information for the **onpload** utility. The **ipload** utility lets you create, edit, and group the components of the load and unload. The **ipload** utility creates a database named **onpload** and stores information about the load components in the database.

## The onpload Database

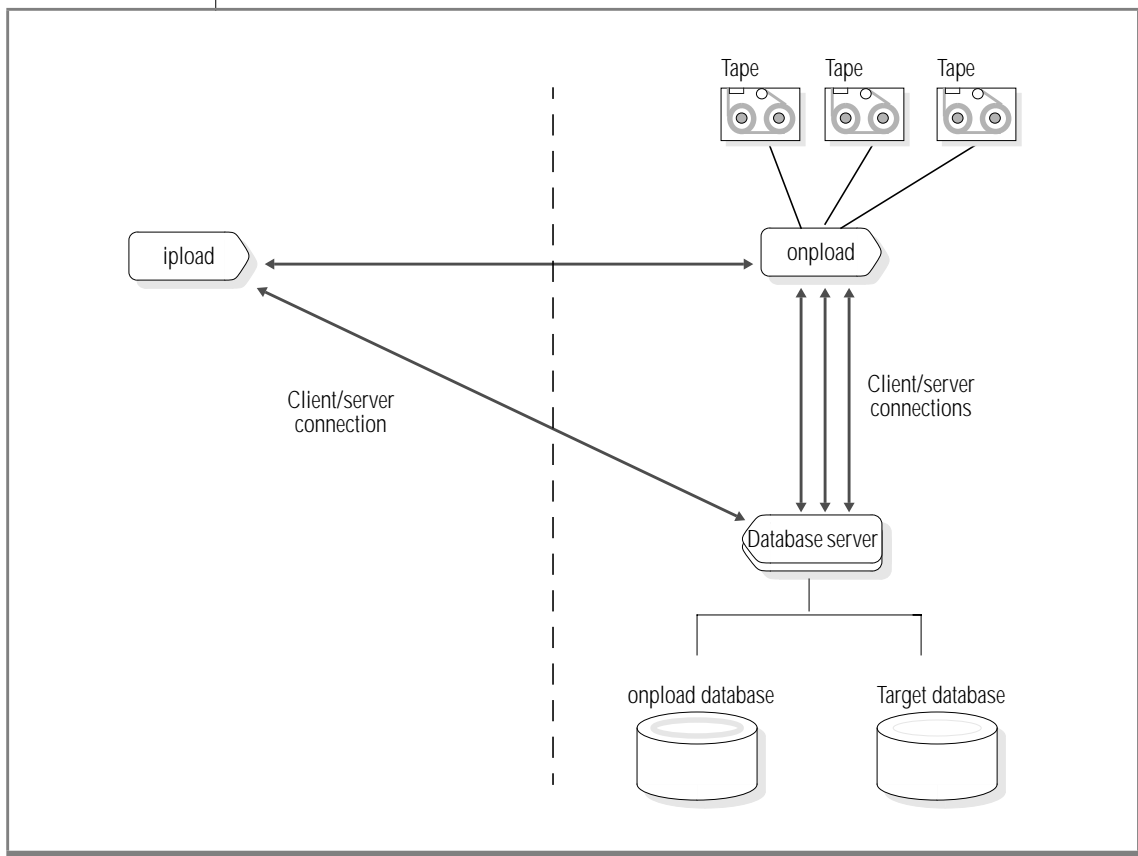
The **onpload** database contains information that the **onpload** utility requires to perform data loads and unloads.

The **onpload** database can reside on any database server on your network. Also, any **onpload** utility can use the **onpload** database as long as the **onpload** utility can access the database server that contains the **onpload** database. In contrast, the **onpload** utility must run on the same computer as the database server that contains the target database.

## The Relationship Among the Parts of the HPL

Figure 1-3 illustrates the relationship among the parts of the HPL. The **ipload** utility connects to the database server to populate the **onpload** database. The **onpload** utility uses the multithreaded architecture to make multiple connections to the database server and multiple I/O connections. “[The Architecture of the onpload Utility](#)” on page 1-13 describes in more detail how **onpload** works.

**Figure 1-3**  
Relationships Among the Parts of the HPL



You can start **onpload** in the following ways:

- Using choices from the **ipload** interface
- Using the **onpload** command

When you start **onpload** from the **ipload** interface, **ipload** and **onpload** use a socket connection to send messages back and forth: start, stop, and simple reports.

When you use the **onpload** command, **onpload** executes completely independently from **ipload**. The part of [Figure 1-3 on page 1-10](#) to the right of the dashed line shows **onpload** loading or unloading data with no interaction from **ipload**.

### *Distinctions Among the Parts of the HPL*

The following distinctions among the **ipload** utility, the **onpload** utility, and the **onpload** database are important:

- The **ipload** utility manages the descriptions of load and unload jobs. It does not actively move data from one place to another.
- The **onpload** utility moves data from one place to another (that is, from a database to a storage device, or from a storage device to a database).
- The **onpload** database contains information that the **onpload** utility uses. The **ipload** utility manages the **onpload** database.

Theoretically, you could manage the **onpload** database yourself and never use the **ipload** utility. However, that process would be very tedious and prone to errors. Informix strongly recommends that you use **ipload**. You can use DB-Access or other database tools to examine the contents of the **onpload** database, but always use **ipload** to modify the database.

---

## Environment Variables

The HPL is part of INFORMIX-Universal Server, so you must start Universal Server before you use the HPL. Before you start Universal Server, you must set these environment variables:

- **INFORMIXDIR**
- **ONCONFIG**
- **INFORMIXSERVER**
- **LD\_LIBRARY\_PATH**

The **INFORMIXDIR**, **ONCONFIG**, and **INFORMIXSERVER** environment variables are documented in the [INFORMIX-Universal Server Administrator's Guide](#).

**LD\_LIBRARY\_PATH** is a new environment variable that is used on some computers for shared libraries. Refer to the machine notes for information about **LD\_LIBRARY\_PATH**.

In addition to the environment variables that you must always set when you use Universal Server, the following environment variables refer to the HPL:

- **DBONPLOAD**
- **PLCONFIG**

### The **DBONPLOAD** Environment Variable

Each database server can have only one active **onpload** database. In most cases, you can use the default **onpload** database, which is named **onpload**.

If you choose to prepare multiple databases to hold different types of control information, you must set the **DBONPLOAD** environment variable before you can run a load or unload.

### To prepare multiple onpload databases

1. Set the **DBONPLOAD** environment variable to the name of the alternative **onpload** database.
2. Restart **ipload**.
3. Use **ipload** to prepare the alternative database.

If you do not use an alternative **onpload** database, you do not need to set **DBONPLOAD**.

## The PLCONFIG Environment Variable

The default configuration file for the **onpload** utility is **plconfig.std**. The configuration file always resides in the **\$INFORMIXDIR/etc** directory. To use an alternative configuration file, you must set the **PLCONFIG** environment variable to the name of the alternative **onpload** configuration file. If you use **plconfig.std**, you do not need to set **PLCONFIG**.

The **onpload** configuration file is described in [Appendix B, “The High-Performance Loader Configuration File.”](#)

---

## The Architecture of the onpload Utility

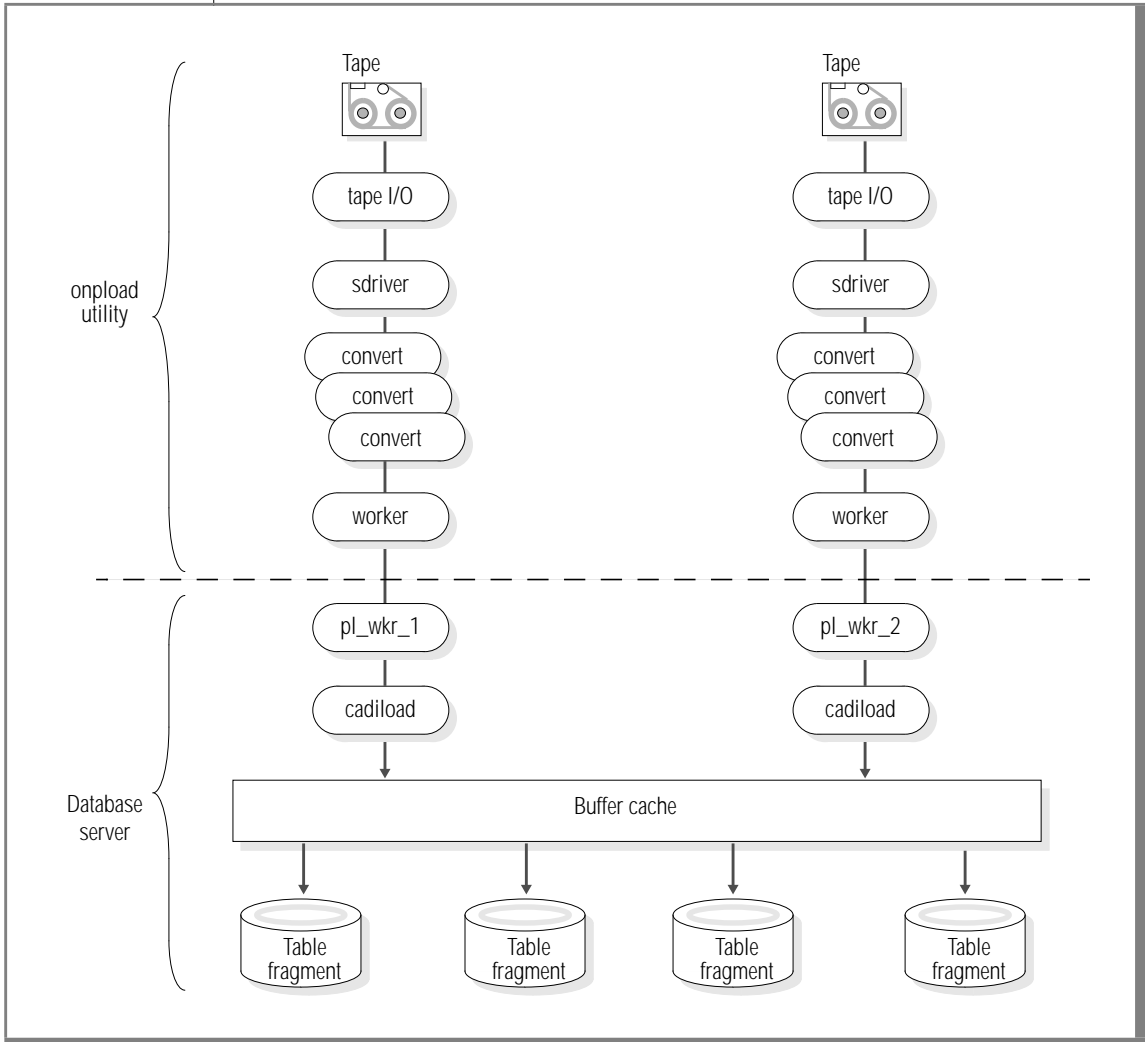
The greater part of this manual discusses the **ipload** utility; however, the **ipload** utility is merely the interface that allows you to prepare the parameters that the **onpload** utility uses. The **onpload** utility actually does the work of loading and unloading data.

The **onpload** utility is a client application that attaches to INFORMIX-Universal Server. The utility is unusual because it uses the same multithreading architecture that Universal Server uses. By using multithreading, **onpload** can take advantage of parallel processing to do both I/O and data conversion as efficiently as possible. Multithreading is described in the [INFORMIX-Universal Server Administrator’s Guide](#). The next sections describe how **onpload** uses multithreading for deluxe loads, express loads, and unloads.

## Deluxe Mode Loads

Figure 1-4 shows the threads that **ipload** uses in a deluxe-mode load process. In deluxe mode, data is subject to the same constraints as if you were loading the data using SQL INSERT statements.

**Figure 1-4**  
A Deluxe-Mode Load





## ***Threads That the onpload Utility Uses***

The **onpload** utility starts the following threads:

- **tape I/O** threads

The **onpload** utility starts one **tape I/O** thread for each tape device. It handles reading of data from the tape device asynchronously.

In the case of pipes input, a similar thread is started. In the case of disk file input, the multithreading AIO subsystem is used instead of a dedicated I/O thread.

- **sdriver** threads

The driver threads control I/O from input files. They handle device abstraction for the different device types handled. The driver threads also are responsible for passing out records from the input and passing records to the converters.

- **convert** threads

The **onpload** utility starts one or more **convert** threads for each device. These threads perform conversions on the input data such as uppercase to lowercase conversion or code-set conversion.

- **worker** threads

The **onpload** utility starts one **worker** thread for each input device. These threads communicate with the database server. The main responsibility of the **worker** thread is to pass data to the database server.

To see the status of the **onpload** threads, you must use the **-j** option of the **onstat** utility. This option is documented in [Appendix G](#).

## Threads That Universal Server Uses

Universal Server uses the following threads to insert the data into the database:

- **pl\_wkr** threads

Each worker thread of the **onpload** utility is paired with a **pl\_wkr** thread in the database server. These threads receive the data from **onpload**.

If you look at a utility that shows Universal Server status, the **pl\_wkr** threads are named **pl\_wkr\_1**, **pl\_wkr\_2**, **pl\_wkr\_3**, and so forth.

- **cadiload** threads

The **cadiload** threads are the insert threads. The insert threads perform a normal insert into the database, just as if you were using an INSERT statement. The SQL optimizer governs the method that is used for inserting the data.

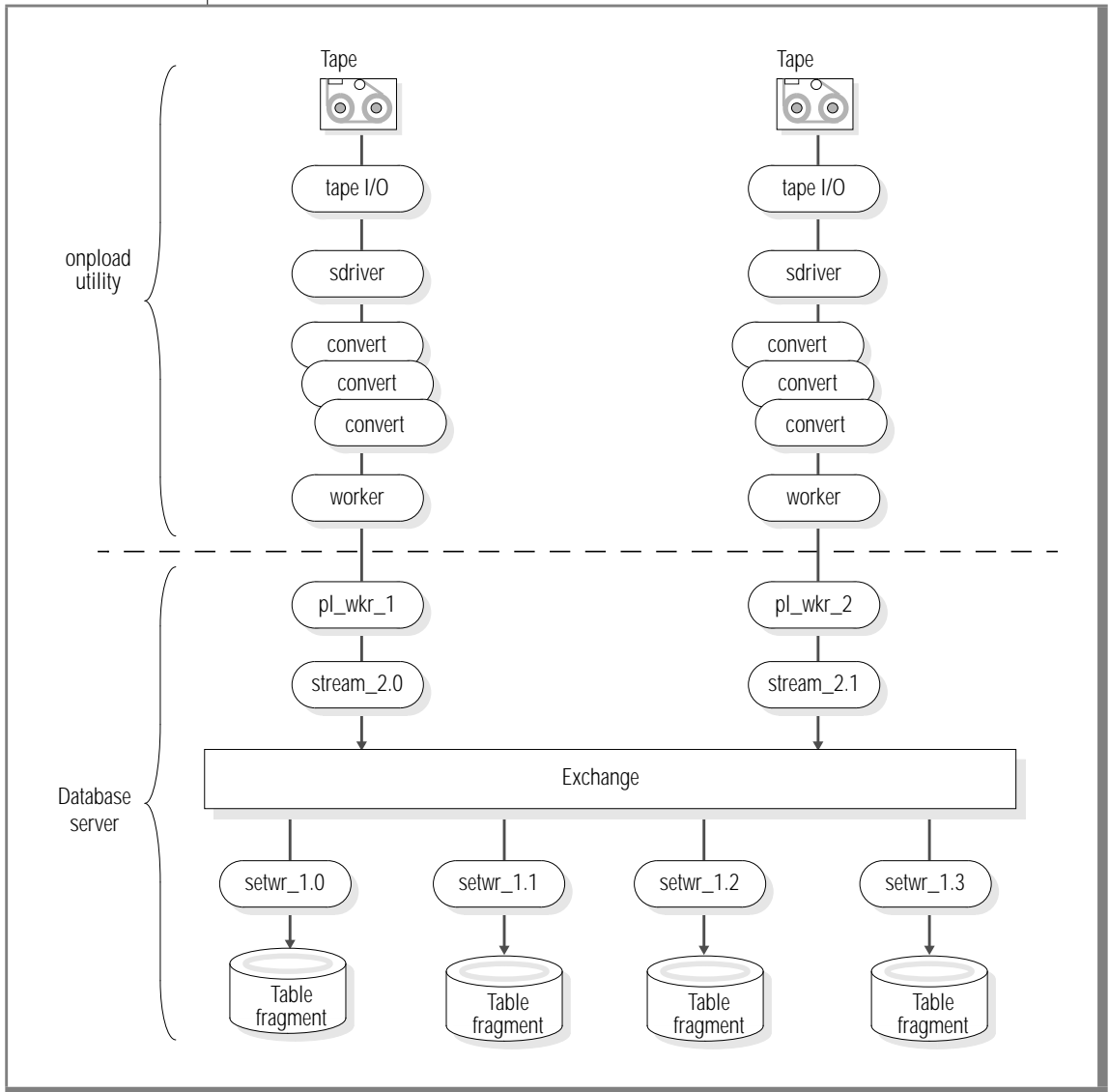
## Express-Mode Loads

[Figure 1-5 on page 1-17](#) shows a single express-mode load process. In express mode, the data is inserted directly into an extent without any evaluation of objects (constraints, indexes, and/or triggers).

The behavior of the **onpload** utility during an express load is the same as for deluxe loads, as described in [“Threads That the onpload Utility Uses” on page 1-15](#). However, the behavior of the database server during an express load is quite different. The express load bypasses all of the SQL layer of the database server. The **pl\_wkr** threads pass the data to **stream** threads (also called *fragmenter* threads) that decide where the data should be stored. The fragmenter threads pass the data to an exchange that distributes the data to **setrw** threads. The **setrw** threads write table rows to disk a page at a time, bypassing the buffer cache.

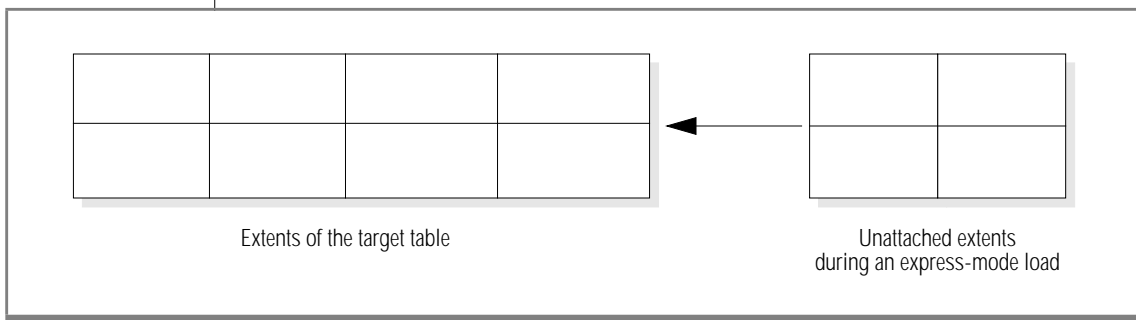
The number of input devices can be different from the number of table fragments. The exchange operator handles multiplexing of data. The data is processed in parallel with respect to the data read from the device array and also with respect to the data written out to table fragments on separate disks. There is also pipeline parallelism in the data flow from input devices out to table fragments on disk. Parallelism is the main mechanism for achieving high performance.

**Figure 1-5**  
An Express-Mode Load



During express-mode load, the database server writes the data to new extents on disk, but those extents are not yet part of the table, as illustrated in Figure 1-6. At the end of express mode, the new extents are added to the table.

**Figure 1-6**  
*Extents After an Express-Mode Load*



After the express-mode load, you must perform a level-0 backup before you can access the target database for writing. If you try to write to the table before you do a level-0 backup, the database server issues ISAM error -197, as follows:

```
Partition recently appended to; can't open for write or logging.
```

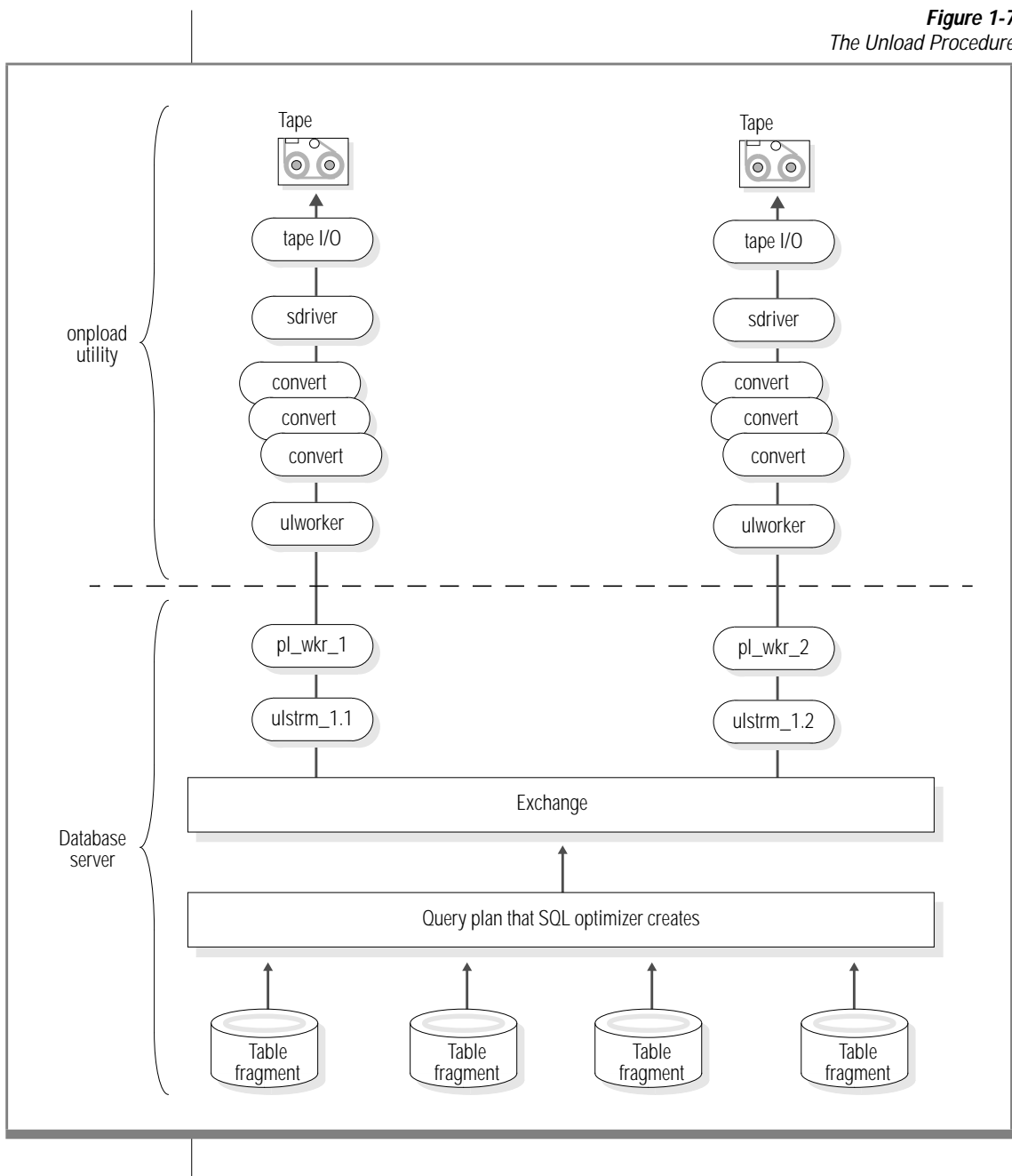
**ANSI**

If your database is ANSI compliant, all access (both read and write) is denied until you perform a level-0 backup. Because data is not logged in express mode, the level-0 backup is necessary to allow for recovery in case of media failure. ♦

## Unloads

Figure 1-7 on page 1-19 shows the **onpload** unload process. In the unload process, the behavior of **onpload** parallels the behavior described in “Threads That the onpload Utility Uses” on page 1-15 and “Threads That Universal Server Uses” on page 1-16, except that the threads are unloading the data instead of loading it.

**Figure 1-7**  
The Unload Procedure



The **ulstrm** (unload-stream) thread packages data for output to the **onpload** client from the query plan. The SQL optimizer creates the query plan. The query plan behaves as if you were running a query from any other client, such as DB-Access. The exchange operator distributes the resulting data to the ulworker threads in a round-robin fashion, and **onpload** unloads the data onto tapes or files.

Parallelism with respect to the output device, the source table fragments, and the flow of the data is evident in [Figure 1-7 on page 1-19](#).

---

# Getting Started

Data-Load Example . . . . .	2-3
Start Universal Server . . . . .	2-4
Create a File of Data . . . . .	2-4
Create a Database . . . . .	2-4
The iupload Utility . . . . .	2-5
Start the iupload Utility . . . . .	2-5
Choose a Project . . . . .	2-6
Check Your Defaults . . . . .	2-6
Looking at the Defaults Window . . . . .	2-6
Looking at the Machines Window . . . . .	2-6
The Load Job Windows . . . . .	2-7
The Load Job Select Window . . . . .	2-7
The Load Job Window . . . . .	2-10
The Device-Array Windows. . . . .	2-10
The Device Array Selection Window . . . . .	2-11
The Device-Array Definition Window . . . . .	2-12
The Format Windows . . . . .	2-13
The Format Views Window . . . . .	2-13
The Record Formats Window . . . . .	2-15
The Format-Definition Window . . . . .	2-17
The Filter, Discard Records, and Logfile Boxes . . . . .	2-19
The Filter Text Box. . . . .	2-19
The Discard Records Text Box. . . . .	2-19
The Logfile Text Box . . . . .	2-19

The Map Windows . . . . .	2-20
The Map Views Window . . . . .	2-20
The Load Record Maps Window . . . . .	2-23
The Map Definition Window . . . . .	2-23
The Load Options Window . . . . .	2-28
The Run Option . . . . .	2-29
The Active Job Window . . . . .	2-30
Verify the Data Transfer . . . . .	2-31
Perform a Level-0 Backup . . . . .	2-31
Generate Example . . . . .	2-31
Start the Example . . . . .	2-32
Prepare the Unload Job Window . . . . .	2-32
Perform the Unload . . . . .	2-37



**T**his chapter guides you step-by-step through two examples that use the **ipload** utility. The first example moves data from a data file into a database table. The second example unloads data from an Universal Server-database into a data file. The chapter is a tutorial; it assumes that you will execute each step as it is discussed.

The purpose of this chapter is to illustrate quickly how the components of the High-Performance Loader (HPL) fit together. The chapter does not attempt to explain the components in any detail. After you complete these examples, you can refer to the later chapters in this book for more information about the options that are available for each of the procedures.

---

## Data-Load Example

The illustrations in the first example use a database with only one table. The table contains three columns. The data to be loaded into the database is in a file that has only four records. In a real production environment, you would probably use the INSERT statement, the **dbimport** utility, or the LOAD statement for such a simple operation. However, by using an extremely simple example, the illustrations can show what happens at each step.

## Start Universal Server

The HPL, which includes the **ipload** utility, is part of Universal Server. Before you can use **ipload**, you must start Universal Server.

## Create a File of Data

The illustrations in this chapter assume that the data to be loaded is in a file named **/work/mydata**. Create a file that contains the following data:

```
1|a|50
2|b|25
3|c|10
4|d|5
```

## Create a Database

The HPL loads data into an *existing* table in an *existing* database. The example in this chapter loads the information from the file **/work/mydata** into a three-column table named **tab1** in a database named **testdb**. You can use DB-Access to prepare the database and table, as follows:

```
CREATE DATABASE testdb;
CREATE TABLE tab1
(
    col1 INTEGER,
    col2 CHAR(1),
    col3 INTEGER
);
GRANT ALL ON tab1 TO PUBLIC;
GRANT CONNECT TO PUBLIC;
```

After you finish preparing the database for the example, exit from DB-Access.

## The *ipload* Utility

The HPL uses information from the **onpload** database to control loading and unloading of data. Theoretically, you could create the **onpload** database and use DB-Access or some other database tool to populate it. However, Informix recommends that you always use **ipload** to manage the **onpload** database.

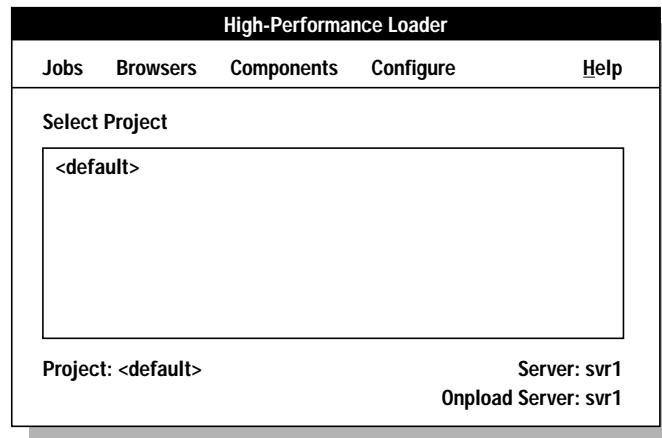
### Start the *ipload* Utility

To start **ipload**, enter the following command at the command-line prompt:

```
ipload
```

The first time you start **ipload**, the utility automatically creates the **onpload** database. The **ipload** utility also puts certain default values into the database. [Appendix A, “The onpload Database,”](#) describes the database tables.

When **ipload** starts, the High-Performance Loader main window (the HPL main window) appears, as Figure 2-1 illustrates.



**Figure 2-1**  
The HPL  
Main Window



**Tip:** To exit from **ipload**, choose **Exit** from the **Jobs** menu. To continue with the example, do not exit.

## Choose a Project

You use the HPL by preparing *load jobs* or *unload jobs* that import or export data. You can assign your load and unload jobs to various *projects* to organize the jobs into functional groups. Projects are described in [Chapter 4, “Defining Projects.”](#)

The **ipload** utility automatically creates a project named **<default>**. If you choose not to organize your work into projects, you can put all of your load and unload jobs in the default project.

For this example, you can use the default project. Click **<default>** on the HPL main window to choose the default project.

## Check Your Defaults

The default values that **ipload** selects when it is first started specify machine type, character code set for character-type data, and other operating characteristics. In most cases, the only default that you might need to change is the machine type. [Chapter 5, “Configuring the High-Performance Loader,”](#) describes the **ipload** defaults.

### *Looking at the Defaults Window*

Choose **Configure**→**Defaults** to see the current default values. After you look at your defaults, you can click **Cancel** to exit from the Defaults window. If you need to change one of the default values, refer to [“Modifying the onpload Defaults” on page 5-5.](#)

### *Looking at the Machines Window*

Choose **Configure**→**Machines** to see the current default values. Make sure that the machine type displayed in the Machines window matches your current machine type. Click the **Machine Type** down arrow to select a machine type.

If you need to change one of the values, refer to [“Modifying the Machine Description” on page 5-10.](#) Click **Cancel** to exit from the Machines window.

---

## The Load Job Windows

A *load job* is a collection of the specific pieces of information that are required to move data from a data file into a database. The Load Job window, illustrated in [Figure 2-3 on page 2-9](#), shows a flowchart that includes all of the components of a load job. After you become familiar with the **ipload** utility, you can create or modify the individual components of a load or unload job with direct menu choices from the HPL main window.

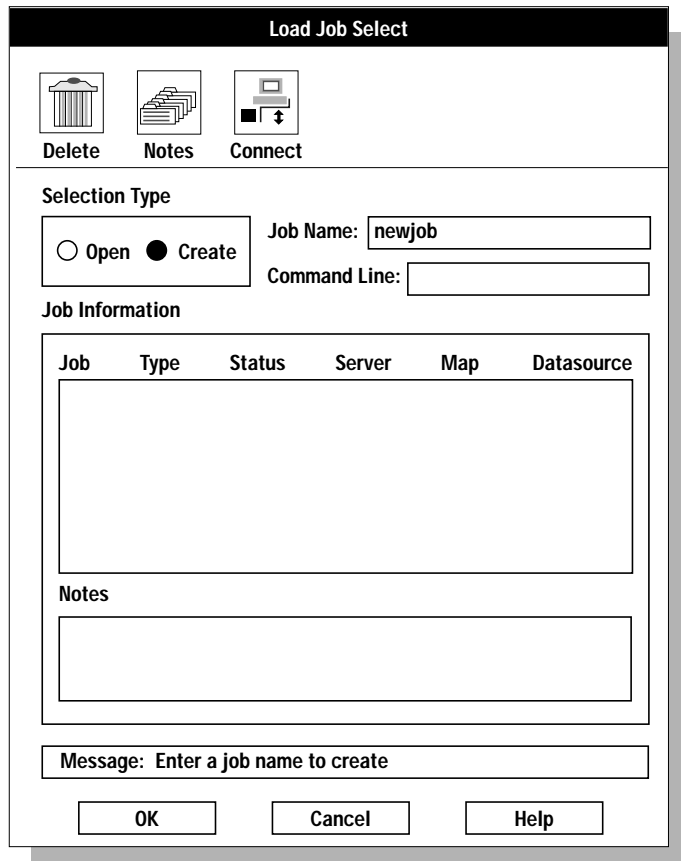
### The Load Job Select Window

The data-load example in this chapter takes records from **/work/mydata** and loads them into **tab1** of the **testdb** database. To perform the load, you need to create a load job.

**To create a load job**

1. Choose **Jobs**→**Load** from the HPL window.

The Load Job Select window appears, as Figure 2-2 illustrates.



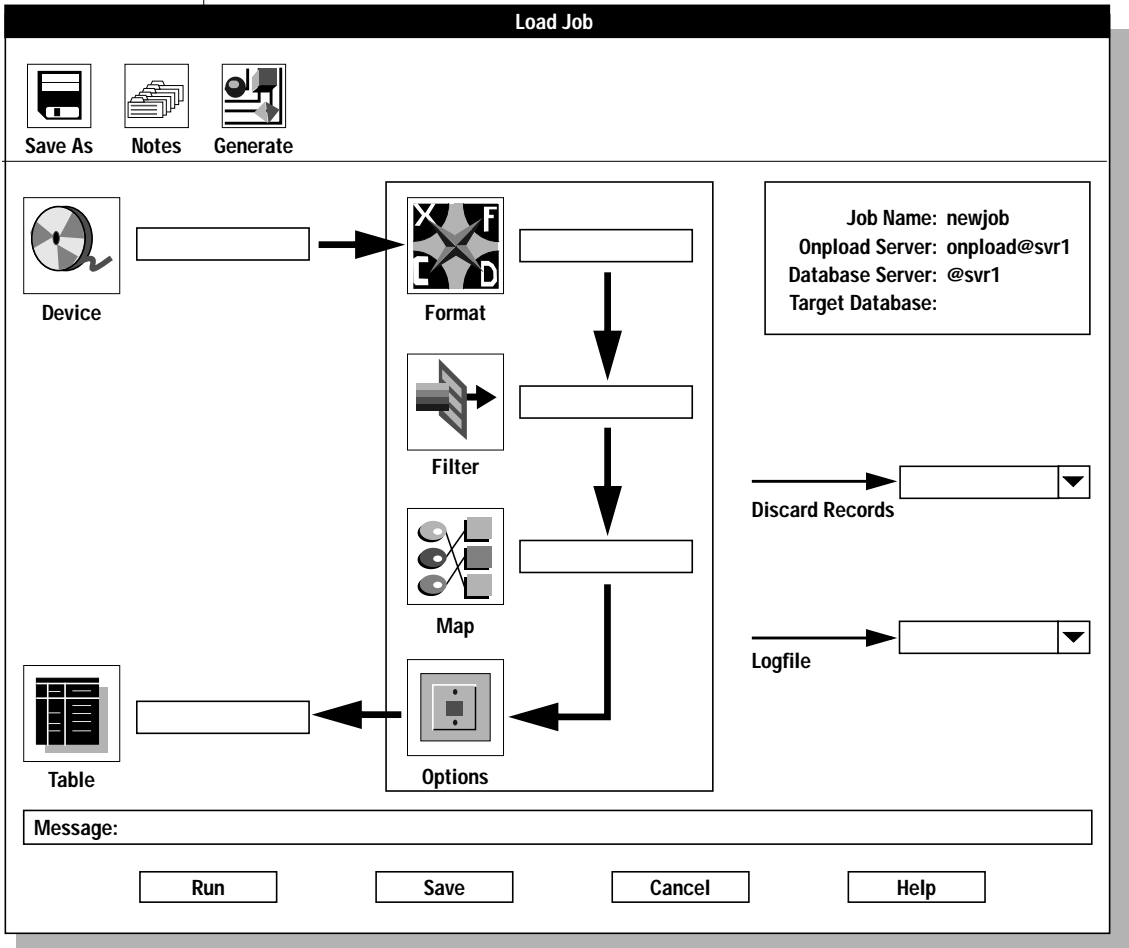
**Figure 2-2**  
The Load Job Select Window

2. Click **Create** in the **Selection Type** group.
3. Choose a name for the load job and type it in the **Job Name** text box. This example uses **newjob**.

4. Click OK.

The Load Job window appears, as Figure 2-3 illustrates.

**Figure 2-3**  
The Load Job Window



## The Load Job Window

The thick arrows on the Load Job window indicate the steps that you take as you build a load job. The icons indicate the task at each step. The thin arrows indicate filenames for error recording. To create a load job, you need to complete the following tasks:

Task	Click
Specify the source of the data	Device
Describe the data	Format
Tell <b>ipload</b> which data you want to discard (optional)	Filter
Specify association between input fields and load-table columns	Map
Specify options for the load job	Options
Specify the database table to load	Table
Record rejected data records (optional)	Discard Records
Record information about the job (optional)	Logfile

## The Device-Array Windows

A *device array* is a collection of files, tape devices, and pipes that **onpload** uses for input and output. The Device Array Selection and device-array definition windows let you create a device array and specify the location of the input data. In this example, the input data is the `/work/mydata` file that you created in [“Create a File of Data” on page 2-4](#).



## The Device Array Selection Window

To create a device array

1. Click **Device** in the Load Job window.

The Device Array Selection window appears, as Figure 2-4 illustrates.

**Device Array Selection**

Copy Delete Print

**Selection Type**

Open  Create Device Array:

**Current Arrays**

**Notes**

Message: Enter a device array name to create

OK Cancel Help

**Figure 2-4**  
The Device Array Selection Window

2. Click **Create** in the **Selection Type** group.

3. Select a name for the device array and type it in the **Device Array** text box.

This example uses `an_array`.

4. Click **OK**.

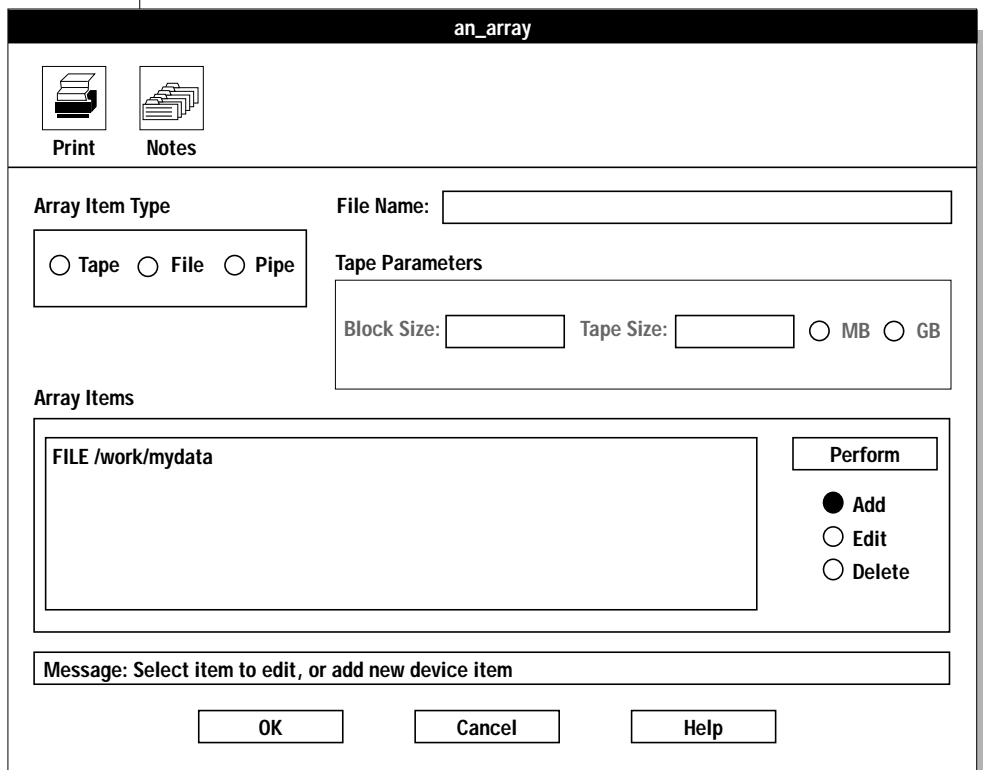
The device-array definition window appears, as Figure 2-5 illustrates.

## The Device-Array Definition Window

The title bar of the device-array definition window shows the array name that you typed in the **Device Array** text box.

**Figure 2-5**

*The Device-Array Definition Window with One Array Item*



### To add a device to the array

1. Click **Add** in the **Perform** group (lower right).
2. Click **File** in the **Array Item Type** group (upper left).
3. Type the full pathname of a device in the **File Name** text box.  
In this example, the device is **/work/mydata**.
4. Click **Perform** to add the **/work/mydata** file to the device array.  
The **ipload** utility lists each item of the device array in the **Array Items** list box. [Figure 2-5 on page 2-12](#) shows the window after you add **/work/mydata** to the array.
5. Click **OK**.  
The display returns to the Device Array Selection window.
6. Click **Cancel**.  
The display returns to the Load Job window. The **Device** list box now displays the device array name that you chose.

---

## The Format Windows

The format specifies the organization of the input data. In this example, the input data is in the file **/work/mydata**, which you created in [“Create a File of Data” on page 2-4](#). Each record in the file has three fields.

## The Format Views Window

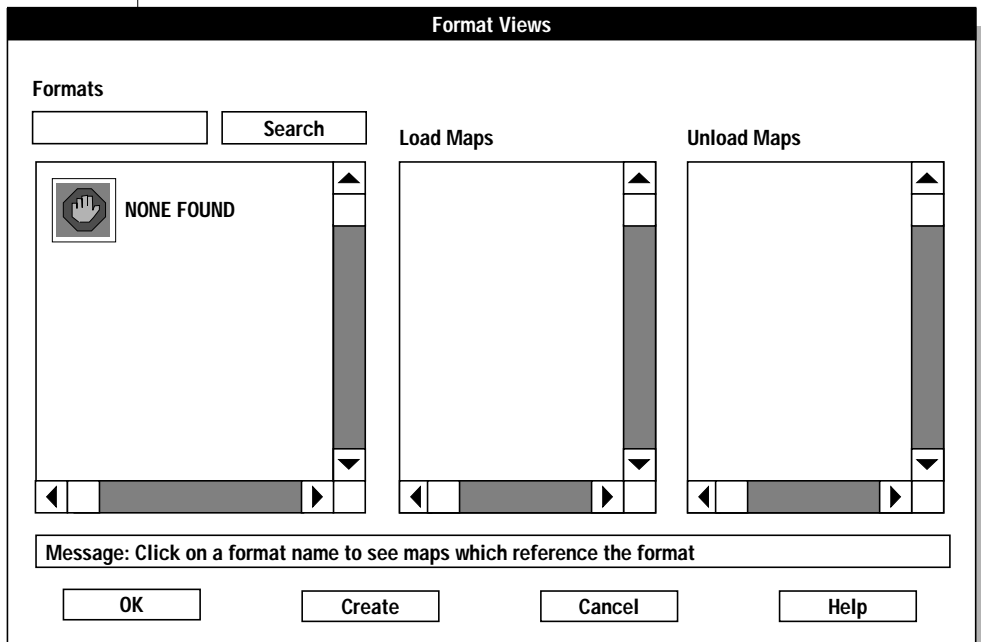
The Format Views window displays existing formats, so that you can choose the format to use in the load job.

**To open the Format Views window**

1. Click the **Format** button in the Load Job window.

The Format Views window opens, as Figure 2-6 illustrates. When you first start **ipload**, no formats are defined, as illustrated by the NONE FOUND icon.

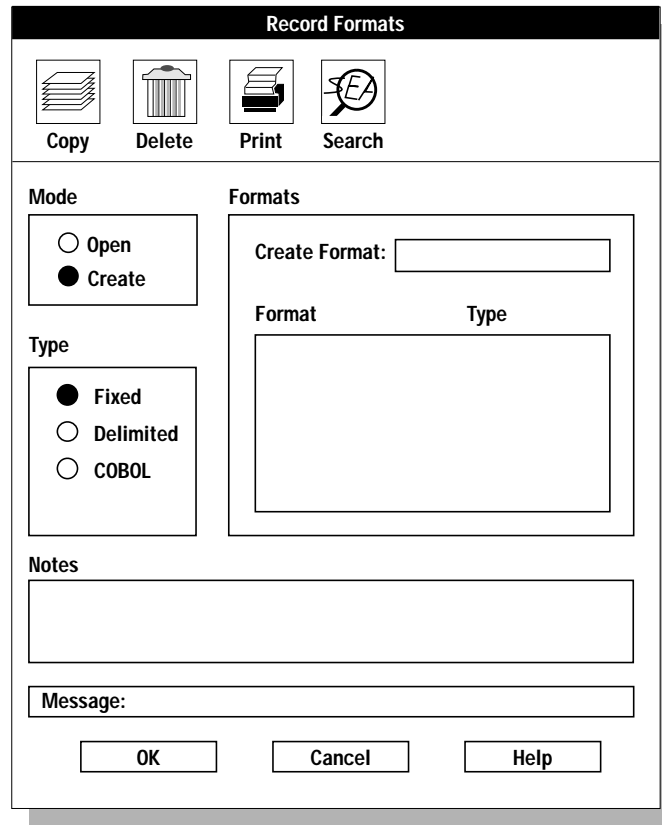
*Figure 2-6*  
The Format Views Window



2. Click **Create** to open the Record Formats window.

## The Record Formats Window

Figure 2-7 shows the Record Formats window. The Record Formats window lets you create a new format or open an existing format.



**Figure 2-7**  
The Record Formats  
Window

### To create a new format

1. Click **Create** in the **Mode** group.
2. Click **Delimited** in the **Type** group.

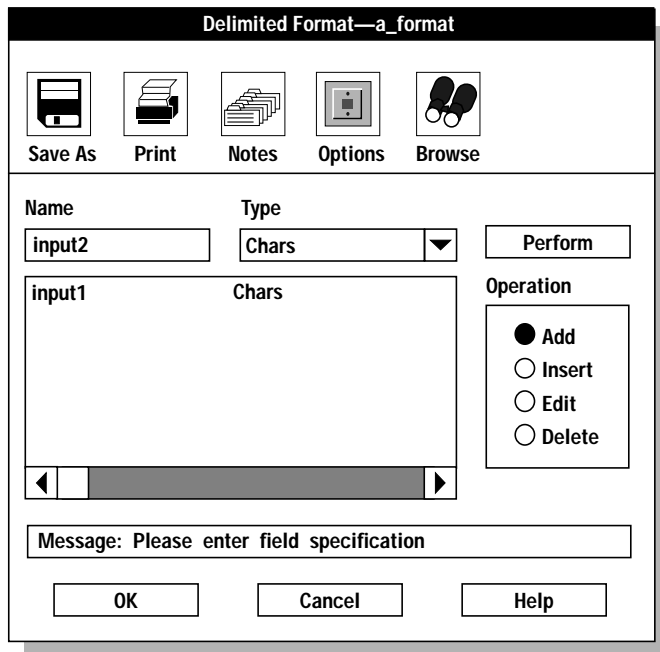
The input data file, `/work/mydata`, is in delimited format. Other formats are described in [Chapter 7, “Defining Formats.”](#)

3. Choose a name for your format and type it in the **Create Format** text box.

This example uses the name **a\_format**.

4. Click **OK**.

The format-definition window opens. Figure 2-8 illustrates a partially completed format-definition window. The title bar of the format-definition window shows the name that you chose for the new format.



**Figure 2-8**  
The Format-Definition Window

## The Format-Definition Window

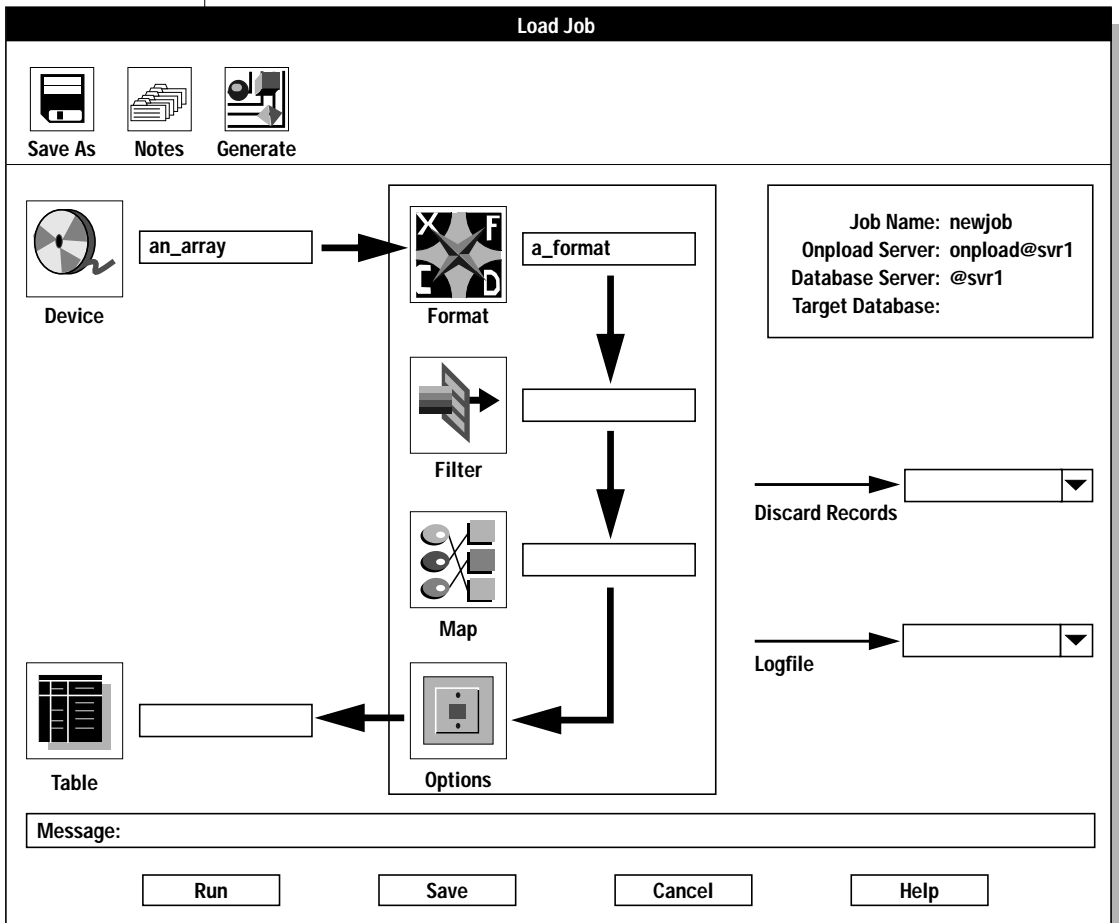
In the format-definition window, you must make an entry for each field of the data records in the input file. The input file for this example (**/work/mydata**) has three fields of data in each record, so you must enter format information for three pieces of data.

### To enter a format definition

1. Click **Add** in the **Operation** group.
2. In the **Name** text box, type a descriptive name for the first field of the data record.  
  
You can choose any descriptive name. This example uses **input1**, **input2**, and **input3** for the three fields of **/work/mydata**.
3. In the **Type** text box, type the type of the data.  
  
Because the data in **/work/mydata** is simple ASCII data, the type is Chars. Other data types are discussed in [Chapter 7, “Defining Formats.”](#)
4. Click **Perform**.  
  
[Figure 2-8 on page 2-16](#) shows the format-definition window partially completed. The entry for the first item is complete. The Name and Type for the second item are present and ready for you to click **Perform**.
5. Repeat steps 2 through 4 for each of the three input fields.
6. Click **OK** after you complete all of the input fields.  
  
The display returns to the Format Views window. The window displays your new format in the **Formats** list box.
7. Click **Cancel** to return to the Load Job window.

The Load Job window now displays the name of your device and the name of your format, as Figure 2-9 illustrates.

**Figure 2-9**  
Partially Completed Load Job Window





---

## The Filter, Discard Records, and Logfile Boxes

The Load Job window now has entries for a device and format. The next incomplete items on the pathway in the Load Job window ([Figure 2-9 on page 2-18](#)) are the **Filter** text box, the **Discard Records** text box, and the **Logfile** text box.

### The Filter Text Box

Use a filter to choose the records from the data file that should be inserted into the table. In this example, all of the records from the `/work/mydata` data file will be inserted into the database table. Therefore, you do not need to create a filter. For this example, you can leave the **Filter** text box blank.

[Chapter 10, “Defining Filters,”](#) describes how to create and use a filter.

### The Discard Records Text Box

The **Discard Records** text box specifies a file that keeps information about records that were rejected because of incorrect format or invalid data. For this example, you can leave the **Discard Records** text box blank.

[“Reviewing Records That the Conversion Rejected” on page 14-6](#) describes how to view rejected records.

### The Logfile Text Box

The **Logfile** text box specifies a file where a record of the load or unload job is kept. For this example, you can leave the **Logfile** text box blank.

[“Viewing the Status of a Load Job or Unload Job” on page 14-9](#) describes how to view the log file.

---

## The Map Windows

The Map windows let you create a map that specifies which data field from the input file (**/work/mydata**) is entered into which columns in the database table.

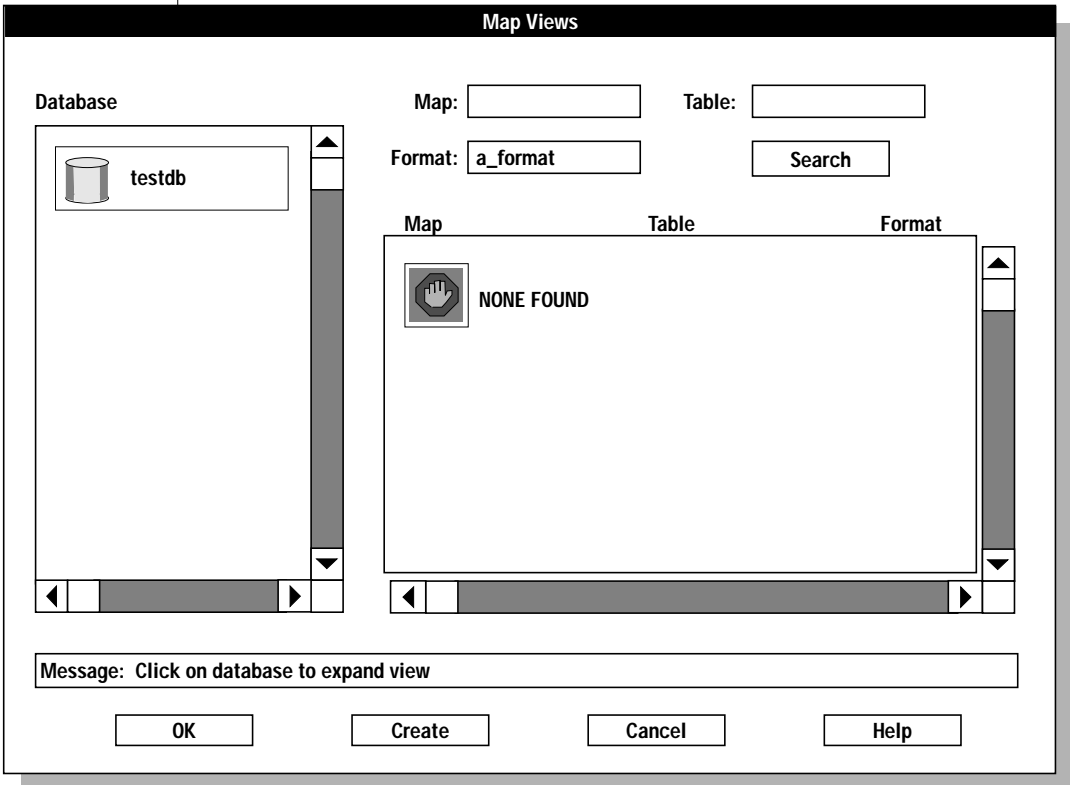
## The Map Views Window

The Map Views window lets you create a new map or edit an existing map. You need to create a map that describes how input data that is described by the record format **a\_format** should be loaded into the table **tab1**.

To create a new map

1. Click the **Map** button in the Load Job window.  
The Map Views window appears, as Figure 2-10 illustrates.

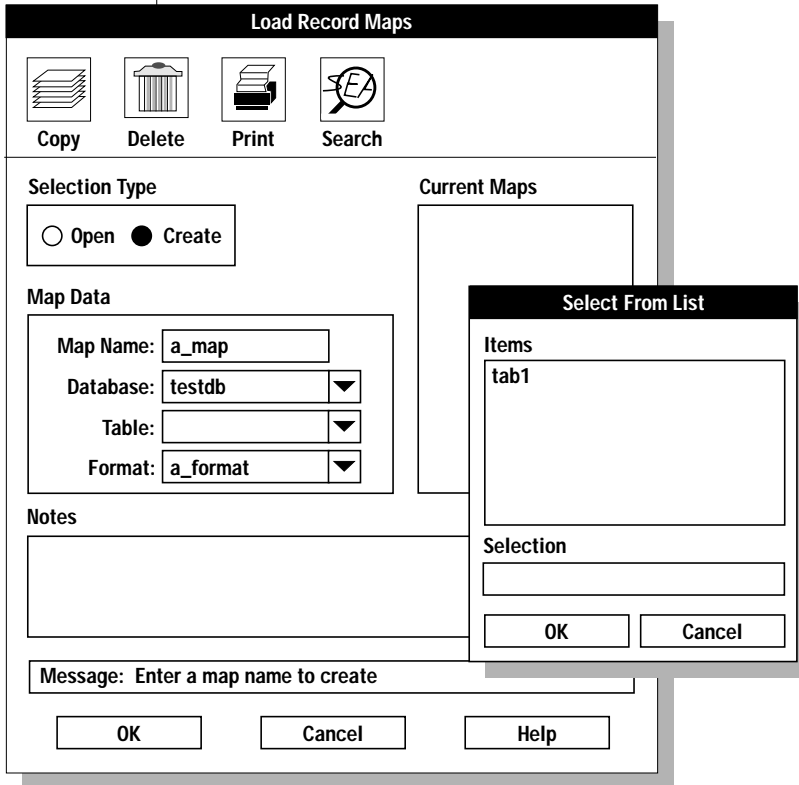
**Figure 2-10**  
The Map Views Window



The NONE FOUND message in the Map column is appropriate. At this point, the Map Views window does not contain any information because you have not yet specified any relationships.

2. Click **Create**.

The Load Record Maps window appears, as Figure 2-11 illustrates.



**Figure 2-11**  
A Partially  
Completed Load  
Record Maps  
Window with an  
Open Selection List

## The Load Record Maps Window

The Load Record Maps window specifies the device array that holds the input data, the format that describes the input data, and the database and table where the input data will be stored.

### To complete the Load Record Maps window

1. Click **Create** in the **Selection Type** group.
2. Select a name for the map and type it in the **Map Name** text box.  
This example uses **a\_map**.
3. Type the name of your database (**testdb**) in the **Database** text box.  
If you want, you can click the down arrow beside the **Database** text box and select a database from the selection list.
4. Click the down arrow beside the **Table** text box to see a list of tables in the selected database.  
[Figure 2-11 on page 2-22](#) illustrates the Load Record Maps window and the selection list at this point.
5. Select a table from the list and click **OK**.  
Because you already filled in the **Format** text box on the Load Jobs window, the **Format** text box is already complete.
6. Click **OK** to open the map-definition window.

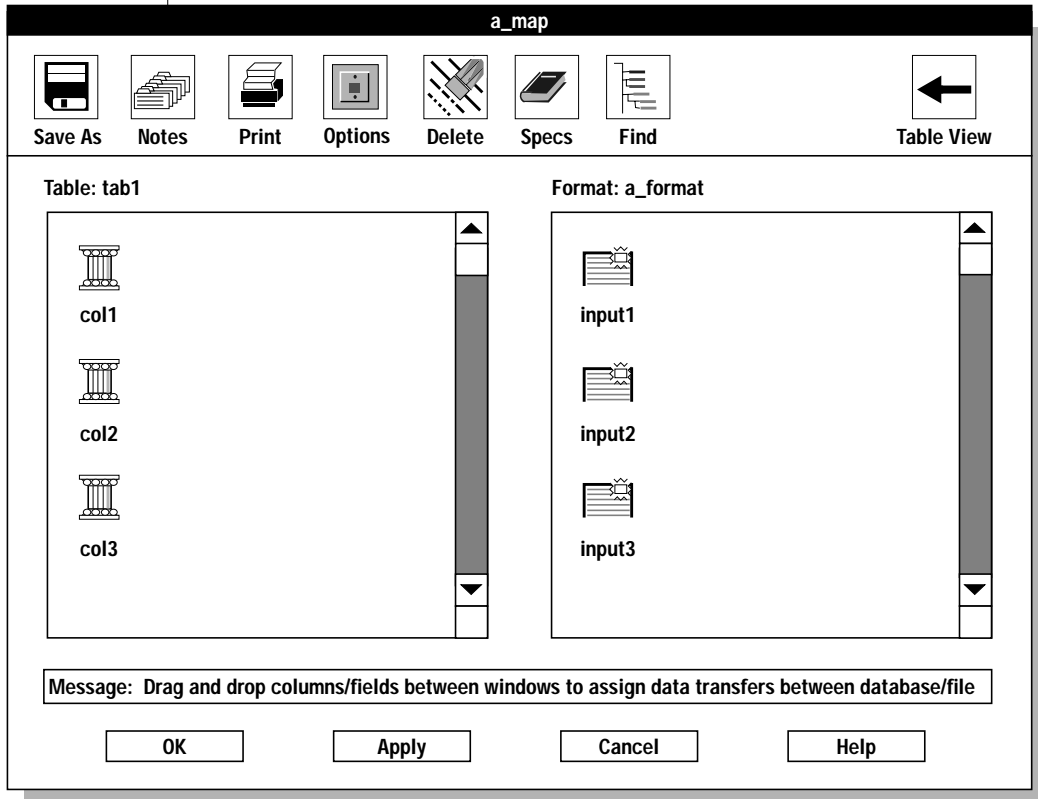
## The Map Definition Window

The Map Definition window lets you associate an input item with a table column. This example stores the data from `/work/mydata` as follows, using the field names assigned on [page 2-15](#).

Data from Input Field	Goes into Table Column
input1	col3
input2	col2
input3	col1

Figure 2-12 shows the map-definition window. The title bar of this window shows the map name that you chose.

**Figure 2-12**  
The Map-Definition Window



**To associate each input item with a column of the database table**

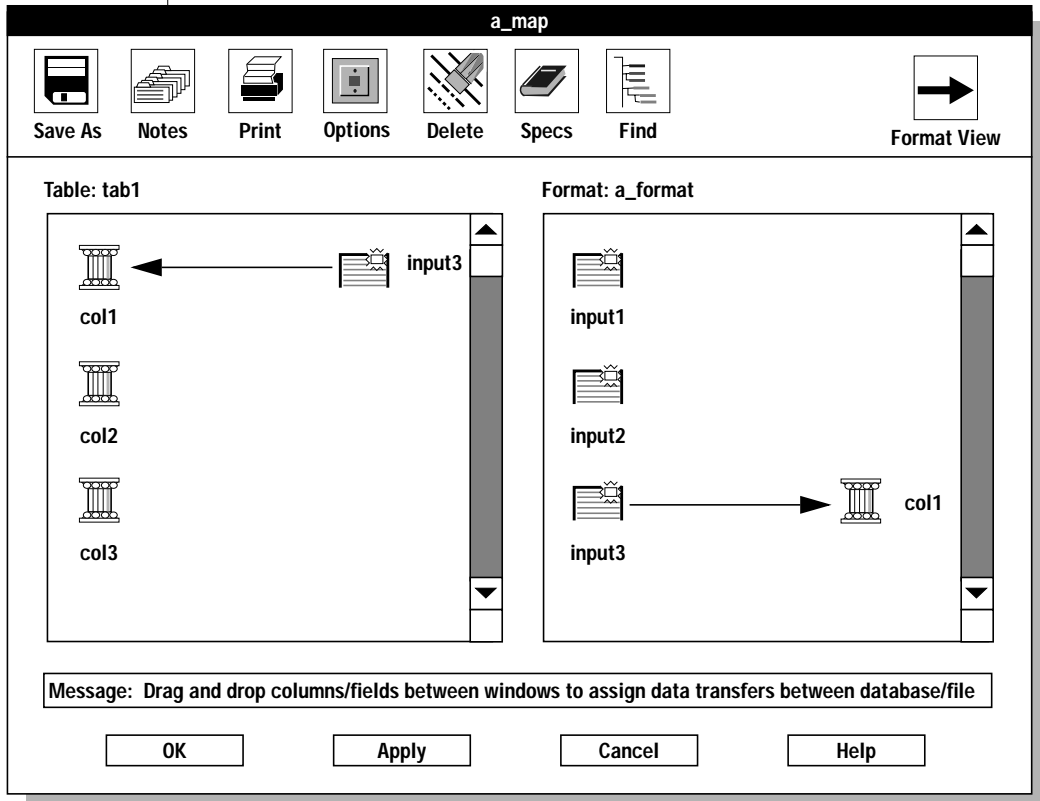
1. Click the **col1** icon and *hold the mouse button down*.  
A box appears around the icon and its name.
2. Drag the boxed icon to the **input3** icon in the right-hand pane.

3. Release the mouse button.

The associated items appear in the second column of each pane. Figure 2-13 shows the map-definition window with this step completed.

**Figure 2-13**

*The Map-Definition Window with One Association Completed*



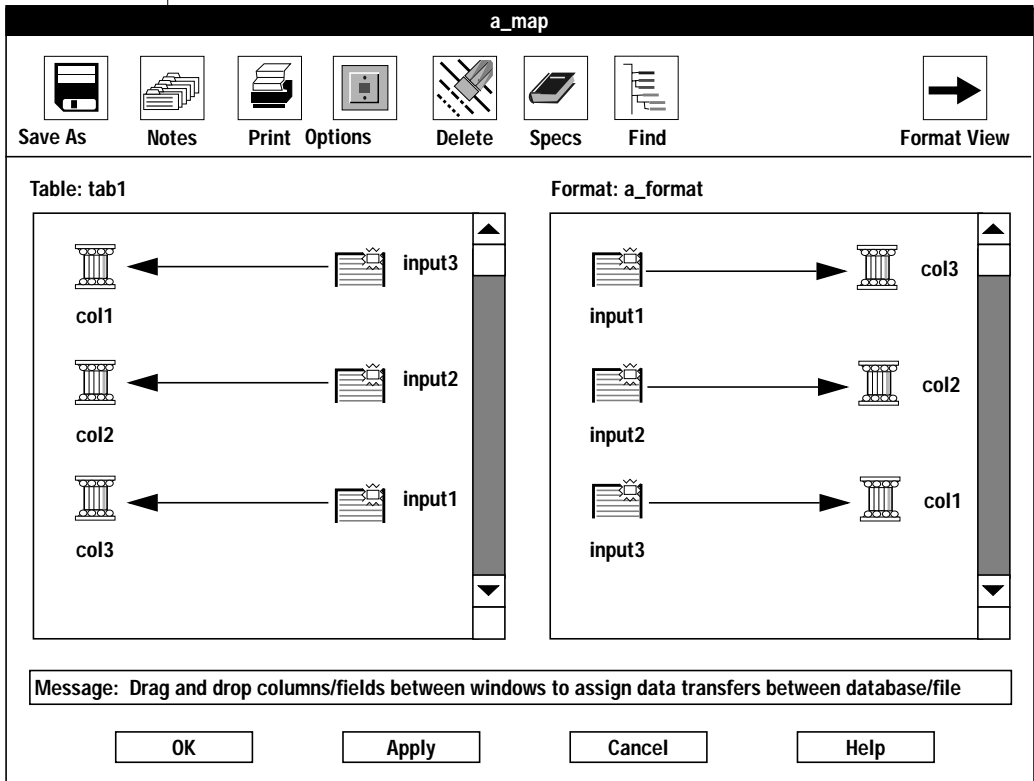
4. Connect col2 to input2.

5. Connect **col3** to **input1**.

Figure 2-14 shows the window with all three connections completed.

**Figure 2-14**

*The Map-Definition Window with All Associations Completed*

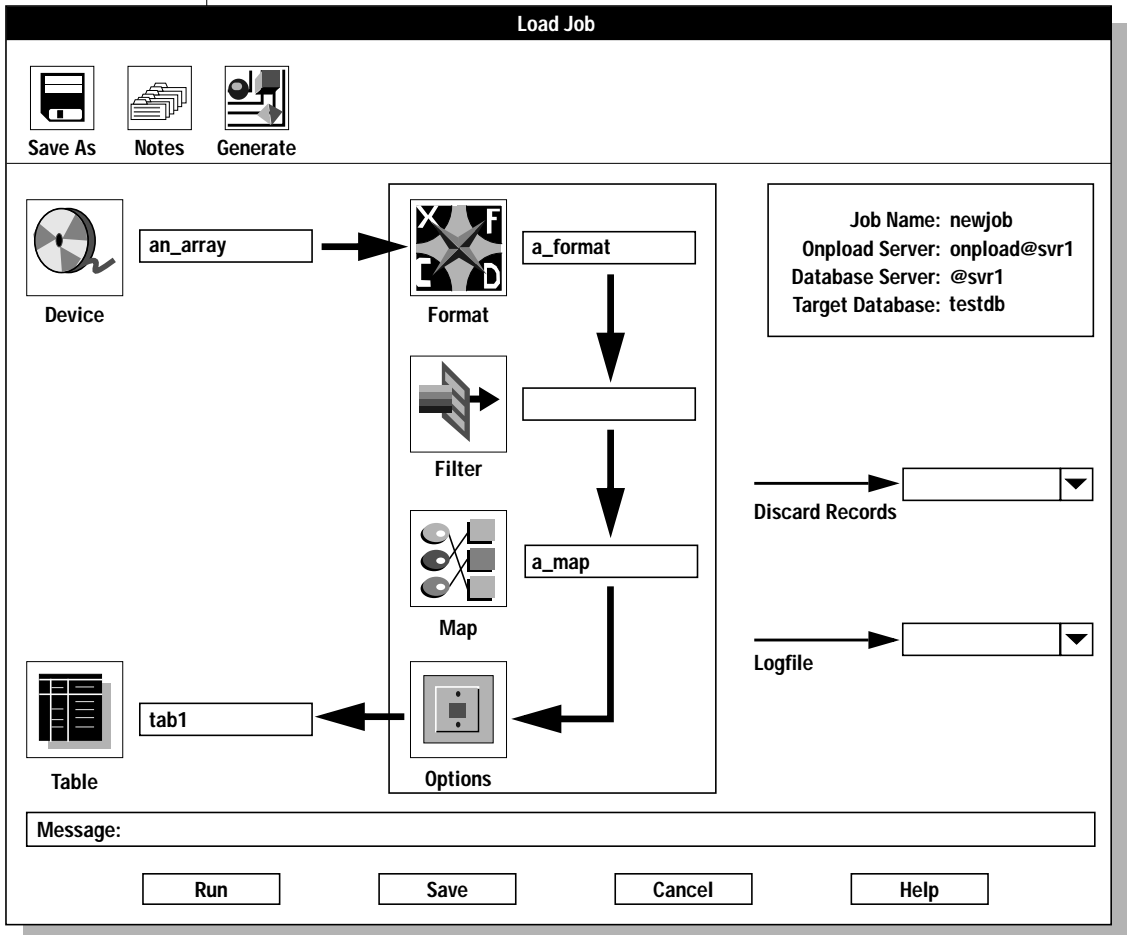


6. Click **OK** to return to the Map Views window.
7. Click **Cancel** to return to the Load Job window.



The Load Job window now has entries in all of the required areas, as Figure 2-15 illustrates. The **ipload** utility was able to fill in the Table and the Target Database (upper right area) because you specified the database and table as you built the map.

**Figure 2-15**  
The Load Job Window with All Required Component Boxes Completed



You have finished all of the required parts of the Load Job window, but you might want to modify the options, as discussed in the next section.

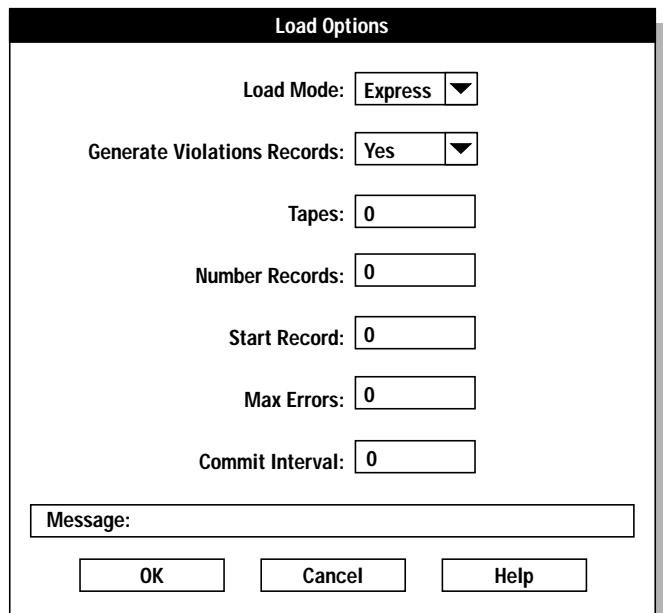
## The Load Options Window

The HPL has two modes of operation: express and deluxe. These modes are described in “[Modes](#)” on page 15-3. Briefly, the express mode is optimized for speed, whereas the deluxe mode provides the full functionality of SQL inserts as data is loaded. For a detailed comparison of these two modes, refer to [Chapter 15, “Managing the High-Performance Loader.”](#) This example uses the express mode.

### To set the load-job options

1. Click **Options** in the Load Job window.

The Load Options window opens, as Figure 2-16 illustrates.



The screenshot shows a dialog box titled "Load Options". It contains the following fields and controls:

- Load Mode:** A dropdown menu with "Express" selected.
- Generate Violations Records:** A dropdown menu with "Yes" selected.
- Tapes:** A text input field containing "0".
- Number Records:** A text input field containing "0".
- Start Record:** A text input field containing "0".
- Max Errors:** A text input field containing "0".
- Commit Interval:** A text input field containing "0".
- Message:** A text input field that is currently empty.
- Buttons:** "OK", "Cancel", and "Help" buttons are located at the bottom of the dialog.

**Figure 2-16**  
The Load Options Window

2. Select **Express** from the **Load Mode** list box.
3. Select **No** from the **Generate Violations Records** list box.
4. Make sure all of the other entries are 0.
5. Click **OK** to return to the Load Job window.

---

## The Run Option

You are now ready to perform the load.

### To finish this example

1. Click **Save** to save the load job.

After you save the load job, the message line displays the following message:

```
Saved job successfully
```

You can now execute the job, or you can return at a later time and execute the job.

2. Click **Run** to execute the load job.

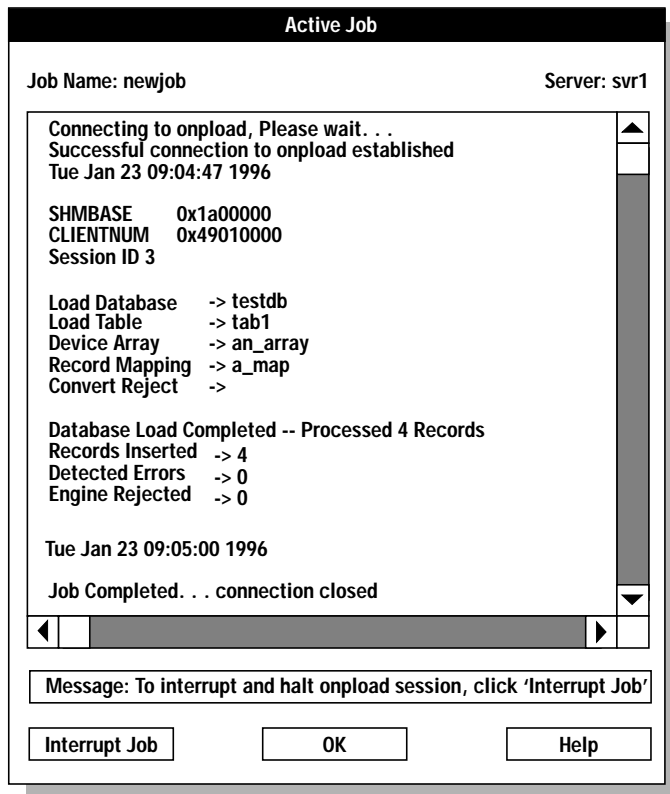
The Active Job window appears, as [Figure 2-17 on page 2-30](#) illustrates.



*Tip:* The **ipload** utility runs your job by generating an **onpload** command and then executing the command. To see the command that **ipload** generated, look at the **Command Line** text box on the Load Job Select window. For more information, refer to [“Using the Command-Line Information” on page 12-12](#).

## The Active Job Window

The Active Job window reports the progress of your job. Figure 2-17 shows the Active Job window after the load has completed.



**Figure 2-17**  
The Active Job  
Window

When the Active Job window reports that the load job is complete, click **OK** to return to the Load Job Select or Unload Job Select window.

## Verify the Data Transfer

If you want, you can use DB-Access to verify that the data from **/work/mydata** has been transferred into your database.

## Perform a Level-0 Backup

The **onpload** utility does not log the data that it writes to a table during an express-mode load. For safety, **onpload** flags the dbspaces that are associated with the table as read-only. To allow for data recovery in case of disk corruption, you must make a level-0 backup. A level-0 backup on the dbspaces affected by the express-mode load saves the data and unsets the read-only flags.

If you do not care about data recovery, you can make a level-0 backup using **/dev/null** as the backup device. This action unsets the read-only flag without backing up data to any real device.

---

## Generate Example

The **ipload** utility has Generate options that you can use to automatically create a format, map, query, and device. After the components are generated, you can modify the components to meet your needs. The Generate options are described in [Chapter 13, “Generate Options.”](#)

This example uses the **Generate** button in the Unload Job window to create the components that are required for an unload job. After you create the components, you can use the **Run** option to execute the unload job.

## Start the Example

If you completed the first example in this chapter, Universal Server and **ipload** are ready for you to use. If you did not complete the example, you need to complete the following tasks as the first example describes:

- Start Universal Server ([page 2-4](#))
- Start the **ipload** utility ([page 2-5](#))
- Check your defaults ([page 2-6](#))

## Prepare the Unload Job Window

An *unload job* is a collection of the specific pieces of information that are required to move data from a database into a data file. The Unload Job window ([Figure 2-3 on page 2-9](#)) shows a flowchart that includes all of the components of an unload job. You can use the **Generate** option to create the components of the unload job and to complete the items on the Unload Job window.

The generate example uses the **Generate** option to unload the contents of the **items** table of the **stores7** database into a file named **/work/items\_out**. (For instructions to create the **stores7** database, refer to the [Informix Guide to SQL: Reference](#).)

### To generate the unload job

1. Choose **Jobs**→**Unload** from the HPL window.  
The Unload Job Select window appears, as [Figure 2-18 on page 2-33](#) illustrates.
2. Click **Create** in the **Selection Type** group.

3. Choose a name for the unload job and type it in the **Job Name** text box.

This example uses the name **unld**.

**Unload Job Select**

Delete   Notes   Connect

**Selection Type**

Open    Create   Job Name:    Command Line:

**Job Information**

Job	Type	Status	Server	Map	Datasource
-----	------	--------	--------	-----	------------

**Notes**

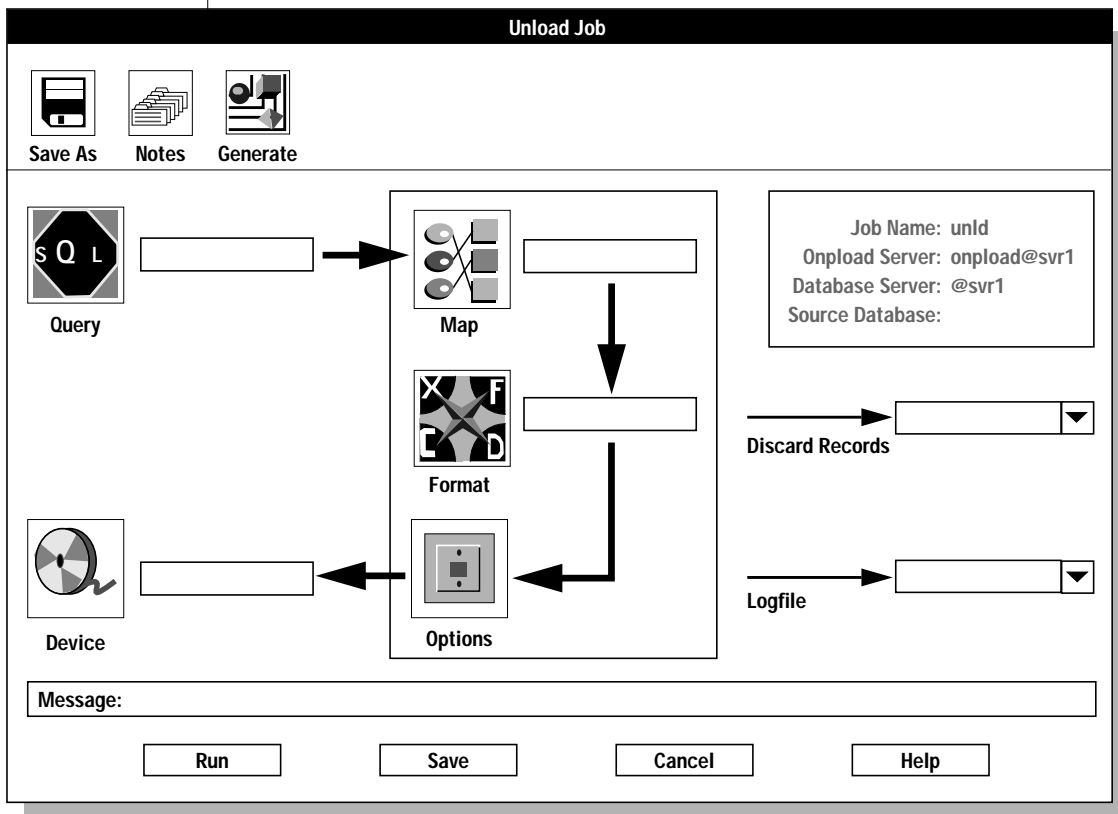
OK   Cancel   Help

**Figure 2-18**  
The Unload Job Select Window

4. Click **OK**.

The Unload Job window appears, as Figure 2-19 illustrates. The information box in the upper right part of the display shows the name of the unload job, the name of the database server where the **onpload** database is stored, and the name of the database server where **ipload** is running.

**Figure 2-19**  
The Unload Job Window



5. Click the **Generate** button.

The Autogenerate Unload Components window appears. [Figure 2-20 on page 2-35](#) shows the completed window.



6. Click **Table**.

You can unload an entire database table or only selected records from the table. **Table** indicates that you want to unload the entire table.

**Query** indicates that you want to unload selected records.

7. Type `stores7` in the **Database** text box.

For this step and steps 8 and 10, you can click the down arrow to the right of the text box and select your entry from a selection list.

[Figure 2-11 on page 2-22](#) shows an example of a selection list.

8. Type `items` in the **Table** text box.

The screenshot shows a dialog box titled "Autogenerate Unload Components". It is divided into two main sections: "Unload from" and "Unload to".

- Unload from:**
  - Radio buttons:  Table,  Query
  - Database: stores7 (dropdown)
  - Table: items (dropdown)
  - Query: (empty dropdown)
- Unload to:**
  - Radio buttons:  Device Array,  File
  - Path: /work/items\_out (dropdown)

At the bottom, there is a message box that says "Message: Enter database to unload". Below the message box are three buttons: "OK", "Cancel", and "Help".

**Figure 2-20**  
The Autogenerate  
Unload Components  
Window

9. Click **File**.

**File** indicates that you want to enter the name of a file. If you choose **Device Array**, you must type the name of an already existing device array.

10. Type the full pathname of the file that will store the unloaded data. This file can be in any directory to which you have write access.
11. Click **OK**.

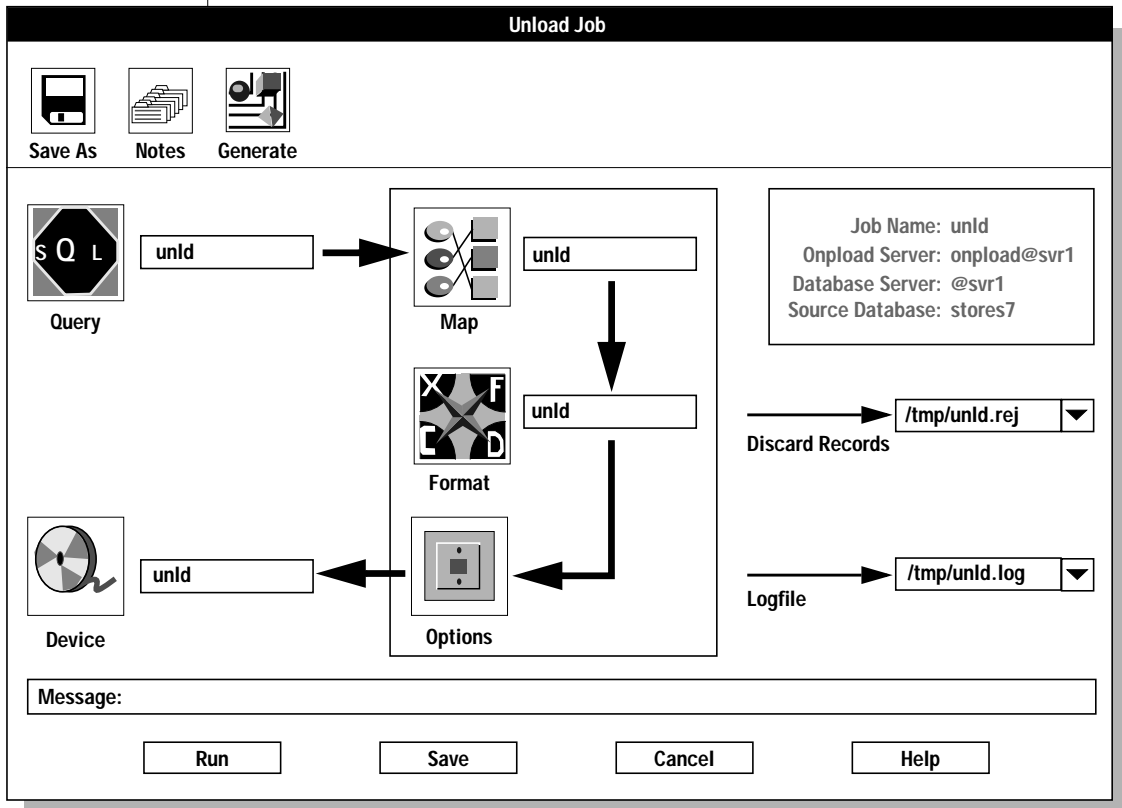


The **Generate** option creates the Query, Format, and Map components for the unload job and fills in the Unload Job window. These components are all named **unld**. The **Generate** option also creates a device array named **unld** and puts the file that you specified (**/work/items\_out**) into that array.

*Tip:* After you finish this exercise, you can choose **Components**→**Devices** from the HPL window and examine the **unld** device array.

Figure 2-21 shows the Unload Job window as completed by the **Generate** option.

**Figure 2-21**  
The Unload Job Window



In addition to completing the main flow of the Unload Job window, the **Generate** option also fills in the Source Database information in the upper right-hand corner and creates pathnames for the Discard Records file and the Logfile. [Chapter 14, “Browsing,”](#) describes the rejected records file and the log file.

## Perform the Unload

You are now ready to perform the unload.

*Tip:* At this point, you might want to preview the records that the query will select. Refer to [“Previewing Data-File Records” on page 14-3.](#)

### To finish this example

1. Click **Save** to save the unload job.

After you save the unload job, the Message line displays the following message:

```
Saved job successfully
```

You can now execute the job, or you can return at a later time and execute the job.

2. Click **Run** to execute the unload job.

The Active Job window appears. This window reports the progress of your unload job. The Active Job window for an unload job is very similar to the Active Job window for a load job, which [Figure 2-17 on page 2-30](#) illustrates.

3. When the Active Job window reports that the unload job is finished, click **Cancel** to return to the HPL main window.
4. You can create another job or choose **Jobs→Exit** to leave the **ipload** utility.





# Using the High-Performance Loader Windows

Using the HPL User Interface . . . . .	3-3
Starting the User Interface . . . . .	3-4
The HPL Main Window . . . . .	3-4
Initial Options on the HPL Main Window . . . . .	3-5
Options of the HPL Main Window . . . . .	3-5
The Component-Selection Windows . . . . .	3-7
The Toolbar Buttons . . . . .	3-9
The Selection Group . . . . .	3-9
The Component-Name Text Box . . . . .	3-9
The Component List Box . . . . .	3-9
The Notes Area . . . . .	3-10
The Message Line . . . . .	3-10
The Buttons. . . . .	3-10
The Component-Definition Windows . . . . .	3-10
The Toolbar Buttons . . . . .	3-12
The Item-Selection Group . . . . .	3-12
The Item-Name Text Box . . . . .	3-12
The Special-Parameters Group . . . . .	3-12
The Item List Box. . . . .	3-13
The Perform Group . . . . .	3-13
The Message Line . . . . .	3-13
The Buttons. . . . .	3-13
The Load Job and Unload Job Windows . . . . .	3-14
The Views Windows . . . . .	3-15
Accessing Views Windows . . . . .	3-15
Available Options in a Views Window . . . . .	3-16
The Selection-List Windows . . . . .	3-19
The Message Windows . . . . .	3-20

Using the HPL Buttons . . . . .	3-20
Toolbar Buttons . . . . .	3-21
The Browse Button . . . . .	3-22
The Copy Button . . . . .	3-23
The Delete Button. . . . .	3-25
The Notes Button . . . . .	3-26
The Print Button . . . . .	3-28
Icon Buttons . . . . .	3-29
Buttons. . . . .	3-31
Using the On-Line Help . . . . .	3-33
Using UNIX Keyboard Commands to Move the Cursor . . . . .	3-33

**T**his chapter describes the user interface (**ipload**) for the HPL. The chapter describes the basic features of the user interface and the mechanics of how to use them.

The preceding chapter, “[Getting Started](#),” gives simple examples that illustrate how the components of **ipload** interact. The following chapters give details about developing the **onpload** database by using the individual components of **ipload**. [Appendix A](#), “[The onpload Database](#),” describes the tables of the **onpload** database.

This chapter discusses the following topics:

- Using the HPL windows
- Using the HPL buttons
- Using on-line help
- Using keyboard commands to move the cursor

---

## Using the HPL User Interface

The **ipload** utility has the following types of displays that appear frequently:

- HPL main window
- Component-selection windows
- Component-definition windows
- Load Job and Unload Job windows
- Views windows
- Selection-list windows
- Message windows

## Starting the User Interface

To start the user interface for the HPL, issue the following command at the system prompt:

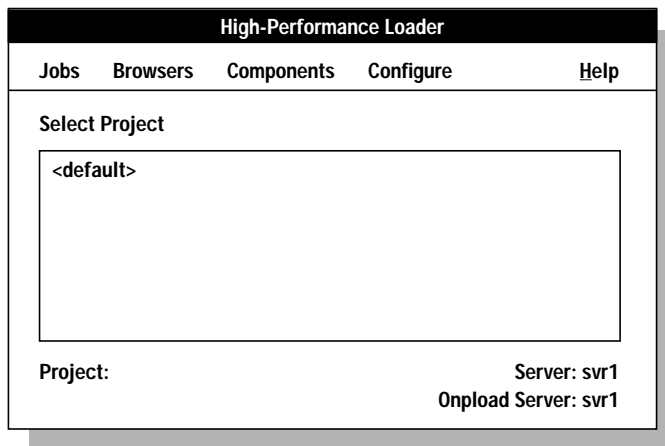
```
ipload
```

After you issue the **ipload** command, a decorative *splash screen* appears that stays on the display while the **ipload** utility finishes loading. If you do not want to see the splash screen, use the **-n** flag, as follows:

```
ipload -n
```

## The HPL Main Window

When you start **ipload**, the High-Performance Loader main window (HPL main window) appears, as Figure 3-1 illustrates. The HPL main window is the focus of the user interface. You return to the main window after each task and choose a new option.



**Figure 3-1**  
The HPL Main Window



### ***Initial Options on the HPL Main Window***

When you first enter **ipload**, most of the options on the HPL main window are disabled. You can take only the following actions:

- You can select the default project in the Select Project list.
- You can choose **Configure→Project** to create a new project. For information on how to create a project, refer to [“Creating a New Project” on page 4-7](#).
- You can choose **Configure →Server** to select a database server and an **onpload** database server. For information about choosing a database server, refer to [“Selecting a Database Server” on page 5-3](#).
- You can choose **Help** to look at the on-line help.
- You can choose **Jobs→Exit** to exit from **ipload**.

### ***Options of the HPL Main Window***

After you select a project, you can choose options from any of the menus on the HPL main window. The following list describes each of the menu options.

Main Menu Option	Submenu Option	Purpose of the Selection	Refer to Page
Jobs	Load	Create a load job and use the Load Job window to load data into a database	<a href="#">12-3</a>
	Unload	Create an unload job and use the Unload Job window to unload data from a database to a file	<a href="#">11-6</a>
	Exit	Exit from the user interface	<a href="#">2-5</a>
Browsers	Record	Review records in a specified format, search the list of available formats, or edit a format	<a href="#">14-6</a>
	Violations	View records that passed the filter and conversion but were rejected by the database	<a href="#">14-7</a>
	Logfile	View load status and see where any errors occurred	<a href="#">14-9</a>
Components	Formats	Create or modify data-file formats	<a href="#">7-3</a>

(1 of 2)

Main Menu Option	Submenu Option	Purpose of the Selection	Refer to Page
	Maps	Create or modify maps that show the relationship between data-file fields and database columns	9-3
	Query	Build, modify, or retrieve SQL-based queries	8-3
	Filter	Create or modify filters that determine source data-file records for conversion and load	10-3
	Devices	Specify a set of files, tapes, or pipes that will be read simultaneously for loading or unloading the database	6-3
	Generate Job	Automatically generate the components for load and unload jobs	13-3
Configure	Server	Select the database servers that hold the <b>onpload</b> database and the target database	5-3
	Project	Create a project under which formats, filters, queries, maps, and load and unload jobs are stored	4-3
	Defaults	Specify the default character sets for the data file and databases	5-5
	Driver	Add a custom driver name and driver type to the list of standard drivers	F-1
	Machines	Specify the machine parameters that are used to convert binary data	5-10
Help	Glossary	View definitions of terms that pertain to the HPL	3-33
	Contents	View the main contents page that directs you to discussions of various HPL topics	3-33

(2 of 2)

## The Component-Selection Windows

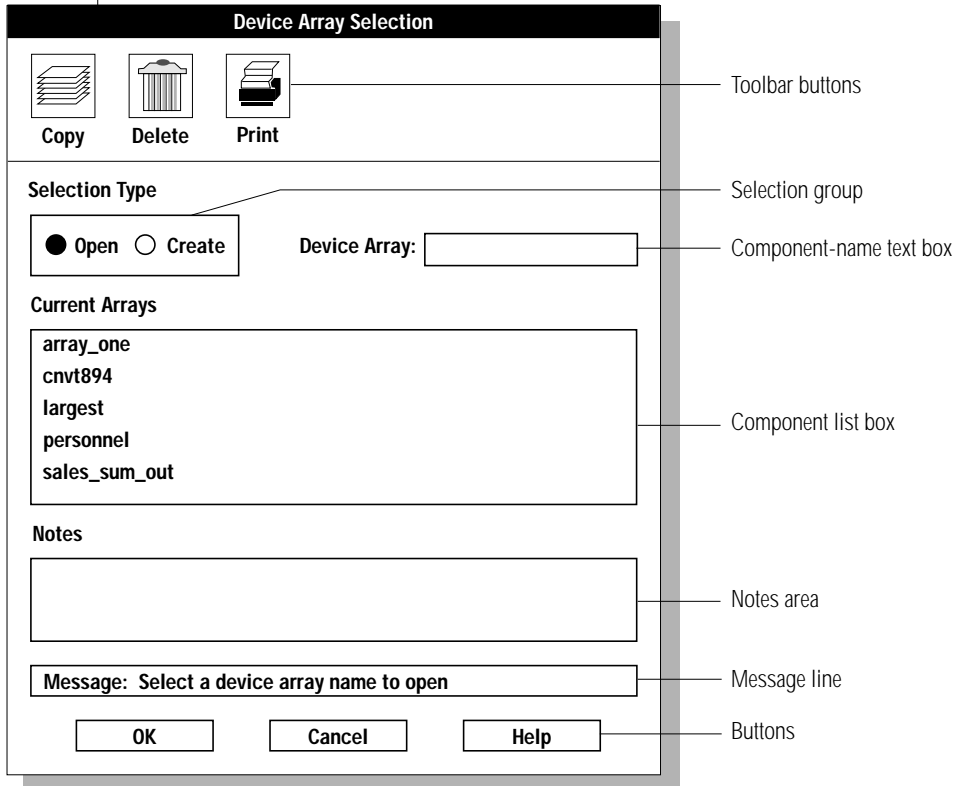
The windows for creating or modifying components often (but not always) come in pairs. The first window, the *component-selection window*, lets you create a new component or select an existing component to modify. The first window also lets you view notes and copy, delete, or print information about a component. The second window, the *component-definition* window, lets you make the actual changes.

The details of a selection window vary depending on the operation that you are performing. However, the component-selection windows have the following standard features:

- Toolbar buttons
- Selection group
- Component-name text box
- Component list box
- Notes area
- Message line
- Buttons

Figure 3-2 shows the Device Array Selection window to illustrate the standard features of component-selection windows.

**Figure 3-2**  
The Device Array Selection Window



### ***The Toolbar Buttons***

The buttons across the top of the display represent actions that you can take after you select a component from the component list. For example, in [Figure 3-2 on page 3-8](#) (the Device Array Selection window), the toolbar buttons indicate that you can copy, delete, or print an array. “[Using the HPL Buttons](#)” on [page 3-20](#) explains how to use these buttons.

### ***The Selection Group***

The selection group allows you to specify the action that you want to take. In most of the displays, you can either open an already existing component or create a new component.

### ***The Component-Name Text Box***

If you click **Create** in the selection group, you must type a name for the new component in the component-name text box. (In [Figure 3-2 on page 3-8](#), you must give a name for the new Device Array.)

Before you can type a name in the **Device Array** text box, you must click inside that text box to activate it. When the text box is active, it has a narrow black border. If you type a character that is not valid, the interface beeps at you, displays a message on the message line, and refuses to display the invalid character.

### ***The Component List Box***

The component list box lists the components that currently exist in this project. If you click **Open** in the selection group, you must select a component from this list.

### ***The Notes Area***

The notes area displays stored comments about the selected component. This area is not an active area. To store a comment about a component, you must select a component and use the **Notes** button. For more information about notes, see [“The Notes Button” on page 3-26](#).

### ***The Message Line***

The message line primarily gives instructions for the next logical action. The message line also gives an error message when an action fails or a completion message when a process is finished.

### ***The Buttons***

The buttons across the bottom of the display let you indicate your next action. For a more complete discussion, see [“Using the HPL Buttons” on page 3-20](#).

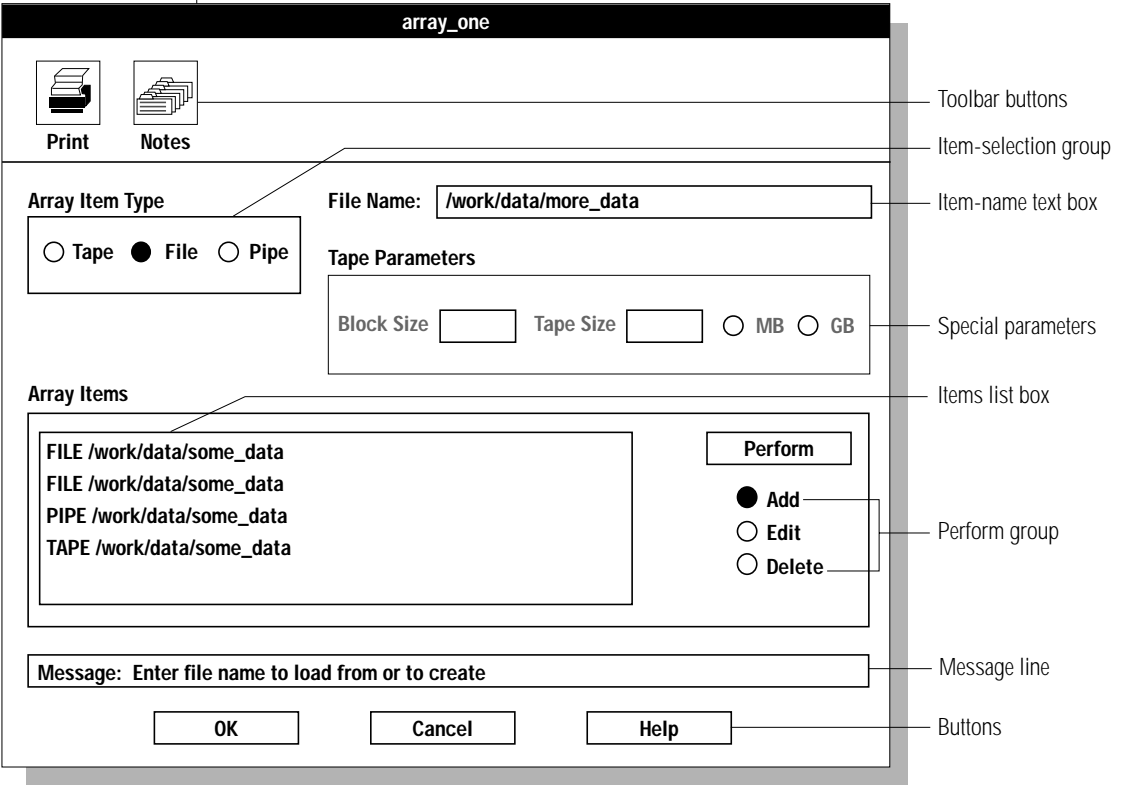
## **The Component-Definition Windows**

After you select a component to create or modify and then click **OK** in the component-selection window, you typically see the component-definition window. The component-definition window allows you to enter, edit, or delete values or items that describe the component. The device-array definition window has the following elements that are common to most of the other component-definition windows:

- Toolbar buttons
- Item-selection group
- Item-name text box
- Special-parameters group
- Item list box
- Perform group
- Message line
- Buttons

Figure 3-3 shows an example of a component-definition window, the device-array definition window.

**Figure 3-3**  
The Device-Array Definition Window



### ***The Toolbar Buttons***

The buttons across the top of the display represent actions that you can take after you select a component from the component list box. For example, in [Figure 3-3 on page 3-11](#) (the device-array definition window), the toolbar buttons indicate that you can print or make a note about an item. “[Using the HPL Buttons](#)” on [page 3-20](#) explains how to use these buttons.

### ***The Item-Selection Group***

The item-selection group lets you specify the type of item that you want to edit or the type of action that you want to take. After you specify a choice in the item-selection group, other options become active. In the device-array definition window, the item-selection group is labeled **Array Item Type**. After you select **Tape**, **File**, or **Pipe**, other options become active.

### ***The Item-Name Text Box***

The item-name text box lets you specify the name or description of one of the items that makes up the component. For example, in the device-array definition window, you type the full pathname of a device in the item-name text box.

In the device-array definition window, the item-name text box is labeled **Tape Name**, **File Name**, or **Pipe Name**, depending on the type of component that you select from the **Array Item Type** group.

### ***The Special-Parameters Group***

When a component-definition window first appears, some of the choices are inactive (shown in gray letters). In general, the inactive choices are not meaningful until you specify some other characteristic of the component that you are editing.

The special-parameters group in the device-array definition window ([Figure 3-3 on page 3-11](#)) is the **Tape Parameters** group. The items in the special-parameters group are meaningful only for tapes. The choices in the **Tape Parameters** group become active only if you select **Tape** from the **Array Item Type** group. The choices in [Figure 3-3](#) are gray because **File** is selected in the **Array Item Type** group.



### ***The Item List Box***

The item list box shows items that you already created to define the component. In the device-array definition window, this list is labeled **Array Items** and shows the tapes, files, and pipes that are already part of the current device array.

### ***The Perform Group***

The **Perform** group lets you specify the action that you want to take. After you select an item and an action, you must click **Perform** to complete the action. For example, to add a new device in the device-array definition window, you must specify the name or description of the device and then click **Perform** to add it to the **Array List**.



***Important:*** Remember to click **Perform** to complete the action that you designated in the **Perform** group.

### ***The Message Line***

The message line primarily gives instructions for the next logical action. The message line also gives an error message when an action fails or a completion message when a process is finished.

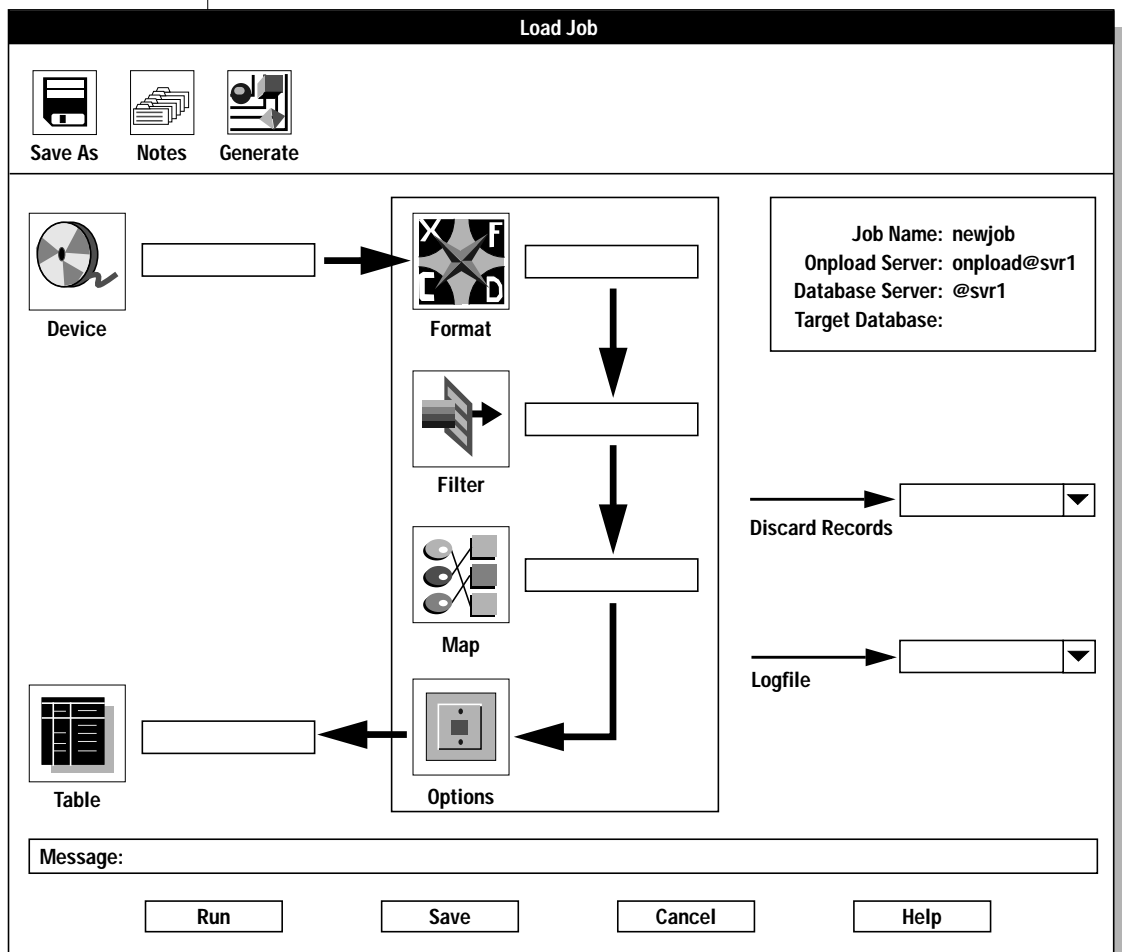
### ***The Buttons***

The buttons across the bottom of the display let you indicate your next action. For a more complete discussion, see [“Using the HPL Buttons” on page 3-20](#).

## The Load Job and Unload Job Windows

The Load Job and Unload Job windows provide a visual presentation of the basic components that you choose for each job. Figure 3-4 shows the Load Job window. The Load Job Window and its functions are discussed in [Chapter 12](#). The Unload Job Window and its functions are discussed in [Chapter 11](#).

Figure 3-4  
The Load Job Window



## The Views Windows

A views window shows a graphic representation of the relationships among various **ipload** components. From a views window, you can search for specific components, select an existing component for editing, or create a new component. A views window does not allow you to change any values. To change values of a component, you must display a component-definition window.

### Accessing Views Windows

The following table lists the four types of views windows and gives instructions for how to access each view.

Window Name	Purpose	How to Access	Refer to Page
Format Views	Show the load and unload maps that are associated with a particular format	<ul style="list-style-type: none"> <li>■ Click <b>Search</b> in the Record Formats window</li> <li>■ Click <b>Format</b> in the Load Job window*</li> <li>■ Click <b>Format</b> in the Unload Job window*</li> </ul>	<a href="#">2-13</a>
Map Views	Show the databases, tables, queries, and formats that are associated with a map	<ul style="list-style-type: none"> <li>■ Click <b>Search</b> in the Load Record Maps window</li> <li>■ Click <b>Search</b> in the Unload Record Maps window</li> <li>■ Click <b>Map</b> in the Load Job window*</li> <li>■ Click <b>Map</b> in the Unload Job window*</li> </ul>	<a href="#">9-21</a> <a href="#">9-11</a>
Database Views	Show the tables in the database or the queries that are associated with the database	<ul style="list-style-type: none"> <li>■ Click <b>Search</b> in the Query window</li> <li>■ Click <b>Table</b> in the Load Job window*</li> <li>■ Click <b>Query</b> in the Unload Job window*</li> </ul>	<a href="#">8-5</a>
Filter Views	Show the formats that are associated with a particular filter	<ul style="list-style-type: none"> <li>■ Click <b>Search</b> in the Filter window</li> <li>■ Click <b>Filter</b> in the Load Job window*</li> </ul>	<a href="#">10-10</a>

\* These options display the View window only if the corresponding text box is empty. If the text box includes the name of a component, the component-definition window is displayed.

### **Available Options in a Views Window**

The four types of Views windows operate in a similar manner. When a Views window appears, you have the following options:

- Type in a component name and search for the component.
- Click a label associated with an icon to expand the view and see related components.
- Click an icon to open the component-definition window that allows you to edit the component values.
- Click **Create** to display the component-selection window that allows you to create a new component.

### *Searching for a Component*

You can use the **Search** button in a Views window to locate a specific component. Type the component name in the search text box and then click **Search**. The view displays only the component names that match the text string.

You can use the following wildcard search characters in the search text string.

---

<b>Wildcard Symbol</b>	<b>Effect</b>
?	Matches any single character
*	Matches any string of characters

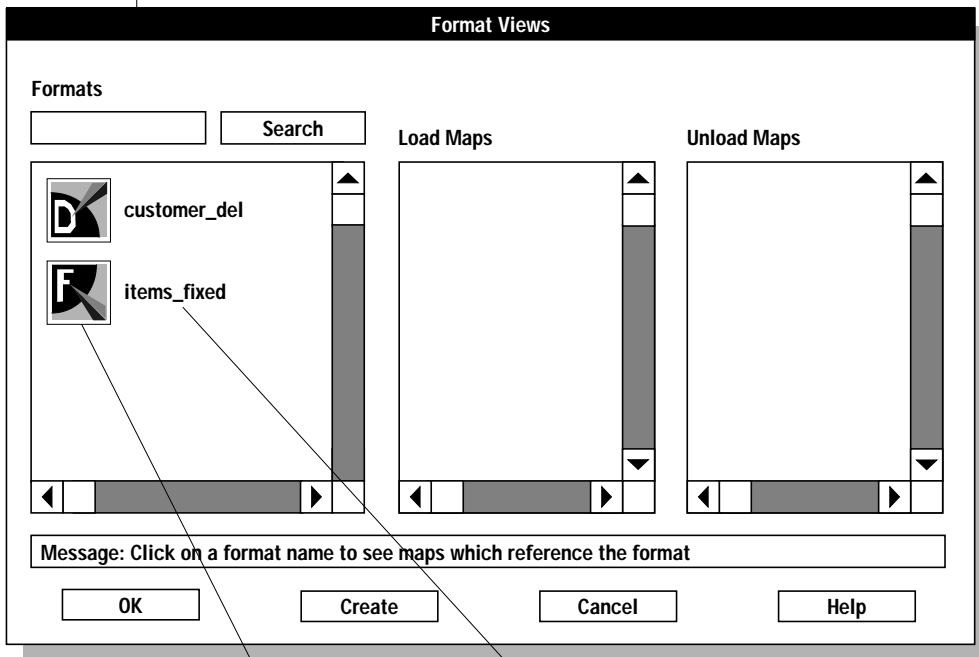
---

For example, type `unj100?` to display components that are named `unj100a`, `unj100b`, `unj1001`, and so on. The expression `unj100?` does not match `unj100aaa`, `unj100ab`, or `unj10015`. However, the expression `unj100*` does match `unj100aaa`, `unj100ab`, or `unj10015` because the `*` symbol matches multiple characters.

*Expanding the View*

Three of the views windows expand their views to show related components. To expand the view, click an icon label (for example, **customer\_del**) in the first pane. In the Database Views window, you can expand the view further by clicking an icon label in the second pane. Figure 3-5 shows the Format Views window.

**Figure 3-5**  
The Format Views Window

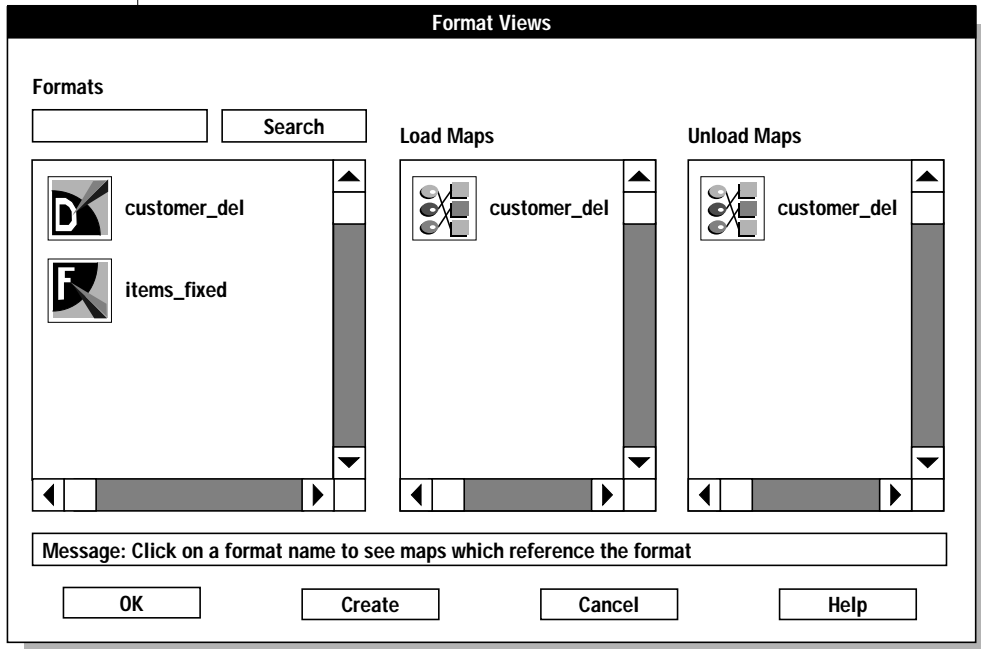


Icon

Icon label

When you click an icon label in the Formats pane, the view expands to show maps that are related to your choice. Figure 3-6 shows the expanded view.

**Figure 3-6**  
*Expanded View of a Format*



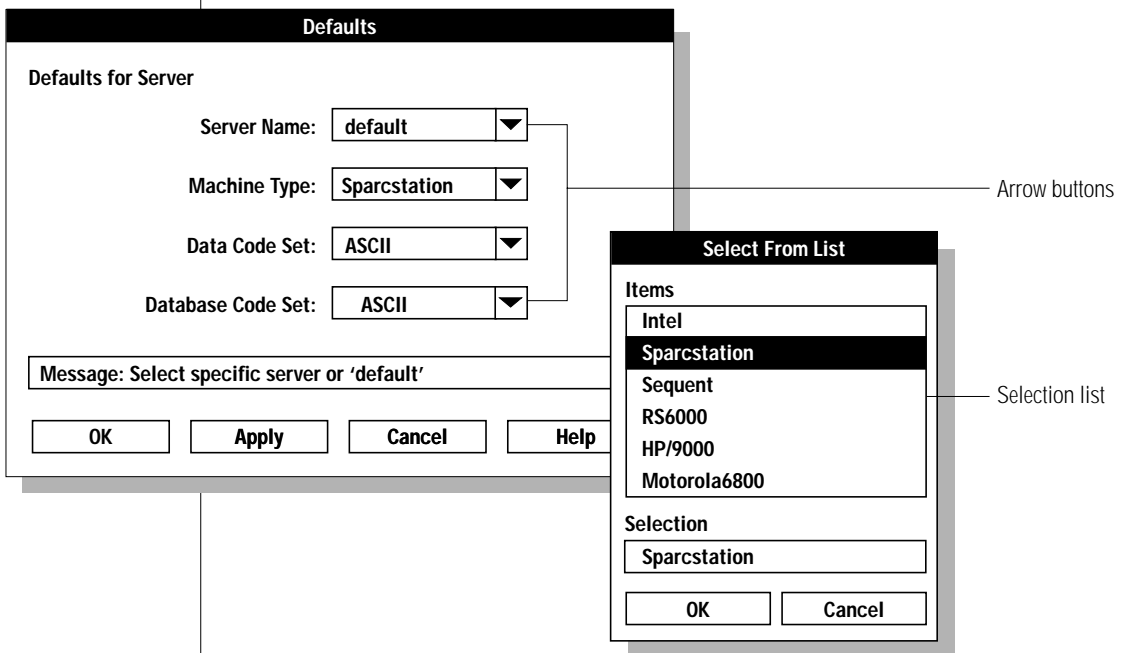
You can click the desired icon to display a definition window for any format or map that is shown.

## The Selection-List Windows

A selection-list window lists the possible values for a text box. A down arrow that follows a text box indicates that you can use a selection list to see and select possible values for the text box. When you click the down arrow, the corresponding selection-list window appears.

Figure 3-7 shows the selection list that is available for the **Machine Type** text box in the Defaults window. After you select an item in the list box, click **OK**, and the item appears in the text box on the original window.

**Figure 3-7**  
The Defaults Window and a Selection List

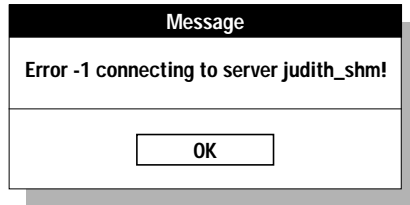


**Tip:** If your entry is rejected, look at the selection list. Your entry is invalid if it is not available in the selection list.

Selection-list windows are available for many text boxes throughout the HPL user interface. These windows have various names, but this document refers to them as selection lists.

## The Message Windows

A message window typically contains either a warning or an information update. A warning lets you verify or cancel the action that you have just chosen. An update informs you about the successful completion of an operation or explains why an operation failed. Figure 3-8 illustrates a typical error message.



**Figure 3-8**  
*The Message Window*

---

## Using the HPL Buttons








Once you move beyond the HPL main window, every window has at least one button to help you move through the interface. In general, buttons appear in three locations:

- Toolbar buttons appear across the top of the display.
- Icon buttons appear in the middle section of the display.
- Buttons appear across the bottom of the display.










## Toolbar Buttons

Toolbar buttons appear at the top of many windows. The function of the window determines which buttons appear. The following sections describe the toolbar buttons. Buttons that appear in only one window are described with the specific window.

Button	Button Name	Purpose	Refer to Page
	Browse	Displays the Browse window	<a href="#">14-3</a>
	Copy	Copies the selected component (format, map, query, filter, device, or project) to a new item	<a href="#">3-23</a>
	Connect	Lets you reattach to an active unload (or load) job from the Unload (or Load) Job Select window	<a href="#">12-8</a>
	Delete (trashcan)	Deletes the selected component (format, map, and so on)	<a href="#">3-25</a>
	Delete (eraser)	Breaks the association between a database column and a data-file field	<a href="#">9-18</a>
	File	Displays the Import/Export File Selection Window	<a href="#">8-13</a>
	Find	Allows you to quickly locate a particular field or column in a map window	<a href="#">9-18</a>

(1 of 2)

Button	Button Name	Purpose	Refer to Page
	Generate	Lets you generate jobs automatically	13-3
	Notes	Allows you to type descriptive text for an item	3-26
	Options	Displays an options window where you can change default values or supply additional parameters	11-11, 12-13
	Print	Prints the parameters for the selected item	3-28
	Save As	Saves a copy of the currently selected item (behaves in the same way as the <b>Copy</b> button)	3-23
	Search	Displays the Views window where you can see the relationships among components	3-15
	Specs	Displays the Specifications window, where you can view the attributes for selected columns or fields	9-20

(2 of 2)

### ***The Browse Button***

The **Browse** button lets you look through the files that show information about the load or unload jobs and any problems that the **onpload** utility found. For more information about the Browse button, refer to [“The Browsing Options” on page 14-3.](#)

## The Copy Button

The **Copy** button lets you copy a selected component. This feature can save you time when you are creating a new component. You can copy an existing component and then modify the copy with your changes.

You can copy one component at a time, or you can select and copy multiple components at the same time. You can copy components that are grouped under a project (filters, formats, maps, and queries) within the same project or to a different project.

If you copy a component within a project, you must give the copy a different name. If you copy a component to a different project, you can retain the name for the copy or give the copy a different name. If you copy multiple components, you must copy them to a different project. When you copy multiple components, the components retain their names.

**Important:** *Devices are not project specific. When you copy a device, you must give the copy a new name.*



### To copy an existing format to a new format

1. In the HPL main window, select the project that includes the format that you want to copy.
2. Choose **Components**→**Formats** to access the Record Formats window.

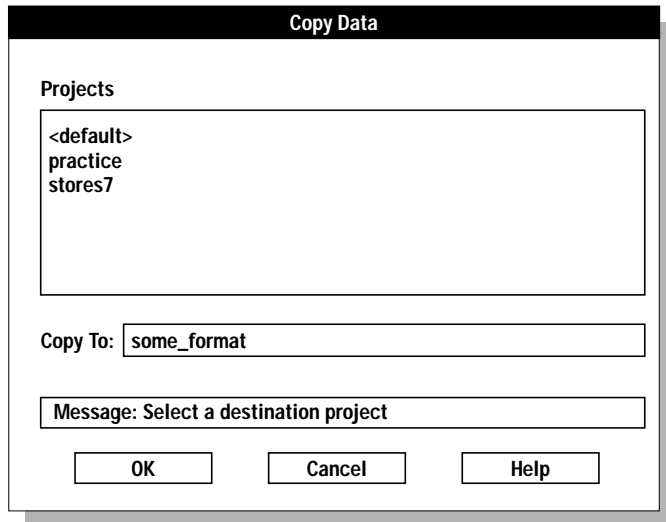
For an example, see [“Creating a Fixed Format” on page 7-5](#).

3. Select the format that you want to copy.

This example assumes that the format to copy is **some\_format**.

4. Click the **Copy** button.

The Copy Data window appears, as Figure 3-9 illustrates. The Copy Data window displays a list of existing projects. The **Copy To** text box shows the name of the format that you are copying.



*Figure 3-9*  
*The Copy Data*  
*Window*

5. Select the project to which you want to copy the format.
6. Type the name that you want to give to the copied format in the **Copy To** text box.

If you are copying the format to another project, you can keep the same name. You must change the name, however, if you are copying the format to the same project.

7. Click **OK**.

The display returns to the Record Formats window.

8. Click **Cancel** to return to the HPL main window.

## The Delete Button

The **Delete** button lets you delete one or more selected components.

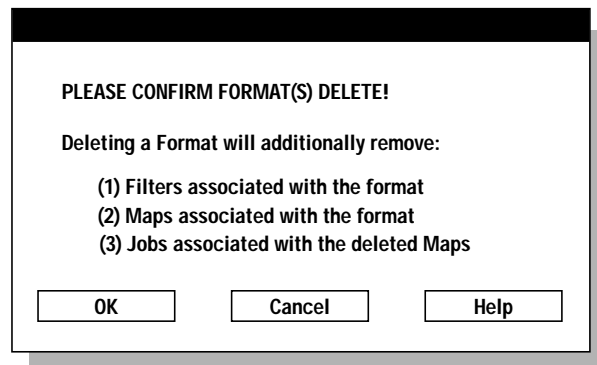
### To delete an existing format

1. In the HPL main window, select the project that includes the format that you want to delete.
2. Choose **Components**→**Formats** to access the Record Formats window.

For an example, see [“Creating a Fixed Format” on page 7-5](#).

3. Select the format that you want to delete.
4. Click the **Delete** button.

The Confirm Delete window appears, as Figure 3-10 illustrates. The Confirm Delete window describes the impact of deleting this format. The text in this window is different for each of the component types.



**Figure 3-10**  
The Confirm Delete Window

5. Click **OK** to confirm the deletion, or click **Cancel** to cancel it.  
If you click **OK**, the format is deleted, as well as any associated maps, filters, and jobs.
6. Click **Cancel** to return to the HPL main window.

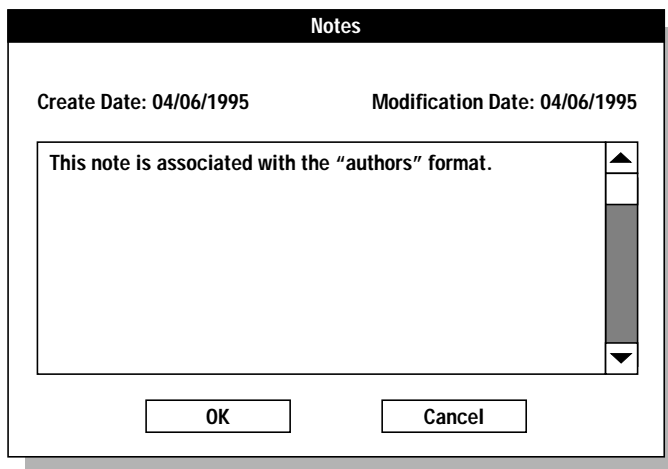
### ***The Notes Button***

The **Notes** button lets you type descriptive text for an item. The text of the note is displayed in the **Notes** area in a window when you select the item. The Notes feature is a useful tool for identifying **ipload** components, load jobs, unload jobs, and projects.

#### **To create a note**

1. Click the **Notes** button in a component-definition window.

The Notes window appears, as Figure 3-11 illustrates.



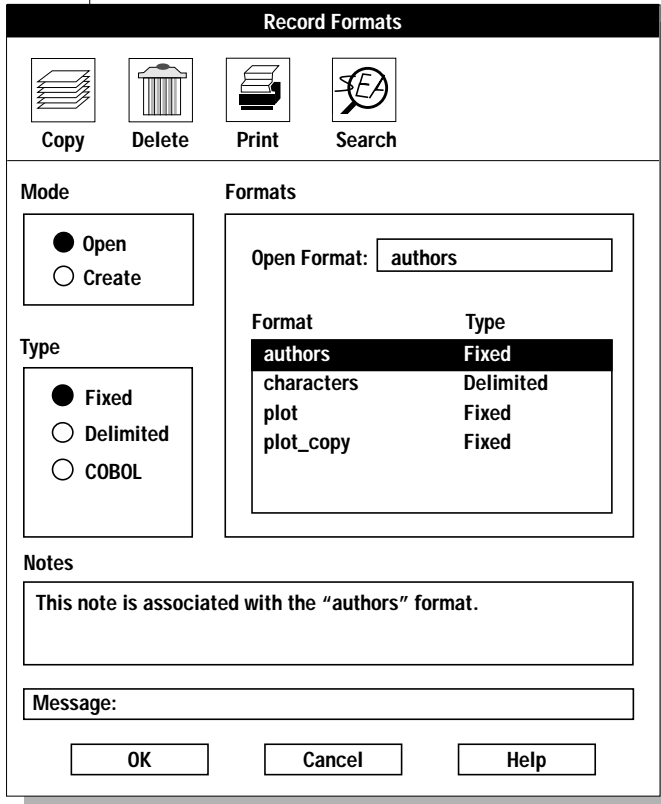
**Figure 3-11**  
*The Notes Window*

2. Type the descriptive text in the **Notes** text box.
3. Click **OK** to store the note and return to the component-definition window.

When you select the component, the note text is displayed in the **Notes** area.

If you do not make any changes to a note, click **Cancel** instead of **OK**.

For example, the note created in [Figure 3-11 on page 3-26](#) is associated with the **authors** format. The next time you go to the Record Formats page and select authors, **ipload** displays the note text, as [Figure 3-12](#) illustrates.



**Figure 3-12**  
The Record Formats Window with Notes Text

The **ipload** utility stores the information that you type in the Notes window in the **note** table of the **onpload** database. For a description of the **note** table, refer to [“The note Table” on page A-13](#).

### The Print Button

The **Print** button lets you print information that is associated with a component. Before you start **ipload**, you must set your workstation so that it can find a printer. For information about setting up a printer, refer to your operating-system manuals.


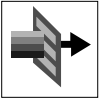
If you click the **Print** button in the map-definition window in [Figure 2-14 on page 2-26](#), the following printout results:

```
-----  
LOAD MAP REPORT  
-----  
Project   : <default>  
Name      : a_map  
  
OPTIONS  
  
Database   Table      Format  
-----  
testdb    tab1        a_format  
  
RECORD FORMAT MAP VIEW  
  
Format Field      Table Column      Option Data  
-----  
input1            col3  
input2            col2  
input3            col1
```








## Icon Buttons

Icon buttons appear in the middle sections of the Load Job and Unload Job windows and Views windows. The icon buttons represent various components. When you click it, each button opens another display. The following table shows and describes the icon buttons that are used in these windows.

Component	Description	Window	Action
 Device	The device or device array where the source files are located	Load Job Unload Job	<ul style="list-style-type: none"> <li>■ If the text box is empty, click the <b>Device</b> button to display the Device Array Selection window, where you can create or open a device type.</li> <li>■ If the text box has an entry, click the <b>Device</b> button to display the device-array definition window for that specific device or type the name of a different device in the text box.</li> </ul>
 Filter	The filter that controls which records are selected from the data file for a database update (The use of a filter is optional.)	Load Job Filter Views	<ul style="list-style-type: none"> <li>■ If the text box is empty, click the <b>Filter</b> button to display the Filter Views window, where you select a filter and associated format. You can also create a filter from this window.</li> <li>■ If the text box has an entry, click the <b>Filter</b> button to display the filter-definition window for that specific filter or type the name of a different filter in the text box.</li> <li>■ In the Filter Views window, click the <b>Filter</b> button to display the filter-definition window for a specific filter.</li> </ul>

(1 of 3)

Component	Description	Window	Action
	<p>The format of the source data used for this load or unload</p>	<p>Load Job Unload Job</p>	<ul style="list-style-type: none"> <li>■ If the text box is empty, click the <b>Format</b> button to display the Format Views window, where you can select a format and associated map. You can also create a format from this window.</li> <li>■ If the text box has an entry, click the <b>Format</b> button to display the format-definition window for that specific format or type the name of a different format in the text box.</li> <li>■ In all Views windows, click the <b>Format</b> button to display the format definition for a specific format. In these windows, the button shows only one of the three symbols (F, D, C) to indicate whether the type of format is fixed, delimited, or COBOL.</li> </ul>
<p>Format</p>			
	<p>The map that correlates fields of the data source to database columns</p>	<p>Load Job Unload Job Map Views Format Views Database Views</p>	<ul style="list-style-type: none"> <li>■ If the text box is empty, click the <b>Map</b> button to display the Map Views window, where you can select a map and associated table and format. You also can create a map from this window.</li> <li>■ If the text box has an entry, click the <b>Map</b> button to display the map-definition window for that specific map or type the name of a different map in the text box.</li> <li>■ In a Views window, click the <b>Map</b> button to display the map-definition window for a specific map.</li> </ul>
<p>Map</p>			
	<p>The options that let you specify characteristics of the load or unload</p>	<p>Load Job Unload Job</p>	<ul style="list-style-type: none"> <li>■ Click the <b>Options</b> button to display the Mapping Options window. For a discussion of these options, refer to <a href="#">“Changing the Load Options” on page 12-13.</a></li> </ul>
<p>Options</p>			

Component	Description	Window	Action
 Query	The query that selects data from the database table	Unload Job Database Views Map Views	<ul style="list-style-type: none"> <li>■ If the text box is empty, click the <b>Query</b> button to display the Database Views window from which you can select the table and associated map and format.</li> <li>■ If the text box has an entry, click the <b>Query</b> button to display the query-definition window for that specific query or type the name of a different query in the text box.</li> <li>■ In a Views window, click the <b>Query</b> button to display the query-definition window for a specific query.</li> </ul>
 Table	The database table into which the converted data will be loaded	Load Job Database Views Query Definition	<ul style="list-style-type: none"> <li>■ Click the <b>Table</b> button to display the Database Views window from which you can select the table and associated map and format. If an association is not apparent, click <b>Create</b> to create one.</li> <li>■ Click the <b>Table</b> button in the query definition window to choose a table and columns for the Select entry.</li> </ul>

(3 of 3)

## Buttons

The buttons across the bottom of the display let you indicate the next action. Most windows have one or more of the following buttons.

Button	Action
Apply	Save changes but do not exit.
Cancel	Do not save any changes. Exit to the previous display.

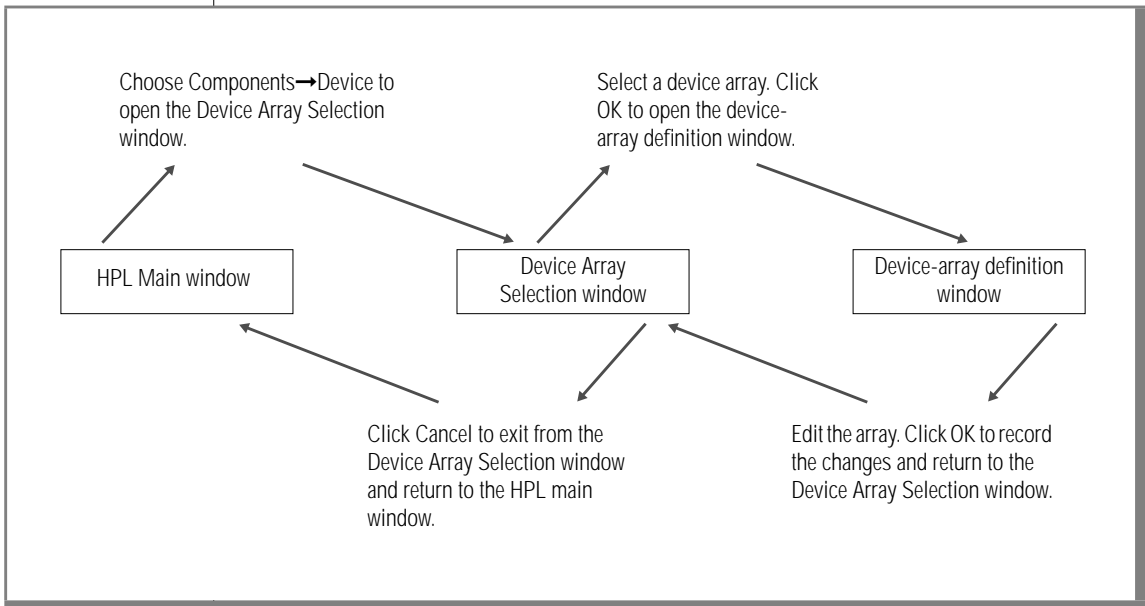
(1 of 2)

Button	Action
Create	Display the component-selection window.
Help	Display context-sensitive help in a separate window. For information about the on-line help, see <a href="#">“Using the On-Line Help” on page 3-33</a> .
OK	Save changes and exit to the previous display.

(2 of 2)

Use **OK** only when you have actually made a change on the display. If you are exiting from a series of displays, use **Cancel** to exit from the display. Figure 3-13 illustrates the use of **OK** and **Cancel**.

**Figure 3-13**  
Using OK and Cancel from the HPL Main Window



---

## Using the On-Line Help

The Help menu on the HPL main window has the following choices:

- Glossary
- Contents

The Glossary option opens a scrolling list of items. Select an item to see its definition. The Contents option takes you to the main contents page. This page directs you to discussions of various HPL topics.

If you click **Help** in any window other than the HPL main window, Help displays information that is related to the current window. After the Help window opens, you can click its **Help** button for more information about using the Help window.

---

## Using UNIX Keyboard Commands to Move the Cursor

Instead of using the mouse to move from area to area in the HPL user interface, you can use keyboard commands to move the cursor. As you move around, the currently selected item is highlighted with a box.

The following table lists the cursor-moving keystrokes.

---

Keystroke	Result
TAB	Move from area to area. Sometimes used to move from tab stop to tab stop.
SHIFT-TAB	Back up; that is, move from area to area in reverse order.
CONTROL-TAB	Move from area to area when TAB is reserved to move from tab stop to tab stop.
Cursor keys	Move from item to item within a functional area.
SPACEBAR	Select the current item or action.

---

Most displays in the HPL user interface are divided into functional areas, such as toolbar buttons, selection group, component-name text box, component list box, and so on. Depending on the nature of the specific display, sometimes `TAB` moves from item to item (or even from tab stop to tab stop) within a major area. On other displays, `TAB` moves only between functional areas, and you must use `SPACEBAR` to move around within the functional area.

---

# Defining Projects

The Project Organization . . . . .	4-3
The Projects Window . . . . .	4-6
Creating a New Project . . . . .	4-7
Selecting a Project . . . . .	4-7





# T

he HPL lets you organize your work by specifying *projects*. A project is a collection of individual pieces that you use to load and unload data. A project can include load and unload jobs and the maps, formats, filters, and queries that you use to build the load and unload jobs. This chapter explains how to create a project and how projects are related. The individual components that you store in projects are described in later chapters.

---

## The Project Organization

The HPL uses only one database, **onpload**, to keep track of the preparation that you do for loading and unloading data. Using projects lets you organize your work into functional areas. For example, you might regularly transfer data to or from several unrelated databases. You could put all of the preparation for each database into a separate project.

When you first start the **ipload** utility, **ipload** creates a project named **<default>**. If you prefer, you can select the **<default>** project and assign all of your work to that project. The HPL does not require that you create any additional projects. However, creating projects and putting separate tasks into distinct projects makes your work easier to maintain.

Figure 4-1 shows the relationships among projects, jobs, and components.

**Figure 4-1**  
Illustration of Project Hierarchy

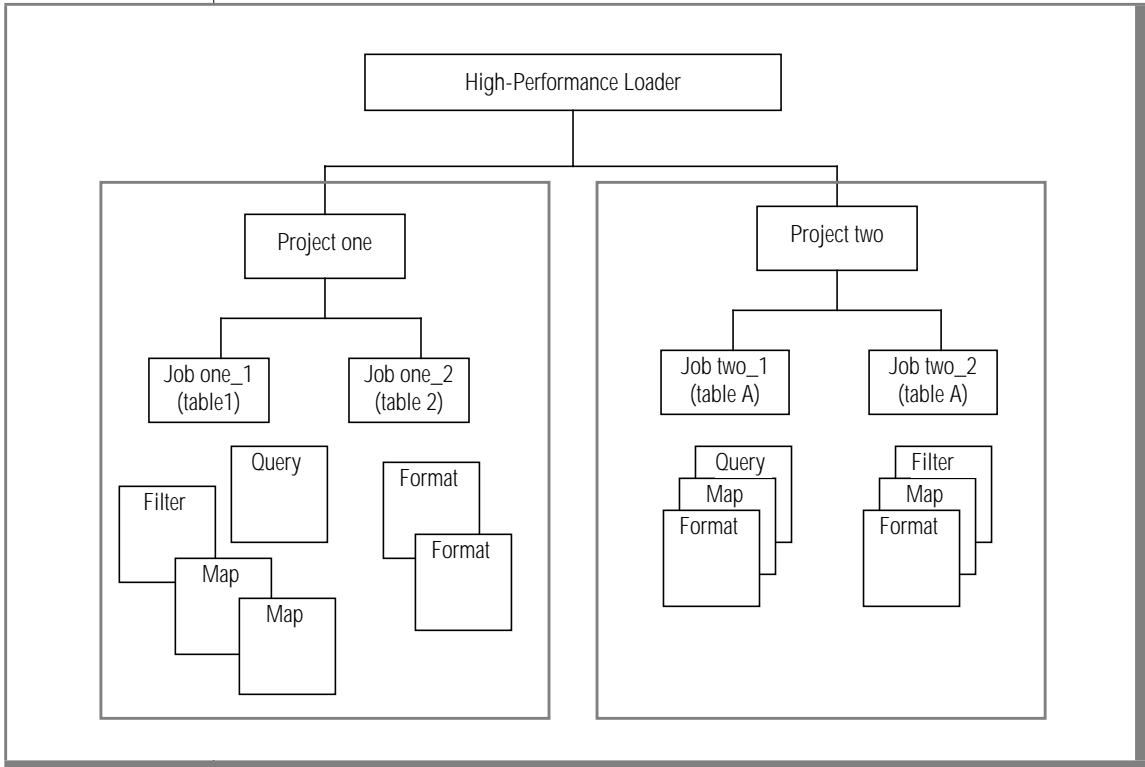


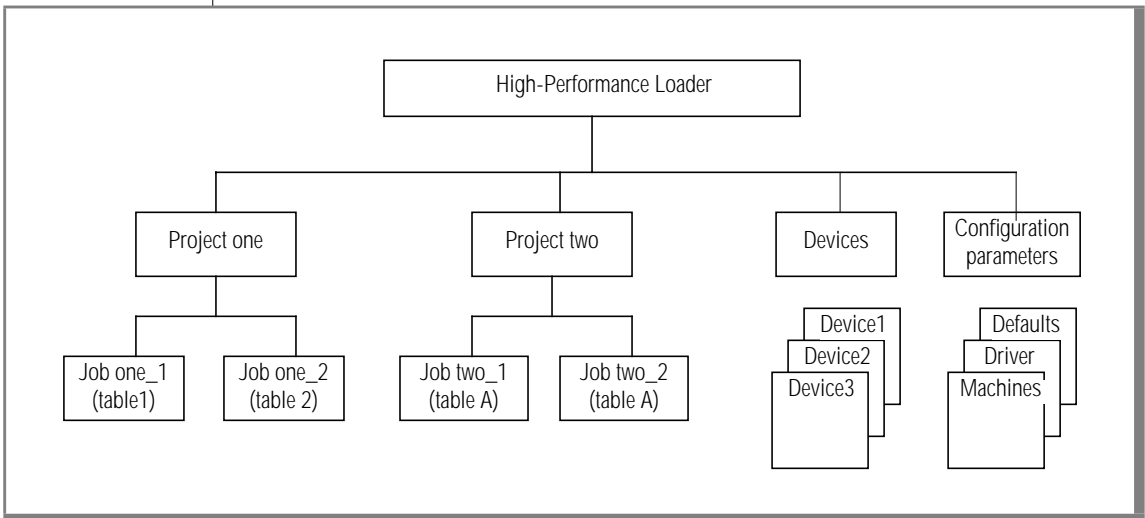
Figure 4-1 shows that jobs are linked directly to the projects. The format, map, filter, and query components belong to a project but are not directly linked to a job, as illustrated with Project one. In general, you create a format, map, and filter or query for each job, as shown with Project two. However, in some cases, you might use the same component for more than one job within a project.

For example, for reports about a medical study, you might want to create three reports: one about subjects under 50 years of age, one about subjects over 50, and one about all subjects. In that case, the description of how to find the information (the format and map) is the same for all three reports, but the selection of information (the query) is different for each report. (Formats, maps, and queries are described in detail in later chapters.)

All components (maps, formats, queries, filters, and load and unload jobs) that you create in a project are associated with that project in the **onpload** database. Components that are associated with a project are visible (usable) only when the project is selected. When you select a different project, a different set of components becomes available.

Device-array definitions and configuration parameters are not included in project definitions. Figure 4-2 shows the components that the HPL uses. Each project is distinct, but the devices and configuration parameters apply to all projects.

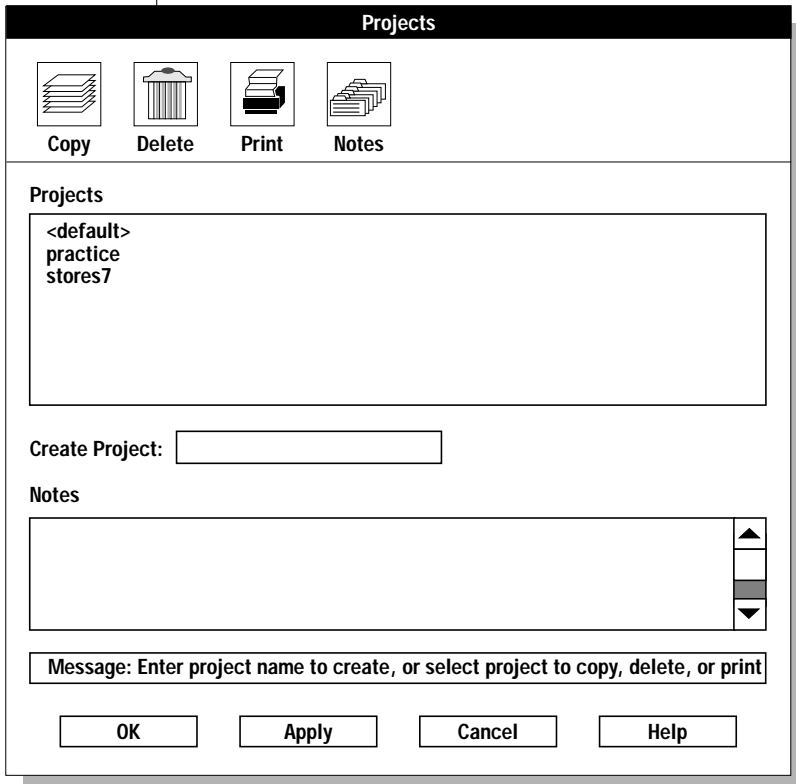
**Figure 4-2**  
Relationship of Projects, Devices, and Configuration Parameters



## The Projects Window

The Projects window (Figure 4-3) lets you select or create a project. After you select a project, you can copy the project, delete it, print the project parameters, or make a note that describes the project. The **ipload** utility stores project information in the **project** table of the **onpload** database. (The **project** table is described on [page A-14](#).)

**Figure 4-3**  
The Projects Window



## Creating a New Project

### To define a new project

1. Choose **Configure→Project** from the HPL main window.  
The Projects window appears, as [Figure 4-3 on page 4-6](#) illustrates.
2. Choose a name for the project and type it in the **Create Project** text box.
3. Click **Apply**.  
The **ipload** utility creates the project but does not exit from the Projects window. You can create another new project, or you can use the toolbar buttons to manipulate the project.
4. Click **Cancel** to return to the HPL main window.

If you want to create one project and then exit, click **OK** instead of **Apply**.

## Selecting a Project

The HPL provides two methods for selecting a project.

### To select a project for a load or unload job or to edit components

1. Select the project name from the **Select Project** list box in the HPL main window.
2. Choose the action that you want to take from one of the menus on the HPL main window.

### To select a project to edit

1. Choose **Configure→Project** from the HPL main window.  
The Projects window appears, as [Figure 4-3 on page 4-6](#) illustrates.
2. Select the project that you want to edit from the **Projects** list box.
3. Perform the desired edit actions (copy, delete, print, or describe with a note).
4. Click **Cancel** to return to the HPL main window.



---

# Configuring the High-Performance Loader

Configuring the iupload Utility . . . . .	5-3
Selecting a Database Server . . . . .	5-3
Using the Connect Server Window . . . . .	5-4
Creating the onpload Database . . . . .	5-5
Modifying the onpload Defaults . . . . .	5-5
The Defaults Window . . . . .	5-5
Server Name . . . . .	5-6
Machine Type . . . . .	5-7
Data Code Set . . . . .	5-7
Changing the onpload Defaults . . . . .	5-7
Selecting a Driver . . . . .	5-8
The Drivers Window . . . . .	5-8
The Driver Class . . . . .	5-9
The Driver Name . . . . .	5-10
Using the Drivers Window . . . . .	5-10
Modifying the Machine Description . . . . .	5-10
The Machines Window . . . . .	5-11
Using the Machines Window . . . . .	5-12





**T**his chapter describes how to prepare the configuration tasks for the HPL. The configuration tasks let you describe the type of computer, code sets, and other aspects of your database server environment. [“Performance” on page 15-10](#) describes how to modify the configuration to improve performance.

---

## Configuring the ipload Utility

Configuration information is stored in the **onpload** database. The configuration tasks include:

- selecting a database server.
- modifying the **onpload** defaults, if necessary.
- selecting a driver, if necessary.
- modifying the machine description, if necessary.

---

## Selecting a Database Server

The HPL needs to know the location of two databases: the **onpload** database and the *target database*. The target database is the Informix database into which you load data or from which you unload data. When you start the **ipload** utility, **ipload** assumes that both the **onpload** database and the target database reside on the database server that the **INFORMIXSERVER** environment variable specifies. You can use the Connect Server window ([Figure 5-1 on page 5-4](#)) to specify different database servers.

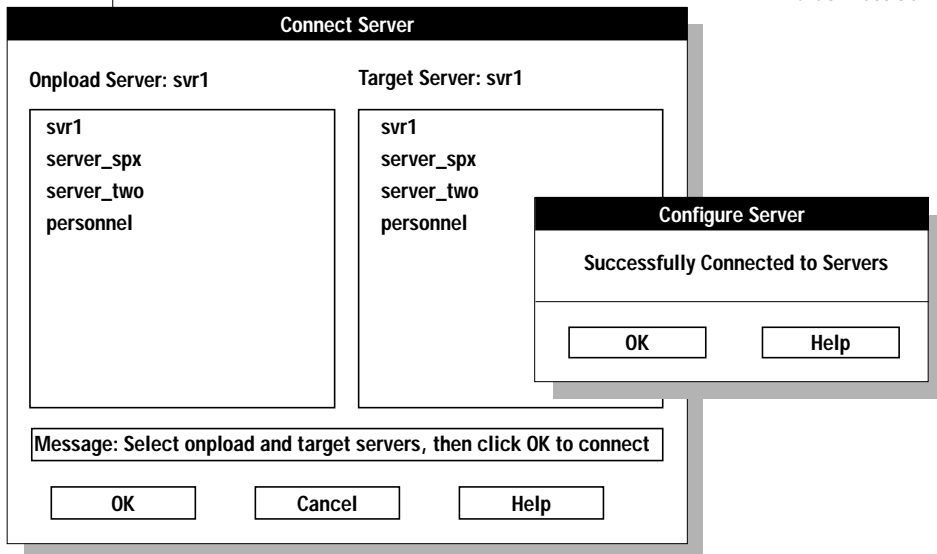
The **sqlhosts** file controls connectivity to database servers. The **ipload** utility scans the **sqlhosts** file to derive the lists of available database servers that the Connect Server window displays. For more information on how to configure connections, refer to the [INFORMIX-Universal Server Administrator's Guide](#).

## Using the Connect Server Window

### To select a database server

1. Choose **Configure**→**Server** from the HPL main window.  
The Connect Server window appears, as Figure 5-1 illustrates.

*Figure 5-1*  
The Connect Server Window



2. Select the database server where the **onpload** database resides from the **Onpload Server** list box.
3. Select the database server that includes the database that you will load or unload from the **Target Server** list box.

4. Click **OK**.  
The Configure Server confirmation window appears, as [Figure 5-1 on page 5-4](#) illustrates.
5. Click **OK** in the Configure Server window to return to the HPL main window.

## Creating the onpload Database

When you first start the **ipload** utility, **ipload** creates an **onpload** database. However, if you use the Connect Server window to choose a different **onpload** database server, **ipload** creates an **onpload** database on that database server.

The default name of the database that the HPL uses is **onpload**. To give some other name to the HPL database, set the **DBONPLOAD** environment variable. Refer to [“The DBONPLOAD Environment Variable” on page 1-12](#).

---

## Modifying the onpload Defaults

You must describe the computer environments of your database servers. This information applies to database servers and is independent of the projects. If you change the description of a database server, the changes apply to all jobs that you run on that database server. You can prepare a default computing environment that applies to all database servers that are not explicitly described.

### The Defaults Window

The Defaults window lets you change the following information:

- Server name
- Machine type
- Data code set

Figure 5-2 shows the Defaults window.

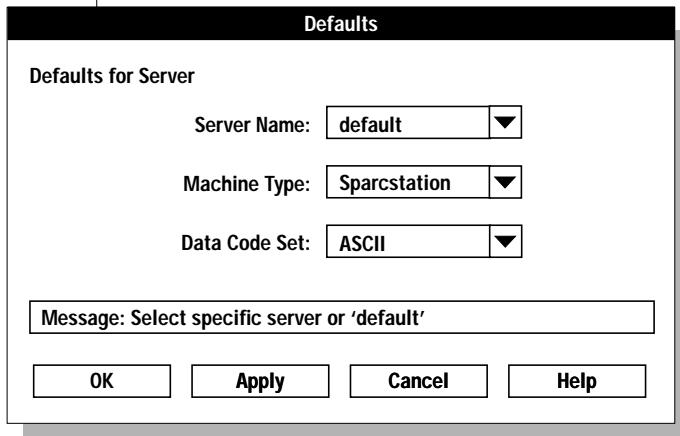


Figure 5-2  
The Defaults  
Window



The **ipload** utility saves the information from the Defaults window in the **defaults** table of the **onpload** database. For more information about the defaults table, see [page A-2](#).

*Tip:* You can use DB-Access to examine the default values. The following tables in the **onpload** database contain default values: **defaults**, **delimiters**, **driver**, and **machines**.

### Server Name

The **Server Name** text box specifies the database server with which the settings are associated. The information provided for the special server name **default** applies to all database servers for which no explicit information is provided. For example, if the majority of the database servers on your network (that will be using the HPL) are BrandX computers, **default** should describe the BrandX computers. To describe the computing environment of the other database servers on the network, specify the database server name.

The selection list that is associated with the **Server Name** text box lists the database servers that are in your **sqlhosts** file. For information about the **sqlhosts** file, refer to the [INFORMIX-Universal Server Administrator's Guide](#).

## Machine Type

The **Machine Type** text box describes fixed-length, binary-format records. It defines the sizes and byte order of data in data files that the specified database server produces. The selection list that is associated with the **Machine Type** text box provides descriptions of several computers. You can use the **Machines** option on the **Configure** menu (refer to “[Modifying the Machine Description](#)” on page 5-10) to add descriptions of other computers to this list.

## Data Code Set

The **Data Code Set** text box specifies the character set of the data file. When you load data into a database, you can convert the character set of the data file into the character set of the database. For example, you can convert EBCDIC to ASCII, or any other character set that your system supports. Conversely, you can convert the data from a database into a selected character set when you unload data.

You can select a desired GLS code set from this selection list. The character set of the database is determined by the **DB\_LOCALE** environment variable. For information about locales and code sets, see the [Guide to GLS Functionality](#). ♦

GLS

## Changing the onpload Defaults

### To specify defaults for onpload

1. Choose **Configure**→**Defaults** from the HPL main window.  
The Defaults window appears, as [Figure 5-3 on page 5-9](#) illustrates.
2. Update the values in each of the text boxes.  
Click the down arrows to display selection lists that show possible values for each text box.
3. Click **Apply** to save the values and prepare the defaults for another database server.
4. Click **Cancel** to return to the HPL main window.

If you want to prepare the defaults for only one database server, click **OK** instead of **Apply**.

---

## Selecting a Driver

You can use pipe-device arrays to connect custom programs to the input or to the output of the **onpload** utility. Although pipe-device arrays provide the simplest way to customize the input or output of **onpload**, connecting the standard input/output of programs together is less efficient than directly incorporating the functionality into the **onpload** program.

The **ipload** utility identifies custom software by the driver name that you assign to the record-format definitions.

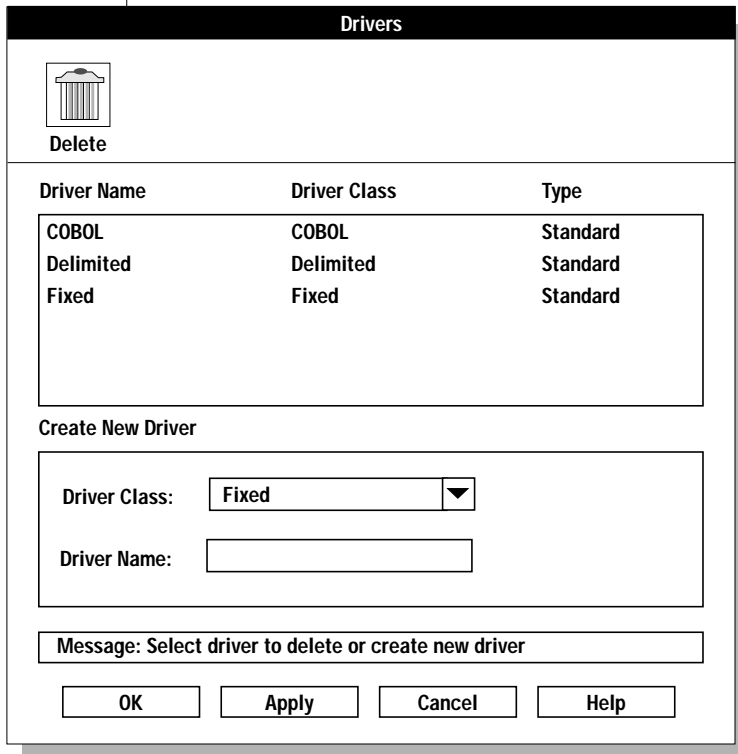
### To incorporate custom file-handling software directly into the onpload program

1. Write the driver using the API described in [Appendix F](#).
2. Add the driver name to the **onpload** database.  
For details, refer to [“Using the Drivers Window” on page 5-10](#).
3. Select the driver from the **Driver** selection list in the Format Options window.  
For details, refer to [“Format Options” on page 7-22](#).

## The Drivers Window

The Drivers window lets you add information about custom drivers. After you add a custom driver name, you can assign the driver to the record-format definitions.

[Figure 5-3 on page 5-9](#) shows the Drivers window. The **Driver Name** list box displays the currently available drivers.



**Figure 5-3**  
The Drivers Window

### *The Driver Class*

The **Driver Class** text box specifies the format type that the custom driver supports. The custom driver must produce data in a format that **onpload** supports. The **onpload** utility supports the following driver classes:

- Fixed
- Delimited
- COBOL

### **The Driver Name**

The **Driver Name** text box specifies the name of the custom-driver program. Before you can use the custom driver, you must add the program to your **ipload** shared library. For more information, refer to [Appendix F](#).

## **Using the Drivers Window**

### **To add a custom-driver name**

1. Choose **Configure**→**Driver** from the HPL main window.  
The Drivers window appears, as [Figure 5-3 on page 5-9](#) illustrates.
2. Type the name of the driver that you are adding in the **Driver Name** text box.
3. Select the Driver Class.
4. Click **Apply** to save this driver and add another driver.
5. When you finish, click **Cancel** to return to the HPL main window.

If you want to add only one driver, click **OK** rather than **Apply**.

---

## **Modifying the Machine Description**

The information stored by the **Machines** option of the **Configure** menu describes the characteristics of a specific computer. The HPL uses these characteristics to control the conversion of binary data formats. Unless you are converting binary data, you do not need to be concerned about the machine description.

When you first start the **ipload** utility, **ipload** stores the characteristics of several computers. You can select one of the existing computer types, modify an existing description, or create a new machine description.



You use the information from the Machines window when you prepare the defaults for the database servers on your network. (See “[Changing the onpload Defaults](#)” on page 5-7.) The information from the Machines window is stored in the **machines** table of the **onpload** database. (For more information on the **machines** table, see [page A-9](#).) The default information for the HPL includes descriptions of the binary data sizes for several popular computers. If the default data does not include the computer from which you are reading data, you can create a description for that computer.

## The Machines Window

Figure 5-4 shows the Machines window. If you select Sparcstation from the **Machine Type** selection list, the following values appear in the Machines window.

The screenshot shows a dialog box titled "Machines". It contains the following fields and controls:

- Machine Type:** A dropdown menu with "Sparcstation" selected.
- Byte Order:** Two radio buttons, "LSB" (unselected) and "MSB" (selected).
- Short Size:** A text input field containing the value "2".
- Integer Size:** A text input field containing the value "4".
- Long Size:** A text input field containing the value "4".
- Float Size:** A text input field containing the value "4".
- Double Size:** A text input field containing the value "8".
- Message:** A text area containing the message "Please select or enter machine type".
- Buttons:** Four buttons at the bottom: "OK", "Apply", "Cancel", and "Help".

**Figure 5-4**  
The Machines Window

The Machines window displays the following information.

Item	Description
Machine Type	Name for the computer that this entry describes
Byte Order	Bit ordering of binary information for this computer. The two possible formats are LSB and MSB. In the LSB format, the least-significant bits of a value are at lower memory addresses. In the MSB format, the most-significant bits of a value are at lower memory addresses.
Short Size	Number of bytes required to hold a short integer value
Integer Size	Number of bytes required to hold an integer
Long Size	Number of bytes required to hold a long-integer value
Float Size	Number of bytes required to hold a floating-point value
Double Size	Number of bytes required to hold a double-sized floating-point value

## Using the Machines Window

### To edit the description of a computer

1. Choose **Configure**→**Machines** from the HPL main window. The Machines window appears, as [Figure 5-4 on page 5-11](#) illustrates.
2. Click the down arrow and select a machine type from the selection list.
3. Modify the values as appropriate.
4. Click **Apply** to save the values and modify another machine description.
5. When you finish, click **Cancel** to return to the HPL main window.

If you want to modify the description of only one computer, click **OK** rather than **Apply**.

**To add a computer type to the Machines list**

1. Choose **Configure→Machines** from the HPL main window.  
The Machines window appears, as [Figure 5-4 on page 5-11](#) illustrates.
2. Type the new name in the **Machine Type** text box.
3. Type an appropriate value in each text box.
4. Click **Apply** to save the values and add another computer type.
5. When you finish, click **Cancel** to return to the HPL main window.

If you want to add only one computer type, click **OK** rather than **Apply**.



---

# Defining Device Arrays

Device Arrays . . . . .	6-3
Using Multiple Devices in a Device Array . . . . .	6-3
Using the Device Array Selection Window . . . . .	6-4
Using the Device-Array Definition Window . . . . .	6-6
The Array Item Type Group . . . . .	6-6
The Device Text Box . . . . .	6-7
The Tape Parameters Group . . . . .	6-7



**A** *device array* groups several input/output devices together so that the HPL can perform parallel processing of the input and output. When you specify multiple devices in a device array, **onpload** sets up separate, parallel streams of input or output when it performs a database load or unload.

---

## Device Arrays

The HPL lets you use *device arrays* to group computer resources to perform parallel processing. Device arrays set up simultaneous access to one or more tape devices, files, or pipes so that the **onpload** utility can take advantage of parallel processing.

Device arrays are not project specific. You can use the same device array for a load or unload job on any of the projects that you define.

### Using Multiple Devices in a Device Array

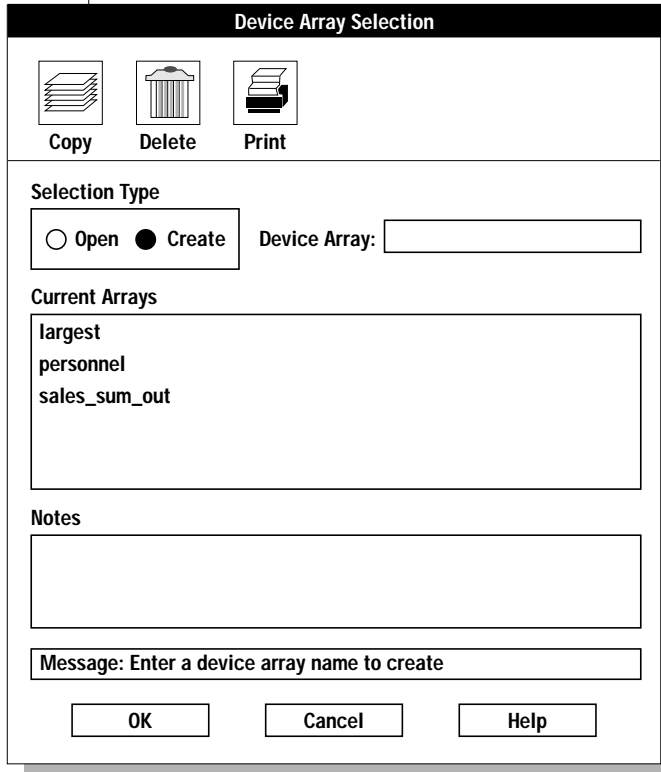
You can include files, pipes, and tape devices in a single array. [“Devices for the Device Array” on page 15-12](#) discusses factors that you should take into account when you decide what devices to assign to an array. If your array includes pipe commands, **onpload** starts the pipe when it begins execution.

When the HPL unloads data, it assigns records to the devices of a device array in a round-robin fashion.

## Using the Device Array Selection Window

The Device Array Selection window (see Figure 6-1) lets you create a new device array or select an existing array.

If you select an existing array, you can edit that array or use one of the toolbar buttons to copy, delete, or print the array.



**Figure 6-1**  
The Device Array Selection Window



**To create a new device array**

1. Choose **Components→Devices** from the HPL main window.  
The Device Array Selection window appears (see [Figure 6-1 on page 6-4](#)).
2. Click **Create** in the **Selection Type** group.
3. Select a name for the new device and type it in the **Device Array** text box.
4. Click **OK**.  
The device-array definition window appears, as [Figure 6-2 on page 6-6](#) illustrates.

**To open an existing device array**

1. Choose **Components→Devices** from the HPL main window.  
The Device Array Selection window appears (see [Figure 6-1](#)).
2. Click **Open** in the **Selection Type** group.
3. Select a device from the **Current Arrays** list box.
4. Click **OK**.  
The device-array definition window appears, as [Figure 6-2](#) illustrates.

## Using the Device-Array Definition Window

Use the device-array definition window (Figure 6-2) to add, edit, or delete devices from an array.

**Figure 6-2**  
A Partially Completed Device-Array Definition Window

The screenshot shows a window titled "new\_array" with a toolbar containing "Print" and "Notes" icons. Below the toolbar, the "Array Item Type" section has three radio buttons: "Tape", "File" (which is selected), and "Pipe". To the right, the "File Name" field is populated with "/extra/data/data\_two". The "Tape Parameters" section includes "Block Size" and "Tape Size" input fields, followed by radio buttons for "MB" and "GB". The "Array Items" section features a list box containing "FILE /work/data/data\_one" and a "Perform" button with three radio buttons: "Add" (selected), "Edit", and "Delete". A message box at the bottom reads "Message: Enter file name to load from or to create". At the very bottom are "OK", "Cancel", and "Help" buttons.

### *The Array Item Type Group*

The **Array Item Type** group lists the types of devices that you can include in a device array. You can mix different types of devices in a single array.

### The Device Text Box

Depending on the array item type that you selected from the **Array Item Type** group, the label for the text box where you type a device name is **Tape Device**, **File Name**, or **Pipe Command**. Fill in this text box as follows.

Device Type	What to Type
Tape Device	The full pathname of the tape device
File Name	The full pathname of the file
Pipe Command	The full pathname of the executable pipe command

### The Tape Parameters Group

When you select Tape as the array item type, the **Tape Parameters** group becomes active (not gray), as Figure 6-3 illustrates. You must type the block and tape size.

**Figure 6-3**  
The Tape Parameters Group

The screenshot shows a window titled "new\_array" with a dark header bar. Below the header are two icons: "Print" (a printer) and "Notes" (a stack of papers). The main content area is divided into two sections. The left section, titled "Array Item Type", contains three radio buttons: "Tape" (which is selected), "File", and "Pipe". The right section, titled "Tape Parameters", is active and contains a "Tape Device:" label followed by an empty text input field. Below this, there are two more input fields: "Block Size:" followed by an empty field and the word "Bytes", and "Tape Size:" followed by an empty field and two radio buttons: "MB" (selected) and "GB".

### To add devices to the device array

1. Click **Add** in the device-array definition window.
2. Click the device type in the **Array Item Type** group.
3. Type the full pathname of the device in the Device text box.
4. If you specified a tape device, the **Tape Parameters** group becomes active, as [Figure 6-3 on page 6-7](#) illustrates.
  - a. Type the block size in kilobytes.
  - b. Click **MB** (megabytes) or **GB** (gigabytes) to specify the units to use for the tape size.
  - c. Type the tape size.
5. When you have included all of the information for the device, click **Perform**.

The device that you added appears in the **Array Items** list box.
6. Repeat steps 2 through 5 to add other items to the device array.
7. When you have added all of the devices to the array, click **OK** to return to the Device Array Selection window.

Your new array appears in the **Current Arrays** list box.
8. Click **Cancel** to return to the HPL main window.

### To edit a device in the device array

1. Click **Edit** in the device-array definition window.
2. Select a device from the **Array Items** list box.

The selected item appears in the Device text box.
3. Edit the pathname and tape parameters, as appropriate.
4. Click **Perform**.
5. Click **OK** to return to the Device Array Selection window.
6. Click **Cancel** to return to the HPL main window.

**Tip:** When you edit a device, you can change the pathname and the tape parameters, but you cannot change the array-item type (tape, file, pipe). If you need to change the device type, you must delete the item and then add a new item.



**To delete a device from the device array**

1. Click **Delete** in the device-array definition window.
2. Select a device from the **Array Items** list box.
3. Click **Perform**.
4. Click **OK** to return to the Device Array Selection window.
5. Click **Cancel** to return to the HPL main window.



# Defining Formats

Formats . . . . .	7-3
Fixed-Length Records . . . . .	7-4
Creating a Fixed Format . . . . .	7-5
Data Types Allowed in a Fixed Format . . . . .	7-7
Bytes . . . . .	7-9
Decimals . . . . .	7-9
Editing a Format . . . . .	7-9
Creating a Fixed Format That Uses Carriage Returns . . . . .	7-11
Creating a Format That Includes Ext Type or Simple LO Data . . . . .	7-12
Fixed-Length Data . . . . .	7-13
In-Line Data . . . . .	7-13
Simple LO Data in a Separate File . . . . .	7-15
Delimited Records . . . . .	7-16
Creating a Delimited Format . . . . .	7-16
Data Types Allowed in a Delimited Format . . . . .	7-16
Creating a Delimited Format That Includes Simple LOs . . . . .	7-17
Creating a Delimited Format That Includes Ext Types . . . . .	7-18
COBOL Records . . . . .	7-19
Creating a COBOL Format . . . . .	7-20
The Picture and Usage Descriptions . . . . .	7-20
The Picture Description . . . . .	7-20
The Usage Description . . . . .	7-20
Packed-Decimal Conversions . . . . .	7-20
Other Formats . . . . .	7-21
Fast Format . . . . .	7-21
Fast Job . . . . .	7-21

Format Options . . . . .	7-22
Modifying Fixed and COBOL Formats . . . . .	7-22
Modifying Delimited Format Options . . . . .	7-24
The Format Views Window . . . . .	7-26



**A** *format* describes the structure of the data in a data file. Before you can import records from a data file into an Informix database or export records from a database to a data file, you must define a format that describes the data file. You do not need to define a format for the database because **ipload** already knows the schema (the organization) of the database table.

This manual uses the word *format* in two ways:

- To refer to the arrangement of data fields in a record of a data file
- To refer to the HPL component that documents the arrangement of the data fields

This chapter describes the formats that the HPL provides and shows how to prepare and edit the format component.

After you familiarize yourself with the concepts in this chapter, you might save yourself some work by using one of the Generate options to create formats automatically. For a description of these options, refer to [Chapter 13, “Generate Options.”](#)

---

## Formats

Data files can be structured in a variety of ways. The HPL supports data-file records of the following formats:

- Fixed-length
- Delimited
- COBOL
- Other formats

You can define new format components at any time. Also, you can test your format before you actually load or unload data. For information about testing a format, refer to [“Previewing Data-File Records” on page 14-3](#).

The **ipload** utility includes options that let you modify the data before it is inserted into the database. For information about modifying data, refer to [“Format Options” on page 7-22](#).

The **ipload** utility stores information about formats in the **formatitem** and **format** tables of the **onpload** database. For more information about the **formatitem** and **format** tables, see [page A-6](#) and [page A-8](#), respectively.

***Important:** To prepare the format component, you must know the format of the records in the data file. If you do not know the data-file format, you must get it from the person who provided the data file.*



---

## Fixed-Length Records

In *fixed-length* or *fixed-format* records, each field starts and ends at the same place in every record. A data file that contains data records of equal and constant length might be organized as Figure 7-1 illustrates.



**Figure 7-1**  
Sample File with  
Fixed-Length  
Records

The data file illustrated in Figure 7-1 has three records. Each record has a field of three characters followed by a field of four characters, so the total record length is seven characters. The file does not contain any separation between records.

When you define a fixed-length format, you specify the length of each field. The **ipload** utility calculates the offset for each field and the total length of the record from the field lengths that you supply.

## Creating a Fixed Format

The Record Formats window and the Fixed Format definition windows let you create and define formats for fixed-length records.

### To create a format for fixed-length records

1. Choose **Components**→**Formats** from the HPL main window.  
The Record Formats window appears, as Figure 7-2 illustrates.

The screenshot shows the 'Record Formats' dialog box. At the top, there is a title bar and a toolbar with four icons: Copy (stack of papers), Delete (trash can), Print (printer), and Search (magnifying glass). Below the toolbar are two main sections: 'Mode' and 'Type'. The 'Mode' section has two radio buttons: 'Open' (unselected) and 'Create' (selected). The 'Type' section has three radio buttons: 'Fixed' (selected), 'Delimited' (unselected), and 'COBOL' (unselected). To the right of these sections is a 'Formats' area. It contains a 'Create Format:' text box with the value 'a\_format'. Below this is a table with two columns: 'Format' and 'Type'. The table is currently empty. Below the table is a 'Notes' text area and a 'Message:' text box. At the bottom of the dialog are three buttons: 'OK', 'Cancel', and 'Help'.

**Figure 7-2**  
The Record Formats  
Window

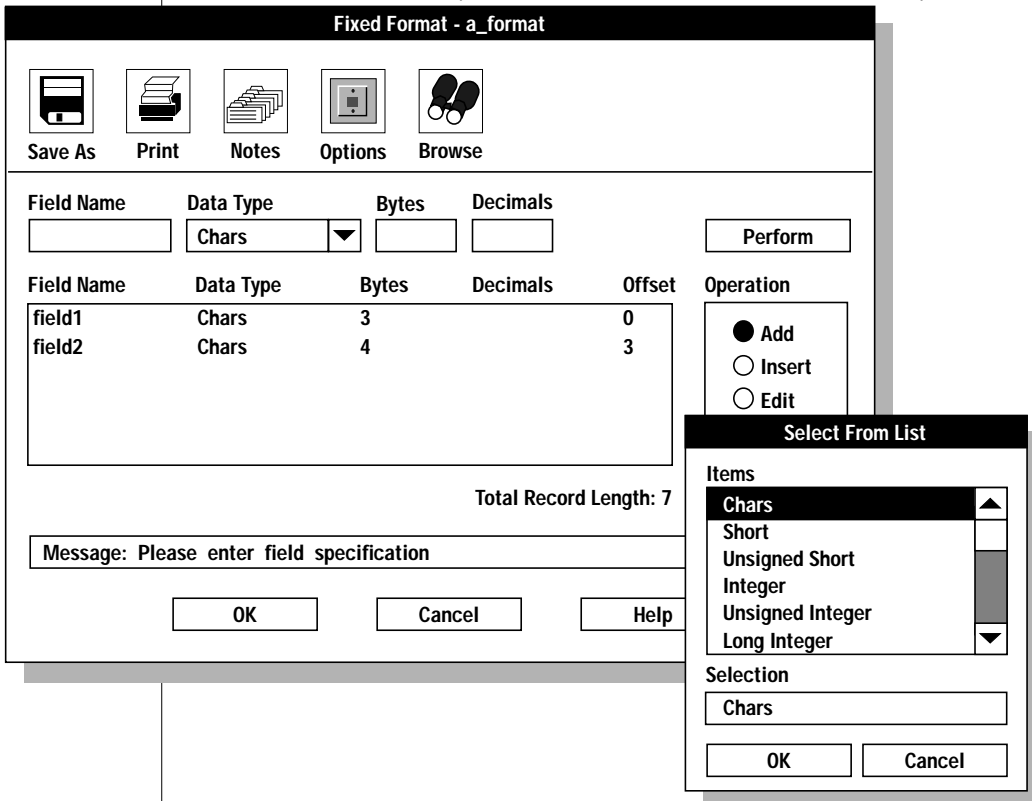
2. Click **Create** in the **Mode** group.
3. Click **Fixed** in the **Type** group.

4. Choose a name for the format and type it in the **Create Format** text box.
5. Click **OK**.

The Fixed Format definition window appears. The title bar includes the name that you chose for the format. Figure 7-3 shows the Fixed Format definition window as it might appear after you prepare the format for the file that [Figure 7-1 on page 7-4](#) illustrates.

**Figure 7-3**

*A Completed Fixed Format Definition Window with an Open Selection List*



6. Click **Add** in the **Operation** group.
7. Choose a name for the field and type the name in the **Field Name** text box.

8. Type the data type in the **Data Type** text box.  
The down arrow next to the **Data Type** text box displays the selection list that appears at the right in [Figure 7-3 on page 7-6](#). “Data Types Allowed in a Fixed Format” describes the data types that appear in the selection list.
9. Type the appropriate value in the **Bytes** text box (or in the **Decimals** text box, if appropriate).
10. Click **Perform**.  
After you click **Perform**, **ipload** calculates the proper offset for this field in the record and displays the value under the Offset heading, as [Figure 7-3 on page 7-6](#) illustrates.
11. Repeat steps 7 through 10 for each field in your data file.
12. Click **OK** to save the format and return to the Record Formats window.
13. Click **Cancel** to return to the HPL main window.



***Tip:** Use the field name to map the data file to the database. You can type any name that you choose. You might find it easier to remember the names if you use the same name as the corresponding column of the database.*

### ***Data Types Allowed in a Fixed Format***

You can use the following data types when you are preparing a fixed format.

<b>Data Type</b>	<b>Description</b>
Chars	ASCII format data
Short Unsigned Short Integer	The number of bytes required in fixed format for integers and floating-point values is specified by the Machines description (Refer to “ <a href="#">The Machines Window</a> ” on page 5-11.) When you select one of these data types, <b>ipload</b> sets the number of bytes.
Unsigned Integer	
Long Integer	
Unsigned Long	
Float	
Double	
Date	Date string

(1 of 2)

Data Type	Description
UNIX Date	A long integer interpreted as the system date from a UNIX system
Simple LO Length	The number of bytes of Simple Large Object (that is, TEXT or BYTE) data that follow this record
Simple LO File	The name of a file that contains a Simple LO (that is, a file that contains TEXT or BYTE data)
Int8	An eight-byte integer type
Serial8	An eight-byte serial column
Ext Type String	The textual representation of an Extended Type (Ext Type) value
Ext Type String Length	The length of a textual Ext Type value The Ext Type value follows at the end of the input record.
Ext Type Binary	The binary representation of an Ext Type value
Ext Type Binary Length	The length of the binary representation of an Ext Type value The binary value follows at the end of the input record.

(2 of 2)

### *Ext Type Data Types*

The HPL supports several data types under the Extended Type (Ext Type) mechanism. As a result, the specific names of these data types do not appear in the data-type selection list. For the following data types, choose the appropriate Ext Type data type: BLOB, BOOLEAN, CLOB, LVARCHAR, collection data types, distinct data types, opaque data types, and row types.

You can view the actual data type of the column to which this field is mapped in the Specifications window. For information on how to view the actual data type, see [“Using the Specs Button” on page 9-20](#).

## Bytes

In [Figure 7-3 on page 7-6](#), the **Bytes** text box specifies the number of characters that the field occupies in the record. In the **Bytes** text box, you must set the number of bytes for the Date, Ext Type String, Ext Type Binary, and Simple LO File data types. The **ipload** utility uses default information to generate the length of the other data types. (To change the default information, refer to [“The Machines Window” on page 5-11](#).) The **ipload** utility automatically calculates the total length of the data file as you add each field description.

## Decimals

In [Figure 7-3 on page 7-6](#), the **Decimals** text box specifies the number of decimal places that are displayed when you convert floating-point types to ASCII. You can set the number of decimals only for the Float and Double data types.

## Editing a Format

After you create and save a format, you might need to add a new field, insert a new field, edit a field, or delete a field. The process for editing an existing format is essentially the same, regardless of the file type. The following example uses a fixed-format file, but the same procedure applies to COBOL and delimited files also.

### To add a new field description to the format

1. Open the Fixed Format definition window.  
For more information, refer to [“Creating a Fixed Format” on page 7-5](#).
2. Click **Add** in the **Operation** group.
3. Type the field specifications in the text boxes at the top of the window.
4. Click **Perform**.

The **ipload** utility adds the new field at the end of the list.

5. Click **OK**.  
The **ipload** utility saves your changes and returns to the Record Formats window.
6. Click **Cancel** to return to the HPL main window.

**To insert a new field into the format**

1. Open the Fixed Format definition window.  
For more information, refer to [“Creating a Fixed Format” on page 7-5](#).
2. Click **Insert** in the **Operation** group.
3. Select the field *before which* you want to insert the new field.
4. Type the field specifications in the text boxes at the top of the window.
5. Click **Perform**.  
The **ipload** utility inserts the new field before the selected field.
6. Click **OK**.  
The **ipload** utility saves your changes and returns to the Record Formats window.
7. Click **Cancel** to return to the HPL main window.

**To edit the description of a field**

1. Open the Fixed Format definition window.  
For more information, refer to [“Creating a Fixed Format” on page 7-5](#).
2. Click **Edit** in the **Operation** group.
3. Select the field from the list of fields.
4. Change the desired information.
5. Click **Perform**.



6. Click **OK**.

The **ipload** utility saves your changes and returns to the Record Formats window.

7. Click **Cancel** to return to the HPL main window.

#### To delete a field description from the format

1. Open the Fixed Format definition window.

For more information, refer to [“Creating a Fixed Format” on page 7-5](#).

2. Click **Delete** in the **Operation** group.
3. Select the field that you want to delete.
4. Click **Perform**.

The **ipload** utility deletes the field.

5. Click **OK**.

The **ipload** utility saves your changes and returns to the Record Formats window.

6. Click **Cancel** to return to the HPL main window.

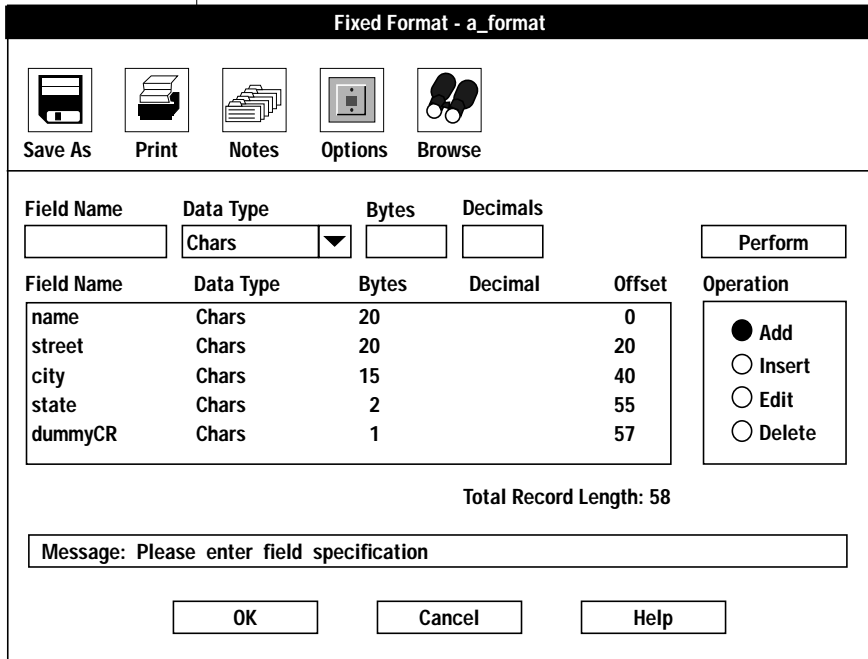
## Creating a Fixed Format That Uses Carriage Returns

A fixed-format data file often includes a carriage return (new line) at the end of each record, such as the data file in Figure 7-4.

20 chars	20 chars	15 chars	2 chars
John Brown	100 Main St.	Citadel	LA
Mary Smith	3141 Temple Way	Chesapeake	AZ
Larry Little	44 Elm Rd. #6	Boston	MA

**Figure 7-4**  
*Fixed-Format File  
with Carriage  
Returns*

When you prepare the format for this data file, you must include a dummy field for the carriage return. When you create the load map for this format (“Load Maps” on page 9-4), do not link the dummy field to a database column. Figure 7-5 shows the format for the data file illustrated in Figure 7-4 on page 7-11.



**Figure 7-5**  
Fixed Format with  
Dummy Entry for  
Carriage Return

## Creating a Format That Includes Ext Type or Simple LO Data

You can organize Ext Type data in a fixed-format data file in the following ways:

- Fixed-length data
- In-line data

You can organize simple-large-object (Simple LO) data in a fixed-format data file in the following ways:

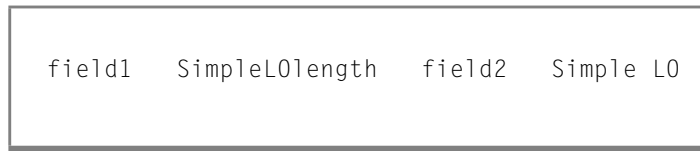
- In-line data
- Data in separate file

### ***Fixed-Length Data***

You can organize your Ext Type data as fixed-length data. When you designate a field as a Ext Type String or Ext Type Binary data type, you specify that the data will occupy a fixed amount of space, similar to the behavior of a fixed-length Chars data type. With these Ext Type data types, you must specify the number of bytes that the field occupies in the record.

### ***In-Line Data***

Simple LO or varying-sized Ext Type data that is included as part of a fixed-format data file is called *in-line* data. When a Simple LO or Ext Type is in line, the data-file record has two parts: a fixed-length part and a variable-length part. For example, a record with two fields and a Simple LO might be organized as Figure 7-6 illustrates.

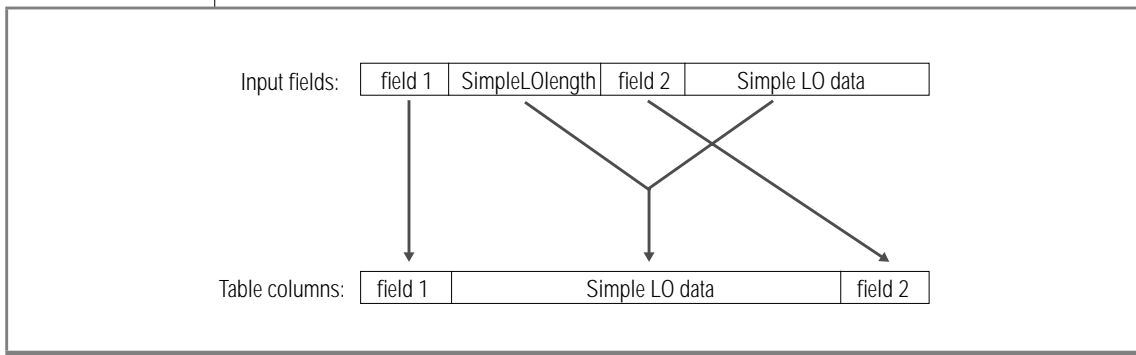


**Figure 7-6**  
*Organization of a Record that Includes a Simple LO*

The *data-type length* of the Simple LO or Ext Type is included in the fixed-length part of the record. The actual data is inserted at the end of the fixed-length part of the record. The HPL reads the data-type length from the fixed-length part of the record and uses that length to read the actual Simple LO or Ext Type data. The HPL also uses the data-type length to calculate the offset to the beginning of the next record.

[Figure 7-7 on page 7-14](#) illustrates the format definition of a record with in-line Simple LO data. The arrows show how the HPL puts the record into the database. The arrows from field 1 and field 2 indicate entries in fixed-length format. The split arrow shows that the HPL uses the **SimpleLOlength** information to find the Simple LO data and insert it into the table. The HPL does not insert the Simple LO length into the database.

**Figure 7-7**  
In-Line Simple LO Data



When you define the format in the format-definition window, select the appropriate data-type-length data type (Ext Type String Length, Ext Type Binary Length or Simple LO Length) for the data-type-length field. Figure 7-8 shows the format for the example in Figure 7-6 on page 7-13. The format does not include an entry for Simple LO data.

**Fixed Format - b\_format**

Save As   Print   Notes   Options   Browse

Field Name	Data Type	Bytes	Decimals
<input type="text"/>	Chars	<input type="text"/>	<input type="text"/>

Perform

Field Name	Data Type	Bytes	Decimal	Offset	Operation
field1	Chars	10		0	<input checked="" type="radio"/> Add
SimpleLOlength	SimpleLO Length	4		10	<input type="radio"/> Insert
field2	Chars	30		14	<input type="radio"/> Edit
					<input type="radio"/> Delete

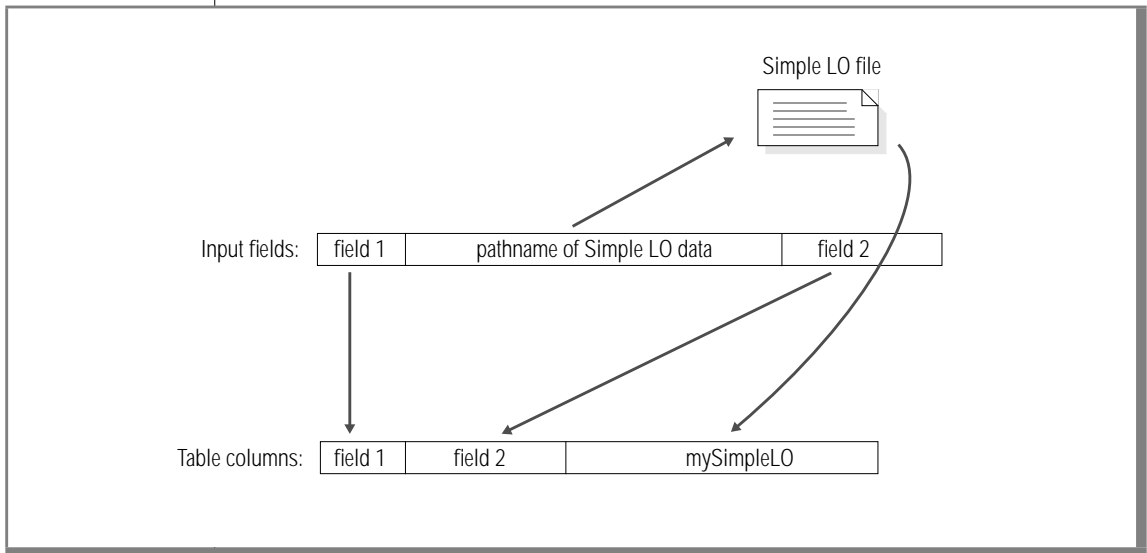
**Figure 7-8**  
Fixed Format  
That Includes a  
Simple LO

When you create a map to link the input fields that are defined by the format to the columns of a database table (see [Chapter 9](#)), connect the data-type-length input field to the table column that contains that particular data. In this case, connect the **SimpleLOlength** input field to the table column that contains the Simple LO data.

### **Simple LO Data in a Separate File**

You can also store Simple LO data in separate files. During a load, Simple LO files are read and inserted into the database. During an unload, the Simple LO file is created and Simple LO data is written to the file. When the fixed-format input contains the pathname of a data file, the HPL uses that pathname to insert data into a column of the database table, as [Figure 7-9](#) illustrates. When you prepare the format, select Simple LO file for the data type.

**Figure 7-9**  
Simple LO Data in a File



When you create a map to link the fields of the input record to the columns of a database table (see [Chapter 9](#)), link the name of the Simple LO file with the Simple LO column. The arrows in [Figure 7-9](#) illustrate how the HPL inserts the Simple LO data into the column.

## Delimited Records

*Delimited records* are records whose fields can vary in length. In a data file that contains delimited records, the records and fields are separated by a *delimiter*. The following data file uses a vertical bar (|) as the field delimiter and a carriage return as the record delimiter:

```
John Brown|100 Main St.|Citadel|LA|215/887-1931
Mary Smith|3141 Temple Way|Chesapeake|AZ|415/812-9919
Larry Little|44 Elm Rd. # 6|Boston|MA|617/184-1231
```

The **ipload** utility uses the vertical bar and carriage return as the default field and record delimiters. For instructions on how to choose a different delimiter, refer to [“Modifying Delimited Format Options” on page 7-24](#).

## Creating a Delimited Format

To create a format for delimited records, follow the same steps as in [“Creating a Fixed Format” on page 7-5](#), with the following modifications:

- In step 3, click **Delimited** in the **Type** group.
- Omit step 9. When you use delimited records, **ipload** does not need byte or decimal information.

### *Data Types Allowed in a Delimited Format*

You can use the following data types when you prepare a delimited format.

Data Type	Description
Chars	Normal ASCII data
Simple LO File	The name of a file that contains a Simple LO (that is, a file that contains TEXT or BYTE data)
Simple LO Text	Simple LO (that is, TEXT or BYTE) data is formatted as ASCII text If the text includes carriage returns (new lines) or delimiters, a backslash (\) must precede those characters.

(1 of 2)

Data Type	Description
Simple LO HexASCII	Simple LO (that is, TEXT or BYTE) data is formatted in ASCII hexadecimal  The <b>ipload</b> utility translates the data into binary before it loads the data into the database.
Ext Type String	The textual representation of a Ext Type value
Ext Type HexASCII	The hexASCII representation of a Ext Type value

(2 of 2)

### Ext Type Data Types

The HPL supports several data types under the Extended Type (Ext Type) mechanism. As a result, the specific names of these data types do not appear in the data type selection list. For the following data types, choose the appropriate Ext Type data type: BLOB, BOOLEAN, CLOB, LVARCHAR, collection data types, distinct data types, opaque data types, and row types.

If you want, you can view the actual data type of the column to which this field is mapped in the Specifications window. For information on how to view the actual data type, see [“Using the Specs Button” on page 9-20](#).

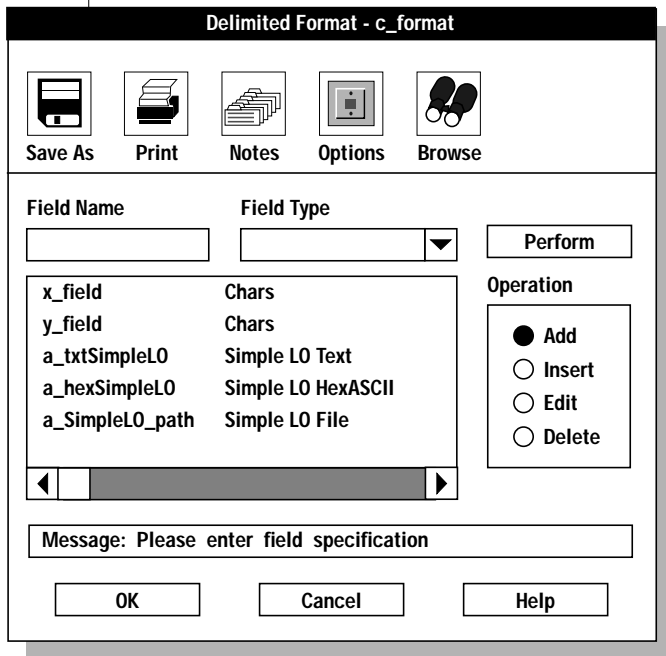
## Creating a Delimited Format That Includes Simple LOs

In a delimited format, Simple LOs can be characters, hexadecimal data, or in a separate file. Figure 7-10 shows a data record that has two fields of character data followed by a field of character Simple LO data, a field of hexadecimal Simple LO data, and the pathname of a file that contains a Simple LO.

```
field1|field2|A TEXT Simple LO|BEEEF6699|/bbs/kaths/data2jn95
```

**Figure 7-10**  
Sample Data File  
Record that  
Includes  
Simple LOs

Figure 7-11 illustrates a format for the file in [Figure 7-10 on page 7-17](#).



**Figure 7-11**  
Delimited Format  
with Simple LO  
Entries

## Creating a Delimited Format That Includes Ext Types

In a delimited format, Ext Types can be characters or hexadecimal data. Use the Ext Type String field type for characters. Use the Ext Type HexASCII data type for hexadecimal data.



## COBOL Records

The HPL supports COBOL sequential data files that do not contain internal indexing. Figure 7-12 illustrates the COBOL-Format definition window for preparing a COBOL format.

The screenshot shows a window titled "COBOL Format - see\_cobol". At the top, there are five icons with labels: "Save As" (floppy disk), "Print" (printer), "Notes" (stack of papers), "Options" (gear), and "Browse" (hand cursor). Below these icons are input fields for "Field Name", "Picture", and "Usage" (set to "Chars" with a dropdown arrow), and a "Perform" button. A table below has columns for "Name", "Picture", "Usage", and "Operation". The "Operation" column contains radio buttons for "Add" (selected), "Insert", "Edit", and "Delete". Below the table, it says "Record Length: 58". A message box at the bottom contains the text "Message: Please enter field specification". At the very bottom are "OK", "Cancel", and "Help" buttons.

**Figure 7-12**  
Fixed Format  
Definition Window  
for a COBOL Format

## Creating a COBOL Format

To create a format for COBOL records, follow the same steps as in “[Creating a Fixed Format](#)” on page 7-5, with the following modifications:

- In [Step 3](#), click **COBOL** in the **Type** group in the Record Formats window.
- In [Step 8](#), type the COBOL picture description in the **Picture** text box.
- In [Step 9](#), type the data type in the **Usage** text box.
- The arrow displays the selection list of available data types for the **Usage** text box.

The new and extended data types Universal Server supports are not available in COBOL format.

## The Picture and Usage Descriptions

The picture and usage description must conform to ANSI-COBOL 85 specifications. For information about COBOL picture strings, refer to the documentation for your COBOL compiler.

### *The Picture Description*

The picture description must match the record file descriptor (FD) from the COBOL program that generates or will use the data. For information on COBOL formats, see your COBOL programmer’s manual.

### *The Usage Description*

The usage description must match the data-field type described in the FD descriptor of the COBOL program. If the COBOL program does not include a usage clause, select the Chars (character) option for the usage.

### *Packed-Decimal Conversions*

When values are converted to packed-decimal formats, supply a picture clause that matches the picture clauses in the COBOL programs that use the data. Otherwise, the COBOL interpretation of the values will be wrong.

The following table lists some examples of appropriate picture clauses.

Picture	Input Data	Output Data	COBOL value =
9999999	123	0000123C	123
9999V99	123	0000123C	1.23
9999.99	123	0000123C	1.23
9999V99	-123.22	0012322D	-123.22

## Other Formats

In addition to delimited, fixed, and COBOL formats, the HPL provides two other formats for loading and unloading data: *fast format* and *fast job*. These formats are not included on the Record Formats window because the format specifications are predefined; you do not need to make any choices.

Fast format and fast job are the most efficient ways to load and unload data because their formats are predefined.

### Fast Format

Fast format loads or unloads data in which each individual column uses Informix internal format. You can reorder, add, or delete columns, but you cannot do any kind of conversion on the column itself.

Select **Fixed internal** in the Generate window to get this type of load. For information about the Generate window, refer to [Chapter 13, “Generate Options.”](#)

### Fast Job

A fast job loads or unloads an entire row of an Informix database table in Informix internal format. A fast job is also called a *raw load* or a *No Conversion Job*. For more information, refer to [“The Format Type Group” on page 13-12.](#)

The **-fn** flag of the **onpload** command-line utility specifies a fast job. For information about the **onpload** utility, refer to [Chapter 16, “The onpload Utility.”](#)

### *Restrictions*

You cannot use this format for Ext Type or Simple LO data. You cannot convert on fast job data.

---

## Format Options

The format options let you change the default driver, the character set, the default computer type, and the delimiters. Information about the format options is stored in the **formats** table of the **onpload** database. For more information about the **formats** table, see [page A-8](#).

## Modifying Fixed and COBOL Formats

You can modify the following options for fixed and COBOL formats.

---

Option	Description
Character set	The code set that is used to translate the data in the data table
Driver	The driver that is used with this format. For more information, refer to <a href="#">“Selecting a Driver” on page 5-8</a> .
Machine	The machine type that produced the data files. For more information, refer to <a href="#">“Modifying the Machine Description” on page 5-10</a> .

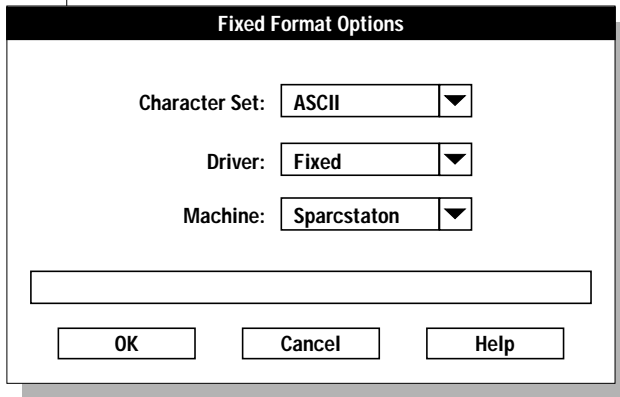
---

For a fixed format, you can select a desired GLS code set from the **Character Set** selection list. For information about locales and code sets, see the [Guide to GLS Functionality](#). ♦

GLS

**To modify the options for fixed and COBOL formats**

1. Display the format-definition window for the desired format.  
To do this, follow the steps in [“Creating a Fixed Format” on page 7-5](#).
2. Click **Options**.  
The Options window (in this example, the Fixed Format Options window) appears, as Figure 7-13 illustrates.



**Figure 7-13**  
*The Fixed Format Options Window*

3. Modify the options as appropriate.
4. Click **OK** to save your options and return to the format-definition window.

## Modifying Delimited Format Options

The Delimiter Options window ([Figure 7-14 on page 7-25](#)) lets you modify the following options of the delimited format.

Option	Description
Driver	The driver used with this format. For more information, refer to <a href="#">“Selecting a Driver” on page 5-8</a> .
Character set	The code set used to translate the data in the data table.
Delimiting characters	The <i>delimiting characters</i> , which are sometimes called <i>record separators</i> and <i>field separators</i> , indicate the beginning and end of records and fields.  You can specify the delimiting characters in ASCII, HEX, OCTAL, or DECIMAL format.

### GLS

You can select a desired GLS code set from the **Character Set** selection list. For information about locales and code sets, see the [Guide to GLS Functionality](#). ♦

### To modify the options for delimited formats

1. Display the Delimited Format definition window.  
To do this, complete the steps in [“Creating a Fixed Format” on page 7-5](#) with the following modification: in step 3, click **Delimited**.
2. Click the **Options** button in the Delimited Format definition window.  
The Delimiter Options window appears, as [Figure 7-14 on page 7-25](#) illustrates.

**Figure 7-14**  
The Delimiter Options Window

**Delimiter Options**

Driver:  Character Set:

Record Start:   
 Record End:   
 Field Start:   
 Field End:   
 Field Separator:

Type

ASCII  
 HEX  
 OCTAL  
 DECIMAL

HEX	OCTAL	CONTROL	ASCII
00	000		Null ▲
01	001	Ctrl-A	sch
02	002	Ctrl-B	stx
03	003	Ctrl-C	etx ▼

3. Modify the options that you want to change.
4. Click **OK** to save your changes and return to the Delimited Format definition window.



**Tip:** You can use the **DBDELIMITER** environment variable to set the field delimiter for the **dbexport** utility and the **LOAD** and **UNLOAD** statements. However, do not use **DBDELIMITER** with the **HPL** because the **onpload** utility does not use this environment variable.

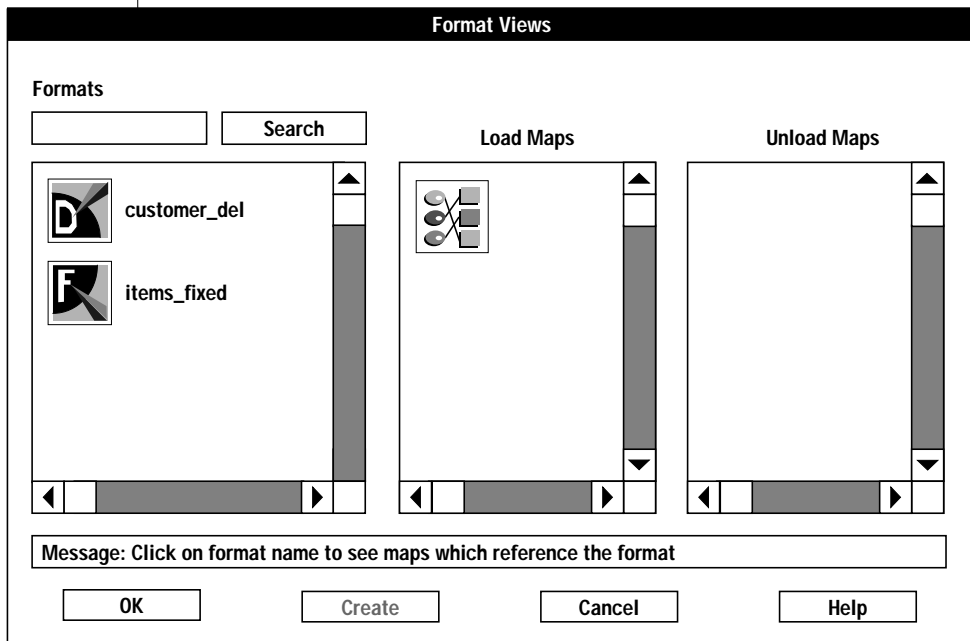
## The Format Views Window

The Format Views window lets you display a list of the formats and load and unload maps that are associated with a project. The Format Views window also lets you create or edit a format. The Format Views window appears in the following situations:

- When you click **Format** in the Unload Job window and no format name is in the **Formats** text box
- When you click **Search** in the Query window

Figure 7-15 shows a Format Views window. “[The Views Windows](#)” on [page 3-15](#) discusses the use of Views windows.

*Figure 7-15*  
The Format Views Window





---

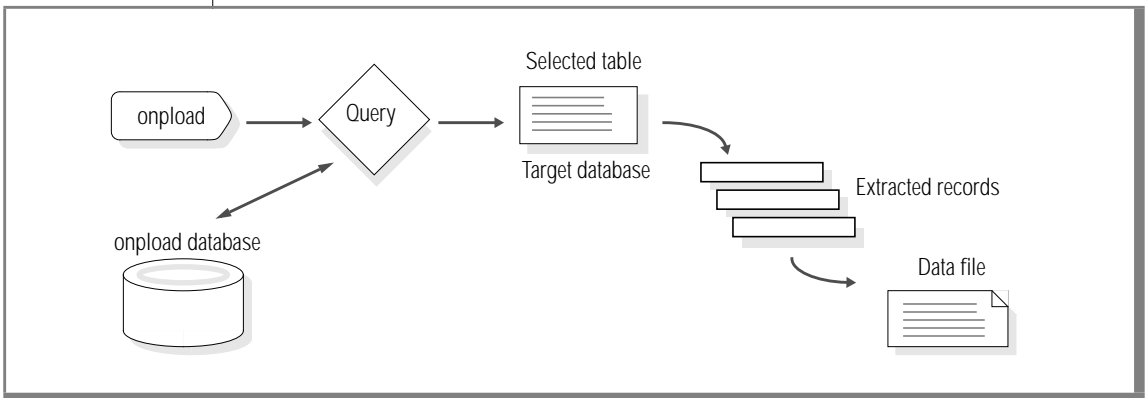
# Defining Queries

Queries . . . . .	8-3
Creating a Query . . . . .	8-4
Using the Table Button . . . . .	8-7
Editing the WHERE Clause . . . . .	8-11
Editing a Query . . . . .	8-13
Exporting and Importing Queries. . . . .	8-13
Importing a Query . . . . .	8-13
Exporting a Query. . . . .	8-15
The Database Views Window . . . . .	8-17



**D**uring the unload process, the HPL uses a *query* to select data from a database table (or tables), as Figure 8-1 illustrates. The HPL can process any valid SQL statement.

**Figure 8-1**  
*Extracting Data from a Database Table*



## Queries

The **ipload** query component lets you build an SQL statement. This manual uses the word *query* in two ways:

- To refer to the SQL statement that selects information from the database
- To refer to the HPL component that lets you build and store the SQL statement

The **ipload** utility stores query information in the **query** table of the **onpload** database. (For more information about the **query** table, see [page A-14](#).) The SQL statement is stored as a text blob.

---

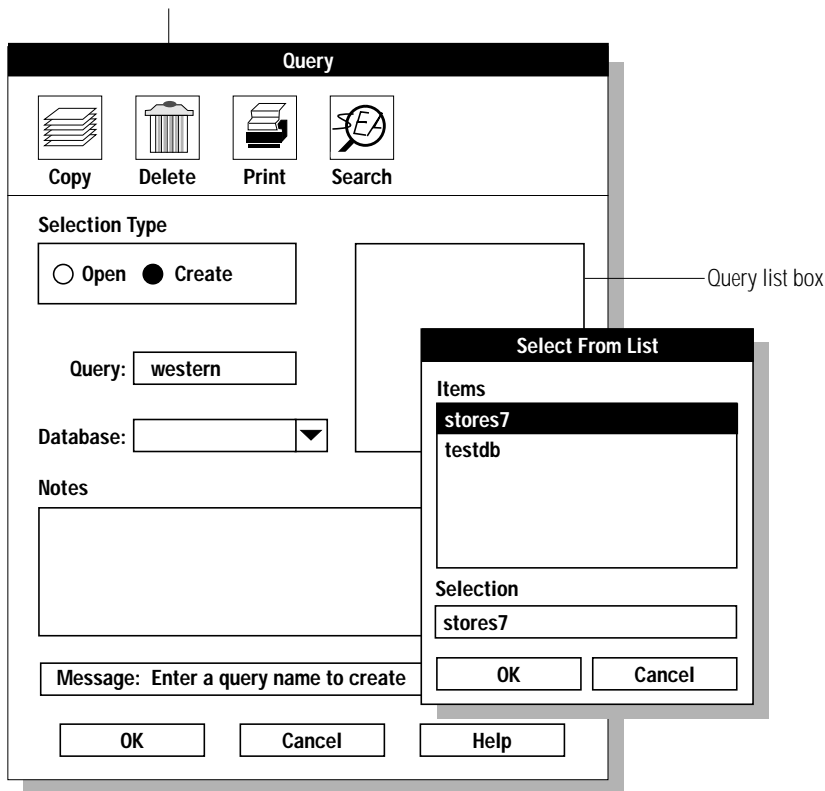
## Creating a Query

Use the Query window to create a new query.

### To create a query

1. Choose **Components**→**Query** from the HPL main window.  
The Query window appears, as [Figure 8-2 on page 8-5](#) illustrates.
2. Click **Create** in the **Selection Type** group.
3. Choose a name for your query and type it in the **Query** text box.
4. In the **Database** text box, type the name of the database that contains the table(s) from which you want to extract data, or click the down arrow to select from a database selection list.

[Figure 8-2](#) shows the Query window with the **Query** text box completed and **stores7** selected from the selection list.



**Figure 8-2**  
The Query Window

5. Click OK.

The query-definition window appears, as [Figure 8-3 on page 8-6](#) illustrates. The name that you chose for your query appears in the title bar.

6. Type your query in the **Select**, **From**, and **Where** text boxes.

Figure 8-3 illustrates the following simple query against the **customer** table of the **stores7** database:

```
SELECT customer.fname, customer.lname,  
       customer.zipcode  
FROM customer  
WHERE zipcode > 50000
```

If you prefer, you can type the entire query into the **Select** text box. If you later edit the query, **ipload** divides the query into **SELECT**, **FROM**, and **WHERE** clauses.

**Figure 8-3**  
*The Query-Definition Window*

The screenshot shows a window titled "western" with a menu bar containing icons for "Save As", "Notes", "Print", "File", and "Table". Below the menu bar, the text "Database: stores7" is displayed. The window is divided into three sections: "Select", "From", and "Where". The "Select" section contains the text "customer.fname, customer.lname, customer.zipcode". The "From" section contains the text "customer". The "Where" section contains the text "zipcode > 50000". At the bottom of the window, there is a message box that says "Message: Enter select, from, and where part of select query in appropriate window". Below the message box are three buttons: "OK", "Cancel", and "Help".

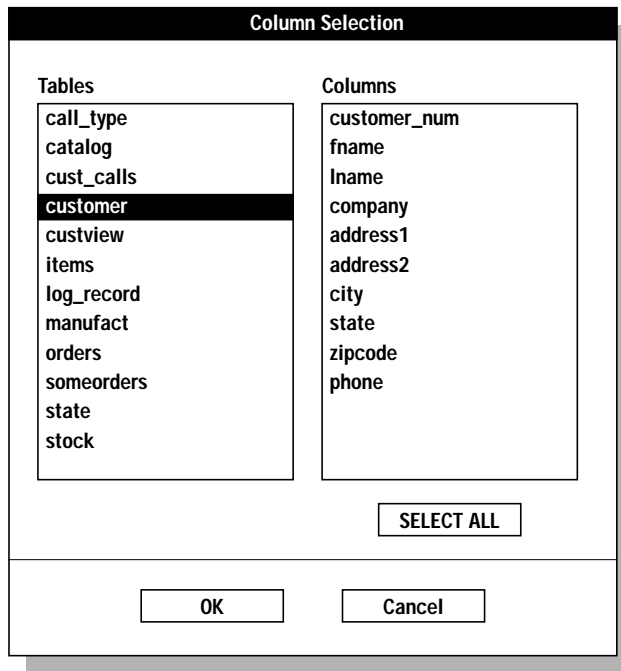
7. Click **OK** to save the query and return to the Query window.  
The query that you just created now appears in the **Query** list box at the right-hand side of the Query window.
8. Click **Cancel** to return to the HPL main window.

## Using the Table Button

The **Table** button displays the Column Selection window. You can use the Column Selection window to build queries by selecting tables and columns. The **ipload** utility inserts the selected columns and tables into the appropriate text boxes of the query-definition window.

### To use the Column Selection window

1. Display the query-definition window ([Figure 8-3 on page 8-6](#)) by following the steps in [“Creating a Query” on page 8-4](#).
2. Click the **Table** button.  
The Column Selection window appears, as [Figure 8-4 on page 8-8](#) illustrates. The Tables list includes synonyms and views that are valid for the local database server.
3. Select a table.  
After you select a table, the right-hand pane displays a list of the columns in that table. [Figure 8-4](#) shows the Column Selection window with the **customer** table selected.



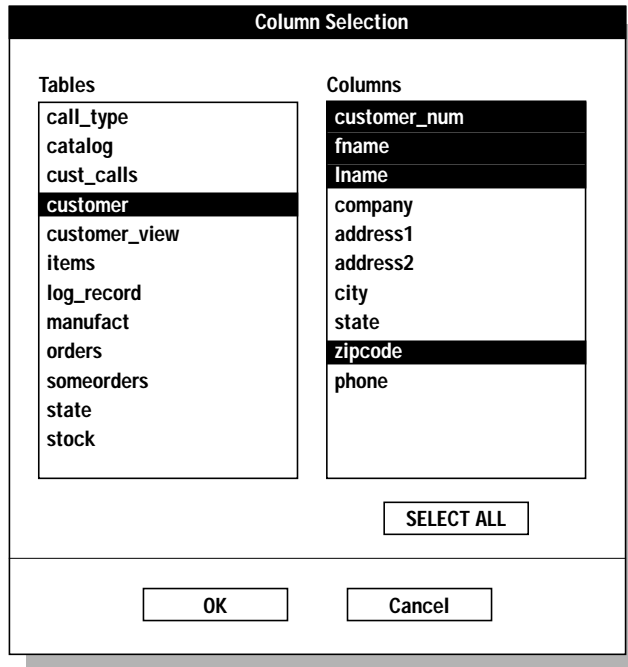
**Figure 8-4**  
The Column Selection Window After Selecting a Table

4. Select one or more columns to be used in the query.  
Use the following actions to select columns.

To Select	Perform This Action
A single column	Select that column.
All columns	Click <b>Select All</b> .
Consecutive columns	Select the first column. Move to the final column and hold down <b>Shift</b> while you select that column.
Several nonconsecutive columns	Select a column. Hold down <b>Control</b> while you select additional items.



Figure 8-5 shows the Column Selection window with several columns selected.



**Figure 8-5**  
Columns Selected  
from a Table

5. When you finish selecting columns, click **OK** to return to the query-definition window.

When the query-definition window reappears, the mouse cursor changes to a pointing hand and the message line reads:

Position Cursor Where Column Data to be Inserted

6. Click the **Select** text box or the **Where** text box.

Figure 8-6 shows columns inserted into the **Select** text box. The **ipload** utility also inserts the table name into the **From** text box.

**Figure 8-6**  
The Query-  
Definition Window  
After Using the Table  
Button

The screenshot shows a window titled "test\_query" with a menu bar containing "Save As", "Notes", "Print", "File", and "Table". Below the menu bar, the text "Database: stores7" is displayed. The main area is divided into three sections: "Select", "From", and "Where". The "Select" section contains the text "customer.customer\_num, customer.fname, customer.lname, customer.zipcode". The "From" section contains the text "customer". The "Where" section is empty. At the bottom of the window, there is a message box that says "Message: Enter select, from, and where part of select query in appropriate window". Below the message box are three buttons: "OK", "Cancel", and "Help".

7. Repeat steps 2 through 6 to add columns from other tables.
8. Modify the text in the **Where** text box so that it is a valid WHERE clause.  
Refer to the next section, [“Editing the WHERE Clause.”](#)
9. Click **OK** to save the query and return to the Query window.
10. Click **Cancel** to return to the HPL window.

## Editing the WHERE Clause

When you use the Column Selection window (Figure 8-4 on page 8-8) to select a column or columns for the WHERE clause, the selected columns appear in the **Where** text box. The =? symbols indicate where you must provide match conditions. Figure 8-7 shows the result of choosing **zipcode** and **customer\_num** from the **customer** table.

The screenshot shows a dialog box titled "test\_query" with a menu bar containing "Save As", "Notes", "Print", "File", and "Table". The main area is divided into sections for "Select", "From", and "Where". The "Where" section contains the text "customer.zipcode=? and customer.customer\_num=?". A message box at the bottom reads "Message: Enter select, from, and where part of select query in appropriate window". Buttons for "OK", "Cancel", and "Help" are at the bottom.

test\_query

Save As   Notes   Print   File   Table

Database: stores7

Select  
customer.customer\_num, customer.fname, customer.lname, customer.zipcode

From  
customer

Where  
customer.zipcode=? and customer.customer\_num=?

Message: Enter select, from, and where part of select query in appropriate window

OK   Cancel   Help

**Figure 8-7**  
The Where Text Box  
Entry After Using  
the Table Button

**To edit the WHERE clause**

1. Select `=?` and change it to the desired match condition.

For example, the **Where** text box in [Figure 8-7 on page 8-11](#) contains the following text:

```
customer.zipcode =? and customer.customer_num =?
```

**You must change both occurrences of `=?` to valid match conditions. You might change the text as follows:**

```
customer.zipcode > 50000 and  
customer.customer_num > 150
```

For a full description of match conditions, refer to [Appendix D, “Match Condition Operators and Characters.”](#)

2. Check the comparison operators.

When you select multiple columns from the Column Selection window, **ipload** inserts `and` into the expression between each column. You might need to change `and` to `or`.

---

## Editing a Query

To edit a query, follow the same steps as for creating a query, but open an already existing query in the Query window.

### To edit a query

1. Choose **Components**→**Query** from the HPL main window.  
The Query window appears, as [Figure 8-2 on page 8-5](#) illustrates.
2. Click **Open**.
3. Select a query from the list of queries.
4. Click **OK**.  
The query-definition window appears, as [Figure 8-3 on page 8-6](#) illustrates. The name of the query that you are editing appears in the title bar.
5. Modify the **Select**, **From**, and **Where** text boxes.
6. Click **OK** to save the modified query.
7. Click **Cancel** to return to the HPL main window.

---

## Exporting and Importing Queries

You can use the **File** button on the query-definition window to export a query to a file or to import a query that you prepared with some other tool. For example, you might use DB-Access to prepare and test a query and to save the query to a file. You can then import that query into the HPL.

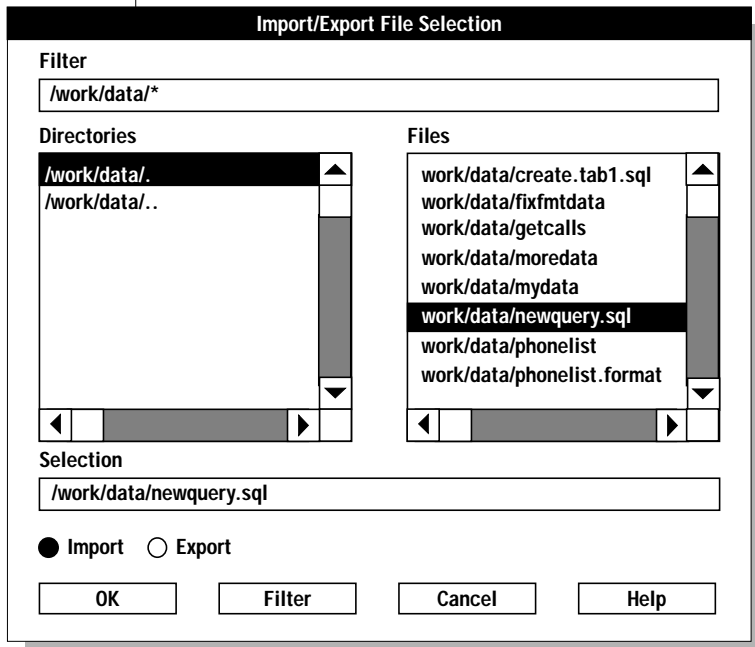
### Importing a Query

You can use the Import/Export File Selection window to import a query that you prepared outside of the HPL.

**To import a query**

1. Display the query-definition window (Figure 8-3 on page 8-6) by following the steps in “Creating a Query” on page 8-4.
2. Click the **File** button.

The Import/Export File Selection window appears, as Figure 8-8 illustrates.



**Figure 8-8**  
*The Import/Export  
File Selection  
Window*

3. Click **Import**.

4. Specify the file that you want to import.

You can do this in either of the following ways:

- Type a pathname and appropriate wildcard(s) in the **Filter** text box and click **Filter**. Use an asterisk (\*) to list all of the files in the directory. Then select a file and click **OK** or double-click a filename.
- Type the full pathname in the **Selection** text box and then click **OK**.

The text from the imported file appears in the query-definition window.

If **ipload** can interpret the SQL statement, the SQL statement is inserted into the appropriate **Select**, **From**, and **Where** text boxes.

If **ipload** cannot interpret the SQL statement, the entire content of the imported file appears in the **Select** text box.

5. Edit the query so that it meets your needs.
6. Click **OK**.

If the query is a valid SQL query, the display returns to the Query window.

If the query is not a valid SQL query, **ipload** highlights the portion of the query that it cannot interpret and provides an error message.

7. From the Query window, click **Cancel** to return to the HPL main window.

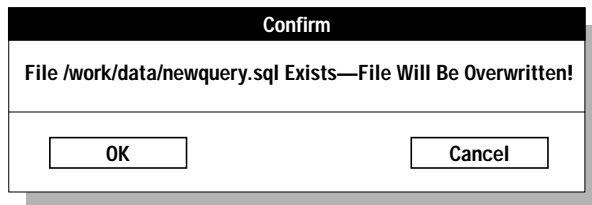
## Exporting a Query

The **File** button also allows you to export the query as an SQL statement. You can prepare a query for export in the following ways:

- Create a new query. (See [“Creating a Query” on page 8-4.](#))
- Open an existing query.
- Import an already prepared query and modify it. (See [“Importing a Query” on page 8-13.](#))

**To export a file**

1. Prepare a query in the query-definition window (see [Figure 8-3](#) on [page 8-6](#)) by following the steps in “[Creating a Query](#)” on [page 8-4](#).
2. Click the **File** button.  
The Import/Export File Selection window appears (see [Figure 8-8](#) on [page 8-14](#)).
3. Click **Export**.
4. Select the directory and file where the query should be stored.  
You can do this in either of the following ways:
  - Add the name of a new file to a pathname in the **Selection** text box and click **OK**.
  - Type a pathname and appropriate wildcard in the **Filter** text box and click **Filter**. Then select a filename.
5. Click **OK**.  
If the file that you specified already exists, **ipload** asks if you want to overwrite the existing file, as [Figure 8-9](#) illustrates.



**Figure 8-9**  
*The Confirm File Overwrite Window*

6. You now have two choices:
  - Click **OK** to overwrite. The display returns to the Query window.
  - Click **Cancel** to choose a different filename.The **ipload** utility writes the text from the **Select**, **From**, and **Where** text boxes into the specified file as a single SQL statement.
7. Click **OK**.  
The display returns to the Query window.



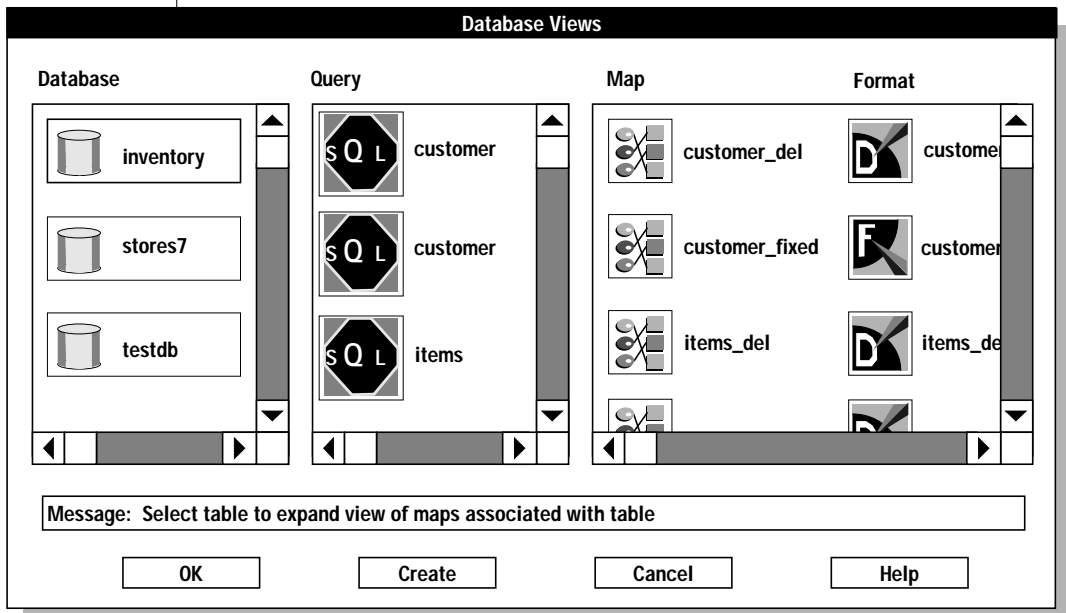
## The Database Views Window

The Database Views window lets you display a list of the queries, maps, and formats that are associated with a project. The Database Views window also lets you create or edit a query. The Database Views window appears in the following situations:

- When you click the **Query** button in the Unload Job window and no query name is in the **Query** text box
- When you click the **Search** button in the Query window

Figure 8-10 shows the Database Views window. “[The Views Windows](#)” on [page 3-15](#) discusses the use of Views windows.

**Figure 8-10**  
The Database Views Window





# Defining Maps

Maps. . . . .	9-3
Load Maps. . . . .	9-4
Using the Map-Definition Window . . . . .	9-4
Using the Table and the Format Panes . . . . .	9-5
Using Unassigned or Multiple-Assigned Fields and Columns . . . . .	9-6
Using Identical Field Names and Column Names . . . . .	9-6
Creating a Load Map . . . . .	9-7
Unload Maps. . . . .	9-10
Creating an Unload Map . . . . .	9-10
Mapping Options . . . . .	9-14
Using Mapping Options. . . . .	9-14
Setting the Mapping Options . . . . .	9-16
Justification. . . . .	9-16
Case Convert . . . . .	9-16
Default Value . . . . .	9-16
Transfer Bytes . . . . .	9-16
Column Offset. . . . .	9-17
Field Offset . . . . .	9-17
Field Minimum and Field Maximum . . . . .	9-17
Fill Character . . . . .	9-17
Picture . . . . .	9-17
Function. . . . .	9-17
Editing Options . . . . .	9-18
Using the Delete Button. . . . .	9-18
Using the Find Button . . . . .	9-18
Using the Specs Button . . . . .	9-20
The Map Views Window . . . . .	9-21

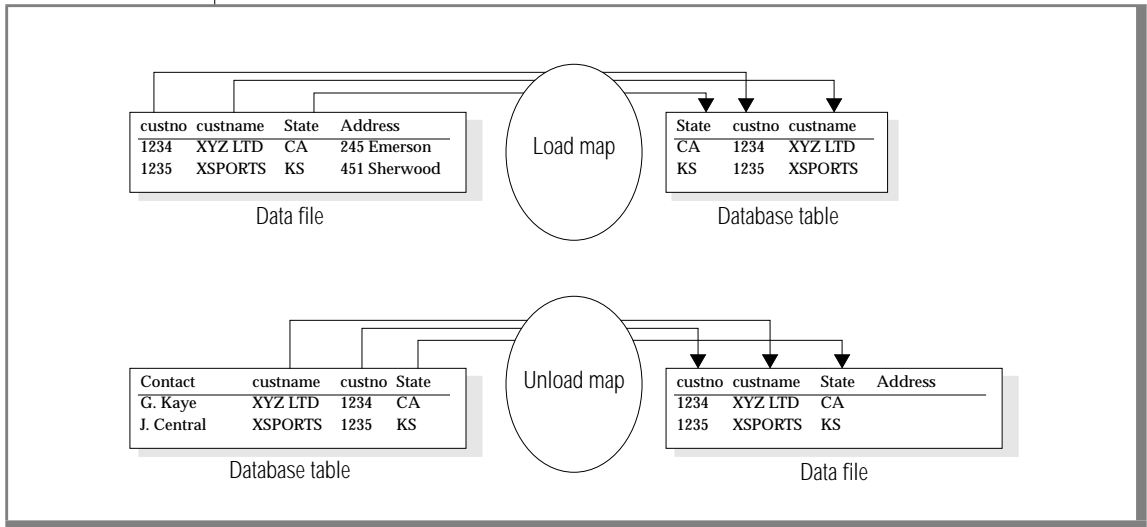


**A** *map* specifies the relationship between the fields of a data file and the columns of a database. This chapter describes how to use the **ipload** utility to build a map.

## Maps

For loading data into a database, you define a *load map*. A load map associates the fields from records in a data file to columns in a database table. For unloading data from a table, you define an *unload map*. An unload map associates the columns extracted from one or more tables by a query to the fields in a data file. Figure 9-1 illustrates these relationships.

**Figure 9-1**  
Using a Map



The **ipload** utility stores information about maps in the **maps**, **mapitem**, **mapoption**, and **mapreplace** tables of the **onpload** database. [Appendix A, “The onpload Database,”](#) describes these tables.

---

## Load Maps

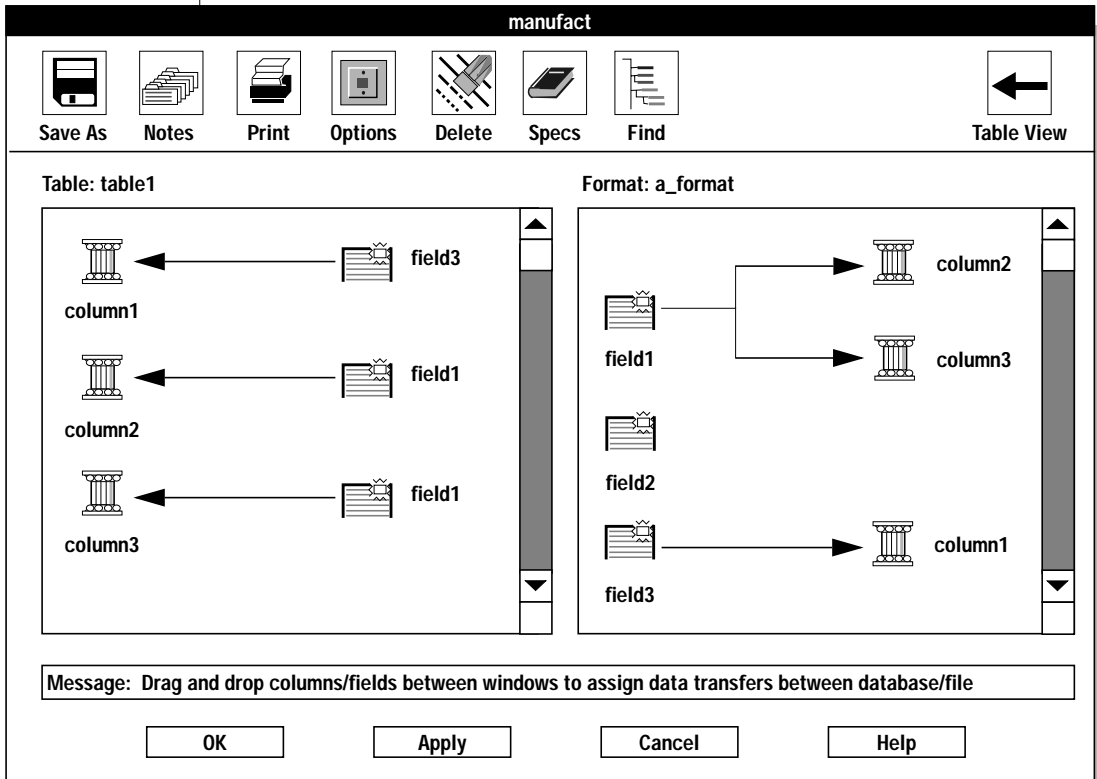
You can create a load map from the Load Job window or from the **Components** menu of the High-Performance Loader (HPL) main window. You can define a map at any time. After you define a map, you use it with the Load Job window or the **onpload** utility.

### Using the Map-Definition Window

The discussion in this section concentrates on how the map-definition window works. For detailed instructions on creating a load map, refer to [“Creating a Load Map” on page 9-7](#).

The map-definition window lets you associate an input item with a table column. [Figure 9-6 on page 9-13](#) shows a map-definition window for a load map. The map specifies which fields of the data file are loaded into database columns. The direction of the arrows indicates that data moves from the fields of a data file into the columns of a database.

**Figure 9-2**  
The Map-Definition Window



### *Using the Table and the Format Panes*

The map-definition window contains two panes: the **Table** pane and the **Format** pane. The window has two panes so that you can take the following actions:

- Scroll the panes to see all of the columns or fields of a long data file or database table
- Connect an input field to more than one column

The left-hand column of icons in each pane represents the active elements of the display. These left-hand columns do not change. In a load map, the columns in the **Table** pane *receive* the input. In the **Format** pane, data from the fields *moves into* the columns of the database table.

The right-hand column of icons in each pane represents the associations that you make. These columns change as you build the map. A field might be listed more than once in the right-hand column of the **Table** pane because you can store a field from the data file in more than one database column. This field is mapped (with a split arrow) to two columns in the **Format** pane. A column never appears more than once in the right-hand list of the **Format** pane because a column can only receive input from one database field.

By scanning the left pane, you can easily see which columns are receiving data from the data file. By scanning the right pane, you can see which fields of the data file are providing data and which fields are not being used.

### ***Using Unassigned or Multiple-Assigned Fields and Columns***

The HPL does not require a one-to-one connection between the fields and columns. You can map a field to multiple columns. [Figure 9-6 on page 9-13](#) shows a map where the data from one field is placed into two columns.

You can also have a column that has no mapping association. Field 1 in the Format pane in [Figure 9-4 on page 9-9](#) does not have an association. If a column does not receive input, **onpload** sets the column to null.

### ***Using Identical Field Names and Column Names***

When you create a format, you can assign arbitrary names to the fields of the data file. You might find it convenient to assign names that correspond to the names of the columns in the database. When you create a map, **ipload** automatically links columns and fields that have the same name, thus saving you work.



## Creating a Load Map

Before you can create a load map, you must create a format that describes the data file that you plan to load. For information about creating a format, refer to [Chapter 7, “Defining Formats.”](#)



**Important:** The HPL does not support conversion from Ext Type data types to non-Ext Type data types. A field that is defined as a Ext Type data type can be mapped only to a Ext Type column. For more information on Ext Type data types, see “[Data Types Allowed in a Fixed Format](#)” on page 7-7 or “[Data Types Allowed in a Delimited Format](#)” on page 7-16.

To create a load map

1. Choose **Components**→**Maps**→**Load Map** from the HPL main window.

The Record Maps window appears, as Figure 9-3 illustrates.

**Figure 9-3**  
The Load Record Maps Window

2. Click **Create** in the **Selection Type** group.
3. Choose a name for the map, and type it in the **Map Name** text box.
4. Type the names of the database and table where the data will be loaded in their corresponding text boxes.

You can also click the down arrow to choose the names from a selection list. The Tables selection list includes Synonyms that are valid for the local database server.

5. Type the format that describes the data file in the **Format** text box. You can also click the down arrow to choose the format from a selection list.

6. Click **OK** to open the map-definition window.

A map-definition window similar to [Figure 9-4 on page 9-9](#) appears.

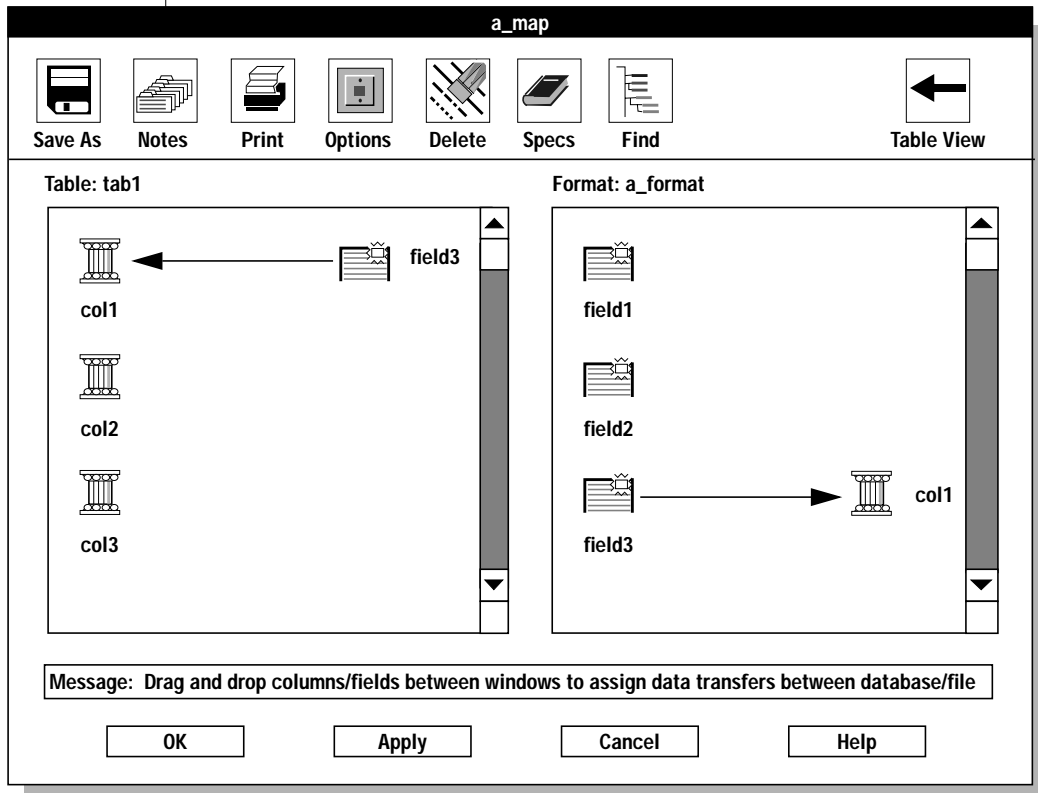
7. Click a column icon in the left-hand column in the **Table** pane and *hold the mouse button down*. A box appears around the icon and its name.

8. Drag the box to a field icon in the **Format** pane.

When you connect columns to fields, it does not matter whether you drag a column to a field or drag a field to a column, but you must always connect items from the left-hand column of each pane.

[Figure 9-4](#) shows a map-definition window with this step completed.

**Figure 9-4**  
Map-Definition Window, One Association Completed



9. Repeat steps 7 and 8 for each field that you want to transfer into the database.
10. Add desired options, if any.  
For instructions, refer to [“Using Mapping Options” on page 9-14](#).
11. Click **OK** to return to the Load Record Maps window.

---

## Unload Maps

An unload map associates columns extracted from a database by a query with the fields in a data-file record. You can create an unload map from the Load Job window or from the **Components** menu of the HPL main window. After you define an unload map, you use it with the Unload Job window or the **onpload** utility.

### Creating an Unload Map

Before you can create an unload map, you must define a query on the table that will be unloaded. For instructions on how to define a query, refer to [“Queries” on page 8-3](#).

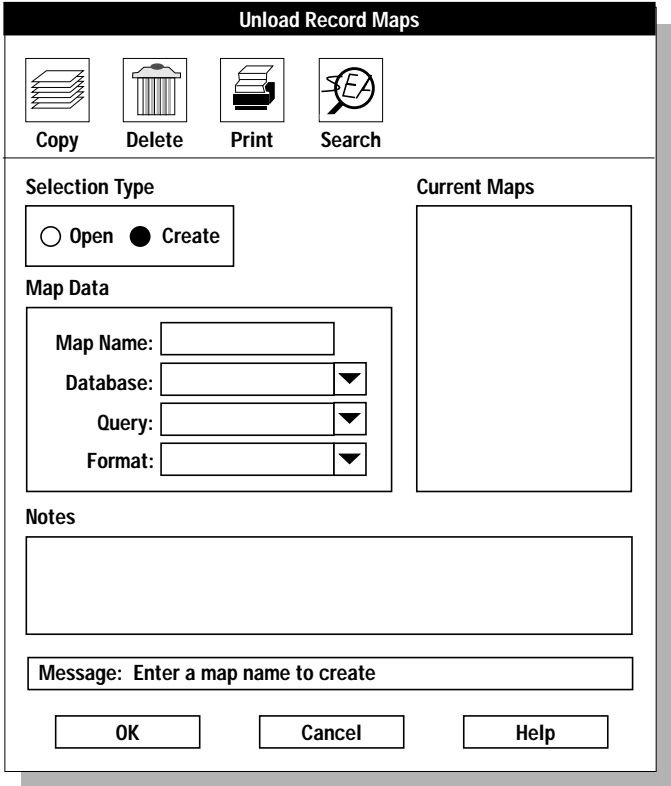


**Important:** *The HPL does not support conversion from Ext Type data types to nonExt Type data types. A Ext Type column can be mapped only to a Ext Type field. For more information on Ext Type data types, see [“Data Types Allowed in a Fixed Format” on page 7-7](#) or [“Data Types Allowed in a Delimited Format” on page 7-16](#).*

To create an unload map

- 1. Choose **Components**→**Maps**→**Unload Map** from the HPL main window.

The Unload Record Maps window appears, as Figure 9-5 illustrates.

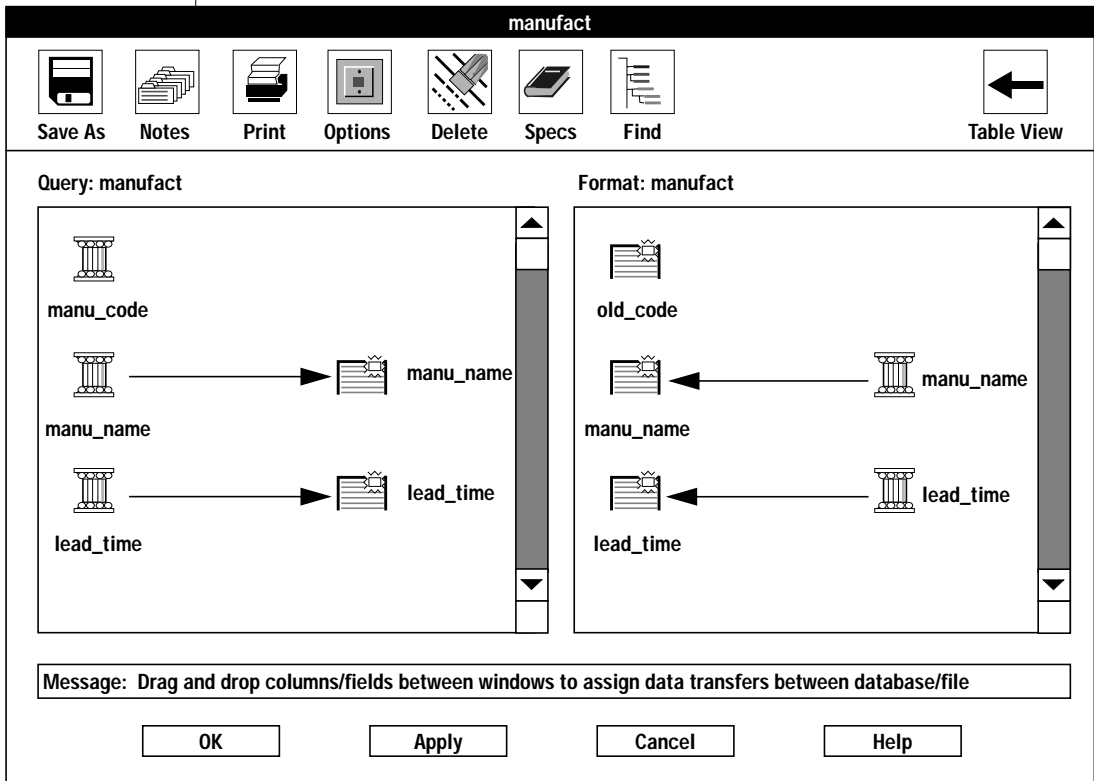


**Figure 9-5**  
*The Unload Record Maps Window*

2. Click **Create** in the **Selection Type** group.
3. Choose a name for the map and type the name in the **Map Name** text box.
4. Type the name of the database in the **Database** text box.  
You can click the down arrow to choose a database from a selection list of databases.
5. Type the name of a query in the **Query** text box.  
You can click the down arrow to choose a query from a selection list of queries.
6. Type the format name in the **Format** text box.  
You can click the down arrow to choose a format from a selection list of formats.
7. Click **OK**.

A map-definition window similar to [Figure 9-6 on page 9-13](#) appears. In this figure, some of the field names match column names. The **ipload** utility automatically maps columns to fields of the same name. The direction of the arrows indicates the flow of data, as shown in [Figure 9-6](#).

**Figure 9-6**  
The Map-Definition Window



8. To map a database column to a data-file field, click the database-column icon. Drag the column to the desired data-file field icon. An arrow links the column icon to the field icon.
9. Repeat step 8 until you have mapped all desired columns to fields.
10. Define any mapping options as appropriate.  
For information about mapping options, refer to the next section [“Mapping Options.”](#)
11. Click **OK** to save the map and return to the Unload Record Maps window.
12. Click **Cancel** to return to the HPL main window.

---

## Mapping Options

The mapping options define conversions that **onpload** applies to the data before it inserts the data into the database (for a load job) or into the data file (for an unload job). These conversions can include case conversion, text justification, data masking through picture strings, default values, and fill characters. The mapping options also allow you to replace imported data with data from other database tables.

The information from the Mapping Options window is stored in the **mapoption** table of the **onpload** database. (For more information about the **mapoption** table, see [page A-11](#).)

## Using Mapping Options

This procedure describes how to specify mapping options.

### To define mapping options

1. Display the map-definition window by following the steps for “[Creating a Load Map](#)” on [page 9-7](#) or “[Creating an Unload Map](#)” on [page 9-10](#).
2. Select the field or column (in the right-hand column of a pane) that you want to modify.
3. Click the **Options** button.

The Mapping Options window appears, as [Figure 9-7 on page 9-15](#) illustrates.





## Setting the Mapping Options

You can set as many of the choices on the Mapping Options window as you need.

### *Justification*

The **Justification** option positions text within a record. You can justify the text to the left or right, or you can center it.

### *Case Convert*

The **Case Convert** option converts the case of the data to the selected case. The HPL supports upper, lower, and proper-name conversions. For example, you can make the following conversions.

Input	Conversion Type	Result
JOHN LEE SMITH	Proper Name	John Lee Smith
john lee smith	Proper Name	John Lee Smith
john lee smith	Upper	JOHN LEE SMITH
JOHN LEE SMITH	Lower	john lee smith

### *Default Value*

The **Default Value** option specifies the value that is inserted into the column when no field is mapped into that column.

### *Transfer Bytes*

The **Transfer Bytes** option specifies the number of bytes in the record field to transfer to the database column.

For variable-length format records, this number reflects the maximum size of the field. The actual number of bytes to transfer is determined by the record or field delimiters.

### ***Column Offset***

The **Column Offset** option specifies the offset from the beginning of a column field at which to start transferring the data from the field of the data record. Offsets are zero based.

### ***Field Offset***

The **Field Offset** option specifies the offset from the beginning of a record field at which to start transferring data to the column. Offsets are zero based.

### ***Field Minimum and Field Maximum***

The **Field Minimum** and **Field Maximum** options specify the smallest and largest acceptable values for a numeric column. If the data in the field is outside that range, the HPL rejects the record. This option is available only for fields with numeric formats, such as integer, short, or float.

### ***Fill Character***

The **Fill Character** option lets you specify a character that you use to pad the contents of a field. The fill character can be any character that you can type on the keyboard. You can specify a fill character for fixed ASCII and COBOL loads or unloads. The fill character is filled in as a trailing character.

### ***Picture***

The **Picture** option lets you reformat and/or mask data from the field of a record before the data is transferred to the database. [Appendix C, “Picture Strings,”](#) explains picture strings.

### ***Function***

The **Function** option specifies a user-defined function that is called for every record that is processed. You must add the function to the dynamically linked library. For information on using custom functions, see the API interface documentation in [Appendix E](#).

---

## Editing Options

This section discusses specialized options in the map-definition window.

### Using the Delete Button

The **Delete** button lets you break the association between a column and a field.

#### To use the Delete button

1. Click an icon in the right-hand column of either of the panes in the map-definition window.
2. Click the **Delete** button.

The **ipload** utility removes the arrow that connects the item to another item.

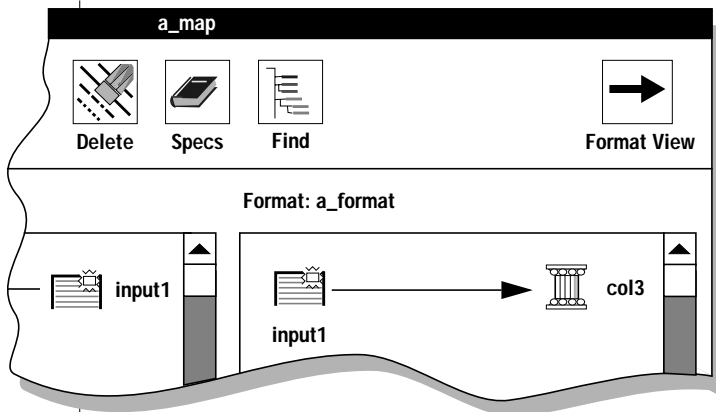
### Using the Find Button

The **Find** button lets you find a column or field in a pane. The **ipload** utility scrolls the selected item into view and puts a box around it. This option is useful when the list of columns or fields is so long that the pane cannot display all of the items.

#### To use the Find button

1. In the map-definition window, click either the **Table** pane or the **Format** pane.

When you click a pane, the view indicator in the upper-right corner of the window changes to show which pane you selected. [Figure 9-9 on page 9-19](#) shows the upper portion of the map-definition window after you click the **Format** pane.

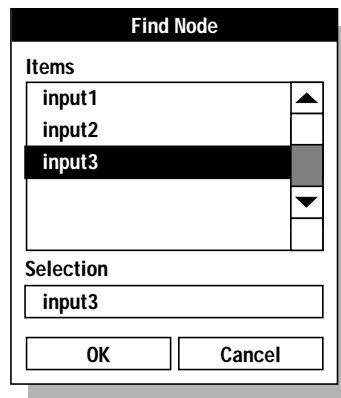


**Figure 9-9**  
The View Indicator

2. Click the **Find** button.

The Find Node window appears, as Figure 9-10 illustrates.

Because the view indicator shows Format View, the Find Node window lists the fields of the data file. To see the columns of the database table, make sure that the view indicator shows Table View.



**Figure 9-10**  
The Find Node Window

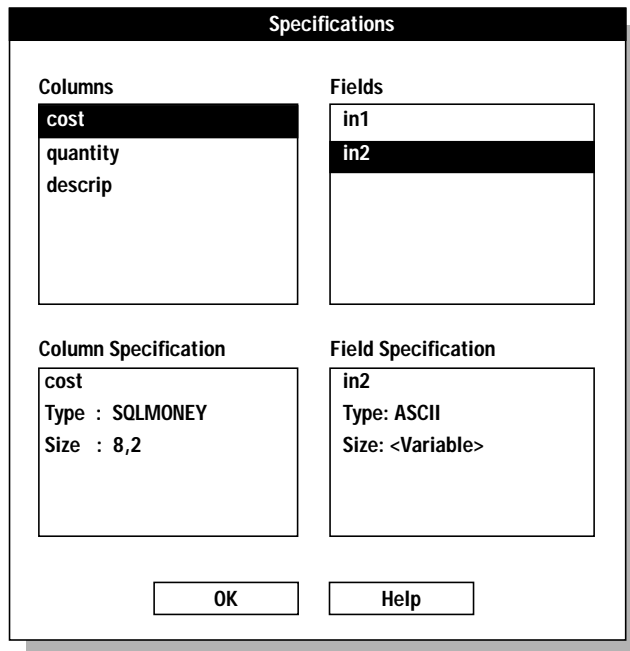
3. To select the item to find, you can use either of these methods:
  - Scroll through the list box to locate the item that you want to find and then select the item.
  - Type the name of the item that you want to find in the **Selection** text box.
4. Click **OK**.

The map-definition window appears again. The selected field or column is highlighted with a box.

## Using the Specs Button

The **Specs** button lets you display the Specifications window, which lets you examine the characteristics of the columns and fields in your map.

Figure 9-11 shows a sample Specifications window.



**Figure 9-11**  
*The Specifications Window*

### To use the Specifications window

1. Click the **Specs** button in the map-definition window.  
The Specifications window appears as [Figure 9-11 on page 9-20](#) illustrates.
2. Select a column from the **Columns** list box or a field from the **Fields** list box or both.  
The specification boxes in the lower part of the screen display the characteristics of the selected items.
3. When you finish examining the specifications, click **OK** to return to the map-definition window.

The Specifications window displays the attributes of columns and fields. The specific name of the data type that you are mapping appears in the column or field specifications box. For example, if you select a field that contains CLOB data (that you defined on the fixed format definition window to have a data type of Ext Type String) the “Type” that appears in the Column Specification Box is CLOB.

The Specifications window does not allow you to edit the attributes it displays. To change the attributes of a field, you must modify the format of the data file. (See [“Format Options” on page 7-22.](#)) To change the attributes of a column, you must use appropriate SQL statements to modify the database table.

---

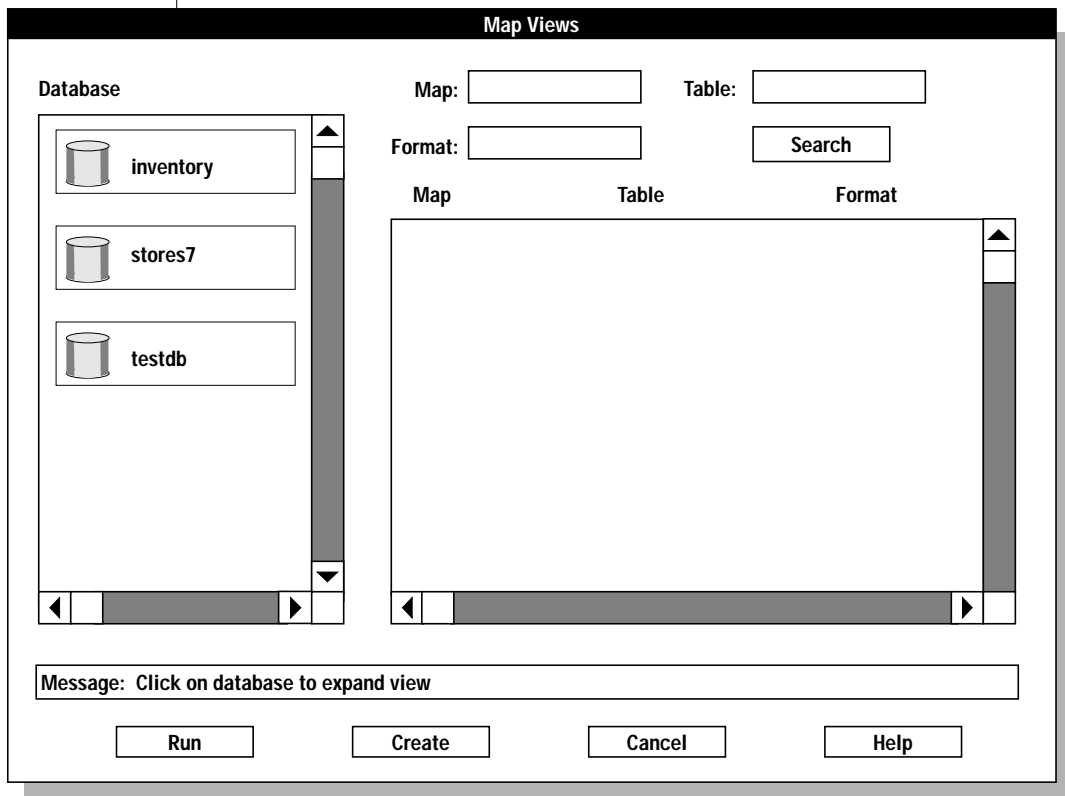
## The Map Views Window

The Map Views window lets you display a list of the components that are associated with a database in a specific project. The Map Views window also lets you create or edit a map. The Map Views window appears in the following situations:

- If you click the **Map** button in the Load Job or Unload Job window when no map name is in the **Map** text box
- If you click the **Search** button in the Load Record Maps or Unload Record Maps window

Figure 9-12 shows the Map Views window for a Load map.

**Figure 9-12**  
The Map Views Window for a Load Map



#### To see the load maps of a database

1. Select a project in the HPL main window.
2. Choose **Components**→**Maps** from the HPL main window.
3. Choose **Maps** →**Load Map** or **Maps**→ **Unload Map**.
4. After the Load Record Maps or Unload Record Maps window appears, click the **Search** button.

The Map Views window appears as Figure 9-12 illustrates.

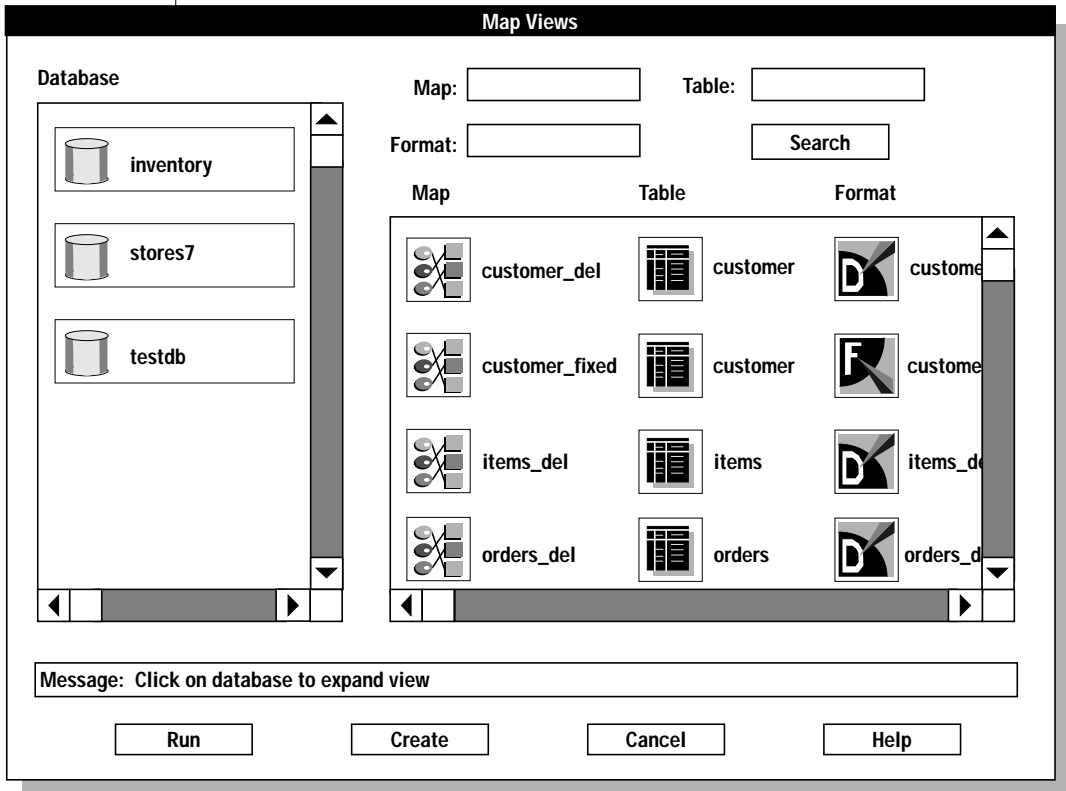


5. Select a database.

The **ipload** utility displays a list of the maps associated with that database, as Figure 9-13 illustrates. The **Table** and **Format** columns show the database column and the format associated with each map.

If you want to edit a specific map or format, click its button and the corresponding definition window appears.

*Figure 9-13  
The Map Views Window with the View Expanded*



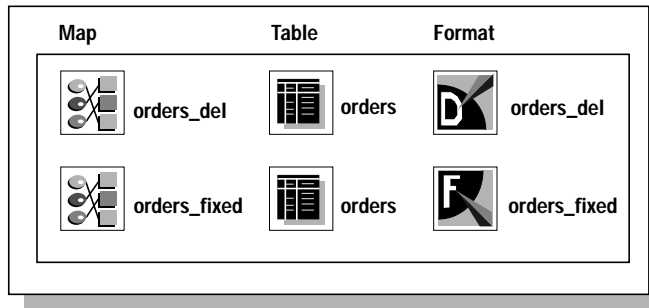
**To see selected load maps**

1. Open the Map Views window (Figure 9-12 on page 9-22).
2. Select a database.
3. Type the name or partial name of a map, table, and/or format in the **Map**, **Table**, or **Format** text box.

You can use wildcards in the name.

4. Click **Search**.

Figure 9-14 shows the maps that are found when you search for any table that includes **orders** in its name.



**Figure 9-14**  
*The Maps That a Search Found*

---

# Defining Filters

Using a Filter . . . . .	10-3
Creating a Filter . . . . .	10-5
Editing a Filter . . . . .	10-8
Filter Views . . . . .	10-10
Filters with Code-Set Conversion . . . . .	10-11



# F

ilters are similar to queries. However, queries select data from database tables, whereas *filters* select data from a data file. During the load process, the **ipload** utility loads all of the records from a data file into a database table unless you use a filter to exclude some of the records.

A *filter* is a mechanism for prescreening data-file records for eligibility as database table entries. You can use the filter to include or exclude records explicitly during the load process. You define *match conditions* to filter the records. Match conditions are selection criteria that test one or more data-file fields for certain values or text.

You can define filters at any time. After you define a filter, you can specify it in the Load Job window. The Load Job window is illustrated in [Figure 12-2 on page 12-9](#).

**Important:** *You cannot use a filter on either simple LO or Ext Type data.*



---

## Using a Filter

Suppose that you have a worldwide telemarketing data file that contains the name, country, yearly salary, and age of potential contacts, as shown in the following example:

John Brown	US	125,000	57
Mary Smith	Argentina	83,000	43
Larry Little	US	118,000	42
Ann South	Canada	220,000	53
David Peterson	France	175,000	72
Richard North	Spain	350,000	39
Nancy Richards	Japan	150,000	54
William Parker	Egypt	200,000	64

To create a database that includes people who earn over \$100,000 a year, are over the age of 50, and live outside the United States

1. Use the match condition **discard salary < 100,000** to exclude people who earn less than \$100,000 a year. The selected records are as follows:

John Brown	US	125,000	57
Larry Little	US	118,000	42
Ann South	Canada	220,000	53
David Peterson	France	175,000	72
Richard North	Spain	350,000	39
Nancy Richards	Japan	150,000	54
William Parker	Egypt	200,000	64

2. Use the match condition **keep age > 50** to include people over the age of 50. The remaining records are as follows:

John Brown	US	125,000	57
Ann South	Canada	220,000	53
David Peterson	France	175,000	72
Nancy Richards	Japan	150,000	54
William Parker	Egypt	200,000	64

3. Use the match condition **discard country = "US"** to exclude people living in the United States. The remaining records are the records that match all of the restrictions:

Ann South	Canada	220,000	53
David Peterson	France	175,000	72
Nancy Richards	Japan	150,000	54
William Parker	Egypt	200,000	64

If you want to use the same data file to create a database of only those people who live in the United States, or only those people under the age of 30, simply define another filter. There is no limit to the number of filters that you can define for a data file.

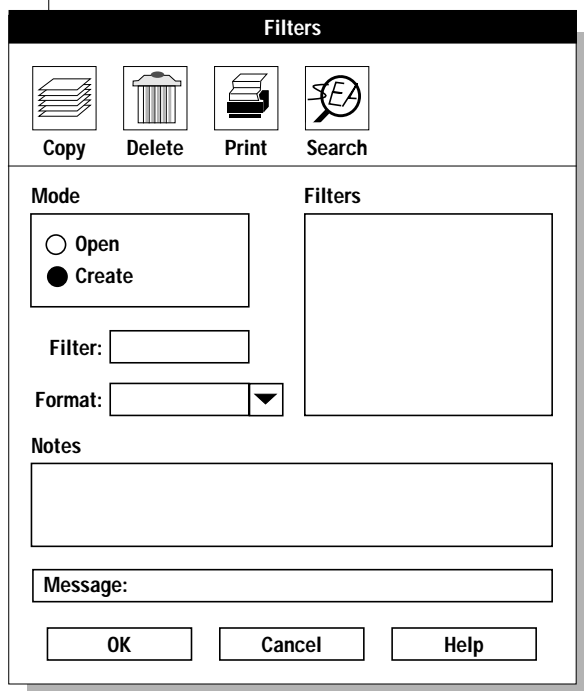
## Creating a Filter

Before you can create a filter, you must create a format that describes the data file. For information about creating a format, refer to [Chapter 7, “Defining Formats.”](#)

The **ipload** utility stores the filter information in the **filters** table of the **onpload** database. For more information about the **filters** table, see [page A-5](#).

### To create a filter

1. Choose **Components**→**Filter** from the HPL main window.  
The Filters window appears, as Figure 10-1 illustrates.



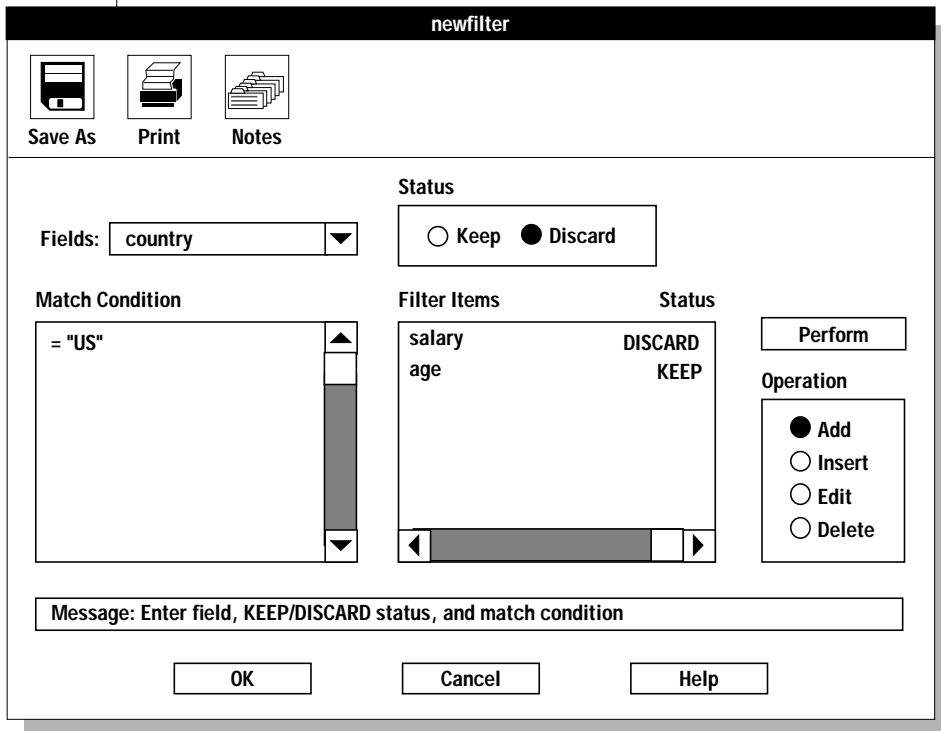
**Figure 10-1**  
The Filters Window

2. Click **Create** in the **Mode** group.
3. Choose a name for the filter and type the name in the **Filter** text box.

4. Type the name of an existing format in the **Format** text box, or click the down arrow and choose a format from the selection list.
5. Click **OK**.

The filter-definition window appears. Figure 10-2 shows a partially completed filter-definition window.

**Figure 10-2**  
The Filter-Definition Window



The filter-definition window lets you prepare a filter that specifies which data from the input file should be loaded into the database table.



The filter-definition window has the following parts.

Section	Description
Fields	Specifies the data-file field used in a match condition.
Status	Indicates whether you want to keep or discard records that meet the match condition.
Match Condition	Specifies the criteria for keeping or discarding a record.
Filter Items/Status	Lists existing filter items and their status. As you add match conditions, the conditions are added to this list.

### To prepare the filter definition

1. Click **Add** in the **Operation** group to specify that you want to add a new match condition.
2. Type the name of the record field that you want to match in the **Fields** text box.  
You can also click the down arrow to see a selection list.
3. Click **Keep** or **Discard** in the **Status** group.  
This selection indicates whether the matching record should be entered into the database or discarded.
4. Type the match condition in the **Match Condition** text box using the appropriate logical operators and match characters.  
See [Appendix D](#) for a list of the logical operators and match characters.
5. Click **Perform**.
6. Repeat steps 2 through 5 for each additional filter item.
7. Click **OK** to save the filter and return to the Filters window.
8. Click **Cancel** to return to the HPL main window.

---

## Editing a Filter

After you create a filter, you might need to change it.

### To edit an existing filter

1. Choose **Components**→**Filter** from the HPL main window.  
The Filters window appears, as [Figure 10-1 on page 10-5](#) illustrates.
2. Click **Open** in the **Mode** group.
3. Select the filter that you want to modify.
4. Click **OK**.  
The filter-definition window appears, as [Figure 10-2 on page 10-6](#) illustrates.
5. Click **Edit** in the **Operation** group.
6. Select the desired filter item from the list of items.  
The field, status, and match conditions appear in their respective areas on the screen.
7. Change the desired information.
8. Click **Perform**.
9. Click **OK** to save your changes and return to the Filters window.
10. Click **Cancel** to return to the HPL main window.

### To add an item to the filter

1. Choose **Components**→**Filter** from the HPL main window.  
The Filters window appears.
2. Click **Open** in the **Mode** group.
3. Select the filter that you want to modify.
4. Click **OK**.  
The filter-definition window appears.
5. Click **Add** in the **Operation** group.
6. Type the name of the record field in the **Fields** text box.
7. Type the match condition in the **Match Condition** text box.
8. Click **Keep** or **Discard** in the **Status** group to indicate the filter status.

9. Click **Perform**.
10. Click **OK** to save your changes and return to the Filters window.
11. Click **Cancel** to return to the HPL main window.

**To insert an item in the filter sequence**

1. Choose **Components**→**Filter** from the HPL main window.  
The Filters window appears.
2. Click **Open** in the **Mode** group.
3. Select the filter that you want to modify.
4. Click **OK**.  
The filter-definition window appears.
5. Click **Insert** in the **Operation** group.
6. From the list of items, select the filter item before which you want to insert the new item.
7. Type the name of the record field in the **Fields** text box.
8. Type the match condition in the **Match Condition** text box.
9. Click **Keep** or **Discard** in the **Status** group to indicate the filter status.
10. Click **Perform**.  
The **ipload** utility inserts the new item before the selected filter item in the **Filter Items** list box.
11. Click **OK** to save your changes and return to the Filters window.
12. Click **Cancel** to return to the HPL main window.

**To delete a filter**

1. Choose **Components**→**Filter** from the HPL main window.  
The Filters window appears.
2. Click **Open** in the **Mode** group.
3. Select the filter that you want to edit.
4. Click **OK**.  
The filter-definition window appears.
5. Click **Delete** in the **Operation** group.
6. Select the item that you want to delete from the list of filter items.

7. Click **Perform**.
8. Click **OK** to save your changes and return to the Filters window.
9. Click **Cancel** to return to the HPL main window.

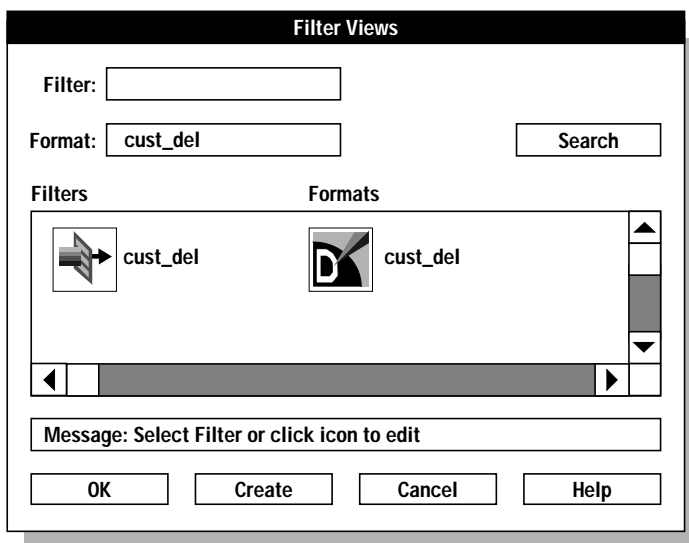
---

## Filter Views

The Filter Views window lets you display a list of the filters and formats that are associated with a project. The Filter Views window also lets you create or edit a filter. The Filter Views window appears in the following situations:

- If you click the **Filter** button in the Load Job window when no filter name is in the **Filter** text box
- If you click the **Search** button in the Filters window

Figure 10-3 shows the Filter Views window. “[The Views Windows](#)” on [page 3-15](#) discusses the use of Views windows.



**Figure 10-3**  
The Filter Views  
Window

---

## Filters with Code-Set Conversion

When you use a filter to select or discard data during the load, the HPL interprets the filter specification in the code set of the database server. The filtering process on data that undergoes code-set conversion occurs in the following order:

1. The **onpload** utility converts the input data to the code set of the database server.
2. The **onpload** utility performs the filtering operation.

If the code-set conversion process creates lossy errors, then the output of the filter operation can be unexpected. For information on lossy errors and how to define or evaluate a code-set conversion specification, see the [Guide to GLS Functionality](#). ♦



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# Unloading Data from a Database

Components of the Unload Job. . . . .	11-3
Choosing the Database Server. . . . .	11-4
Running Multiple Jobs . . . . .	11-4
The Unload Job Windows . . . . .	11-5
Creating an Unload Job . . . . .	11-6
Running the Unload Job. . . . .	11-8
Problems During an Unload Job . . . . .	11-9
Using the Command-Line Information . . . . .	11-10
Changing the Unload Options . . . . .	11-11
Editing an Unload Job . . . . .	11-12
The Generate Options . . . . .	11-13





**A**n *unload job* converts Informix database records to a specified format and then unloads those records to a file, tape, pipe, or device array. You can execute an unload job from the Unload Job window of **ipload**, or you can execute the **onpload** utility from the command line.

This chapter describes the Unload Job window. For instructions on using the **onpload** command-line utility, refer to [Chapter 16, “The onpload Utility.”](#)

---

## Components of the Unload Job

Before you can unload data, you must first define the following components of the unload job:

- The device array that receives the unloaded data  
Refer to [Chapter 6, “Defining Device Arrays.”](#)
- The format that describes the organization of the data file into which you are unloading data  
Refer to [Chapter 7, “Defining Formats.”](#)
- The query that extracts the desired records from the database  
Refer to [Chapter 8, “Defining Queries.”](#)
- The unload map that describes the relationship between the columns of a database table and the fields of the data-file record  
The map also specifies any necessary data translations, such as case conversion and justification. Refer to [Chapter 9, “Defining Maps.”](#)

You can define these components in the following ways:

- Define each component from the Unload Job window.
- Define each component individually from the **Components** menu.
- Use the **Generate Job** option from the **Components** menu.
- Use the **Generate** button in the Unload Job window.

For information about using the generate options, refer to [Chapter 13, “Generate Options.”](#)

## Choosing the Database Server

You must run the unload job on the *target server*. The target server is the database server that contains the database from which you unload the data. The database must be on the same database server as the **onpload** program that extracts data from it. You can run the **ipload** utility on any database server on your network.

## Running Multiple Jobs

You can run multiple unload jobs concurrently. However, because the HPL is designed to use as many system resources as possible, running concurrent jobs might overload the system. If you are using a UNIX **cron** job to run the load and unload jobs, let one job finish before you start the next.

The Unload Job window displays the target and **onpload** database servers in the upper right-hand corner of the display.

---

## The Unload Job Windows

The Unload Job Select window lets you create a new unload job or select an existing job for editing.

The Unload Job window lets you create or modify the components of an unload job and run the unload job. You can change unload options before you run the unload job. The unload options include the isolation level and the maximum number of errors to permit before the **onpload** program aborts the unload job.

The **ipload** utility stores the information about the unload job in the **session** table of the **onpload** database. The **session** table draws information from other onpload tables, such as **maps**, **formats**, and so on. For more information about the tables of the **onpload** database, see [Appendix A](#).

## Creating an Unload Job

Use the Unload Job Select and Unload Job windows to create a new unload job.

### To create an unload job

1. Choose **Jobs**→**Unload** from the HPL main window.

The Unload Job Select window appears, as Figure 11-1 illustrates.

**Unload Job Select**

Delete   Notes   Connect

**Selection Type**

Open    Create

Job Name:

Command Line:

**Job Information**

Job	Type	Status	Server	Map	Data Source
-----	------	--------	--------	-----	-------------

**Notes**

Message: Select job(s) to open, delete, copy, or print

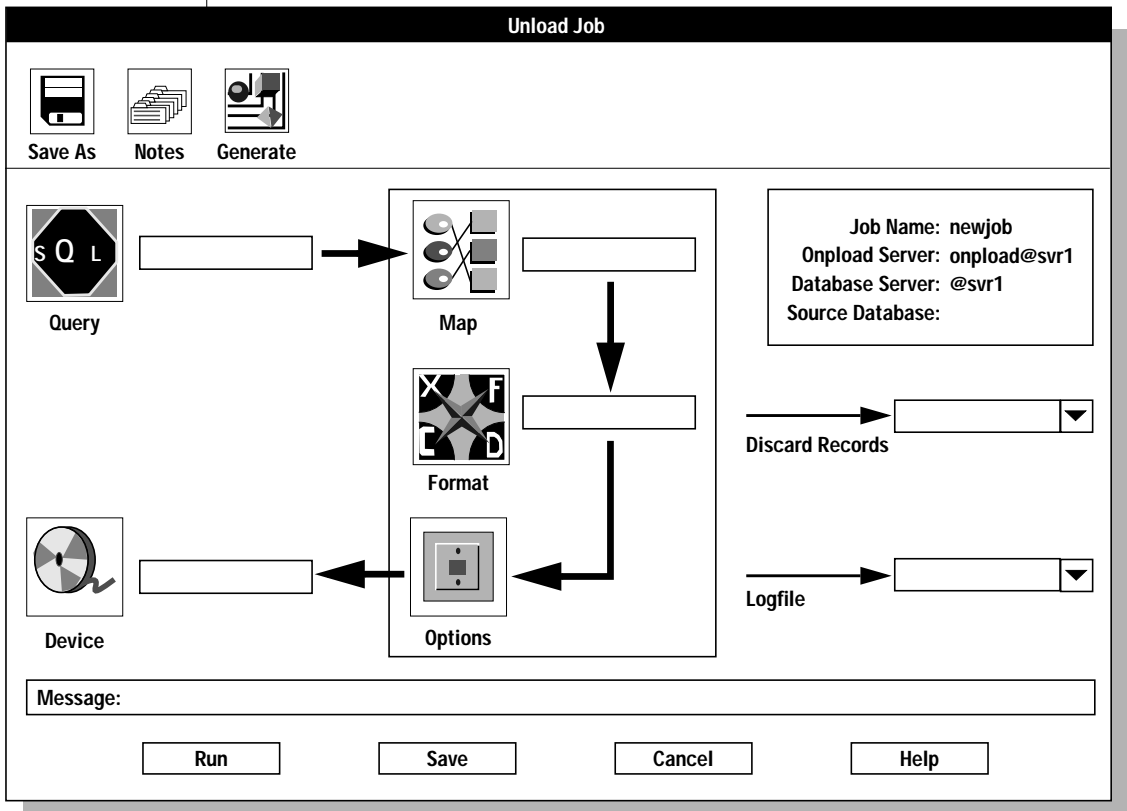
OK   Cancel   Help

**Figure 11-1**  
The Unload Job Select Window

2. Click **Create** in the **Selection Type** group.
3. Choose a name for this unload job and type the name in the **Job Name** text box.
4. Click **OK**.

The Unload Job window appears, as Figure 11-2 illustrates. [Chapter 3, “Using the High-Performance Loader Windows,”](#) provides detailed descriptions of the buttons in the Unload Job window.

*Figure 11-2  
The Unload Job Window*

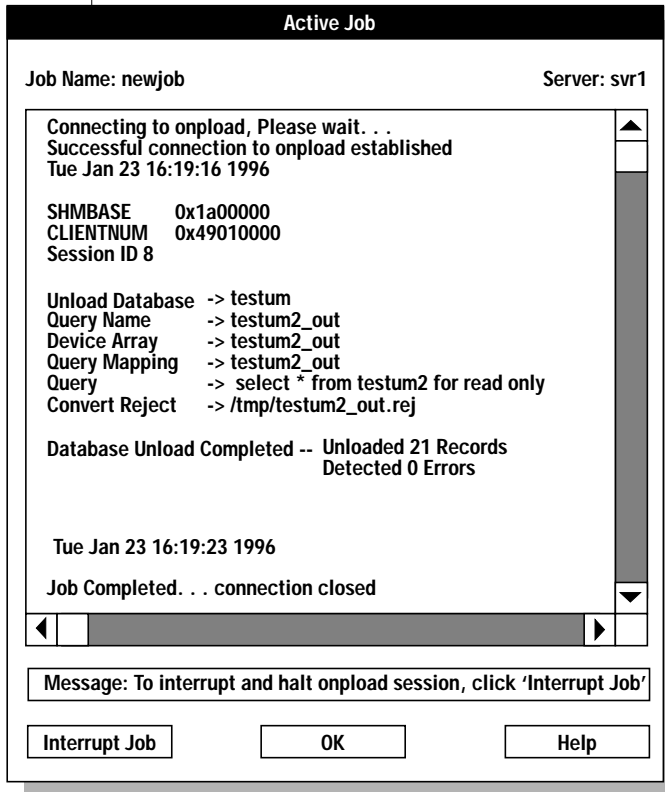


5. Type appropriate values for all of the unload components.  
If you click a component button, the corresponding view window opens, and you can create or select the component.
6. Specify the file that contains rejected records.  
Use one of these methods:
  - Type the name of the rejected file in the **Discards Records** text box.
  - Click the down arrow next to the **Discard Records** text box to select the filename from the file-selection list.
7. Select the file that contains the unload status log.  
Use one of these methods:
  - Type the name of the log file in the **Logfile** text box.
  - Click the down arrow next to the **Logfile** text box to select a filename from the file-selection window.
8. Click the **Options** button to change unload options.  
For more information, refer to [“Changing the Unload Options” on page 11-11.](#)
9. Click **Save** to save this unload job. (If you click **Run** to run the job immediately, the job is saved automatically.)
10. Now you can either run the unload job or exit and run the job later.
  - Click **Run** to run the job.
  - Click **Cancel** to exit to the Unload Job Select window.

## Running the Unload Job

If you click **Run** in the Unload Job window, the Active Job window appears, as [Figure 11-3 on page 11-9](#) illustrates. The Active Job window displays the progress of your job and indicates when the job completes. When the Active Job window indicates that the job is complete, click **OK** to return to the Unload Job Select window.

The information that **onpload** displays in the Active Job window is also stored in the log file whose name you selected in Step 7. For information on how to review the log files, see the [“Viewing the Status of a Load Job or Unload Job” on page 14-9.](#)



**Figure 11-3**  
 The Active Job  
 Window

### ***Problems During an Unload Job***

If you encounter any problems during the unload, examine the various files that **onpload** creates. For information on how to review these files, see [Chapter 14, “Browsing.”](#)

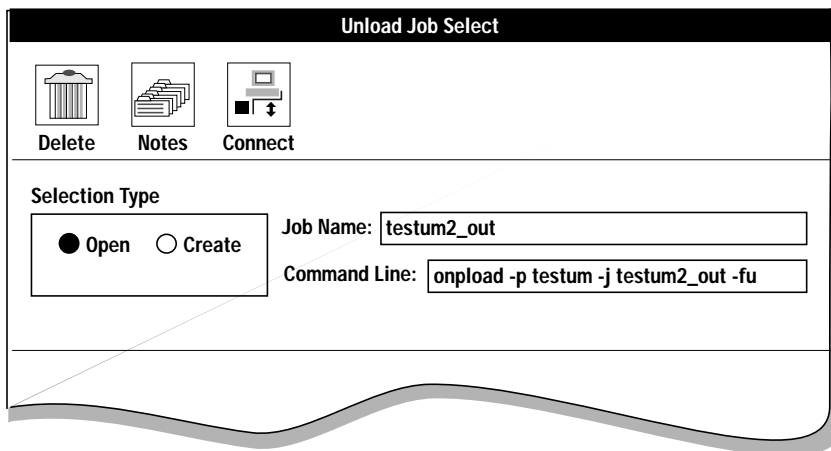


***Important:*** If a write to a file fails because a disk is out of space, the operating system does not return information on how much of the write succeeded. In this situation, the **onpload** utility cannot accurately report the number of records that were actually written to disk. Thus, the number of records that are logged as unloaded in the log file is imprecise.

## Using the Command-Line Information

If you select an existing job in the Unload Job Select window, the **Command Line** text box shows the **onpload** command that **ipload** generated for that unload job. Figure 11-4 shows the **Command Line** portion of an Unload Job Select window. The **Command Line** text box displays the **onpload** command generated for the job that [Figure 11-3 on page 11-9](#) illustrates.

*Figure 11-4*  
Fragment of the Unload Job Select Window



The command line, **onpload -p testum -j testum2\_out -fu**, contains the following elements.

Argument	Description
-p testum	The project where the job is stored
-j testum2_out	The name of the job
-fu	The job that unloads (rather than loads) data



You can copy the **onpload** command from the **Command Line** text box and paste it at a system prompt to run the unload job. If you need to run the unload job multiple times (for example, every evening at 5:00 P.M.), you can save the **onpload** command and execute it later.

You do not need to start **ipload** to run a job from the system prompt. The **ipload** and **onpload** utilities both use the **onpload** database, but each utility uses it independently.

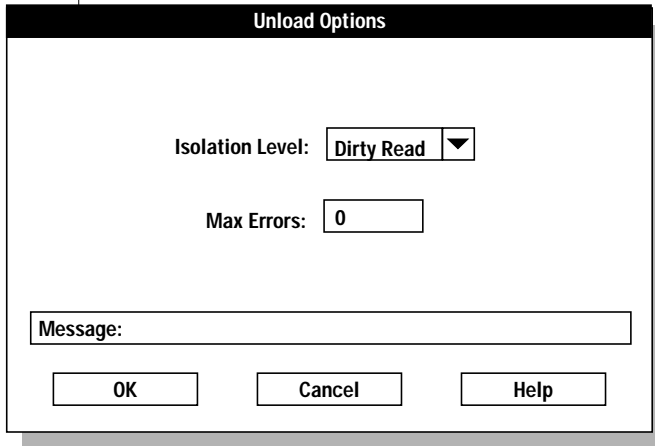
## Changing the Unload Options

The Unload Options window contains the following options.

Option	Description
Isolation Level	<p>The criteria for how the query selects records. The four levels of isolation (from highest to lowest) are as follows:</p> <ul style="list-style-type: none"> <li>■ Committed</li> <li>■ Cursor Stability</li> <li>■ Repeatable Read</li> <li>■ Dirty Read</li> </ul> <p>The higher the isolation level, the lower the unload performance. For a more detailed definition of isolation levels, refer to the <a href="#">Informix Guide to SQL: Syntax</a>.</p>
Max Errors	<p>The maximum number of error conditions to be encountered. If the number of unload errors exceeds this number, the unload job stops.</p>

**To change unload options**

1. Display the Unload Job window.  
Refer to the instructions for [“Creating an Unload Job”](#) on page 11-6.
2. Click the **Options** button.  
The Unload Options window appears, as Figure 11-5 illustrates.



**Figure 11-5**  
*The Unload Options Window*

3. Change the desired options.
4. Click **OK** to return to the Unload Job window.

## Editing an Unload Job

After you save an unload job, you can return to the unload job and modify it.

**To edit an unload job**

1. Choose **Jobs**→**Unload** from the HPL main window.
2. Click **Open** in the **Selection Type** group.
3. Select a job from the **Job Information** list box.

4. Click **OK**.  
The Unload Job window appears, as [Figure 11-2 on page 11-7](#) illustrates.
5. Make appropriate changes to the entries in the Unload Job window.
6. Click the **Options** button to change unload options.  
For more information, refer to [“Changing the Unload Options” on page 11-11](#).
7. Click **Save** to save this unload job.
8. Now you can either run the unload job or exit and run the job later.
  - Click **Run** to run the job.
  - Click **Cancel** to exit.

---

## The Generate Options

Instead of individually creating the components that are required on the Unload Job window, you can use the generate options to create an unload job. You can click the **Generate** button in the Unload Job window, or you can choose **Components**→**Generate** from the HPL main window. [Chapter 13, “Generate Options,”](#) describes the generate options.

The generate options do not give you as much flexibility as the Unload Job window, but the options let you create the components quickly. In addition, the generate options let you create formats (Binary, Fixed Internal, and No Conversion) that are not available from the format-definition window.



---

# Loading Data to a Database Table

Components of the Load Job . . . . .	12-3
Choosing the Database Server. . . . .	12-4
Running Multiple Jobs . . . . .	12-4
Preparing User Privileges and the Violations Table . . . . .	12-4
Setting User Constraints . . . . .	12-5
Managing the Violations and Diagnostics Tables . . . . .	12-5
The Load Job Windows . . . . .	12-7
Creating a Load Job . . . . .	12-8
Running the Load Job . . . . .	12-10
Making a Level-0 Backup . . . . .	12-11
Problems During a Load Job . . . . .	12-11
Using the Command-Line Information . . . . .	12-12
Changing the Load Options . . . . .	12-13
Editing a Load Job. . . . .	12-15
The Generate Options . . . . .	12-15



**A** *load job* loads data from a set of one or more files into a single database table. A record format, which defines each field of a record, specifies the layout of the input data. A *load map* specifies how the record fields are mapped to the columns of the target table. During the load process, the **onpload** utility converts data from record field to table column. This chapter describes the load process.

---

## Components of the Load Job

The High-Performance Loader (HPL) lets you define the individual components of a data load individually or lets you use the generate option to define the components automatically. The components of the load job specify:

- the device array where the source data files resides.
- the format of the data files.
- the filter that accepts or rejects source-file records for the load.
- the *map* that specifies the relationship between the data-file format and the database table schema.

When you run a load job, you select which individual components to use. The collection of the various components for a specific load is called the load *job*. You can assign a name to a load job, save the job, and then retrieve and rerun it as often as you need to. You can modify an existing job or save it under another job name.

You can define as many different load jobs as you need. You can group your load jobs under one or more projects to make the tasks easier to manage.

## Choosing the Database Server

You must run the load job on the *target server*. The target server is the database server that contains the database into which you load the data. The target database must be on the same database server as the **onpload** program that updates it.



*Tip:* The **onpload** database and the **ipload** interface can be on different computers. You can run the **ipload** interface on any computer that can connect to the database server that contains the **onpload** database.

## Running Multiple Jobs

You can run only one express-load job at a time on the same table; however, you can run multiple unload jobs concurrently. Because the HPL is designed to maximize the use of system resources, running concurrent jobs might overload the system. If you are using a UNIX **cron** job to run the load or unload jobs, let one job finish before you start the next.

## Preparing User Privileges and the Violations Table

You must make sure that the user who runs a load job has sufficient privileges to manage the constraints and the violations table. The following table summarizes the actions that you must take. The following sections discuss these actions in more detail.

Table Status	Privileges of the User	Action
Owned by user		No further action is required.
Not owned by user	User has DBA privileges on the table.	No further action is required.
Not owned by user	User does not have DBA privileges on the table.	User must have: <ul style="list-style-type: none"> <li>■ resource privileges on database.</li> <li>■ alter privileges on table.</li> </ul> Owner must start violations table.



For detailed information about user privileges and violations tables, refer to the [Informix Guide to SQL: Syntax](#) and the [Informix Guide to SQL: Reference](#).

### **Setting User Constraints**

To modify any constraint, index, or trigger, a user must have both Alter privileges on the table and the Resource privilege on the database. The user must also have these privileges to start or stop a violations table. You use the GRANT statement to set these privileges.

### **Managing the Violations and Diagnostics Tables**

You can turn on or off the generation of constraint-violation information. If you turn on the generation of constraint-violation information, **onpload** writes the information to the *violations* and *diagnostics* tables. For more information refer to “[Changing the Load Options](#)” on page 12-13.

The HPL manages the violations and diagnostics tables in the following manner:

1. Starts the load job.
2. Starts the violations and diagnostics tables if they do not exist already. (If a violations and diagnostics table already exists, the HPL uses that table).

The HPL uses the following SQL statement to start the violations table:

```
START VIOLATIONS TABLE FOR tablename
```

3. Performs the load job.
4. Stops the violations and diagnostics tables if they were started at step 2.

The HPL uses the following SQL statement to stop the violations and diagnostics tables:

```
STOP VIOLATIONS TABLE FOR tablename
```

5. Drops the violations table if the violations table is empty.

The START VIOLATIONS statement creates the violations and diagnostics tables and associates them with the load table. The STOP VIOLATIONS statement dissociates the violations and diagnostics tables from the load table. For more information about the START VIOLATIONS and STOP VIOLATIONS statements, refer to the [Informix Guide to SQL: Syntax](#).

The violations table (*tablename\_vio*) and the diagnostics table (*tablename\_dia*) are always owned by the owner of the table with which it is associated. The Resource privilege lets a user start and stop a violations table, but it does not let the user drop a table that he or she does not own. Thus, the HPL cannot drop the violations table in step 5 if the user is not the owner.

Failure to drop the violations table does not cause the load job to fail. However, this failure leaves in the database a violations table that is not associated with a table. If the user tries to run the job again, the START VIOLATIONS TABLE statement in step 2 fails because the table *tablename\_vio* already exists.

To solve this problem, the owner of the table or the database administrator must explicitly create the violations and diagnostics tables using the START VIOLATIONS statement. When the owner creates the violations table, the following actions take place:

- In step 2, the HPL uses the already existing violations table.
- In step 4, the HPL does not stop the violations table because the table was not started in step 2.
- In step 5, the HPL does not drop the violations table because the user does not own the table.

After the load job is complete, an active violations table remains in the database. This table might be empty, but it causes no harm. When the user runs the load job a second time, the violations table is available, and the load job succeeds.

---

## The Load Job Windows

The Load Job Select ([Figure 12-1 on page 12-8](#)) and Load Job ([Figure 12-2 on page 12-9](#)) windows let you create, save, and execute a load job. The Load Job window visually represents the various components of a load. After you select the components, you can save the load job for future use or execute it immediately.

The **ipload** utility assigns pathnames for the log files that document the load and that capture records that do not pass the specified filter or that do not pass conversion.

When you use **ipload** to create a job, **ipload** stores information for the job in a row in the **session** table ([page A-15](#)) of the **onpload** database. The **ipload** utility stores information about the components of the load job in other tables of the **onpload** database, including **format**, **maps**, **filters**, and so on. When you use the **onpload** command, columns in the **session** table reference the components to assemble the information necessary for the job. These tables are documented in [Appendix A, “The onpload Database.”](#)

## Creating a Load Job

The Load Job Select window lets you create a new load job or select an existing job to edit.

### To create a load job

1. Choose **Jobs**→**Load** from the HPL main window.

The Load Job Select window appears, as Figure 12-1 illustrates.

**Load Job Select**

Delete Notes Connect

Selection Type

Open  Create Job Name:

Command Line:

Job Information

Job	Status	Server	Map	Data Source
-----	--------	--------	-----	-------------

Notes

Message: Enter a job name to create

OK Cancel Help

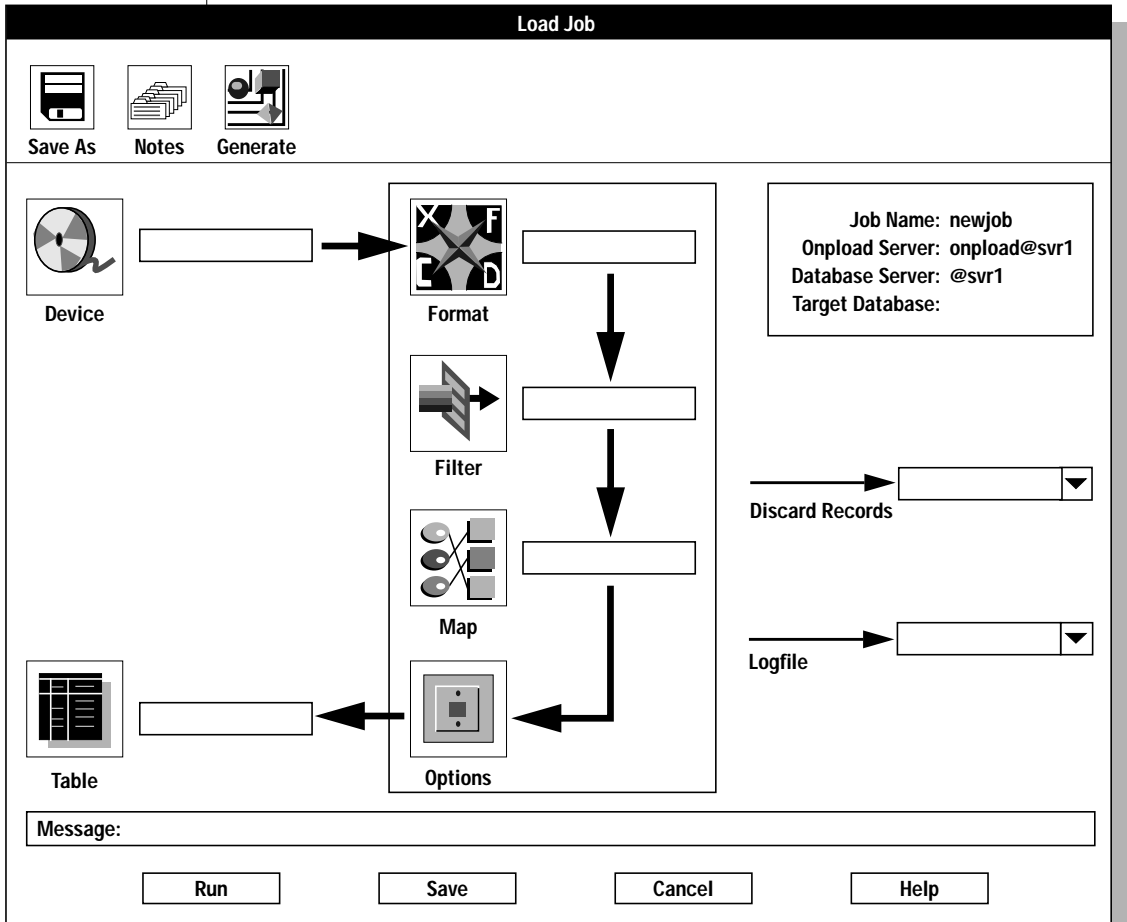
**Figure 12-1**  
*The Load Job Select Window*

2. Click **Create** in the **Selection Type** group.
3. Select a name for the job and type it in the **Job Name** text box.

4. Click OK.

The Load Job window appears, as Figure 12-2 illustrates.

**Figure 12-2**  
The Load Job Window



5. Type the appropriate values for the components of the load. [“Icon Buttons” on page 3-29](#) describes the icons that represent the components of the load. For detailed information about these components, refer to the individual chapters on device arrays, formats, filters, and maps.

6. Select a base name for the files that contain rejected records and type it in the **Discard Records** text box.  
[“Reviewing Records That the Conversion Rejected” on page 14-6](#) gives information about rejected records.
7. Choose a name for the file that contains the load job status log and type it in the **Logfile** text box.  
For more information about the log file, refer to [“Viewing the Status of a Load Job or Unload Job” on page 14-9](#).
8. Click the **Options** button to change the load options.  
For more information on these options, refer to [“Changing the Load Options” on page 12-13](#).
9. Click **Save** to save this unload job. (If you click **Run** to run the job immediately, the job is saved automatically.)
10. Now you can either run the load job or exit and run the job later.
  - Click **Run** to run the job.
  - Click **Cancel** to exit to the Load Job Select window.

## Running the Load Job

If you click **Run** in the Load Job window, the Active Job window appears, as [Figure 2-17 on page 2-30](#) illustrates. The Active Job window displays the progress of your job and indicates when the job completes. When the Active Job window indicates that the load job is complete, click **OK** to return to the Load Job Select window.

***Tip:** Before you run a load job, you might want to check your definitions by viewing the data-file records according to a specified format. For more information, see [“Previewing Data-File Records” on page 14-3](#).*

After you run an express-mode load, you must make a level-0 backup before you can access the table that you loaded.



## Making a Level-0 Backup

Express-mode loads do not log loaded data. After an express-mode load, **onpload** sets the table to read-only as a protective measure. To make the table available for write access, you must do a level-0 backup for all the dbspaces that the fragments of the loaded table occupy. The level-0 backup allows data recovery for the table in case of future database corruption.

If you do not need to provide for data recovery, you can use `/dev/null` as the backup device for the level-0 backup. This strategy makes the table available for write access without actually backing up the data. If a user attempts to write into the table before you make a level-0 backup, The database server issues ISAM error -197.

If you run several express-load jobs on *different* tables in a database, you can complete all of the loads before you perform the level-0 backup. However, if you try to do a second load on the same table without making a level-0 backup, the database server issues ISAM error -197.

For discussions of table fragments and dbspaces, refer to the [INFORMIX-Universal Server Administrator's Guide](#). For information about making backups, refer to either the [INFORMIX-Universal Server Archive and Backup Guide](#) or [INFORMIX-Universal Server Backup and Restore Guide](#), depending on the system you use.

## Problems During a Load Job

If you encounter any problems during the load, examine the various files that **onpload** creates. For information on how to review these files, see [Chapter 14, "Browsing."](#)



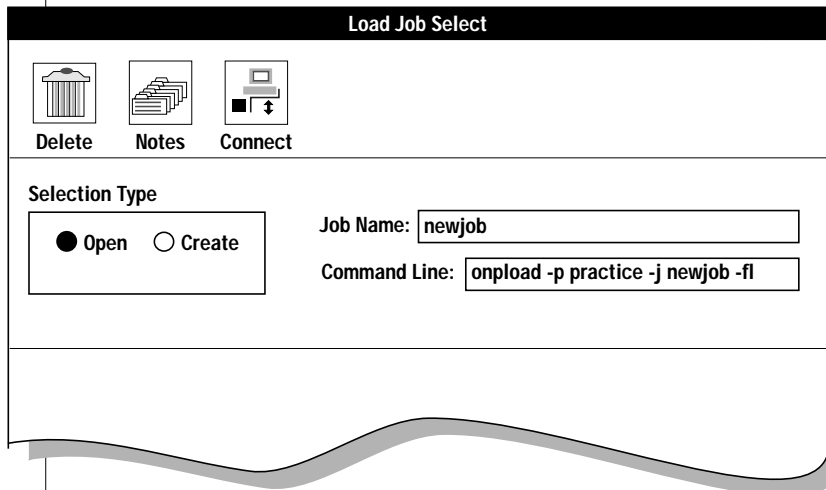
**Warning:** *Because of operating-system limitations, the **onpload** utility cannot load successfully from a file (on disk) that is longer than 2 gigabytes. If you try to read a file that is longer than 2 gigabytes, **onpload** fails only after processing the first 2 gigabytes of data. The HPL log file reports the following error:*

```
Cannot read file /some_dir/a_long_file - aio error code 27
```

## Using the Command-Line Information

If you select an existing job in the Load Job Select window, the **Command Line** text box shows the **onpload** command that **ipload** generated for that load job. Figure 12-3 shows the **Command Line** portion of a Load Job Select window. The **Command Line** text box displays the **onpload** command generated for the load job that [Figure 2-15 on page 2-27](#) illustrates.

**Figure 12-3**  
Fragment of the Load Job Select Window



The command line, **onpload -p practice -j newjob -fl**, contains the following arguments.

Argument	Description
-p practice	The project where the job is stored
-j newjob	The name of the job
-fl	The job that loads (rather than unloads) data

You can copy the **onpload** command from the **Command Line** text box and paste it at a system prompt to run the load job. If you need to run the load job multiple times, you can save the **onpload** command and execute it later.



You do not need to start **ipload** to run a job from the system prompt. The **ipload** and **onpload** utilities both use the **onpload** database, but each utility uses it independently.

## Changing the Load Options

Before you run a load job, you can review or change any load options. The load options include specifying the number of records to load, the starting record number, and the loading mode.

The **ipload** utility stores option information in the **session** table of the **onpload** database. For more information on the **session** table, see [Appendix A](#).

The Load Options window contains the following options.

Option	Description
Load Mode	The mode for the load: express or deluxe
Generate Violations Records	Whether or not to generate violations records
Tapes	The number of tapes that contain source data
Number Records	The number of records to process in the data file
Start Record	The record number in the data file from which to start loading
Max Errors	The maximum number of error conditions to be encountered. If the number of load errors exceeds this number, the load stops.
Commit Interval	The number of records to load before logging the transaction. If you set the commit interval to 0, <b>onpload</b> uses the default value of 10. You can use this option only with deluxe mode.

**To change load options**

1. Display the Load Job window.  
Refer to “[Creating a Load Job](#)” on page 12-8.
2. Click the **Options** button.

The Load Options window appears, as Figure 12-4 illustrates.

**Load Options**

Load Mode:

Generate Violations Records:

Tapes:

Number Records:

Start Record:

Max Errors:

Commit Interval:

Message:

**Figure 12-4**  
*The Load Options Window*

3. Change the desired option(s).
4. Click **OK** to return to the Load Job window.

## Editing a Load Job

After you create and save a load job, you can later return and modify that load job.

### To edit a load job

1. Choose **Jobs→Load** from the HPL main window.  
The Load Job Select window appears, as [Figure 12-1 on page 12-8](#) illustrates.
2. Click **Open** in the **Selection Type** group.
3. Select a job from the **Job Information** list box.
4. Click **OK**.  
The Load Job window appears, as [Figure 12-2 on page 12-9](#) illustrates.
5. Make appropriate changes to the entries in the Load Job window.
6. Click the **Options** button to change load options.
7. Click **Save** to save this load job.
8. Run or cancel the load, as follows:
  - Click **Run** to run the data load.
  - Click **Cancel** to exit.

---

## The Generate Options

Instead of individually creating the components that are required on the Load Job window, you can use the generate options to create a load job. You can click the **Generate** button in the Load Job window, or you can choose **Components→Generate Job** from the HPL main window. [Chapter 13, “Generate Options,”](#) describes the use of the generate options.

The generate options do not give you as much flexibility as creating each component individually, but these options let you create the components quickly. (After you generate the components, you can edit the components individually by accessing them through the **Components** menu.) In addition, the generate options let you create formats (Fixed Internal and No Conversion) that are not available from the format-definition window.



---

# Generate Options

Types of Generate Tasks . . . . .	13-3
Generating from the Load Job Window . . . . .	13-4
Using the Autogenerate Load Components Window . . . . .	13-4
Generating from the Unload Job Window . . . . .	13-6
Using the Autogenerate Unload Components Window . . . . .	13-6
Generating from the Components Menu . . . . .	13-10
The Generate Window . . . . .	13-10
The Generate Group. . . . .	13-11
The Format Type Group . . . . .	13-12
Generating Load and Unload Components . . . . .	13-13
Using the No Conversion Job Option . . . . .	13-14



**T**he generate options of the **ipload** utility let you automatically generate components of a load or unload job. The generate options can save you time when you create new formats, maps, queries, and load and unload jobs.

When you generate a load or unload job for an Informix database, **ipload** creates a format for the data file and a map that associates the columns of the table with the fields of the data-file records. Although the generated components might not match your database schema or data-file records exactly, the components created by the generate options provide useful starting points for building HPL components. After you generate default components, you can modify the components to match your specific needs.

---

## Types of Generate Tasks

The **ipload** utility lets you perform the following tasks:

- Generate load components from the Load Job window
- Generate unload components from the Unload Job window
- Generate both load and unload components from the **Components** menu

---

## Generating from the Load Job Window

The **Generate** button in the Load Job window lets you save time when the format of the data file corresponds to the format of the database table. When you generate from the Load Job window, **ipload** makes the following assumptions about the file (or device array) that contains the data:

- The file is an ASCII file.
- The file uses the same locale as the database.
- The file uses a vertical bar (|) for the field delimiter and a new line for the record delimiter.
- The fields in each record of the file correspond one-to-one to the columns of the target table.
- All records in the file should be loaded.

## Using the Autogenerate Load Components Window

When you generate from the Load Job window, **ipload** creates a format, a map, a job, and, if needed, a device array.

### To generate a job from the Load Job window

1. Choose **Jobs→Load** from the HPL main window.  
The Load Job Select window appears, as [Figure 12-1 on page 12-8](#) illustrates.
2. Click **Create** in the **Selection Type** group.
3. Select a name for the load job and type it in the **Job Name** text box.
4. Click **OK**.  
The Load Job window opens, as [Figure 12-2 on page 12-9](#) illustrates.
5. Click the **Generate** button.  
The Autogenerate Load Components window appears, as [Figure 13-1 on page 13-5](#) illustrates.



**Autogenerate Load Components**

**Load From**

Device Array

File

**Load To**

Database:

Table:

Message: Enter file name to load from

OK Cancel Help

**Figure 13-1**  
The Autogenerate Load Components Window

6. Click **Device Array** or **File** to indicate the location of the source data.  
To load from an existing device array, click **Device Array** and type the name of the device array.  
To load from a file, click **File** and type the full pathname of the file. The **ipload** utility automatically generates a device array that includes the file.
7. In the **Load To** group, type the name of the database and table that will receive the data.
8. Click **OK**.  
The **ipload** utility generates the components of the load and returns to the Load Job window.
9. If needed, click the **Filter** button to prepare a filter.
10. If you want, change the pathnames in the **Discard Records** and **Logfile** text boxes.
11. Click **Save** to save the components and the job.
12. Click **Run** to execute job or **Cancel** to exit.

---

## Generating from the Unload Job Window

The **Generate** button in the Unload Job window lets you save time when the format of the data file is similar to the format of the database table. When you generate from the Unload Job window, **ipload** makes the following assumptions about the file (or device array) into which the data is unloaded:

- The file is an ASCII file.
- The file uses the same locale as the database.
- The file uses a vertical bar (|) for the field delimiter and a new line for the record delimiter.

## Using the Autogenerate Unload Components Window

When you generate from the Unload Job window, **ipload** creates a format, a map, a job, and, if needed, a device array. You can generate an unload that uses a query to select from one or more tables or that unloads an entire table.

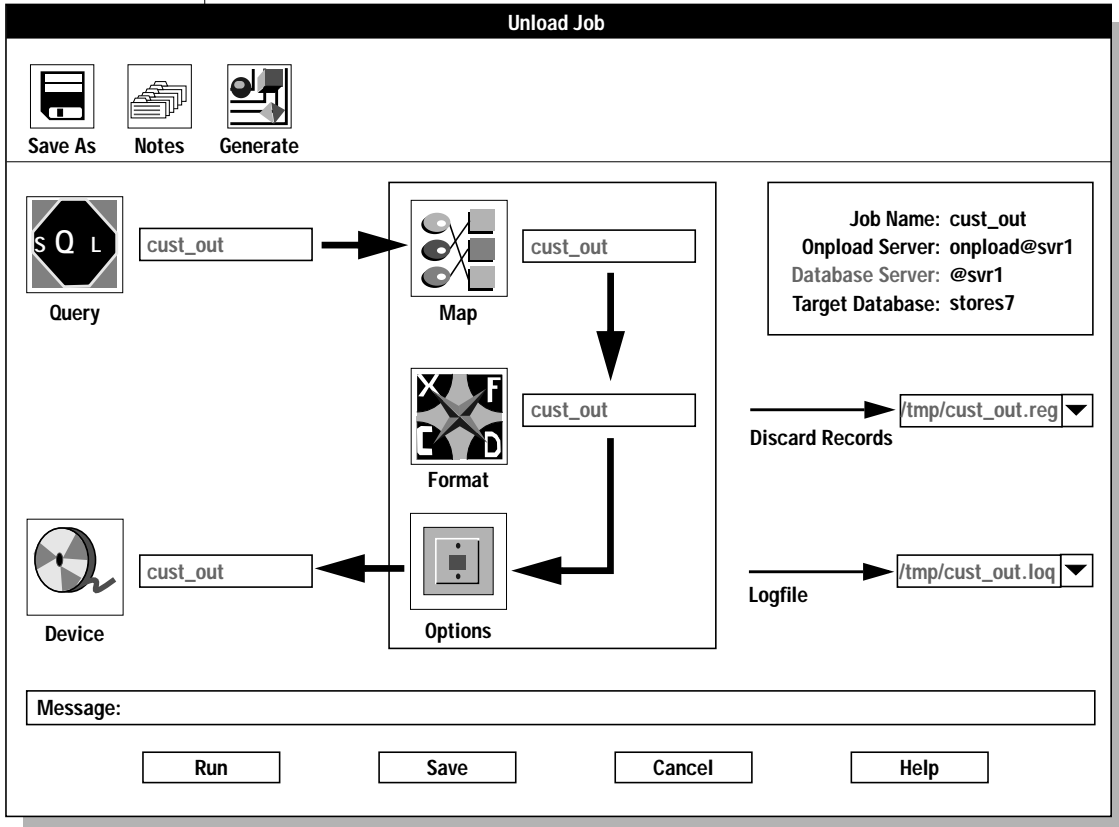
### To generate a job that uses a query

1. Follow the instructions in [“Creating a Query” on page 8-4](#) to create a query.
2. Choose **Jobs→Unload** from the HPL main window.  
The Unload Job Select window appears, as [Figure 11-1 on page 11-6](#) illustrates.
3. Click **Create** in the **Selection Type** group.
4. Select a name for the unload job and type it in the **Job Name** text box.
5. Click **OK**.  
The Unload Job window opens, as [Figure 11-2 on page 11-7](#) illustrates.



10. Click **OK** to generate the components of the unload.  
The display returns to the Unload Job window. The **ipload** utility completes the Unload Job window. If you chose **cust\_out** for the unload job name (step 4), the Unload Job window appears as Figure 13-3 illustrates.

**Figure 13-3**  
The Unload Job Window



11. Click **Save** to save this Unload Job.  
You can click **Run** to run the job, or click **Cancel** to exit and run the job later.

12. To run the job, click **Run**.  
The Active Job window appears, as [Figure 2-17 on page 2-30](#) illustrates.
13. When the Active Job window displays Job Completed, click **Cancel** to return to the main HPL window.

#### To generate a job that unloads an entire table

1. Choose **Jobs**→**Unload** from the HPL main window.  
The Unload Job Select window appears, as [Figure 11-1 on page 11-6](#) illustrates.
2. Click **Create** in the **Selection Type** group.
3. Choose a name for the unload job and type it in the **Job Name** text box.
4. Click **OK**.  
The Unload Job window opens, as [Figure 11-2 on page 11-7](#) illustrates.
5. Click the **Generate** button.  
The Autogenerate Unload Components window appears, as [Figure 13-2 on page 13-7](#) illustrates.
6. Click **Table** in the **Unload From** group.
7. Enter the desired database and table in the **Database** and **Table** text boxes, respectively.  
You can use the down arrows to see selection lists. When you unload from a table, you do not enter a query.
8. Click **Device Array** or **File** in the **Unload To** group.  
If you click **Device Array**, you can use the down arrow to see a list of the available device arrays.  
If you click **File**, **ipload** creates a device array of the same name as the unload job and inserts the specified file into that device array.
9. Click **OK** to generate the components of the unload.  
The Unload Job window reappears, with the components of the job completed.

10. Click **Save** to save this Unload Job.  
You can click **Run** to run the job, or click **Cancel** to exit and run the job later.
11. To run the job, click **Run**.  
The Active Job window appears, as [Figure 2-17 on page 2-30](#) illustrates.
12. When the Active Job window displays Job Completed, click **Cancel** to return to the main HPL window.

---

## Generating from the Components Menu

To generate all of the components for both load and unload jobs in one operation, choose **Components→Generate Job** from the main HPL window. This Generate option lets you choose formats that are not available from the format-definition window.

### The Generate Window

The Generate window appears, as [Figure 13-4 on page 13-11](#) illustrates. This window generates all of the components required for a load job and an unload job: format, load map, unload map, query, and device array. The Generate window lets you specify the characteristics of the components that **ipload** creates.

**Figure 13-4**  
The Generate Window

### *The Generate Group*

The **Generate** group specifies the type of generate to perform. The **Generate** group has the following choices.

Choice	Effect	Refer to Page
Load/Unload Job	Generates both load and unload jobs	<a href="#">13-13</a>
No Conversion Job	Generates a job that treats an entire database record as one entity	<a href="#">13-14</a>
Maps and Formats only	Generates only a format, a load map, and an unload map	

## The Format Type Group

The **Format Type** group specifies the format of the data file. The **Format Type** group has the following choices.

Choice	Description	Refer to Page
Delimited	The fields of a data-file record are separated by a field delimiter, and records are separated by a record delimiter. The default delimiters are vertical bar ( ) and new line, respectively.	7-24
Fixed Internal	The data file uses Informix internal format. The only changes to the data that you can make when you use this format are ALTER TABLE changes: modify the order of columns, delete or add columns, or change the data type.  The HPL loads and unloads data in this format more efficiently than data in the Delimited and Fixed ASCII formats.	7-21
Fixed ASCII	All records are the same length. Each record contains characters in fixed-length fields.  This format is the same as the Fixed format choice of the Record Formats window.	7-5
Fixed Binary	The data-file records contain data in fixed-length fields. Character-oriented data is in character fields. Numeric data (integer, float, and so on) is in machine-dependent binary values.  Use this format for loading or unloading data for an application that has or requires data in binary format. Data in binary format is much more compact than data in ASCII format.	7-5
COBOL	The data file is formatted according to COBOL 86 standards. All COBOL data types are supported.	7-20



**Tip:** To generate EBCDIC data, select the *Delimited* or *Fixed ASCII* format and use the format options to change the code set. Refer to “[Format Options](#)” on page 7-22.



## Generating Load and Unload Components

When you choose **Components→Generate**, you can generate all of the components required for a load job and an unload job: format, load map, unload map, query, and device array.

### To generate the components for loading or unloading an Informix database

1. Choose **Components→Generate Job** from the HPL main window. The Generate window appears, as [Figure 13-4 on page 13-11](#) illustrates.
2. Click **Load/Unload Job** in the **Generate** group.
3. Select a format for the data file in the **Format Type** group.
4. Select a name for the generated components and type it in the **Generate Name** text box.

This name is used for each of the components that this option creates.

5. Type the name of the database that you will load or unload in the **Database** text box or click the down arrow to select a database from the selection list.
6. Type the name of the table within the database in the **Table** text box or click the down arrow to select a table from the selection list.
7. Type the name of a device array in the **Device** text box or click the down arrow to select a device from the selection list.

If you enter the name of a device (file) instead of a device array, **ipload** creates a device array of the same name as the unload job and inserts the specified device into that device array.

When you specify a file instead of a device array in the **Device** text box, **ipload** makes the following assumptions about the data file:

- The file is an ASCII file.
  - The file uses the same locale as the database.
  - The file uses a vertical bar (|) for the field delimiter and a new line for the record delimiter.
  - The fields in the data file are in the same order as the columns of the target table.
8. Click **OK**.

Figure 13-5 shows appropriate choices for generating load and unload jobs for delimited output from the **state** table of the **stores7** database. After **ipload** creates the components, you can run the job or use the component-definition windows to make any necessary changes.

**Figure 13-5**  
The Generate Window

The screenshot shows a dialog box titled "Generate". It is divided into two main sections: "Generate" and "Format Type".

- Generate Section:** Contains three radio button options: "Load/Unload Job" (selected), "No Conversion Job", and "Maps and Formats Only".
- Format Type Section:** Contains five radio button options: "Delimited" (selected), "Fixed Internal", "Fixed ASCII", "Fixed Binary", and "COBOL".
- Fields:** "Generate Name" (text field with "state\_fixed"), "Database" (dropdown menu with "stores7"), "Table" (dropdown menu with "state"), and "Device" (dropdown menu with "state\_device").
- Message:** A text box at the bottom reads: "Message: Select options for automatically generating jobs, maps, queries, and formats".
- Buttons:** "OK", "Cancel", and "Help" buttons are located at the bottom of the dialog.

## Using the No Conversion Job Option

The **No Conversion Job** option uses the Informix internal format to unload data from a table. Jobs loaded or unloaded with this option are sometimes called *raw loads* or *raw unloads*. The **No Conversion Job** option treats an entire database record as one entity, using the Informix internal format. It does not generate formats or maps. The **No Conversion Job** option is the fastest option that you can use for loading and unloading data. Use this option to transport data or when you need to reorganize the disks on your computer.

When you run a job that you created with the **No Conversion Job** option, **ipload** displays a Fast Job Startup window instead of the usual load or unload job window.

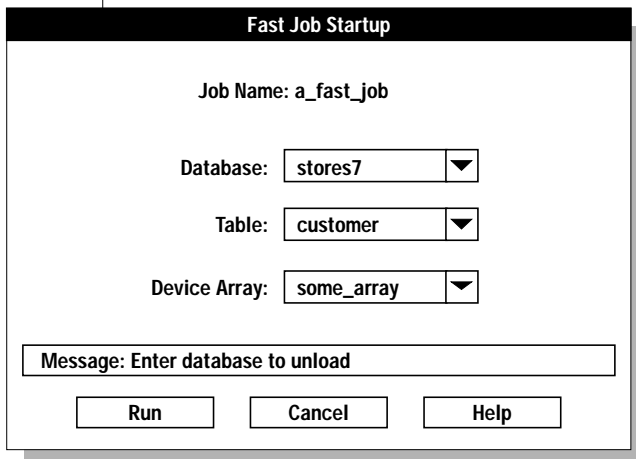
**To use the Fast Job Startup window**

1. Choose **Components**→**Generate Job** from the main HPL window.
2. Click **No Conversion Job** in the **Generate** group.
3. Select a name for the job and type it in the **Generate Name** text box.
4. Type the names of the database, table, and device array in the **Database**, **Table**, and **Device** text boxes, respectively.
5. Click **OK**.

The display returns to the HPL main window.

6. Choose **Jobs**→**Load** (or **Jobs**→**Unload**) from the HPL main window.  
The Load Job Select or Unload Job Select window appears.
7. Select the job from the **Job Information** list box.
8. Click **OK**.

The Fast Job Startup window appears, as Figure 13-6 illustrates.



**Figure 13-6**  
*The Fast Job Startup  
Window for a Load  
Job*

9. Click **Run** to execute the job.  
The Active Job window appears, as [Figure 2-17 on page 2-30](#) illustrates.
10. When the Active Job window displays **Job Completed**, click **Cancel** to return to the main HPL window.



---

# Browsing

The Browsing Options. . . . .	14-3
Previewing Data-File Records. . . . .	14-3
Using the Record Browser Window . . . . .	14-4
Reviewing Records That the Conversion Rejected . . . . .	14-6
Viewing the Violations Table . . . . .	14-7
Viewing the Status of a Load Job or Unload Job. . . . .	14-9
Viewing the Log File . . . . .	14-9
Sample Log File . . . . .	14-11



**T**he browsing options of the HPL let you preview records from the data file and let you review various files associated with the HPL.

---

## The Browsing Options

You can use the browsing options to:

- preview records from a data file.
- review records that the filter or the conversion reject.
- view the violations table.
- view the status of a load job or unload job.

### Previewing Data-File Records

Before you actually execute a load job, you can use the Record Browsers window to check your definition of the format. The display clearly shows errors such as incorrect field lengths or missing fields. You can edit the format (see [“Editing a Format” on page 7-9](#)) to correct your format definitions.

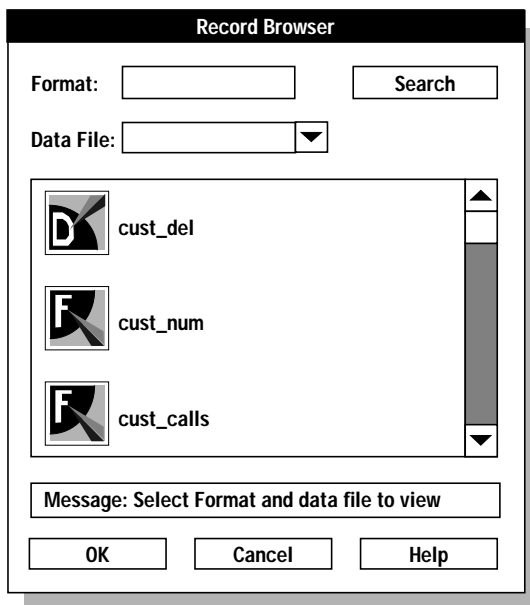
### Using the Record Browser Window

The Record Browser window lets you review records in a specified format, search the list of available formats, or edit a format.

#### To review data-file records in a selected format

1. In the HPL main window, select the project that contains your load job.
2. Choose **Browsers**→**Record**.

The Record Browser window appears, as Figure 14-1 illustrates.



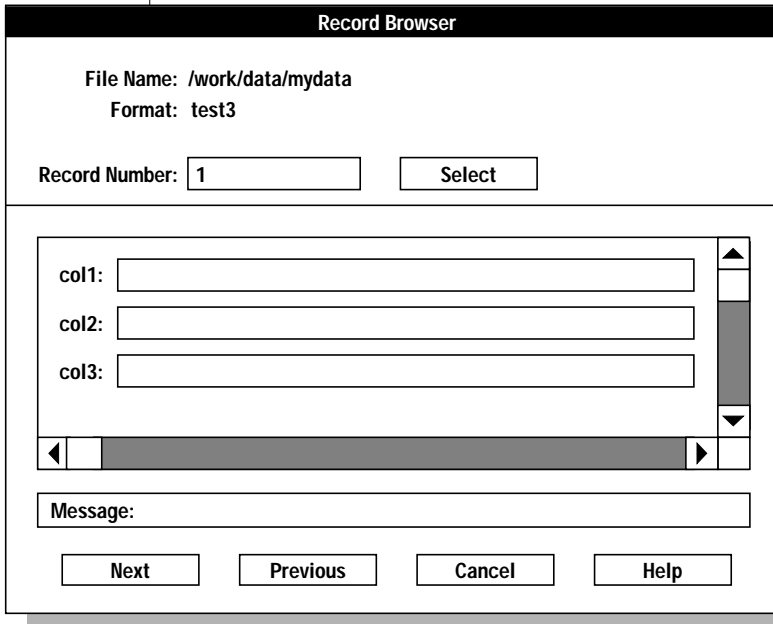
**Figure 14-1**  
The Record Browser Window

3. Type the name of the format to be applied to the source data file or click the format name in the list box.
4. In the **Data File** text box, type the name of the data file that you plan to load, or click the down arrow and select a file from the selection list.



5. Click **OK**.

The second Record Browser window appears, as Figure 14-2 illustrates. This Record Browser window displays each of the fields in the format, followed by the value of the field for the given Record Number.



**Figure 14-2**  
The Record Browser Window

6. You can take the following actions:
  - Type the record number that you want to view. Click **Select**.
  - Click **Next** to display the next record.
  - Click **Previous** to display the previous record.
7. When you finish browsing, click **Cancel** to return to the HPL main window.

#### To search for and edit a format

1. In the HPL main window, select the project that contains your load job.
2. Choose **Browsers→Record**.  
The Record Browser window appears, as [Figure 14-1 on page 14-4](#) illustrates.
3. In the **Format** text box, type the format name or partial format name that you want to find.  
You can use wildcards (for example, *\*cust\**).
4. Click **Search**.  
The **ipload** utility displays all formats of the current project that include the letters *cust*.
5. Click **Cancel** to return to the HPL main window.

#### To edit a format

1. Select the project that contains your load job.
2. Choose **Browsers→Record** from the HPL main window.
3. Click a format button to edit the format.  
The **ipload** utility displays the format-definition window. For information about editing a format, refer to [“Editing a Format” on page 7-9](#).

## Reviewing Records That the Conversion Rejected

When you execute a load job, **onpload** creates a file that contains information about records of the data file that the conversion rejected. This file is named *basename.rej* where *basename* is the base name that you selected in step 6 of [“Creating a Load Job” on page 12-8](#). When you use a generate option to create the components for a load job, *basename* is */tmp/jobname* where *jobname* is the name that you selected for the unload job.

### To review rejected records

1. On the HPL main window, select the project that contains your load job.
2. Choose **Browser→Record**.  
The Record Browsers window appears, as [Figure 14-1 on page 14-4](#) illustrates.
3. Type the name of the format to be applied to the rejected-records file in the **Format** text box, or click the format name in the list box.
4. Type the name of the rejected-records file in the **Data File** text box, or click the down arrow and select a data file from the selection list.
5. Click **OK**.  
The second Record Browser window appears, as [Figure 14-2 on page 14-5](#) illustrates.
6. You can take the following actions:
  - Type the record number that you want to view. Click **Select**.
  - Click **Next** to display the next record.
  - Click **Previous** to display the previous record.
7. Click **Cancel** to return to the HPL main window.

## Viewing the Violations Table

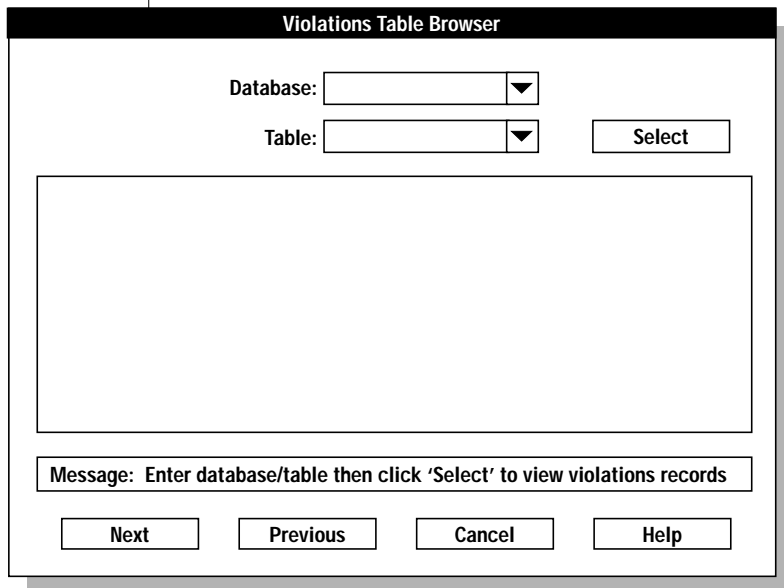
The load job also creates two tables in the target database that contain information about records that passed the conversion but that the database server rejected. The tables are named *tablename\_vio* and *tablename\_dia*, where *tablename* is the name of the table being loaded.

Viewing the violations table lets you browse through records that passed the filter and conversion but that the database server rejected. The HPL writes these records into the violations table (*tablename\_vio*). The data in the violations table has the same format as the database table.

The [Informix Guide to SQL: Syntax](#) discusses in detail the information found in the violations table.

**To view the violations table**

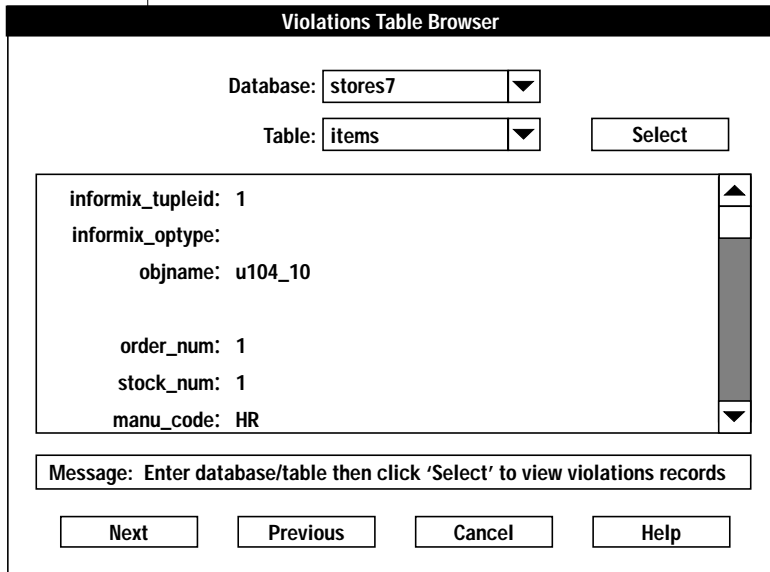
1. Choose **Browsers**→**Violations** from the HPL main window.  
The Violations Table Browser window appears, as Figure 14-3 illustrates.



**Figure 14-3**  
*The Violations Table  
Browser Window*

2. Type the name of the database and table for which you want to review the violations, or click the down arrows to make your choices from selection lists.
3. Click **Select**.

[Figure 14-4 on page 14-9](#) shows the first record of a violations table.



**Figure 14-4**  
A Record in the  
Violations Table  
Browser Window

4. Click **Next** and **Previous** to move forward and backward through the violations table.
5. Click **Cancel** to return to the HPL main window.

## Viewing the Status of a Load Job or Unload Job

When a load or unload job is complete, **onpload** writes a record of the load or unload job into a log file. For information on the messages that the log file can contain, see [Appendix H](#).

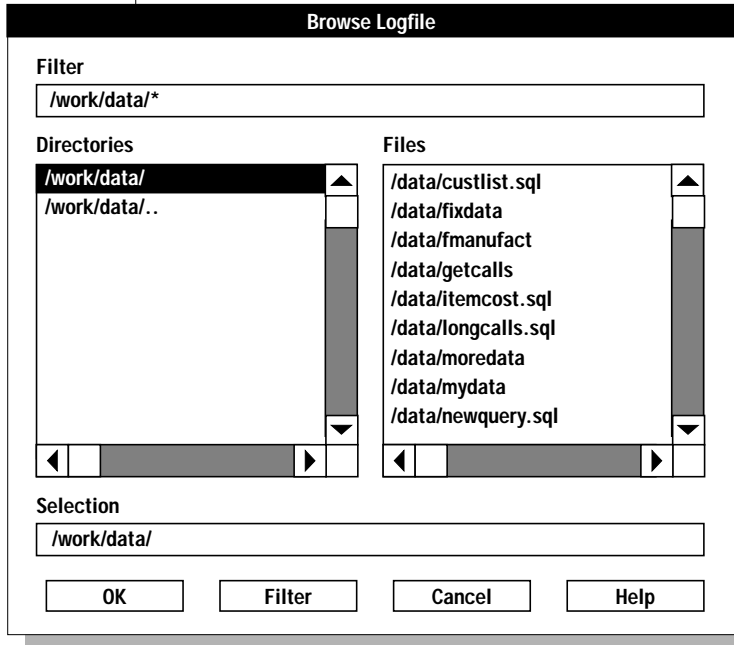
### Viewing the Log File

The default name for a log file is `/tmp/jobname.log`, where *jobname* is the name that you chose for the job.

You can specify a different name for the log file in the Load Job window ([Figure 12-2 on page 12-9](#)) or Unload Job Window ([Figure 11-2 on page 11-7](#)).

To view the log file

1. Choose **Browsers**→**Logfile** from the HPL main window.  
The Browse Logfile window appears, as Figure 14-5 illustrates. When the window appears, the **Filter** text box and the **Selection** text box show the directory from which **ipload** was started.



**Figure 14-5**  
*The Browse Logfile Window*

2. In the **Filter** text box, type the full pathname of the directory that contains the log.  
You can use wildcards to select only certain files from that directory.
3. Click **Filter**.  
The **Files** list box shows a list of the files that match the path that you entered in the **Filter** text box.
4. In the **Files** list box, click the name of the file that you want to examine.  
The full pathname of the selected file appears in the **Selection** text box.

5. Click **OK**.  
A Browse window appears that displays the contents of the selected file.
6. Review the log using the scroll bar to move through the log.
7. Click **Cancel** to return to the HPL main window.

Alternatively, if you know the full pathname of the log file, you can simply type the pathname in the **Selection** text box and click **OK**.

### ***Sample Log File***

The following example shows a sample log file entry:

```
Sat Mar 11 13:52:42 1995

Session ID 1

Unload Database -> stores7
Query Name      -> f_manufact
Device Array    -> fmanufact
Query Mapping   -> f_manufact
Query           -> select * from manufact
Convert Reject  -> /work/data/f_manu_unl

Database Unload Completed --
  Unloaded 9 Records  Detected 0 Errors

Sat Mar 11 13:52:50 1995
```

You can review the log file to determine load status and to see where any errors occurred. The log file is a simple ASCII file. You can print it if necessary.





# Managing the High-Performance Loader

Modes . . . . .	15-3
Deluxe Mode . . . . .	15-4
Express Mode . . . . .	15-4
Express Mode Limitations. . . . .	15-5
How Express Mode Works . . . . .	15-6
Foreign-Key Constraints . . . . .	15-7
Comparison Between Express Mode and Deluxe Mode Load Operation. . . . .	15-8
Violations . . . . .	15-9
Rejected Records from the Input File . . . . .	15-9
Constraint Violations. . . . .	15-10
Viewing Error Records . . . . .	15-10
Performance . . . . .	15-10
Configuration Parameters . . . . .	15-11
Mode . . . . .	15-12
onstat Options for onpload . . . . .	15-12
Devices for the Device Array . . . . .	15-12
Usage Models . . . . .	15-13
Reorganizing Computer Configuration . . . . .	15-13
Altering the Schema of a Table . . . . .	15-14
Loading and Unloading Data . . . . .	15-14
Settings for a No-Conversion Load or Unload . . . . .	15-15
Express-Mode Load with Delimited ASCII . . . . .	15-16
Performance Hints . . . . .	15-16
Choose an Efficient Format . . . . .	15-17
Ensure Enough Converter Threads and VPs . . . . .	15-17
Ensure Enough Buffers of Adequate Size . . . . .	15-18
Increase the Commit Interval. . . . .	15-19



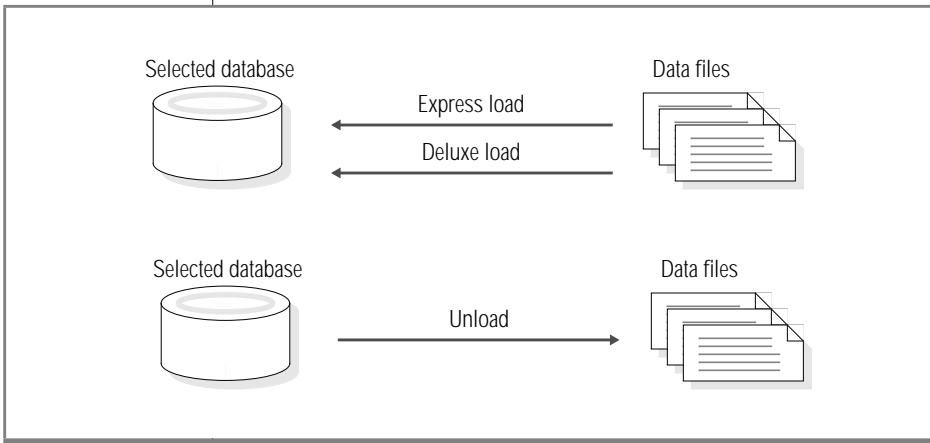
**T**his chapter discusses the following aspects of managing the HPL:

- Modes
- Violations
- Performance

---

## Modes

The HPL offers two *load modes*: deluxe and express. Express mode is faster, and deluxe mode is more flexible. You can choose the mode that is best suited for your environment. The HPL has only one unload mode. Figure 15-1 illustrates the load and unload modes of the HPL.



**Figure 15-1**  
*The Load and Unload Modes of the HPL*

## Deluxe Mode

The deluxe mode performs row-by-row referential and constraint checking as the data is loaded. Deluxe mode also logs each insert. Deluxe mode does not lock the table, so the loading of data can take place while other users are working. Deluxe mode is not as fast as express mode but allows users to access and update the table during a load. Loaded data is immediately visible to the user.

A deluxe-mode load simulates an INSERT statement, except that the HPL allows the load to handle parallel data streams. Deluxe mode has the following characteristics:

- Logs data
- Updates indexes
- Evaluates triggers
- Sets constraints to `FILTERING WITHOUT ERROR`
- Sets the isolation mode as if for an insert cursor.

## Express Mode

Express-mode loads are significantly faster than deluxe-mode loads; however, no one else can access the table until the load is complete. The express mode locks the table for exclusive use by the load utility and disables referential and constraint checking on the table during the load.

Express mode requires that you perform a level-0 backup after you finish the load. This additional step is important when you consider the relative speeds of the deluxe mode and express mode. If the table that you are loading is empty and has no objects such as indexes or constraints, express mode is almost surely faster. However, if the table that you are loading is large and/or has many constraints, deluxe mode might be faster when you consider the time that is required for enabling the objects and performing the level-0 backup.

An express-mode load has the following characteristics:

- Sets all objects (such as indexes or constraints) to disabled before loading
- Reenables all objects after loading, if possible, and flags objects that cannot be reenabled in the violations and diagnostic tables
- Locks the table during the load
- Requires a level-0 backup after completion

### ***Express Mode Limitations***

Express mode has the following limitations:

- Cannot load Simple LO or Ext Type data types
  - Does not invoke triggers on the loaded data
  - Cannot load an HDR replicated table
  - Cannot load a table that is fragmented by row ID
  - Cannot load tables with primary key constraints when child table records refer to the load table
  - Cannot load rows that are larger than the system page size
- For information about page size, refer to the [\*INFORMIX-Universal Server Administrator's Guide\*](#)

If your load job has any of these conditions, you must use deluxe mode to load your data.

### ***How Express Mode Works***

This discussion describes how the HPL implements express mode. You do not need to understand this discussion to use the HPL. The sequence of events when you run an express-mode load is as follows:

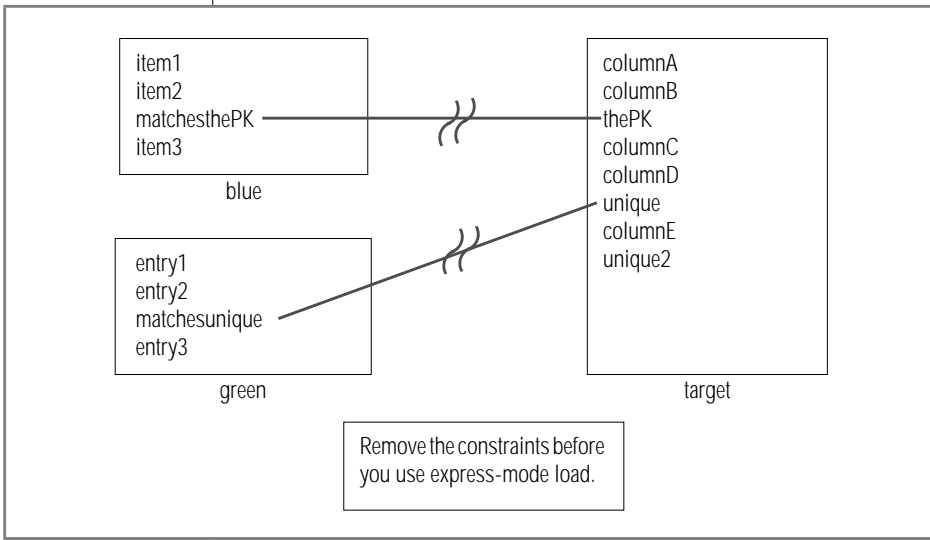
1. The **onpload** utility locks the table with a shared lock.  
Other users can read data in already-existing rows.
2. The **onpload** utility creates new extents and fills them with the new rows. However, **onpload** does not update the database structures that track extents.  
The new extents are not visible to the user.
3. At the *end* of the express load, **onpload** updates the internal structures of the database.
4. The **onpload** utility sets the table to read-only.  
This setting occurs because in express mode **onpload** does not log data, and therefore, the table is in an unrecoverable state.
5. The **onpload** utility unlocks the table and enables the constraints.  
The new rows become visible to the user for read only.
6. The user performs a level-0 backup.  
For more information, see [“Making a Level-0 Backup” on page 12-11](#).
7. Universal Server sets the table to read/write.

If the load fails, **onpload** discards the extents and clears the internal information that says the table is unrecoverable.

## Foreign-Key Constraints

Express mode cannot disable primary constraints or unique constraints that are referenced as foreign keys that are active on other tables. If you want to load data into such a table, you must first use `SET CONSTRAINTS DISABLED` statements to disable the foreign-key constraints in the referencing table or tables. After the load is finished, reenable the foreign-key constraints.

Figure 15-2 shows an example of foreign-key constraints. The table **target** has a primary key (**thePK**) and a unique key (**unique**) that table **blue** and table **green** reference. Before you perform an express-mode load into the table **target**, you must disable the foreign-key constraints in both table **blue** and table **green**.



**Figure 15-2**  
Foreign-Key  
Constraints

### ***Comparison Between Express Mode and Deluxe Mode Load Operation***

The following table contrasts the operation of express mode and deluxe mode. For additional information on the differences between these two modes, see [“Deluxe Mode”](#) and [“Express Mode”](#) on page 4.

Express Mode		Deluxe Mode	
Action	Performed by	Action	Performed by
Set objects to disabled	<b>onpload</b>	Set constraints to filtering	<b>onpload</b>
Load records from the data file into the table (including rows that would cause violations if constraints were on)	<b>onpload</b>	Load records from data file into the table. Write records that violate constraints into the violations table <i>and not</i> into the target table	<b>onpload</b>
Enable objects. Detect violators and <i>copy</i> them into the <b>_vio</b> table	<b>onpload</b>	Set constraints to non-filtering	<b>onpload</b>
Perform a level-0 backup to make the database writable	user		
Resolve violators	user	Resolve violators	user



---

## Violations

When you load records from a data file, some of the records might not meet the criteria that you established for the database table. For example, the data file might contain:

- null values where the table specifies NOT NULL.
- values in an incorrect format (for example, alphabetic characters in a numeric field).
- records that do not have the expected number of fields.

The way that the HPL treats these errors depends on the mode (deluxe or express) and the type of job (load or unload).

The HPL separates errors into the following two classes:

- Rejected records from the input file
  - These records include:
    - records that the filter rejected.
    - records that cannot be converted.
- Constraint violations

## Rejected Records from the Input File

Input-file records that the HPL rejects because they could not be converted include records in an incorrect format and records that do not have the expected number of fields. The **onpload** utility writes these records into a file with the suffix **.rej**. The **onpload** utility writes records that are rejected because they do not match the filter criteria into a file with the suffix **.flt**.

## Constraint Violations

When the **onpload** utility starts a deluxe-mode load, it invokes the following SQL statement:

```
SET CONSTRAINTS ON mytable FILTERING
```

This statement has two results:

- The utility adds two tables, **mytable\_vio** and **mytable\_dia**, to the database that contains **mytable**.
- All of the constraints that are associated with the table are set to filtering. Filtering mode causes any record that does not meet the constraint requirements to be added to the **mytable\_vio** table instead of generating an error.

The use of filtering mode for constraints is covered in detail in the [Informix Guide to SQL: Syntax](#)

## Viewing Error Records

Choose from the **Browsers** menu in the HPL main window to look at the error records that **onpload** generates. “[The Browsing Options](#)” on page 14-3 explains how to use the browser options.

---

## Performance

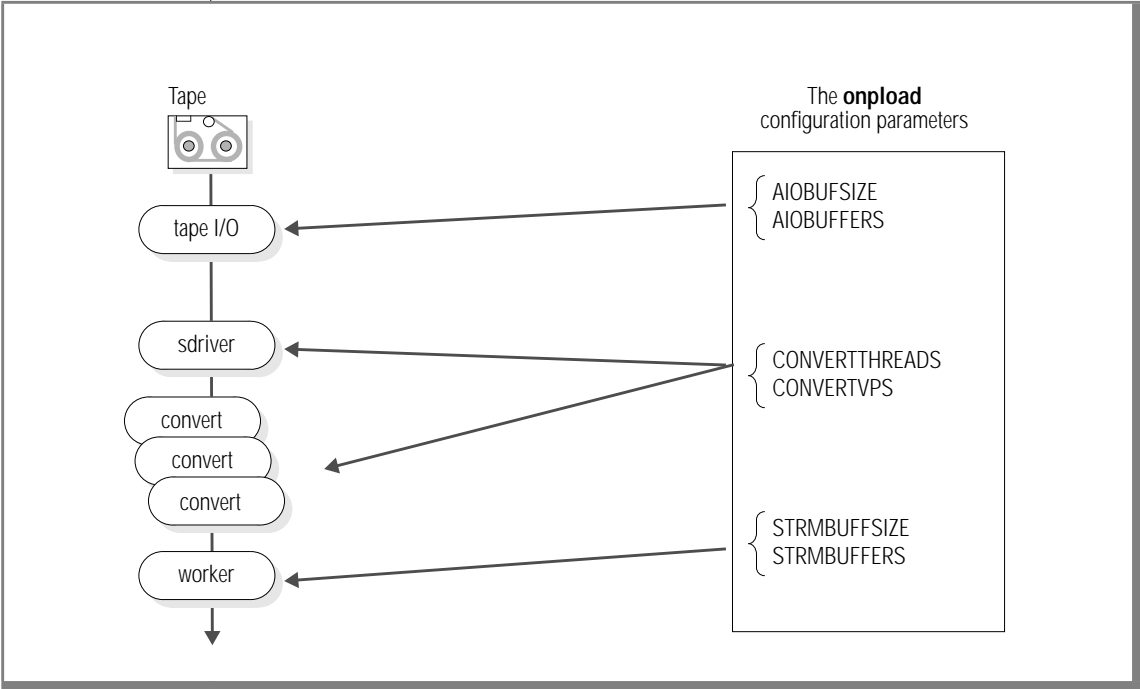
You can improve HPL performance by preparing an environment that is optimized for the particular load or unload job that you are performing. You should consider the following aspects of your load and unload jobs:

- Configuration-parameter values
- Mode (express or deluxe)
- Devices for the device array
- Usage models

## Configuration Parameters

The **onpload** configuration parameters control the number of threads that **onpload** starts and the number and size of the buffers that are used to transfer data. Figure 15-3 shows which part of the **onpload** process is affected by each configuration parameter.

**Figure 15-3**  
*The onpload Configuration Parameters*



The AIOBUFSIZE and AIOBUFFERS parameters control the number and size of the buffers that **onpload** uses for reading from the input device. CONVERTTHREADS and CONVERTVPS control the amount of CPU resources to apply to data conversion. STRMBUFFSIZE and STRMBUFFERS control the number and size of the buffers used to transport data between **onpload** and the database server.

The **onpload** configuration parameters are stored in the `$INFORMIXDIR/etc/$SPLCONFIG` file. [Appendix B](#) describes each configuration parameter and gives the default value for each parameter. Choosing appropriate values for the configuration parameters is discussed in [“Usage Models”](#) on page 15-13 and [“Performance Hints”](#) on page 15-16.

## Mode

[“Modes”](#) on page 15-3 discusses the characteristics of express mode and deluxe mode. You cannot use express mode in certain situations. For example, express mode does not support loading Simple LO or Ext Type data types, ensuring constraints, or invoking triggers. For a list of situations in which you must use deluxe mode, see [“Express Mode Limitations”](#) on page 15-5.

### *onstat Options for onpload*

The **onstat** utility has two options that you can use to observe the behavior of database server threads during express-mode loads. Use the following command to display light-append information:

```
onstat -g lap
```

The **onstat -j** option provides an interactive mode that lets you gather special information about an **onpload** job. The **-j** option is documented in [Appendix G](#) of this manual.

The **onstat** utility is documented in the [INFORMIX-Universal Server Administrator's Guide](#).

## Devices for the Device Array

On a data-load job, each device runs independently of other devices. Thus mixing fast and slow devices does not adversely affect the speed of the load.

In most unload jobs, all devices receive equal amounts of data. Thus the speed of all devices is limited by the speed of the slowest device. If you have several fast devices and one or two slow devices, it might be advantageous to remove the slow devices.

When CPU resources are plentiful during an HPL job, the device controllers are a potential bottleneck. If you have configured extra converter threads and extra converter VPs, CPU use should be close to 100 percent. If CPU use is not close to 100 percent, the cause might be one of the following situations:

- The device controller is managing too many devices.
- The devices themselves are slow.

## Usage Models

Three major usage models are envisioned for the HPL, as follows:

- Reorganizing computer configuration
- Altering the schema of a table
- Loading or unloading external data

### *Reorganizing Computer Configuration*

If you are not changing the table schema, use a no-conversion job to unload and load when you need to reorganize the configuration of your computer or change to a different computer. The no-conversion mode is the fastest means of performing an unload/load because rows are unloaded in Informix internal format with no conversion and reloaded in the same fashion. You can use this mode even when you move the database among heterogeneous computers. (That is, you can use a no-conversion job even when the source and target computers use different internal byte representations.)

For information about preparing for a no-conversion unload/load with **ipload**, refer to [“Using the No Conversion Job Option” on page 13-14](#). To set no-conversion mode when you are using the **onpload** utility at the command line, use the **-fn** option. For more information, refer to [Chapter 16, “The onpload Utility.”](#)

### ***Altering the Schema of a Table***

When you need to alter a table (add, drop, or change the data type of columns), use the Fixed Internal format. In Fixed Internal format, rows are unloaded in Informix internal format on a column-by-column basis. Thus you can drop, add, or modify columns and still minimize conversion overhead. For more information, refer to [“The Format Type Group” on page 13-12](#).

### ***Loading and Unloading Data***

When you load or unload data from an external source, you must assess the type of data and the amount of conversion that is required so that you can choose appropriate configuration parameters.

The following sections show possible configuration parameters for two different types of load jobs. Suppose your hardware has the following configuration:

- Eight CPU symmetric multiprocessors, each about 40 MIPS
- Several (say 16) 300-megabyte disks (for the database)
- Four 1.2-megabyte tape devices (to load to and unload from)
- 512-megabyte memory

You also have this information about your system:

- The database server is running with seven CPU virtual processors.
- The data that you want to load has a row of about 150 bytes with a mix of INT, DATE, DECIMAL, CHAR, and VARCHAR data types. (This is similar to the LINEITEM table in the TPC-D database).

### **Settings for a No-Conversion Load or Unload**

A no-conversion load or unload is not highly CPU intensive because no conversion is involved. In this case, the load or unload is expected to be limited by the speed of the tape devices. For more information, see [“Using the No Conversion Job Option” on page 13-14.](#)

The following table lists sample values of configuration parameters for a raw load.

<b>Configuration Parameter</b>	<b>Suggested Value</b>	<b>Comment</b>
CONVERTVPS	4	This process is not CPU intensive.
CONVERTTHREADS	1	This process is not CPU intensive.
STRMBUFFSIZE	128	Choose some multiple of the AIOBUFSIZE, up to about 8*AIOBUFSIZE.
STRMBUFFERS	5	Should be CONVERTTHREADS + 4.
AIOBUFSIZE	32	Choose a buffer size to match the best block size for the tape drive. Large buffers increase performance if sufficient memory is available.
AIOBUFFERS	5	CONVERTTHREADS + 4 or 2*CONVERTTHREADS, whichever is larger

### ***Express-Mode Load with Delimited ASCII***

In an express-mode load with delimited ASCII, the load or unload job is limited by the available CPU. The conversion to or from Informix types to ASCII is the most expensive portion of these operations. Hence, the following configuration might be more appropriate.

The following table lists sample values of configuration parameters for an express-mode load with delimited ASCII.

<b>Configuration Parameter</b>	<b>Sample Value</b>	<b>Comment</b>
CONVERTVPS	8	One convert VP per CPU
CONVERTTHREADS	2	Four devices * 2 thread/device = 8 threads
STRMBUFSIZE	32	Should be some multiple of AIOBUFSIZE. For this CPU-intensive case, 1 or 2*AIOBUFSIZE is sufficient.
STRMBUFFERS	4	CONVERTTHREADS + 4
AIOBUFSIZE	32	Choose a buffer size to match the best block size for the tape drive. Large buffers increase performance if sufficient memory is available.
AIOBUFFERS	5	CONVERTTHREADS + 4 or 2*CONVERTTHREADS, whichever is larger

## **Performance Hints**

In general, the performance of the HPL depends on the underlying hardware resources: CPU, memory, disks, tapes, controllers, and so on. Any of these resources could be a bottleneck, depending on the speed of the resource, the load on the resource, and the particular nature of the load or unload.

For example, load and unload jobs that perform no conversions consume minimal CPU resources. These jobs are thus likely to be limited by device or controller bandwidth. On the other hand, ASCII loads and unloads are CPU intensive because of the overhead of conversion to and from ASCII. This section discusses some topics that you should consider when you try to improve performance.



### ***Choose an Efficient Format***

When you load data to or unload data from a non-Informix source, you can use fixed or delimited format in an appropriate code set such as ASCII or EBCDIC. In general, ASCII loads and unloads are the fastest. If you are using **onpload** for a machine or schema reorganization, choose the no-conversion format.

Delimited and fixed ASCII formats are comparable in behavior except when VARCHAR data is present. If the schema contains VARCHAR data and the length of the VARCHAR data varies greatly, you might want to choose delimited format.

### ***Ensure Enough Converter Threads and VPs***

As mentioned earlier, loads and unloads other than raw and fast-format ones are likely to be CPU intensive due to conversion overhead. In such cases, conversion speed is likely to determine the load or unload speed. It is thus important to use sufficient conversion resources (that is, enough converter threads and VPs).

The number of converter threads that is required for a device depends on the relative speeds of the device and the CPU as well as the data types in the table being loaded or unloaded. CHAR and VARCHAR formats are the cheapest to convert. INT, DATE, SMFLOAT, and FLOAT are more expensive. DECIMAL and MONEY are among the most expensive formats to convert.

The **\$PLCONFIG** file specifies the number of converter threads per device. You can override this value on the **onpload** command line with the **-M** option.

The number of converter VPs should be based on the conversion intensity of the load or unload and the number of physical CPUs on the computer. If the load or unload is expected to be convert intensive, you might want to specify the number of convert VPs to be the number of physical CPUs (or one fewer) to take advantage of all of the available CPUs. You can set the number of converter VPs in the **onpload** configuration file.

The database server and **onpload** client VPs might both be competing for the same physical CPU resources. To reduce contention, run only the number of VPs that are necessary on both the database server and **onpload** sides. However, if the number of database server VPs is already specified, you might have a choice only in the number of **onpload** VPs. In this case, the suggestions in the previous paragraph apply.

Too few converter threads and VPs can make conversion a bottleneck. On the other hand, too many converter threads can waste time in scheduling threads in and out of the VPs. In general, more than ten converter threads per VP is too many.

### ***Ensure Enough Buffers of Adequate Size***

The **onpload** utility lets you set the size and number of AIO and stream buffers in the **plconfig** configuration file. For adequate performance, you should provide at least two (preferably three) AIO and stream buffers per converter thread. The size of AIO buffers should be at least as large as the device block size, and the size of the stream buffers should be large (32 or 64 kilobytes), as the following table illustrates.

Configuration Parameter	Size	Comment
STRMBUFFSIZE	64	Should be some multiple of AIOBUFSIZE for best performance
STRMBUFFERS	2 * CONVERTTHREADS	
AIOBUFSIZE	64	
AIOBUFFERS	2 * CONVERTTHREADS	

### ***Increase the Commit Interval***

In deluxe mode, the commit interval (see [“The Load Options Window” on page 12-14](#)) specifies the number of records that should be loaded before the transaction is committed. Low values (frequent commits) degrade performance and high values improve performance. If you increase the commit interval, you might need to increase the size of your logical-log buffers.

While larger commit intervals can speed up loads, larger commit intervals require larger logical-log space and increase the checkpoint time. These side effects might impact other system users during **onpload** operations.



---

# The onpload Utility

Understanding the onpload Utility . . . . .	16-3
Starting the onpload Utility . . . . .	16-3
Using the onpload Utility . . . . .	16-4
Syntax . . . . .	16-4



# T

his chapter describes the syntax of the **onpload** utility. It includes descriptions of available options as well as descriptions of methods you can use to invoke **onpload**.

---

## Understanding the onpload Utility

After you create the **onpload** database with the **ipload** interface, the **onpload** utility allows you to perform loads and unloads directly from the command line.

The **onpload** command uniquely specifies a row in the **session** table in the **onpload** database. Each row in the **session** table specifies all the components and options that are associated with a job.

## Starting the onpload Utility

You can start **onpload** from the command line or from the **ipload** utility. When you click **Run** in the Load Job window ([Figure 12-2 on page 12-9](#)) or in the Unload Job window ([Figure 11-2 on page 11-7](#)), **ipload** starts **onpload** using information from the **onpload** database.

Typically, you use **ipload** to start a job when you plan to perform that particular load or unload once. For a job that needs to be run periodically, such as a weekly report, you might choose to run the job from the command line.

The information that you give to **onpload** as command-line arguments takes precedence over any information that is in the **onpload** database. The information from the command-line arguments is effective only for a single load. The command-line arguments do not affect the values in the **onpload** database or in the PLCONFIG configuration file.

## Using the onpload Utility

In most cases, use the Load Job window (page 12-9) or Unload Job window (page 11-7) to prepare the load or unload job. After you prepare the job, the **Command Line** text box on the Load Job Select window (page 12-8) or the Unload Job Select window (page 11-6) shows you the command line that **onpload** prepared for the job. You can copy that command line and use it to run the job at a later time. You can also use the command-line options shown in this chapter to modify the basic command line that **onpload** prepared.

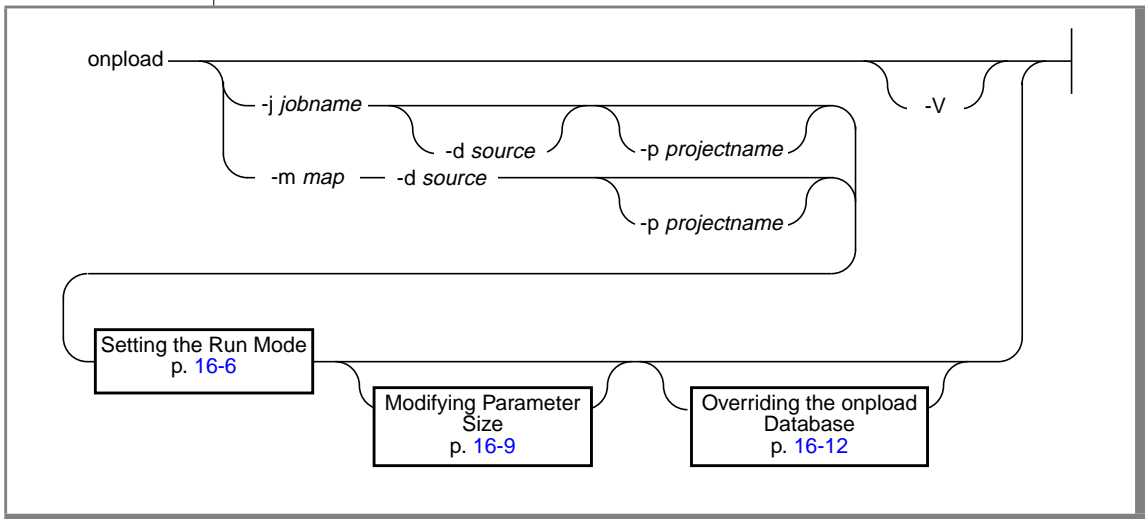


***Tip:** You can display a command-line listing of all **onpload** options and their functions by entering **onpload** at the command line with no options.*

The following sections give additional information about the syntax and individual options of the **onpload** utility.

---

## Syntax





Element	Purpose	Key Considerations
<b>-V</b>	Displays the current version number and the software serial number.	<b>Restrictions:</b> This option is available only from the command line.
<b>-d source</b>	Sets the pathname of the file, tape, or pipe or the name of the device array to use for the load or unload session.	<b>Additional Information:</b> If the <b>-f</b> option is not set to <b>a</b> , <b>d</b> , or <b>p</b> , <b>onpload</b> assumes that the data source is a file. <b>Additional Information:</b> To use <b>ipload</b> , see <a href="#">“Interpreting the -d and -f Options Together” on page 16-8.</a>
<b>-j jobname</b>	Names a load or unload job from the <b>onpload</b> database.	<b>Additional Information:</b> To set using <b>ipload</b> , see <a href="#">“Components of the Unload Job” on page 11-3</a> and <a href="#">“Components of the Load Job” on page 12-3.</a>
<b>-m map</b>	Names a map from the <b>onpload</b> database.	<b>Additional Information:</b> To use <b>ipload</b> , see <a href="#">“Using a Map” on page 9-3.</a>
<b>-p projectname</b>	Identifies the project where the format and map are stored.	<b>Additional Information:</b> To use <b>ipload</b> , see <a href="#">“The Project Organization” on page 4-3.</a>

For example, you might use the Load Job window to prepare the following command:

```
onpload -p zz -j bigload -fl
```

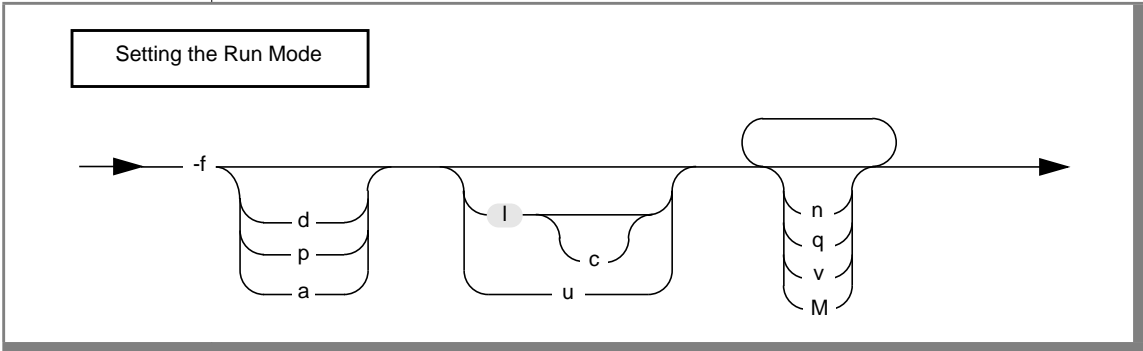
If you receive a tape that you know contains data with bugs, you might choose to modify the command to allow errors and to save the log in a special place, as follows:

```
onpload -p zz -j bigload -fl -e 1000 -l /mylogs/buggytape.log
```

For information on the **-fl** option, see [“Setting the Run Mode with the -f Option” on page 16-6.](#)

## Setting the Run Mode with the -f Option

The **-f** option lets you set the type of source data and the type of mode. Possible modes are as follows: deluxe load, express load, or unload.



Element	Purpose	Key Considerations
<b>M</b>	Displays the program module or line number in messages.	<b>Restrictions:</b> This flag is available only from the command line. <b>Additional Information:</b> This flag is used for debugging.
<b>a</b>	Treats data source as a device-array.	<b>Additional Information:</b> The definition of the device array is extracted from the <b>onpload</b> database. To use <b>ipload</b> , see <a href="#">“Device Arrays” on page 6-3</a> .
<b>c</b>	Sets mode to deluxe mode.	<b>Additional Information:</b> If this flag is not set, <b>onpload</b> uses express mode. To use <b>ipload</b> , see <a href="#">“Modes” on page 15-3</a> .
<b>d</b>	Treats data source as a device (tape or file).	<b>Additional Information:</b> To set using <b>ipload</b> , see <a href="#">“Device Arrays” on page 6-3</a> .
<b>l</b>	Loads data into database.	<b>Additional Information:</b> This is the default flag, as opposed to <b>u</b> , which unloads data from database. To use <b>ipload</b> , see <a href="#">“Components of the Load Job” on page 12-3</a> .
<b>n</b>	Specifies that <b>onpload</b> does not need to perform data conversion.	<b>Restrictions:</b> The target table for the load must have the same schema as the table from which the data is extracted. <b>Additional Information:</b> If <b>onpload</b> generated the input data file as an Informix format data file, you do not need to perform data conversion when you reload data. To use <b>ipload</b> , see <a href="#">“Using the No Conversion Job Option” on page 13-14</a> .

Element	Purpose	Key Considerations
<b>p</b>	Treats data source as a program to execute and reads interface to the program by way of a pipe.	<b>Additional Information:</b> To use <b>ipload</b> , see <a href="#">“Device Arrays” on page 6-3</a> .
<b>q</b>	Tells <b>onpload</b> not to generate status messages while a job is running.	None.
<b>u</b>	Unloads data from database.	<b>Additional Information:</b> If this flag is not set, <b>onpload</b> loads data into the database. To use <b>ipload</b> , see <a href="#">“Components of the Unload Job” on page 11-3</a> .
<b>v</b>	Tells <b>onpload</b> not to generate violations records.	<b>Restrictions:</b> This flag is available only from the command line.

(2 of 2)

### *Typing the -f Flags*

When you combine **-f** flags into one group, do not put spaces between the flags. For example, use **-f acq**.

If you prefer, you can use multiple occurrences of the **-f** option instead of combining all of the possible **-f** flags into one group. For example, the following two command lines are equivalent:

```
onpload -m mymap -d mydev -flnc
```

```
onpload -m mymap -d mydev -fl -fn -fc
```

### *Interpreting the -d and -f Options Together*

The argument of the **-d** option gives the name of the data source. You can specify the device type of the data source with flags of the **-f** option, as follows:

- If the command line does not specify a device type, **onpload** treats the data source as the pathname of a cooked file on disk. Because no device type is specified, the following **onpload** command treats **filename** as the name of a file:

```
onpload -d filename -m mapname
```

- The **-fd** in the following command causes **onpload** to treat **/dev/rmt/rst11** as the name of a tape device:

```
onpload -d /dev/rmt/rst11 -m mapname -fd
```

- The **-fa** in the following command causes **onpload** to treat **tapearray3** as the name of a device array. The device array is described in the **onpload** database.

```
onpload -d tapearray3 -m mapname -fa
```

- The **-fp** in the following command causes **onpload** to treat **apipename** as the name of a pipe. When **onpload** starts executing, it causes the pipe process to start executing.

```
onpload -d apipename -m mapname -fp
```

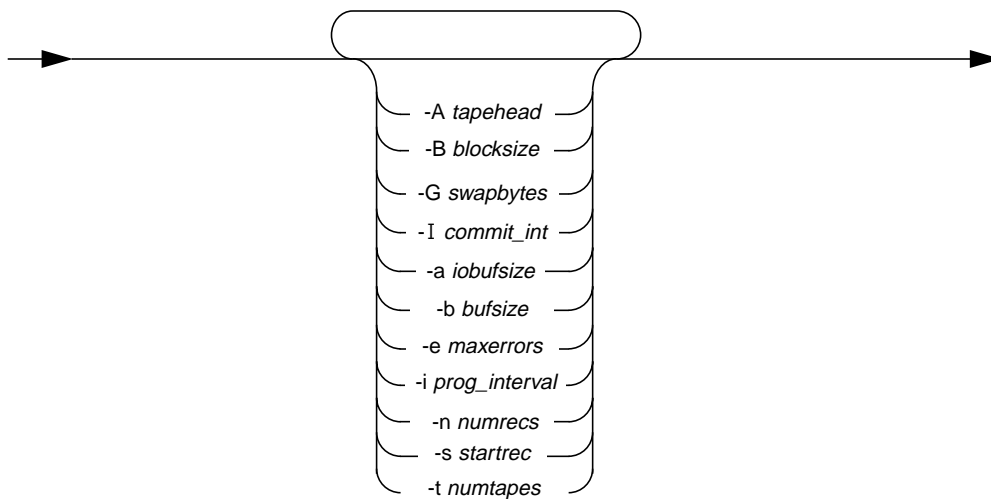
The same semantics apply for an unload job. If you use the **u** flag of the **-f** option to indicate an unload job, the interpretation of the data-source name is as described previously. For example, the following command specifies that **onpload** should unload data to the device **/dev/rmt/rst11**:

```
onpload -d /dev/rmt/rst11 -m mapname -fdu
```

## Modifying Parameter Size

The options that are described in this section let you enter size information that overrides existing parameters in the **onpload** database.

Modifying Parameter Size



Element	Purpose	Key Considerations
<b>-A</b> <i>tapehead</i>	Tells <b>onpload</b> to skip the specified number of bytes on the tape before it starts reading data records.	<b>Restrictions:</b> This option is available only from the command line. <b>References:</b> For specific details on this option, see <a href="#">“The session Table” on page A-15.</a>
<b>-B</b> <i>blocksize</i>	Sets the tape I/O block size (bytes).	<b>Additional Information:</b> If the data source is a device array, this setting is ignored. To use <b>ipload</b> , see <a href="#">“The Tape Parameters Group” on page 6-7.</a>
<b>-G</b> <i>swapbytes</i>	Sets the number of bytes in a swap group.	<b>Restrictions:</b> This option is available only from the command line. <b>Additional Information:</b> This option globally reverses the byte order in the input data stream. Each group of bytes is swapped with the group of bytes that follows it.
<b>-I</b> <i>commit_int</i>	Sets the number of records to process before doing a commit.	<b>Restrictions:</b> This option applies only to deluxe mode. <b>Additional Information:</b> To use <b>ipload</b> , see <a href="#">“The Load Options Window” on page 12-14.</a>
<b>-a</b> <i>iobufsize</i>	Sets the size (kilobytes) of the asynchronous I/O buffers, the memory buffers used to transfer data to and from tapes and files.	<b>Restrictions:</b> This option is available only from the command line. <b>Additional Information:</b> This value overrides the value (AIOBUFSIZE) set in the HPL configuration file ( <b>plconfig</b> ). <b>References:</b> For specific details on this option, see <a href="#">“AIOBUFSIZE” on page B-3.</a>
<b>-b</b> <i>bufsize</i>	Sets the size (kilobytes) of the server stream buffer, the memory buffer used to write records to the database.	<b>Restrictions:</b> This option is available only from the command line. <b>Additional Information:</b> Larger buffers result in more efficient data exchange with the database. This value overrides the value (STRMBUFSIZE) set in the HPL configuration file ( <b>plconfig</b> ). <b>References:</b> For specific details on this option, see <a href="#">“STRMBUFSIZE” on page B-5.</a>
<b>-e</b> <i>maxerrors</i>	Sets the error threshold that causes the load/unload session to shut down.	<b>Additional Information:</b> If no number is specified, the default is to process all records. To use <b>ipload</b> , see <a href="#">“The Load Options Window” on page 12-14.</a>

Element	Purpose	Key Considerations
<b>-i</b> <i>prog_interval</i>	Sets the number of records to process before making an entry in the log file specified by the <b>-l</b> option.	<b>Restrictions:</b> This option is available only from the command line. <b>Additional Information:</b> If no log file is specified, progress messages are sent to <b>stdout</b> . If the <b>-i</b> option is omitted, the default number is 1000. To set, see “Using the <b>-i</b> Option.”
<b>-n</b> <i>numrecs</i>	Sets the number of records to load.	<b>Additional Information:</b> If no number is specified, all records are processed. <i>The <b>-n</b> option does not affect unload operations.</i> To use <b>ipload</b> , see “The Load Options Window” on page 12-14.
<b>-s</b> <i>startrec</i>	Sets the starting record to load.	<b>Additional Information:</b> This option is used to skip records. If you do not set this option, the load starts with the first record. <i>The <b>-s</b> option does not affect unload operations.</i> To use <b>ipload</b> , see “The Load Options Window” on page 12-14.
<b>-t</b> <i>numtapes</i>	Specifies the number of tapes to load.	<b>Additional Information:</b> If you do not set this option, the default value is 1. To use <b>ipload</b> , see “The Load Options Window” on page 12-14.

### Using the **-i** Option

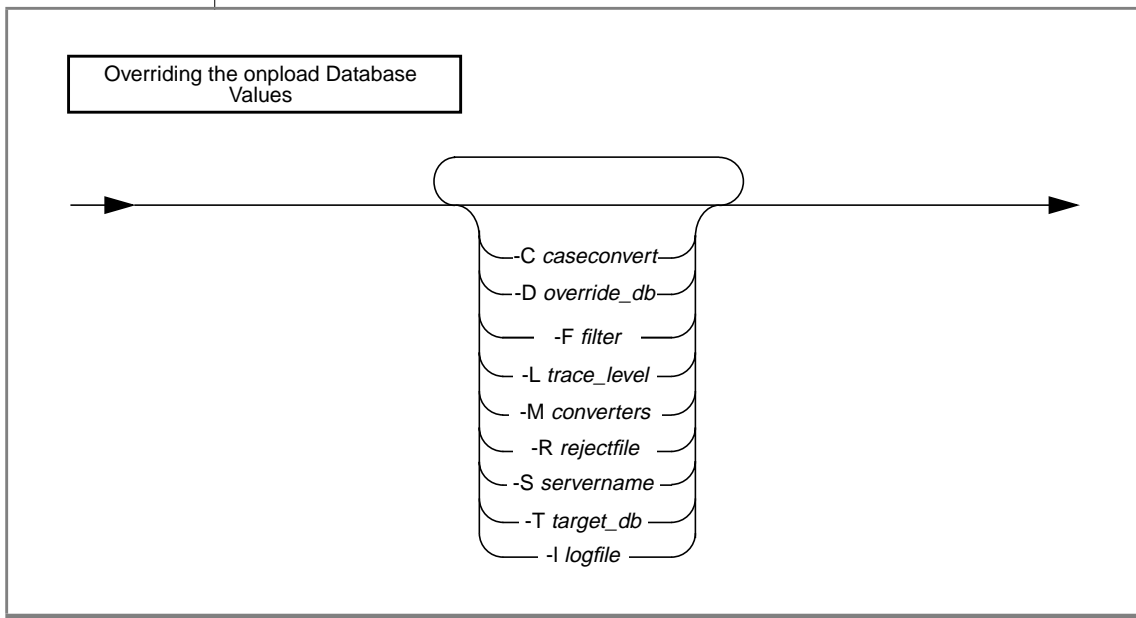
The **-i** option lets you specify the number of records to process before **onpload** reports the progress in an entry in the log file. The **onpload** utility calculates progress message count as follows:

$$\text{row\_count} = (\text{total\_rows} / \text{prog\_interval}) * \text{prog\_interval}$$

The **onpload** utility updates the row count only once for each stream buffer of data that it processes. Thus, reducing the row count on the **-i** option does not necessarily increase the number of progress messages in the log file. For example, if the stream buffer holds 910 rows of data, setting *row\_count* to 10, 100, and 900 has the same effect: **onpload** writes one progress message.

## Overriding the onpload Database Values

The options that are described in this section let you enter size information that overrides existing parameters in the **onpload** database.





Element	Purpose	Key Considerations
<b>-C</b> <i>caseconvert</i>	Sets the case-conversion option that converts all character information.	<p><b>Additional Information:</b> If you do not set this option, no case conversion is done. Possible flags include:</p> <ul style="list-style-type: none"> <li>U or u= uppercase</li> <li>L or l= lowercase</li> <li>P or p= proper names</li> <li><i>blank</i> = no conversion</li> </ul> <p>To use <b>ipload</b>, see <a href="#">“The Mapping Options Window” on page 9-15.</a></p>
<b>-D</b> <i>override_db</i>	Overrides the database specified in the map used for the load.	<p><b>Additional Information:</b> To use <b>ipload</b>, see <a href="#">“The Load Record Maps Window” on page 9-7.</a></p>
<b>-F</b> <i>filter</i>	Identifies the filter that <b>onpload</b> uses for screening load records.	<p><b>Additional Information:</b> To use <b>ipload</b>, see <a href="#">“Using a Filter” on page 10-3.</a></p>
<b>-L</b> <i>trace_level</i>	Sets the amount of information logged during the load.	<p><b>Restrictions:</b> This option is available only from the command line. The value of <i>trace_level</i> must be an integer from 1 to 5.</p> <p><b>Additional Information:</b> The default value is 1. Higher values result in more output. Do not use this option unless you are doing serious debugging.</p>
<b>-M</b> <i>converters</i>	Sets the maximum number of conversion threads per device.	<p><b>Restrictions:</b> This option is available only from the command line.</p> <p><b>Additional Information:</b> This value overrides the value of CONVERTTHREADS set in the HPL configuration file (<b>plconfig</b>). If the value for <i>converters</i> is greater than 1, <b>onpload</b> can dynamically allocate more conversion threads as needed to process data.</p> <p><b>References:</b> For specific details on this option, see <a href="#">“CONVERTVPS” on page B-4.</a></p>
<b>-R</b> <i>rejectfile</i>	Identifies the file destination for rejected records.	<p><b>Additional Information:</b> The file is named <i>rejectfile.rej</i>. To use <b>ipload</b>, see <a href="#">“The Load Job Window” on page 12-9</a></p>

(1 of 2)

Element	Purpose	Key Considerations
<b>-S</b> <i>servername</i>	Sets the <b>onpload</b> database server.	<b>Additional Information:</b> To use <b>ipload</b> , see <a href="#">“The Connect Server Window” on page 5-4.</a>
<b>-T</b> <i>target_db</i>	Sets the target database server.	<b>Additional Information:</b> To use <b>ipload</b> , see <a href="#">“The Connect Server Window” on page 5-4.</a>
<b>-l</b> <i>logfile</i>	Specifies the name of a file to which <b>onpload</b> sends messages.	<b>Additional Information:</b> If you do not specify a log file, <b>onpload</b> sends messages to <b>stdout</b> . To use <b>ipload</b> , see <a href="#">“The Unload Job Window” on page 11-7</a> and <a href="#">“The Load Job Window” on page 12-9.</a>

---

# The onpload Database

The tables in the **onpload** database hold information that the **onpload** utility uses. This appendix describes the tables in the **onpload** database that you create or modify with **ipload**.

When you start the **ipload** utility, the utility looks for a database named **onpload** on the database server that your **INFORMIXSERVER** environment variable specifies. If the **onpload** database is not present, **ipload** creates an **onpload** database as a non-ANSI database.

When **ipload** creates a new **onpload** database, it populates some of the tables in the database with default values. You can use DB-Access to *examine* the values in the tables. However, Informix strongly recommends that you always use **ipload** to *change* the **onpload** database.

---

## The defaults Table

The **defaults** table contains default values that the HPL uses. When **ipload** creates the **onpload** database, it inserts a single row into this table. This row specifies the default configuration assumptions for the database server, the type of computer, and the data code set.

---

Column	Type	Description
node	CHAR(18)	The name of a database server
machine	CHAR(18)	Specifies the default machine type (foreign key to the <b>machines</b> table)
datatype	CHAR(18)	The code set of the data file
dbgl	CHAR(18)	Reserved Used previously for the code set of the target database

---

You can specify a set of defaults for each database server. If this table does not contain an entry for a database server, the database uses the defaults that the record named **default** specifies.

Use the Defaults window to modify this table. Refer to [“Modifying the onpload Defaults” on page 5-5](#).

---

## The delimiters Table

The **ipload** utility uses the values in the **delimiters** table to display the field-delimiter values shown in the Delimiter Options window (see [page 7-25](#)). When **ipload** creates the **onpload** database, it inserts values into this table. The values in the **delimiters** table are for reference and do not change. Refer to [“Modifying Delimited Format Options” on page 7-24](#).

---

Column	Type	Description
hex	CHAR(2)	Hexadecimal representation of the delimiter
octal	CHAR(4)	Octal representation of the delimiter
ascii	CHAR(15)	ASCII characters (printable) that form the delimiter
control	CHAR(10)	Control character sequence that generates the delimiter

---



---

## The device Table

The **device** table defines the elements of a device array. Use the device array definition window to modify this table. Refer to [“Using the Device-Array Definition Window” on page 6-6](#).

---

Column	Type	Description
name	CHAR(18)	Name of the device array described in this row (primary key)
seq	INTEGER	Device number within the device array (primary key)
type	CHAR(5)	Device type (pipe, file, or tape)
file	CHAR(128)	File or device to be accessed by this array element
blocksize	INTEGER	I/O blocksize (tape devices only)
devicesize	INTEGER	Capacity of device (tape devices only)

---

(1 of 2)

Column	Type	Description
pipecommand	CHAR(128)	The pipe command to invoke when <b>onpload</b> starts to access to the device element
lockflag	CHAR(1)	Flag for locking mechanism that <b>ipload</b> uses
header	TEXT	The tape header for a device that DDR uses

(2 of 2)

## The driver Table

The *onpload* utility uses different set routines, called *drivers*, to handle different file formats. For example, the delimited driver handles delimited file formats. The routines in a driver process data unloaded from or loaded into the data file. The **onpload** utility includes drivers for widely used data-file formats. You can prepare additional, custom drivers for other formats and bind them into the **onpload** shared library. The set of available drivers is stored in the **driver** table.

Column	Type	Description
drivername	CHAR(18)	Name of driver (primary key)
drvertype	CHAR(1)	Data-file format: Fixed, Delimited, COBOL

You can use the tools that [Appendix F](#) describes to build custom drivers. A custom driver takes data from a file and constructs input for **onpload** that is in a format that **onpload** recognizes (Fixed, Delimited, COBOL).

To add custom drivers to the **driver** table, refer to [“The Drivers Window” on page 5-8](#).

---

## The filteritem Table

The **filteritem** table defines the conditions to be applied to load data to filter out records. Each filter item is attached to a particular field of a record in a data file. Use the filter options to modify this table. Refer to [“Creating a Filter” on page 10-5](#).

Column	Type	Description
formid	INTEGER	Filter identifier (foreign key to the <b>filters</b> table)
seq	INTEGER	Specifies the order in which the filter items (the match expression) are applied
fname	CHAR(18)	The name of the field that this filter affects
option	CHAR(7)	Specifies the disposition of a record (discard or keep) when the match criterion is true
match	CHAR(60)	Match expression that is applied to data field

---

## The filters Table

The **filters** table assigns a unique number to each group of filter items that together form a filter. Each filter is associated with a project and a format definition. Use the filter-definition window to create or modify a filter. Refer to [“The Filter-Definition Window” on page 10-6](#).

Column	Type	Description
formid	SERIAL	Filter identifier (primary key)
projectid	INTEGER	Project with which this filter is associated (foreign key to the <b>project</b> table)

---

(1 of 2)

Column	Type	Description
formatid	INTEGER	Format identifier of the format definition to which this filter applies (foreign key to the <b>formats</b> table)
name	CHAR(18)	The name of the filter
lockflag	CHAR(1)	Flag for locking mechanism used by <b>ipload</b>

(2 of 2)

## The formatitem Table

The **formatitem** table defines the data-file records. Each field of a data file is described by an entry in this table. Use the Records Format window to prepare the record formats. [Figure A-1 on page A-7](#) lists the possible values for the **ftype** column. Refer to “[A Completed Fixed Format Definition Window with an Open Selection List](#)” on page 7-6.

Column	Type	Description
formid	INTEGER	Record format identifier (foreign key to the <b>formats</b> table)
seq	INTEGER	Item sequence number for internal organization
fname	CHAR(18)	Name of record field
ftype	INTEGER	A number that indicates the type of data in the field ( <a href="#">Figure A-1</a> show the possible values for <b>ftype</b> .)
bytes	INTEGER	Number of bytes in field
decimals	INTEGER	Number of decimal values to format when converting to ASCII
offset	INTEGER	Offset in record image where field starts
qual	INTEGER	Informix DATETIME/INTERVAL qualifier
picture	CHAR(15)	COBOL picture definition



**Figure A-1**  
Possible Values for the ftype Column

<b>ftype Value</b>	<b>Type of Data</b>	<b>ftype Value</b>	<b>Type of Data</b>
1	Character (fixed and delimited)	23	Comp-4
2	Date	24	Comp-5
3	Short integer	25	Comp-6
4	Integer	26	Comp-X
5	Long Integer	27	Comp-N
6	Floating-point vale	28	Character (COBOL)
7	Double floating-point value	34	Simple LO Length
8	Unsigned short integer	35	Simple LO File
9	Unsigned integer	36	Simple LO HexASCII
10	Unsigned long integer	37	Simple LO Text
11	UNIX date	39	Int8
18	Packed Decimal	42	Ext Type String
19	Zoned decimal	43	Ext Type HexASCII
20	Comp-1	44	Ext Type Binary
21	Comp-2	45	Ext Type StringLength
22	Comp-3	46	Ext Type BinaryLength

## The formats Table

The **formats** table defines the basic information for a record format. Use the Records Format window to modify this table. Refer to [“The Record Formats Window” on page 7-5](#).

Column	Type	Description
formid	SERIAL	Unique format identifier (primary key)
projectid	INTEGER	Project to which the format is assigned (foreign key to the <b>project</b> table)
name	CHAR(18)	Name of format
type	CHAR(10)	Data-file format: Fixed, Delimited, COBOL
driver	CHAR(18)	Driver to use to access data records
machine	CHAR(18)	Machine name that defines binary-data parameters (foreign key to the <b>machinename</b> column of the <b>machines</b> table)
datatype	CHAR(18)	Character code set to use for conversion of data records
recordlength	INTEGER	Length in bytes of a fixed-format record
recordstrt	CHAR(15)	Record-start sequence for delimited format
recordstrty	CHAR(10)	Type of the record-start sequence: Hex, Octal, ASCII, or Decimal
recordend	CHAR(15)	Record-end sequence for delimited format
recordendt	CHAR(10)	Type of the record-end sequence: Hex, Octal, ASCII, or Decimal
fieldsep	CHAR(15)	Field-separator sequence for delimited format
fieldsept	CHAR(10)	Type of the field-separator sequence: Hex, Octal, ASCII, or Decimal
fieldstrt	CHAR(15)	Field-start sequence for delimited format

(1 of 2)

Column	Type	Description
fieldstrty	CHAR(10)	Type of the field-start sequence: Hex, Octal, ASCII, or Decimal
fieldend	CHAR(15)	Field-end sequence for delimited format
fieldendt	CHAR(10)	Record-end sequence separator type: Hex, Octal, ASCII, or Decimal
lockflag	CHAR(1)	Flag for locking mechanism that <b>ipload</b> uses

(2 of 2)

## The language Table

The **onpload** utility does not use the **language** table at this time.

## The machines Table

The **machines** table defines the binary type sizes and byte order for different computers. The HPL uses this information when you transfer binary data. When **ipload** creates the **onpload** database, it inserts definitions for several different types of computers into this table.

To transfer binary data to or from a computer that is not described in this table, you can create a new machine definition using the Machines window. Refer to [“The Drivers Window” on page 5-8](#).

Column	Type	Description
machinename	CHAR(18)	Computer name or type (primary key)
byteorder	CHAR(3)	Binary byte ordering: LSB or MSB
shortsize	INTEGER	Size of a short integer
intsize	INTEGER	Size of an integer

(1 of 2)

Column	Type	Description
longsize	INTEGER	Size of a long integer
floatsize	INTEGER	Size of a float value
doublesize	INTEGER	Size of a double value

(2 of 2)

## The mapitem Table

The **mapitem** table defines the relationship between the columns of a database table and the record fields of a data file. The table stores pairs of column/record entries. The map options modify this table. Refer to “[Maps](#)” on page 9-3.

Column	Type	Description
formid	INTEGER	Specifies the map to which this record belongs (foreign key to the <b>maps</b> table)
seq	INTEGER	Unique identifier for the database-column/data file-record pair
colname	CHAR(18)	Name of database column
fname	CHAR(18)	Name of field in a data-file record

## The mapoption Table

The **mapoption** table defines conversion options for the mapping pairs that are defined in **mapitem** table. Use the Mapping Options window to modify this table. Refer to [“Using Mapping Options” on page 9-14](#).

Column	Type	Description
formid	INTEGER	Specifies the map to which this record belongs (foreign key to the <b>maps</b> table)
seq	INTEGER	The database-column/data file-record pair to which this option applies (foreign key to the <b>mapitem</b> table)
bytes	INTEGER	Maximum number of bytes to transfer from a field of a data file
minvalue	FLOAT	Minimum value allowed in field
maxvalue	FLOAT	Maximum value allowed in field
ccase	CHAR(18)	Case conversion option: None, Lower, Upper, Proper Noun
justify	CHAR(18)	String justification to perform: None, Left, Right, Center
fill	CHAR(1)	Fill character for string padding
picture	CHAR(55)	Picture mask to apply to target data
coloffset	INTEGER	Offset in column at which to start data transfer
recoffset	INTEGER	Offset in record field from which to start data extract
function	CHAR(55)	Custom function to call
looktable	CHAR(18)	Not in use
matchcol	CHAR(18)	Not in use
coldefault	CHAR(18)	Default value to set on column: ASCII HEX or ASCII binary

(1 of 2)

Column	Type	Description
inputcode	CHAR(18)	Format in which the simple LO is stored in the data file: ASCII HEX or ASCII binary
storecode	CHAR(18)	Format in which to store the simple LO
blobcolumn	CHAR(18)	The column that contains the name of the file where the simple LO is stored

(2 of 2)

If the values of **inputcode** and **storecode** are different, **onpload** converts the contents of the simple LO.

## The maps Table

The **maps** table defines record-to-table mappings (for loads) and query-to-record mappings (for unloads). Use the map options to modify this table. Refer to [“Maps” on page 9-3](#).

Column	Type	Description
projectid	INTEGER	Project to which this map is assigned (foreign key to the <b>project</b> table)
formid	SERIAL	Unique identifier for map (primary key)
name	CHAR(18)	Name of map
type	CHAR(6)	Specifies whether the map is a load or unload map; possible values include: <ul style="list-style-type: none"> <li>■ Record (load map)</li> <li>■ Query (unload map)</li> </ul>
dbname	CHAR(30)	Name of load or unload database
qtable	CHAR(27)	Name of table to be loaded; used only for loads

(1 of 2)

Column	Type	Description
query	CHAR(18)	Name of query; used only for unloads
formatid	INTEGER	Identifier of the format that this map uses (foreign key to the <b>format</b> table)
lockflag	CHAR(1)	Flag for locking mechanism that <b>ipload</b> uses

(2 of 2)

## The note Table

The **note** table holds comments that you can store about the components that are used for loads and unloads. You can store notes about all of the **onpload** components: projects, devices, formats, maps, queries, filters, and load and unload jobs. For information about creating a note, refer to [“The Notes Button” on page 3-26](#).

Column	Type	Description
type	CHAR(18)	Specifies the type of component to which this note is attached
formid	INTEGER	Corresponds to the <b>formid</b> of the component specified in the <b>type</b> column (The two columns together uniquely identify the component to which the note is attached.)
projectid	INTEGER	ID of project to which this note belongs (foreign key to the <b>project</b> table)
createdate	DATE	Date that the note was created
modifydate	DATE	Date that the note was last modified
note	TEXT	Text of the note

---

## The project Table

The **project** table lists the projects in this **onpload** database. Use the Project window to modify this table. Refer to [“The Project Organization” on page 4-3](#).

---

Column	Type	Description
name	CHAR(18)	Name of object
projectid	SERIAL	Uniquely identifies the project (primary key)
dcreate	DATE	Date that the project was created

---

---

## The query Table

The **query** table stores the queries that are used for unloading data from an Informix database. Use the query-definition window to modify this table. Refer to [“Creating a Query” on page 8-4](#).

---

Column	Type	Description
formid	SERIAL	Unique number that identifies this query (primary key)
projectid	INTEGER	Number of the project that includes this query (foreign key to the <b>projects</b> table)
name	CHAR(18)	Name of the query
database	CHAR(30)	Name of database being queried
arrayname	CHAR(18)	Not in use
lockflag	CHAR(1)	Flag for locking mechanism that <b>ipload</b> uses
sqlselect	TEXT	SQL statement of the query

---



## The session Table

The **session** table controls the parameters that **onpload** uses to invoke a load or unload job.

Column	Type	Description
sessiontype	CHAR(1)	Describes the type of load or unload session: U = Job is driven by the user interface. N = Job expects a socket interface and is removed when the job is finished. S = Job is run from the command line.
automate	CHAR(1)	Flag for automatically creating maps and formats at runtime: Y = Create automatically. blank = Do not create.
lockflag	CHAR(1)	Flag for locking mechanism that <b>ipload</b> uses
sessionid	SERIAL	Session identifier (primary key)
name	CHAR(20)	Name of the load or unload job. This name appears in the command line displayed in the Load Job Select or Unload Job Select window.
status	CHAR(1)	Job status: R = running C = connecting S = starting blank = Job is complete.
server	CHAR(40)	Override default server to load and unload
map	CHAR(18)	Name of the map that controls the load (foreign key to the <b>name</b> column of the <b>maps</b> table; the <b>maps</b> table specifies the format and, for unload jobs, the query)
infile	CHAR(160)	Name of the device array (foreign key to the <b>name</b> column of the <b>device</b> table)

(1 of 3)

Column	Type	Description
hostname	CHAR(40)	Name of the computer on which the <b>onpload</b> utility is running
dbname	CHAR(30)	Name of database to be loaded or unloaded
filter	CHAR(18)	Filter for screening import data (foreign key to the <b>name</b> column of the <b>filters</b> table)
recordfilter	CHAR(80)	File in which to store filtered records
suspensefile	CHAR(80)	File in which to store records that do not pass conversion
rejectfile	CHAR(80)	File in which to place records that the database server rejected
logfile	CHAR(80)	File in which to place session status messages
projectid	INTEGER	Project for maps and formats (foreign key to the <b>project</b> table)
headersize	INTEGER	Size in bytes of header information to strip from input
quiet	INTEGER	If true, suppresses status message output
tracelevel	INTEGER	Higher values result in more status messages
sourctrace	INTEGER	If true, source and module line numbers are placed in status message outputs
multithread	INTEGER	Sets the maximum number of conversion threads that you can invoke on a device
blocksize	INTEGER	I/O blocksize for accessing device
filetype	INTEGER	Specifies the type of file: tape, array, pipe
number_records	INTEGER	Specifies the number of records to load
start_record	INTEGER	Specifies the number of the record at which to start loading
maxerrors	INTEGER	Maximum number of errors to allow before aborting the load or unload

(2 of 3)

Column	Type	Description
swapbytes	INTEGER	Specifies the number of bytes to swap (If <i>swapbytes</i> is 4, the first 4 bytes are swapped with the next 4 bytes. If blank, bytes are not swapped.)
runmode	INTEGER	1 = Deluxe mode, no conversion 2 = Express mode, no conversion 5 = Deluxe mode, with conversion 6 = Express mode, with conversion
loadmode	INTEGER	Type of job: 1 = load; 2 = unload
caseconvert	INTEGER	Case conversion type. Convert to: U or u = uppercase L or l = lowercase P or p = proppernames
commitinterval	INTEGER	Commit interval for committing a load transaction (The value is specified in the Load Options window, page 12-14. The commit interval applies only to deluxe mode.)
socketport	INTEGER	Set by <b>onpload</b> to specify the port number of the connection
numtapes	INTEGER	Number of tapes to load

(3 of 3)



---

# The High-Performance Loader Configuration File

The default `$INFORMIXDIR/etc/plconfig.std` file is the *high-performance loader configuration file*. The file is similar to the `$INFORMIXDIR/etc/SONCONFIG` file. The `plconfig.std` file sets various **onpload** buffer and system configuration parameters. You can modify the parameters to maximize resource utilization.

The `PLCONFIG` environment variable specifies an alternative name for the HPL configuration file. This file must reside in the `$INFORMIXDIR/etc` directory. If you do not set the `PLCONFIG` environment variable, the default name of the file is `plconfig.std`.

---

## Configuration Parameter Descriptions

The description of each parameter has one or more of the following fields (depending on their relevance):

<i>default value</i>	The value that appears in the <code>plconfig.std</code> file unless you explicitly change it
<i>units</i>	The units in which the parameter is expressed
<i>range of values</i>	The possible values for this parameter
<i>refer to</i>	Cross-reference to further discussion

---

## File Conventions

Each parameter in the `$INFORMIXDIR/etc/plconfig.std` file is on a separate line. The file can also contain blank lines and comment lines that start with a `#` symbol. The syntax of a parameter line is as follows:

```
PARAMETER_NAME parameter_value# optional comment
```

Parameters and their values are case sensitive. The parameter names are always all uppercase letters. If the parameter-value entry is described with uppercase letters, you must use uppercase. You must put white space (tabs or spaces or both) between the parameter name, parameter value, and optional comment. Do not use any tabs or spaces within a parameter value.

---

## AIOBUFFERS

<i>default value</i>	Maximum of (4, CONVERTTHREADS)
<i>recommended value</i>	Maximum of (4, 2*CONVERTTHREADS)
<i>range of values</i>	Integer value $\geq 4$
<i>refer to</i>	<a href="#">“Loading and Unloading Data” on page 15-14</a>

The AIOBUFFERS parameter sets the number of buffers used to transport data from converter threads to the AIO handler.

---

## AIOBUFSIZE

<i>default value</i>	64
<i>units</i>	Kilobytes
<i>range of values</i>	Minimum: 0.5 kilobyte (512 bytes) Maximum: depends on system resources
<i>refer to</i>	<a href="#">“Loading and Unloading Data” on page 15-14</a>

The AIOBUFSIZE parameter sets the size of the AIO memory buffers that transfer data to and from tapes and files. The HPL uses the AIO buffers to pass data between the converters and the I/O drivers.

The AIOBUFSIZE parameter is not the same as the tape-block size that you can set in the device arrays (see [page 6-7](#)). The tape-block size lets you control the size of the block that the device controller sends to the tape drive, while AIOBUFSIZE lets you control the size of internal buffers that pass data. If your computer has memory available, you can improve performance by increasing the AIOBUFSIZE parameter.

---

## CONVERTTHREADS

<i>default value</i>	1
<i>range of values</i>	Minimum: 1 Maximum: depends on computer configuration
<i>refer to</i>	<a href="#">“Loading and Unloading Data” on page 15-14</a>

The CONVERTTHREADS parameter sets the number of convert threads for each file I/O device. The convert threads run on the convert VPs.

## CONVERTVPS

If you are doing a convert-intensive job, increasing CONVERTTTHREADS can improve performance on multiple-CPU computers. For convert-intensive jobs, set CONVERTTTHREADS to 2 or 3 as a starting point for performance tuning. Except for computers with many CPUs, the useful maximum number of CONVERTTTHREADS is almost always less than 10.

The total number of convert threads that **onpload** uses is as follows:

$$\text{CONVERTTTHREADS} * \text{numdevices}$$

where *numdevices* is the number of devices in the current device array.

Having more than one converter per thread, in general, allows the conversion phase to run faster given that CPU resources are available. Conversion can be a CPU-intensive phase if complex conversions are being performed.

---

## CONVERTVPS

<i>default value</i>	Single-processor computer: 1 Multiprocessor computer: 50 percent of physical CPUs
<i>range of values</i>	From 1 to the number of physical CPUs
<i>refer to</i>	<a href="#">“Loading and Unloading Data” on page 15-14</a>

The CONVERTVPS parameter limits the maximum number of VPs used for convert threads. This parameter limits the number of VPs that the **onpload** client uses so that **onpload** does not monopolize system resources.

Setting CONVERTVPS too large can cause performance degradation. Do not set more converter VPs than there are physical CPUs. If the number of CONVERTVPS exceeds the number of physical CPUs, system resources are consumed with no performance benefit.

On single-CPU computers, increasing this parameter has a negative effect on performance.



---

## STRMBUFFERS

<i>default value</i>	Maximum of (4,2*CONVERTTHREADS)
<i>recommended value</i>	Maximum of (4,2*CONVERTTHREADS)
<i>range of values</i>	Integer $\geq 4$
<i>refer to</i>	<a href="#">“Loading and Unloading Data” on page 15-14</a>

The STRMBUFFERS parameter sets the number of server-stream buffers per device. The **onpload** utility sends data to the database server through a *server stream*. The server stream is a set of shared-memory buffers. The memory for the server-stream buffer is allocated from the memory allocated for the database server.

Each device has a separate server stream with STRMBUFFERS buffers. Thus the total number of stream buffers is as follows:

$$\text{STRMBUFFERS} * \text{numdevices}$$

where *numdevices* is the number of devices in the current array.

---

## STRMBUFSIZE

<i>default value</i>	64
<i>units</i>	Kilobytes
<i>range of values</i>	Minimum: 2 * system page size Maximum: depends on system resources
<i>refer to</i>	<a href="#">“Loading and Unloading Data” on page 15-14</a>

The STRMBUFSIZE parameter sets the size of a server-stream buffer. Larger buffers are more efficient because moving buffers around requires less overhead.



---

# Picture Strings

The HPL uses two types of picture strings, as follows:

- COBOL picture strings
- Other picture strings

COBOL picture strings describe a data field in a file that a COBOL program generates. For a discussion of COBOL picture strings, refer to [“COBOL Records” on page 7-19](#). The other picture-string type reformats and masks character data. This appendix discusses the non-COBOL picture strings.

Picture strings allow you to insert constants, strip unwanted characters, and organize the position of character data. Picture strings have three basic types: alphanumeric, numeric, and date. Each type is handled uniquely. The picture-string type is determined by the control characters that you use to specify the picture.

You specify the picture string in the **Picture** text box in the Mapping Options window. For information about the Mapping Options window, refer to [“Mapping Options” on page 9-14](#).

---

## Alphanumeric Pictures

Alphanumeric pictures control formatting of alphanumeric strings. An alphanumeric picture allows you to mix constant characters in the picture specification with the data being processed. You can also mask out unwanted character types.

When the HPL processes an alphanumeric picture, the picture string is scanned until a picture-control character is found. All noncontrol characters in the picture string are placed directly into the output string.

When a control character is found in the picture string, the input data is scanned until a character that matches the type of the picture-replacement character is found. This character is placed in the output string, and the process is repeated.

The alphanumeric picture-control characters are X, a, A, 9, and \. A picture string that includes any of the preceding characters is, by definition, an alphanumeric picture string. All other characters in an alphanumeric picture string are treated as literals and inserted directly into the resulting output string.

The following table describes the behavior of the alphanumeric picture-control characters.

---

Character	Definition
X	Replaces the control character with any character from input data.
A	Replaces the control character with an alphanumeric character from input.
a	Replaces the control character with an alphabetic character from input.
9	Replaces the control character with a numeric character from input. Stuffs the string with leading 0 characters so that the length of the input string matches the length of the picture specification.
\	Causes the character that follows the backslash to be placed in the output. That is, the character that follows a backslash is not a control character.

---

The following table lists some examples of alphanumeric pictures.

Picture	Input Data	Output Data
XX-AJXXXX	12P45-q	12-PJ45-q
AA-\AJAAAA	12P45-q	12-AJP45q
aaaaaaaa	12P45-q	Pq
aa99999	123abc	ab00000

## Numeric Pictures

Numeric pictures allow you to decode and reformat integer and decimal numeric values. A value is interpreted as a numeric value only if its picture string contains numeric picture-control characters.

The input data is first scanned for the number of digits to the left and right of the decimal point (if any), and for a negative sign that can either precede or follow the data. The picture string is then used to reformat the value. The numeric picture-control characters are 9, S, V, and Z.

The following table describes the behavior of the numeric picture-control characters.

Character	Definition
9	Replaces the control character with a numeric character.
S	Replaces the control character with a minus sign if the input value is negative.
V	Inserts a decimal point.
Z	Replaces the control character with a numeric character or a leading zero.

The following table lists some examples of numeric pictures.

Picture	Input Data	Output Data	Comment
9999999	123	0000123	Simple reformat
S999.99	123-	-123.00	Sign controlled on output
99V99	123	01.23	Implicit decimal point
99.99	103.455	103.45	Strip decimals

## Date Pictures

When you load data, the date-format picture specifies how the HPL formats the input data before it writes the data into a database. When you extract data from a database, the date-format picture specifies how the HPL reformats the date before it writes the date to the output.

The date control characters are M, D, and Y. The following table provides definitions of these control characters.

Character	Definition
D	Day value
H	Hour value
M	Month value or minute value
S	Second value
Y	Year value

You can use Informix DATETIME strings, such as YYYY/MM/DD HH:MM:SS.

The following table shows some examples of date picture strings.

Picture	DBDATE Value	Input	Output
MM/DD/YY	YMD2/	12/20/91	91/12/20
MM/DD/YY	DMY2/	12/20/91	20/12/91
MMDDYY	DMY2/	122091	20/12/91
MM DD YYYY	DMY4/	12/20/1991	20/12/1991
MM/DD/YY	DMY2.	12/20/91	20.12.91
M/D/YY	DMY2/	02/01/91	2/1/91





# Match Condition Operators and Characters

This appendix describes the operators that are available when you match text and provides an example of each.

Operator	Description
<code>= value</code>	<p>Matches if the character string in, or the value of, the data-record field equals the specified text or value. If you specify a character string, the characters must be delimited by quotes.</p> <p>For example, if you are matching on a field named <code>City</code>, the match condition <code>= "Dallas"</code> selects all records whose <code>City</code> field contains the entry Dallas.</p>
<code>value</code>	<p>Equals (<code>=</code>) is the default operator. Thus this case is equivalent to <code>=value</code>, except that the characters do <i>not</i> have to be delimited by quotes.</p> <p>For example, if you are matching on a field named <code>City</code>, the match condition <code>Dallas</code> selects all records whose <code>City</code> field contains the entry Dallas.</p>
<code>&gt; value</code>	<p>Matches if the data record field is greater than the specified value.</p> <p>For example, if you are matching on a field named <code>Income</code>, the match condition <code>&gt; 50000</code> selects all records whose <code>Income</code> field contains an entry greater than 50,000.</p> <p>Character strings must be delimited by quotes (<code>&gt; "Jones"</code>).</p>

Operator	Description
< <i>value</i>	<p>Matches if the data record field is less than the specified value.</p> <p>For example, if you are matching on a field named <i>Income</i>, the match condition &lt; 50000 selects all records whose <i>Income</i> field contains an entry less than 50,000.</p> <p>Character strings must be delimited by quotes (&lt; "Jones").</p>
>= <i>value</i>	<p>Matches if the data-record field is equal to or greater than the specified value.</p> <p>For example, if you are matching on a field named <i>Income</i>, the match condition &gt; 50000 selects all records whose <i>Income</i> field contains an entry 50,000 or greater.</p> <p>Character strings must be delimited by quotes (&gt;= "Jones").</p>
<= <i>value</i>	<p>Matches if the data-record field is less than or equal to the specified value.</p> <p>For example, if you are matching on a field named <i>Income</i>, the match condition &lt;= 50000 selects all records whose <i>Income</i> field contains an entry 50,000 or less.</p> <p>Character strings must be delimited by quotes (= "Jones").</p>
<> <i>value</i>	<p>Matches if the data-record field is not equal to the specified value. Character strings must be delimited by quotes.</p> <p>For example, if you are matching on a field named <i>State</i>, the match condition &lt;&gt; "TX" selects all records whose <i>State</i> field contains an entry other than TX.</p>
between <i>value1</i> and <i>value2</i>	<p>Matches if the data-record field is between the range specified in value 1 and value 2.</p> <p>For example, if you are matching on a field named <i>Income</i>, the match condition between 50000 and 100000 selects all records whose <i>Income</i> field contains an entry between 50,000 and 100,000.</p> <p>Character strings must be delimited by quotes.</p>

(2 of 3)

Operator	Description
and	<p>Constructs a comparison of two or more items. Matches only if the data record fields match <i>all</i> of the comparisons.</p> <p>For example, if you are matching on a field named <code>City</code> and a field named <code>Income</code>, the match condition <code>(City) = "Dallas" and (Income) &gt; 100000</code> selects all records whose <code>City</code> field contains the entry <code>Dallas</code> and whose <code>Income</code> field contains an entry greater than 100,000.</p>
or	<p>Constructs a comparison of two or more items. Matches if the data record field(s) matches <i>any</i> of the comparisons.</p> <p>For example, if you are matching on a field named <code>City</code>, the match condition <code>= "Dallas" or = "Fort Worth"</code> selects all records whose <code>City</code> field contains either the entry <code>Dallas</code> or the entry <code>Fort Worth</code>.</p>
NULL	<p>Matches when all characters are blank or when a character is binary zero (null).</p> <p>For example, you might want to discard any records that have all blanks for a name field.</p>
* (asterisk)	<p>Wildcard match of any number of characters in a string.</p> <p>For example, to match on a field that contains the city name and state, the match condition <code>Dall*</code> would select records with any of the following entries:</p> <ul style="list-style-type: none"> <li>■ Dallas-Forth Worth</li> <li>■ Dallas, TX</li> <li>■ Dallas TX</li> </ul>
?	<p>Matches any single character in a string.</p> <p>For example, to match on a field that contains a last name, the match condition <code>Sm?th</code> would select records with any of the following entries:</p> <ul style="list-style-type: none"> <li>■ Smith</li> <li>■ Smyth</li> </ul>

(3 of 3)



---

# Custom Conversion Functions

Custom conversion functions allow you to add additional data conversion capability to the HPL. This feature lets **onpload** call a custom conversion function during the data-conversion process.

When you create a custom conversion function, you associate it with a particular mapping of input field to output field. To associate a custom function with a field, enter the name of the function in the **Function** text box of the Mapping Options window. For information about mapping options, refer to [“Mapping Options” on page 9-14](#).

Although the mapping options associate the custom conversion function with a particular field, the function can access all the input data fields and all the output data fields through a set of API functions provided with the **onpload** utility.

---

## Custom Conversion Example

As an example, you might implement a custom conversion functions to do the following, expressed in pseudocode:

```
IF input field 1 satisfies condition A
THEN
    DO calculation X on input field 7
    OUTPUT data to output column 7
ELSE
    DO calculation Y on input field 6
    OUTPUT data to output column 5
```

The custom conversion function feature is available only on computers with operating systems that support dynamic linking.

---

## The onpload Conversion Process

The **onpload** conversion process is identical for both import or export operations. The **onpload** utility:

- extracts the source data from their native format.
- examines the map.
- applies the conversions called out in the map. Conversion order is implied by the ordering of the source-field names that are specified in the map.
- calls any custom conversion function that is specified for a source field. When **onpload** calls the custom conversion function, **onpload** passes the value of the input field, the buffer into which the output should be placed, and the maximum length of the output buffer.
- if there is a custom conversion function, applies the value that the custom conversion function places in the function output buffer to the destination field that is associated with the source field in the map.
- sends the results to the output generators.

The custom conversion function API uses ASCII strings as the canonical data type. The API functions present data as ASCII strings and expect data from the custom conversion functions to be presented as ASCII strings. The API functions convert source data of different types to ASCII strings, and also convert ASCII string data from custom conversion functions to destination data types.

Custom conversion functions are loaded into the **onpload** executable through a shared library.

**To integrate your custom conversion functions into the onpload executable**

1. Prepare the custom conversion function table.

The **onpload** utility uses the entries in a function table to translate custom-function string names that are specified in the load or unload map. You must supply the function table and the custom conversion functions.

To code the function table, use the following template for the file **plcstcnv.c**. You can copy this template from the **\$INFORMIXDIR/incl/hpl** directory. Add as many entries into the **functiontable** array as needed.

The **onpload** utility searches the **functiontable** array for the string name of the custom conversion function that the map specifies. The function pointer that is associated with the string name is retrieved and used as the custom conversion function. In the following template for the file **plcstcnv.c**, **ycf1** and **ycf2** are the strings that **ipload** uses to find the custom functions **your\_conversion\_func1** and **your\_conversion\_func2**, respectively. (To add custom function string names to the **onpload** database, refer to [“Mapping Options” on page 9-14](#).)

```

/*
 * plcstcnv.c
 */
#include "pldriver.h"

extern int your_conversion_func1();
extern int your_conversion_func2();

struct functable functiontable[] =
{
    {"ycf1", your_conversion_func1},
    {"ycf2", your_conversion_func2},
    {0, 0}
};
/* end of plcstcnv.c */

```

2. Prepare your conversion functions. Use the template in the following example to code your conversion functions:

```
/*
 * your_custom_conversion.c
 */

/*
 * The argument list must be adhered to.
 */
int your_conversion_func1(outbuffer, buflen, value)
    char *outbuffer; /* where to put your output */
    int  buflen;     /* max size of buffer in bytes*/
    char *value;     /* input value */
{
    /* your processing here */
}

int your_conversion_func2(outbuffer, buflen, value)
    char *outbuffer; /* where to put your output */
    int  buflen;     /* max size of buffer */
    char *value;     /* input value */
{
    /* your processing here */
}
/* end of your_custom_conversion.c */
```

3. Rebuild the **onpload** shared-library file **ipldd07a.SOLIBSUFFIX**, (where **SOLIBSUFFIX** is the shared-library suffix for your platform). Follow the instructions in [“Rebuilding the Shared-Library File”](#) on page F-5.

The **onpload** utility uses the same library for both custom conversion functions and custom drivers. When you rebuild the library, if there are custom drivers, you must link the custom driver code as well as the custom conversion functions.

4. Install the shared library in the appropriate path for your platform. For example, on Solaris the shared library should be installed in **/usr/lib**.



## API Functions

The **onpload** utility expects your custom conversion function to have the following prototype:

```

/*
 * input::  char* outbuffer:  where to put your output.
 *          int   buflen:    size you have for your output.
 *          char* value:     the input value to work on.
 * return:: 0                to indicate ok.
 *          non-zero         to discard entire record.
 */

int your_func(outbuffer, buflen, value)
    char *outbuffer;
    int   buflen;
    char *value;
{
    /* your processing here */
}

```

To discard an entire record, return a nonzero value. Otherwise, return a zero value.

The following functions support your access to data in the source and destination buffers.

### ***DBXget\_source\_value(fldname,buffer,buflen)***

This routine retrieves the source value that is associated with **fldname** and copies the value to the specified buffer.

Arguments	I/O	Description
char *fldname	Input	Name of source field, as defined in <b>ipload</b> map
char *buffer	Input	Address where <b>fldname</b> value is placed
int buflen	Input	Buffer size in bytes

***DBXget\_dest\_value(fldname,buffer,buflen)***

This routine retrieves the destination value that is associated with **fldname** and copies the value to the specified buffer.

Arguments	I/O	Description
char *fldname	Input	Name of destination field, as defined in <b>ipload</b> map
char *buffer	Input	Address where <b>fldname</b> value is placed
int buflen	Input	Buffer size in bytes

***DBXput\_dest\_value(fldname,buffer)***

If a previous conversion has not set the destination value, this routine sets the destination value that is passed to the buffer. The **ipload** utility automatically clips the data value if it is too long.

Arguments	I/O	Description
char *fldname	Input	Name of destination field, as defined in <b>ipload</b> map
char *buffer	Input	Address where <b>fldname</b> value is placed

***DBXget\_dest\_length(fldname)***

This routine returns the maximum length of the data buffer that is associated with **fldname**.

Arguments	I/O	Description
char *fldname	Input	Name of destination field, as defined in <b>ipload</b> map

---

# Custom Drivers

If your operating system supports dynamic linking of libraries, you can use a *custom driver* to extend the functionality of the HPL to support different file types or access mechanisms. For example, you could implement a custom interface to load data from a structured file, a high-speed communications link, or another program that generates data to be stored in the database.

The **onpload** utility accesses the custom code through the driver name that you assign to the record-format definition. When **onpload** references a record format, the driver that the record format specifies is examined. If the driver name does not match one of the standard drivers (Fixed, COBOL, Delimited), **onpload** looks into the custom-driver function table to find the custom driver.

The custom-driver code reads data into buffers during a load job and writes out buffers during an unload job. By following the coding procedure discussed in this appendix, you can use the parallel I/O facilities of the HPL to manipulate data buffers, or you can completely replace the HPL I/O facilities with your own I/O functionality.

---

## Adding a Custom Driver to the onpload Utility

To add a custom driver to **onpload**, you must perform the following tasks:

- Add the custom driver to the **onpload** database.
- Prepare the code for the custom driver.  
For instructions, refer to [“Preparing the Custom-Driver Code” on page F-3](#).
- Build the shared-library file for the custom driver and custom-conversion functions and install the file in the appropriate directory.  
For instructions, refer to [“Rebuilding the Shared-Library File” on page F-5](#).

## Adding the Driver Name to the onpload Database

You must add the name of the custom driver to the **onpload** database so that you can select it when you prepare a load or unload job.

### To add a driver name to the onpload database

1. Choose a name for your custom driver.  
You can select your own name. This section uses the name *your\_custom\_driver*.
2. Add the name to the **onpload** database.  
Choose **Configure**→**Driver** to add the driver name to the database.  
For more information, refer to [“Using the Drivers Window” on page 5-10](#).
3. If you prepare multiple custom drivers, you must choose a name for each driver and add it to the **onpload** database.

## Preparing the Custom-Driver Code

A driver is implemented as a set of functions, referred to as *methods*. The methods enable **onpload** to open, close, read, and write data files. You can create a custom driver that adds more complex functionality to data-file handling of **onpload**.

A custom driver consists of one or more functions that replace or add to the capability of an existing driver method. The custom driver does not need to provide all of the methods for a driver because any method that is not affected inherits the behavior of the standard driver.

To add to the capability of an existing driver method, the custom driver function calls the existing driver method from the custom function before or after any custom processing, as appropriate.

To replace an existing driver method, the custom function provides all processing that is necessary for that function. The custom driver function does not call the existing standard driver functions.

To prepare the custom-driver code, you must prepare the following two files. You can store the files in any convenient directory.

- The *your\_custom\_driver.c* file contains the functions that provide your user-specific driver functionality. You must provide a function for each driver.
- The *plcstdrv.c* file tells **onpload** where to find the custom-driver functions.

### To prepare the file that provides the driver functionality

1. Create a file for the driver functions (for example, *your\_custom\_driver.c*).
2. Prepare the driver code.

This appendix includes two examples of driver files, “[Driver Example One](#)” on page F-11 and “[Driver Example Two](#)” on page F-15. Use these examples as templates for building your driver code.

The driver methods and API functions that you can use are described in “[Available Driver Methods](#)” on page F-19 and “[Available API Support Functions](#)” on page F-21.

### To prepare the `plcstdrv.c` file

1. Use the following code as a template to create the `plcstdrv.c` file. You can copy a template for `plcstdrv.c` from the `$INFORMIXDIR/incl/hpl` directory.

```
/******  
 * Start of plcstdrv.c  
 */  
  
/* plcstdrv.h is in $INFORMIXDIR/incl/hpl */  
#include "plcstdrv.h"  
  
/* Your driver configuration function */  
int your_driver_config_function();  
  
(*pl_get_user_method(driver, method)) ()  
char *driver;  
int method;  
{  
    /*  
     * your_driver_name is the name of your driver  
     */  
    if (strcmp(driver, "your_driver_name") == 0)  
    {  
        /*  
         * If onpload is trying to configure the driver,  
         * return the function that will handle the  
         * initialization.  
         */  
        if (method == PL_MTH_CONFIGURE)  
            return(your_driver_config_function);  
    }  
    /*  
     * YYYY is the name of the another driver  
     * This is how additional custom drivers are configured.  
     */  
    if (strcmp(driver, "YYYY") == 0)  
    {  
        if (method == PL_MTH_CONFIGURE)  
            return(YYYY_driver_config_function);  
    }  
}  
/****** end of plcstdrv.c *****/
```

2. Replace *your\_driver\_name* with the name of the driver that you chose in step 1 of “Adding the Driver Name to the onpload Database” on page F-2.
3. Replace *your\_driver\_config\_function* with the function name of the driver-configuration function that you coded in *your\_custom\_driver.c*.
4. To add multiple custom drivers, repeat the main **if** statement for each driver.

## Rebuilding the Shared-Library File

If you use custom drivers or custom conversion functions, you must rebuild the **ipldd07a.SOLIBSUFFIX** shared-library file with your custom-code files. (*SOLIBSUFFIX* is the shared-library suffix for your operating system.)

After you rebuild **ipldd07a.SOLIBSUFFIX**, you must install it in the appropriate path for shared libraries on your operating system. For example, on Solaris **ipldd07a.so** must be installed in the **/usr/lib** directory because the **onpload** executable has the **setgid** bit set. On Solaris, programs that have the **setgid** bit set do not use the **LD\_LIBRARY\_PATH** environment variable, and so you must install the programs directly in **/usr/lib**.

**To build the shared-library file**

1. Use the following code as a template to prepare a makefile. You can copy a template for the makefile from the **\$INFORMIXDIR/incl/hpl** directory.

```
#####  
# Makefile for building onpload shared library  
#  
  
LD = ld  
  
# link flag for building dynamic library, may be different # for your  
# platform, see the man page for ld, the link  
# editor.  
LDSOFLAGS = -G  
  
# where to find plcstdrv.h  
INCL = $INFORMIXDIR/incl/hpl  
  
# SOLIBSUFFIX is the shared library suffix for your  
# platform. For Solaris it is "so"  
SOLIBSUFFIX = so  
  
PLCDLIBSO = ip1dd07a.${SOLIBSUFFIX}  
  
.c.o:  
$(CC) $(CFLAGS) -I$(INCL) -c $<  
  
#  
# plcstdrv.c contains the custom driver table, required  
# plcstcnv.c contains the custom function table, required  
# your_custom_driver.c contains your custom driver  
# routines, optional  
# your_custom_conversion.c contains your custom  
# conversion functions, optional  
#  
  
SO0BJS = plusrdrv.o plusrcnv.o your_custom_driver.o  
your_custom_function.o  
  
so1ib: $(SO0BJS)  
$(LD) -o $(PLCDLIBSO) $(LDSOFLAGS) $(SO0BJS)  
  
##### end of makefile #####
```



2. Include the following files in the makefile.

File	Description
<code>plcstdrv.c</code>	Prepares the custom driver tables
<code>plcstcnv.c</code>	Prepares the custom-conversion function tables
<code>your_custom_driver.c</code>	Contains your user-specific driver functions
<code>your_custom_functions.c</code>	Contains your user-specific conversion functions

[Appendix E, “Custom Conversion Functions,”](#) describes the `plcstcnv.c` and the `your_custom_functions.c` files.

3. Run **make** using the makefile.

The makefile builds the shared-library file `ipldd07a.SOLIBSUFFIX`, where `SOLIBSUFFIX` is the shared-library suffix for your operating system.

The HPL uses the same library for both custom-conversion functions and custom drivers, so when you rebuild the library, you must also link the custom-conversion code.

4. Install the shared library in the appropriate path for your operating system.

For example, on Solaris you must install the shared library in the `/usr/lib` directory. You can move `ipldd07a.SOLIBSUFFIX` into the shared-library directory, or you can use a link. For administrative purposes, a link might be clearer.

5. Set the owner and group of the shared-library files to **informix**. Set the permission bits to 0755 (octal).

**Tip:** When Informix updates libraries, the letter before the decimal (here, the letter **a**) changes to indicate that the library has changed. If you do not find `ipldd07a`, look for `ipldd07b` or `ipldd07c`.



---

## Connecting Your Code to onpload at Runtime

When **onpload** determines that a custom driver is required to read or write data for a given record format, it calls the function **pl\_get\_user\_method()**.

The **pl\_get\_user\_method** returns the function that the loader should call to perform initial driver configuration before any I/O activity is started. The function that you specify should be a function that you are supplying in your driver. This function should not do any other initialization. The example in the previous section illustrates the coding technique for this initial connection of your driver to **onpload**.

### Driver Initialization

The **onpload** utility calls the configure function that you returned in **pl\_get\_user\_method**, expecting this function to configure all driver methods that are to be customized. The configure function must call the **pl\_inherit\_methods()** function, specifying the class of driver that is appropriate for the data being processed.

A driver class can be one of following classes.

---

Driver Class	Description
Fixed	Fixed drivers process data on the assumption that the data is organized as constant length records of the same format. Fields in the record will consistently appear at the same offset in each record.
Delimited	Delimited drivers assume that the record and field boundaries are defined by markers (called delimiters) in the data.
COBOL	The COBOL driver treats data as constant length records in the same manner as the Fixed driver. The distinguishing factor of the COBOL driver is its support for conversion of the ANSI COBOL data types.

---

After the **pl\_inherit\_methods()** function is called, you can add additional functions that are called to support open, close, read, and write requirements of the driver. Call **pl\_set\_method\_function()** to tie your driver functions into the **onpload** execution.

## Registering Driver Functions

The `pl_set_method_function()` registers a passed function to the passed method ID. For a description of the method IDs (defined in `SINFORMIXDIR/incl/plcustom/pldriver.h`) applicable to your driver implementation, refer to the “[Available API Support Functions](#)” on page F-21. The following table shows the available methods.

Method	Description
PL_MTH_OPEN	The function called to open the file of interest for the load/unload
PL_MTH_CLOSE	The function called to close the file at the end of the load/unload
PL_MTH_RAWREAD	The function called to get the next block of data from the load file
PL_MTH_RAWWRITE	The function called to write a block of data that is passed to it

You do not need to register a function for any of the methods IDs (although presumably you register at least one, or there is no point in writing the driver).

Your driver function can either take full responsibility for supporting its applicable method, or it can invoke the standard function and add to the standard processing. When you use the standard RAWREAD and RAWWRITE methods that are implemented in `onpload`, your driver benefits from the asynchronous parallel I/O that these functions support.

Use the **pl\_driver\_inherit()** function to get the standard function for the passed method. For example, to find and execute the function currently registered for reading data from the load input, you would code as follows:

```
int my_rawread_function(bufptr, bufsize, bytesread)
char *bufptr;
int    bufsize;
int    *bytesread;
{
    int (*funcptr)();
    int rtn;

    funcptr = pl_driver_inherit(PL_MTH_RAWREAD);
    rtn = (*funcptr)(bufptr, bufsize, &bytesread);
    if (rtn)
        return(rtn); /* error */
    /*
     * Now you have a buffer of data in bufptr, of
     * size bytesread. So you can process data in
     * this buffer here before it is converted
     */
    return(rtn);
}
```

## Restrictions in Coding Driver Methods

Custom code that is used with the HPL is executed in the Informix multithreaded environment. The driver thread that executes custom code can migrate among Informix virtual processors (VPs). Thus, you must observe several restrictions when you develop custom code. (For more information on the Informix multithreaded environment, refer to the [INFORMIX-Universal Server Administrator's Guide](#).)

When you prepare custom code, observe the following restrictions:

- All variables must be allocated on the stack.  
You cannot use global or static variables. As the driver thread migrates among VPs, the values for these types of variables are undefined.  
System calls that allocate or free memory are prohibited. Memory that is allocated using system calls is inaccessible as the driver thread migrates among VPs, causing segmentation violations. Two examples of these prohibited calls are `malloc(3C)` and `free(3C)`.
- Calls to `exit(2)` or `_exit(2)` are prohibited.  
These system calls force the VP on which the driver thread is running to exit, which causes an immediate shutdown of **onpload**.
- Do not use system calls.  
For performance reasons, Informix strongly discourages system calls. System calls cause the VP on which the driver thread is running to be blocked for the duration of the system call. This blockage prevents the VP from doing other work, causing **onpload** to run less efficiently.

---

## Driver Examples

The following section shows two examples of custom drivers. The first example shows how to code a custom driver that completely takes over the open, close, read, and write responsibility.

### Driver Example One

The custom driver in this example takes over the open, close, read, and write responsibility. The example illustrates the form of a driver and the necessary initialization, registration, and mechanism of the driver. The coding of user-specific functionality is not represented.

### ***The plcstdrv.c File for Example One***

Assume that you chose **MYDRIVER** as the driver name and that you added this name to the **onpload** database with the **ipload** program. The **plcstdrv.c** file is as follows:

```
/* plcstdrv.c */
#include "pldriver.h"

int mydriver_configure();

(*pl_get_user_method)(driver, method)
char *driver;
int method;
{
    if (strcmp(driver, "MYDRIVER") == 0)
    {
        /*
        * If onpload is trying to configure the driver,
        return
        * the function that will handle the
        initialization
        */
        if (method == PL_MTH_CONFIGURE)
            return(mydriver_configure);
    }
    return(NULL);
}
/* end of plcstdrv.c */
```

**Custom-Driver Code for MYDRIVER**

The following driver code supports **MYDRIVER**:

```

/* mydriver.c */
#include <stdio.h>
#include "pldriver.h" /* This file is in $INFORMIXDIR/incl/plcustom */

static int myopen_func();
static int myclose_func();
static int myread_func();
static int mywrite_func();

FILE *myfile; /* Important Note.. You may not use static */
              /* variables in the driver due to the */
              /* multithreaded implementation */
              /* This restriction can be bypassed by */
              /* calling pl_lock_globals as in the */
              /* mydriver_configure function below */

int
mydriver_configure(driver, methodtable)
    char *driver; /* name of driver ("MYDRIVER") */
    void *methodtable; /* table passed to api funcs */
{
    /*
     * Data presented to MYDRIVER is fixed length data, so
     * we want to use the "Fixed" configuration for our
     * standard function support
     */
    pl_inherit_methods("Fixed", methodtable);

    /*
     * Register our specific functions
     */
    pl_set_method_function(methodtable, PL_MTH_OPEN, myopen_func);

    pl_set_method_function(methodtable, PL_MTH_CLOSE, myclose_func);

    pl_set_method_function(methodtable, PL_MTH_RAWREAD, myread_func);

    pl_set_method_function(methodtable, PL_MTH_RAWWRITE, mywrite_func);

    /*
     * Since we are using globals in our driver,
     * we must make the following API call.
     */
    pl_lock_globals();
}

/*****
 * Support the Open Request. This function is called before other
 * processing is started, so you can initialize your local data here.
 *****/

```

## Driver Example One

```
int
myopen_func(device)
    devicearray *device;
{
    /*
     * The device structure passed has the name of the file to open.
     */
    myfile = fopen(device->filename, "r");
    if (myfile)
        return(PL_RTN_OK);
    /*
     * An error occurred, so shut down the load
     */
    return(PL_RTN_FAIL);
}

/*****
 * This function is called to wrap up the file operations.
 * All cleanup should be done in this function.
 *****/
int
myclose_func(device)
{
    close(myfile);
    return(PL_RTN_OK);
}

/*****
 * Fetch a buffer of data, and insert it into the buffer passed
 *****/
int myread_func(bufptr, bufsize, bytesread)
    char *bufptr;
    int bufsize;
    int *bytesread;
{
    int rtn;

    /*
     * Read data from the file
     */
    rtn = fread(bufptr, 1, bufsize, myfile);

    /*
     * If we did not get data, shut down, we are done
     */
    if (rtn <= 0)
        return(PL_RTN_EOF);

    /*
     * Manipulate the buffer with your custom logic
     * (function not illustrated, this is your specialized stuff)
     */
    do_my_buffer_analysis(bufptr);
}
```



```

    return(PL_RTN_OK);
}

/*****
 * Write the passed buffer to our file
 *****/
int mywrite_func(bufptr, bytes)
char *bufptr;
int bytes;
{
    int rtn;

    /*
     * Manipulate the buffer with your custom logic
     * (function not illustrated, this is your specialized stuff)
     */
    do_my_buffer_analysis(bufptr);

    /*
     * Write data to the file
     */
    rtn = fwrite (bufptr, 1, bytes, myfile);
    return(PL_RTN_OK);
}

```

## Driver Example Two

This section provides an example of custom-driver code that adds functionality to the standard driver. The custom driver that is added in this example provides the same functionality as the previous driver, but it does so with the asynchronous I/O inherent in the standard driver methods and is therefore faster.

Assume that the driver name is **FASTDRIVER** and that this name has been added to the **onpload** database with the **ipload** program.

### ***The plcstdrv.c File for Both Drivers***

After you add the code for **FASTDRIVER**, the **plcstdrv.c** file is as follows:

```
/*
 * plcstdrv.c
 */

int mydriver_configure();
int fastdriver_configure(); /* added for FASTDRIVER */

int
(*pl_get_user_method)(driver, method)
char *driver;
int method;
{
    if (strcmp(driver, "MYDRIVER") == 0)
    {
        /*
         * If onpload is trying to configure the driver, return
         * the function that will handle the initialization
         */
        if (method == PL_MTH_CONFIGURE)
            return(mydriver_configure);
    }
    /*
     * The following if is added for FASTDRIVER
     */
    if (strcmp(driver, "FASTDRIVER") == 0)
    {
        if (method == PL_MTH_CONFIGURE)
            return(fastdriver_configure);
    }
    return(NULL);
}
/* end of plcstdrv.c */
```

**Custom-Driver Code for FASTDRIVER**

The following driver code supports **FASTDRIVER**:

```

/*
 * fastdriver.c
 */
#include <stdio.h>
#include "pldriver.h" /* This file can be found in $INFORMIXDIR/etc/plcustom */

static int fastread_func();
static int fastwrite_func();

int
fastdriver_configure(driver, methodtable)
char *driver; /* name of driver ("FASTDRIVER") */
void *methodtable; /* table passed to api funcs */
{
/*
 * Data presented to FASTDRIVER is fixed length data, so
 * we want to use the "Fixed" configuration for our
 * standard function support
 */
pl_inherit_methods("Fixed", methodtable);

/*
 * Register our specific functions. Since we are adding
 * functionality to the existing driver, we do not need
 * to support an OPEN or EXIT method, we will use the
 * standard one.
 */

pl_set_method_function(methodtable, PL_MTH_RAWREAD, fastread_func);

pl_set_method_function(methodtable, PL_MTH_RAWWRITE, fastwrite_func);
}

/*****
 * Fetch a buffer of data, and insert it into the buffer passed.
 *****/
int
fastread_func(bufptr, bufsize, bytesread)
char *bufptr;
int  bufsize;
int  *bytesread;
{
int rtn;
int (*funcptr)();

/*
 * Read data (async mode) from the file
 */
funcptr = pl_driver_inherit(PL_MTH_RAWREAD);
rtn = (*funcptr)(bufptr, bufsize, bytesread);

```

## Driver Example Two

```
/*
 * If we did not get data, shut down, we are done
 */
if (rtn <= 0)
    return(PL_RTN_EOF);

/*
 * Manipulate the buffer with your custom logic
 * (function not illustrated, this is your specialized stuff)
 */
do_my_buffer_analysis(bufptr);
return(PL_RTN_OK);
}

/*****
 * Write the passed buffer to our file.
 *****/
fastwrite_func(bufptr, bytes)
char *bufptr;
int bytes;
{
    int rtn;

/*
 * Manipulate the buffer with your custom logic
 * (function not illustrated, this is your specialized stuff)
 */
do_my_buffer_analysis(bufptr);
int (*funcptr)();

/*
 * Write data to the file
 */

funcptr = pl_driver_inherit(PL_MTH_RAWWRITE);
rtn = (*funcptr)(bufptr, bytes);

return(rtn);
}
```

---

## Available Driver Methods

The following section describes the methods that you can use to build custom drivers. The methods defined in this section use the return values that are described in the following table.

Return Value	Interpretation
PL_RTN_OK	Method executed successfully
PL_RTN_FAIL	Method did not succeed. Stop processing.
PL_RTN_EOF	Method reached the end of the file

## PL\_MTH\_OPEN

Call this function to open the file of interest for the load or unload.

Function Information	Description of Arguments
Input arguments:	devicearray *device; Device/file pathname to open
Output arguments:	None
Return values:	PL_RTN_OK, PL_RTN_FAIL

## PL\_MTH\_CLOSE

Call this function to close the file at the end of the load or unload.

Function Information	Description of Arguments
Input arguments: None	
Output arguments: None	
Return values: PL_RTN_OK, PL_RTN_FAIL	

## PL\_MTH\_RAWREAD

Call this function to get the next block of data from the load file.

Function Information	Description of Arguments
Input arguments: char *bufptr; int bufsize;	Pointer to buffer to load Size of buffer to read in bytes
Output arguments: int *bytes;	Number of bytes read
Return values: PL_RTN_OK, PL_RTN_FAIL, PL_RTN_EOF	

## PL\_MTH\_RAWWRITE

Call this function to write a block of data.

Function Information	Description of Arguments
Input arguments: char *bufptr; int bufsize;	Pointer to buffer to write Size of buffer to write in bytes
Output arguments: none	
Return values: PL_RTN_OK, PL_RTN_FAIL	

---

## Available API Support Functions

This section describes the API support functions that you can use with custom drivers. The methods defined in this section use the return values that are described in the following table.

Return Value	Interpretation
PL_RTN_OK	Function succeeded.
PL_RTN_FAIL	Function failed.

### pl\_inherit\_methods(driver, methodtable)

This function loads the passed method function table with the functions currently configured for the passed driver.

Function Information	Description of Arguments
Function type:	int
Input arguments:	char *driver void *methodtable
Return values:	PL_RTN_OK, PL_RTN_FAIL

The **onpload** utility is supplied with three standard drivers described in [“Driver Initialization”](#) on page F-8.

*pl\_set\_method\_function(methodtable, method, function)*

## **pl\_set\_method\_function(methodtable, method, function)**

This function inserts the passed function into the method chain.

Function Information		Description of Arguments
Function type:	int	
Input arguments:	void *methodtable	Method table passed to PL_MTH_CONFIGURE
	int method	Method ID
	int (*funcptr)()	Function to insert into method chain
Return values:	PL_RTN_OK, PL_RTN_FAIL	

## **pl\_driver\_inherit(method)**

This function returns a pointer to the function that currently supports the passed method and advances the method chain so that the next request returns the next function in the method list.

Function Information		Description of Arguments
Function type:	int	
Input argument:	int method	Method ID
Return values:	PL_RTN_OK, PL_RTN_FAIL	

When you inherit a driver and use the **pl\_set\_method\_function** to override a method, you can assume all processing functionality for method.

However, if you want to add to the existing processing functionality, **pl\_driver\_inherit** returns the function that was installed in the function table prior to the call to **pl\_set\_method\_function**.



### Example

You are processing a file in which the context of the data determines the record fields present. You want to analyze the records and reformat the data into a delimited format that the **onpload** data converter recognizes.

In the driver setup, specify that your function should inherit the Delimited driver and add your custom function to the **PL\_MTH\_READREC** method.

When your function is called, get the inherited function with **pl\_driver\_inherit()**. Invoke this function, which returns a pointer to the start of a record and its length.

Apply your changes to the data in the buffer that is returned by the call to the inherited function.

## **pl\_get\_recordlength()**

This function returns the length of the active record format. If the format is for a delimited record type, the value returned is 0.

Function Information		Description of Arguments
Function type:	int	
Return values	length of record	Function succeeded
	PL_RTN_FAIL	Function failed

## **pl\_set\_informix\_conversion(flag)**

When this function is set to 1, it disables data conversion during the load. The data must be formatted in Informix final-form format.

## *pl\_lock\_globals()*

When this function is set to 0, data conversion is enabled.

Function Information		Description of Arguments
Function type:	int	
Input argument:	int flag	1 = disable, 0 = enable
Return values:	PL_RTN_OK, PL_RTN_FAIL	

## **pl\_lock\_globals()**

This function ensures global data integrity when you supply a custom driver that uses globally defined variables.

Function Information		Description of Arguments
Function type:	int	
Return values:	PL_RTN_OK, PL_RTN_FAIL	

## **pl\_reset\_inherit\_chain(method)**

This function resets the function inheritance chain to the start of the list. You should need it only if you are implementing recursive processing.

Function Information		Description of Arguments
Function type:	void	
Input arguments:	int method	Method ID
Return values:	none	

---

# The onstat -j Option

The **-j** option of the **onstat** utility provides special information about the status of an **onpload** job. The **-j** option provides an interactive mode that is analogous to **onstat -i**. For information about **onstat -i** and using the interactive mode, refer to the [INFORMIX-Universal Server Administrator's Guide](#).

---

## Using the onstat -j Option

When **onpload** starts, it writes a series of messages to **stdout** or to a log file. The following lines show a typical **onpload** log file:

```
Mon Jul 24 16:11:30 1995

SHMBASE          0x4400000
CLIENTNUM        0x49010000
Session ID 1

Load Database    -> cnv001
Load Table       -> cnv001a
Load File        -> testrec.dat
Record Mapping   -> cnv001a

Database Load Completed -- Processed 50 Records
Records Inserted-> 50
Detected Errors--> 0
Engine Rejected--> 0

Mon Jul 24 16:11:37 1995
```

## Using the `onstat -j` Option

The two lines that start with `SHMBASE` and `CLIENTNUM` provide the information that you need to locate shared memory for an instance of **onpload**. The **oninit** process (Universal Server) has similar values stored in the `$ONCONFIG` file. When you use **onstat** to gather information about the **oninit** process, **onstat** uses information from `$INFORMIXDIR/etc/$ONCONFIG` to locate shared memory. When you use **onstat** to gather information about **onpload**, you must give **onstat** the name of a file that contains `SHMBASE` and `CLIENTNUM` information.

Typically the file that contains the `SHMBASE` and `CLIENTNUM` information is the log file. For example, if the **onpload** log file is `/tmp/cnv001a.log`, you can enter the following command:

```
onstat -j /tmp/cnv001a.log
```

The previous command causes **onstat** to attach to **onpload** shared memory and to enter interactive mode. You can then enter ? or any other bogus request to see a usage message displayed. An example follows:

```
onstat> ?
Interactive Mode: One command per line, and - are optional.
  -rz    repeat option every n seconds (default: 5) and
         zero profile counts
MT COMMANDS:
all      Print all MT information
ath      Print all threads
wai      Print waiting threads
act      Print active threads
rea      Print ready threads
sle      Print all sleeping threads
spi      print spin locks with long spins
sch      print VP scheduler statistics
lmx      Print all locked mutexes
wmx      Print all mutexes with waiters
con      Print conditions with waiters
stk <tid> Dump the stack of a specified thread
glo      Print MT global information
mem <pool name|session id> print pool statistics.
seg      Print memory segment statistics.
rbm      print block map for resident segment
nbm      print block map for non-resident segments
afr <pool name|session id> Print allocated poolfragments.
ffr <pool name|session id> Print free pool fragments.
ufr <pool name|session id> Print pool usage breakdown
iovs     Print disk IO statistics by vp
iofs     Print disk IO statistics by chunk/file
ioqs     Print disk IO statistics by queue
iog      Print AIO global information
iob      Print big buffer usage by IO VP class
sts      Print max and current stack sizes
qst      print queue statistics
wst      print thread wait statistics
jal      Print all Pload information
jct      Print Pload control table
jpa      Print Pload program arguments
jta      Print Pload thread array
jmq      Print Pload message queues, jms for summary only
onstat>
```

## Using the `onstat -j` Option

Most of the options are the same as those that you use to gather information about Universal Server, with the following exceptions:

```
jal    Print all Pload information
jct    Print Pload control table
jpa    Print Pload program arguments
jta    Print Pload thread array
jmq    Print Pload message queues, jms for summary only
```

These options apply only to **onpload**. You can use **onstat -j** to check the status of a thread, locate the VP and its PID, and then attach a debugger to a particular thread. The options for **onstat** that do not apply to **onpload** are not available (for example, `-g ses`).

---

# HPL Log-File and Pop-Up Messages

This appendix provides explanatory notes and corrective actions for unnumbered messages that print in the HPL log file. The appendix also includes information specific to messages that are returned to standard output or appear in a pop-up dialog box (depending on the way you invoked **onpload**).

If error numbers appear in these messages, you can look up their explanations and corrective actions in the [Informix Error Messages](#) manual.

A few of the messages included here might require you to contact Informix Technical Support. Such messages are rarely, if ever, seen at customer locations.

For information on how to view the log file and some guidance on how and when you might want to read it, see [“Viewing the Log File” on page 14-9](#).

---

## How the Messages Are Ordered

The HPL log-file messages appear in this appendix in alphabetical order, sorted with the following additional rules:

- The time stamp that precedes each message is ignored.
- Letter case in alphabetization is ignored.
- File, record, database server, and table names are ignored.
- Error numbers are ignored.

- Spaces are ignored.
- Quotation marks are ignored.
- The word “the” is ignored if it is the first word in the message.

A cause and suggested corrective action for a message or group of messages follows the message text.

A section that lists pop-up messages (or messages that are returned to standard error) appears after the log-file message sections. Messages in this section are arranged according to the same rules that apply to log-file messages.

---

## Message Categories

Four general categories of messages can be defined, although some messages fall into more than one category:

- Routine information
- Assertion-failed messages
- Administrative action needed
- Fatal error detected

The assertion-failed messages reflect their traditional use by Informix technical staff to assist in troubleshooting and diagnostics. The information that they report often falls into the category of *unexpected events* that might or might not develop into problems caught by other error codes. Moreover, the messages are terse and often extremely technical. They might report on one or two isolated statistics and not provide an overall picture.

When technical staff investigate a problem, this information can suggest to them possible research paths. However, you might find that the information has little or no application when it is taken out of this context, or when processing proceeds normally.



---

## Log-File Messages: A-Cannot create...

Cannot access database table *table\_name*: SQL error *error\_num*, ISAM error *error\_num*.

- Cause:** The target database table cannot be accessed.  
**Action:** Refer to the [Informix Error Messages](#) manual.

Cannot allocate shared memory.

- Cause:** A memory allocation error occurred. Probably the system is out of virtual shared memory.  
**Action:** Run **onpload** again when fewer users are on the system, or increase the amount of available shared memory via UNIX kernel configuration.

Cannot allocate TLI memory for *operating\_system* structure.

- Cause:** System memory cannot be allocated for communications. This situation should only happen if all system resources are consumed.  
**Action:** Note the circumstances and contact Informix Technical Support.

Cannot bind socket connection: *errno=UNIX\_error\_num*.

- Cause:** A TCP socket cannot be opened.  
**Action:** See [/usr/include/errno.h](#).

Cannot bind TLI connection: *t\_errno=t\_error\_num*.

- Cause:** An error occurred when **onpload** attempted to open a TLI connection.  
**Action:** Check that TLI services are installed on the operating system. See [/usr/include/tiuser.h](#).

Cannot configure driver *driver\_name*.

- Cause:** If the **Driver Class** specification is not **Fixed, Cobol, or Delimited**, either the **onpload** custom-driver shared library is not in the PATH, or the custom-driver shared library is not installed correctly.
- Action:** For information on building a shared library, see [Appendix F](#).

Cannot connect to message server: Socket error=*UNIX\_error\_num*.

- Cause:** This message is generated by **ipload** when it cannot connect to the **onpload** socket service.
- Action:** See [/usr/include/errno.h](#).

Cannot connect to message server: TLI error=*t\_error\_num*, TLI event=*t\_event\_num*, errno=*error\_num*.

- Cause:** An error occurred when **onpload** attempted to open a TLI connection.
- Action:** Check that TLI services are installed on the operating system. See [/usr/include/tiuser.h](#) (*t\_error\_num*).

Cannot connect to server *server\_name*: SQL error *error\_num*, ISAM error *error\_num*.

- Cause:** The target database server cannot be opened.
- Action:** Refer to the [Informix Error Messages](#) manual.

Cannot connect worker to server data stream.

- Cause:** A possible permissions problem exists for **onpload** or **oninit**.
- Action:** Note the circumstances and contact Informix Technical Support.

---

## Log-File Messages: Cannot disable... - Cannot open...

Cannot disable *table\_name* object constraints: SQL error *error\_num*, ISAM error *error\_num*.

- Cause:** The constraint objects are disabled during the load and re-enabled after the load. An error occurred when **onpload** attempted to disable the constraint objects.
- Action:** Refer to the [Informix Error Messages](#) manual.

Cannot disable primary-key constraint. Child-table references exist.

- Cause:** You attempted to use express mode to load a table that has child-table records that refer to it. Express mode does not support this condition. (The **onpload** utility cannot disable the primary key constraint when child-table records refer to the load table.)
- Action:** Perform the load in deluxe mode or remove the constraint in question.

Cannot express load to logged table on HDR server *server\_name*.

- Cause:** You attempted to use express mode to load an HDR replicated table. Express mode does not support this condition.
- Action:** Perform the load in deluxe mode.

Cannot filter indexes for table *table\_name*: SQL error *error\_num*, ISAM error *error\_num*.

- Cause:** The index objects are set to filtering mode during the load and re-enabled after the load. An error occurred when **onpload** attempted to set the indexes objects to filtering mode.
- Action:** Refer to the [Informix Error Messages](#) manual.

## Log-File Messages: Cannot disable... - Cannot open...

Cannot get systable info for table *table\_name*: SQL error *error\_num*, ISAM error *error\_num*.

**Cause:** Cannot access the systable table to get dictionary information for the indicated table.

**Action:** Refer to the [Informix Error Messages](#) manual.

Cannot load code-set conversion file *file\_name*.

**Cause:** The data type for the load file is different than the data type for the server. The code-set does not exist in the `$INFORMIXDIR/gls/cvx` directory where *x* is the version number of the `gls cv` subdirectory.

**Action:** Check that the file exists. Check the file for permissions.

Cannot load mapping definitions.

**Cause:** A memory-allocation error or database-integrity error occurred when **onpload** accessed the **onpload** database.

**Action:** Use **oncheck** to check the **maps**, **mapitem**, **mapoption**, **formats**, and **formatitem** tables for consistency. If the tables are consistent, a referential integrity problem between the map and the format the map references might exist. If the problems persists, contact Informix Technical Support.

Cannot locate delimiter in data file.

**Cause:** No delimiter is found when **onpload** scans for an end-of-record delimiter in the load data.

**Action:** Check that the end-of-record delimiter specification is correct, or that you have the correct data file.

Cannot open.

**Cause:** An internal error occurred when **onpload** attempted to open the load or unload file.

**Action:** Note the circumstances and contact Informix Technical Support.

*Log-File Messages: Cannot disable... - Cannot open...*

Cannot open simple large object file *file\_name*. Simple large object not loaded.

- Cause:** The record references a filename that should contain a simple large object, but the file cannot be located.  
**Action:** Check that the simple large object file exists.

Cannot open database *database\_name*: SQL error *error\_num*, ISAM error *error\_num*.

- Cause:** The target database cannot be opened.  
**Action:** Refer to the [Informix Error Messages](#) manual.

Cannot open file *file\_name*: error number *UNIX\_error\_num*.

- Cause:** The file cannot be opened.  
**Action:** See [/usr/include/errno.h](#).

Cannot open TCP connection for *server\_name*: errno *UNIX\_error\_num*.

- Cause:** A TCP socket cannot be opened.  
**Action:** See [/usr/include/errno.h](#).

---

## Log-File Messages: Cannot perform... -Custom...

Cannot perform express-mode load on table with pseudo rowid.

**Cause:** The load table is fragmented by row ID. Express mode does not support this condition.

**Action:** Perform the load in deluxe mode.

Cannot perform express-mode load with `rowsize=row_length > page_size`.

**Cause:** The table-row size exceeds page size. Express mode does not support this condition.

**Action:** Perform the load in deluxe mode.

Cannot read file `file_name`: AIO error code `UNIX_error_num`.

**Cause:** The load file cannot be accessed. This error might result from operating-system limitations; the **onpload** utility cannot load successfully from a file (on disk) that is longer than 2 gigabytes.

**Action:** See `/usr/include/errno.h`.

Cannot re-enable all objects: `num_violations` violations detected. Check for violations in violations table `table_name` and diagnostics table `table_name`.

**Cause:** Data loaded by **onpload** violates the object constraints specified for the table. The records that violate the object-constraints have been placed in the **violations** table, and the reason code for each violation is listed in the **diagnostics** table.

**Action:** Review the information in the **violations** and **diagnostics** tables.

Cannot re-order query statement to align simple large objects or Ext Types.

**Cause:** The unload query does not contain a FROM clause.  
**Action:** Rewrite the query so that it contains a FROM clause.

Cannot set mode of *table\_name* objects from *current\_mode* to *final\_mode* mode: SQL error *error\_num*, ISAM error *error\_num*.

**Cause:** The constraint objects are disabled during the load and re-enabled after the load. An error occurred when **onpload** attempted to reset constraint objects back to their original state.  
**Action:** Refer to the [Informix Error Messages](#) manual.

Cannot start violations table for *table\_name*: SQL error *error\_num*, ISAM error *error\_num*.

**Cause:** An error occurred when **onpload** attempted to set up the violations table for the load table.  
**Action:** Refer to the [Informix Error Messages](#) manual.

Cannot stop violations table for *table\_name*: SQL error *error\_num*, ISAM error *error\_num*.

**Cause:** If a violations table exists on the load table, violations can be turned off during the load. An error occurred when **onpload** attempted to turn off violations detection.  
**Action:** Refer to the [Informix Error Messages](#) manual.

Cannot write file *file\_name*: AIO error code *UNIX\_error\_num*.

**Cause:** The unload file cannot be accessed.  
**Action:** See `/usr/include/errno.h`.

Code-set conversion overflow.

**Cause:** The code-set conversion caused the number of bytes in the simple large object to expand or contract when **onpload** unloaded the data into a fixed-format record. The **onpload** utility cannot update the simple large object tag in the record that specifies the length of the simple large object at this stage.

**Action:** To unload this data, use a delimited format.

Custom conversion function *function\_name* not found in shared library.

**Cause:** The custom function specified in a map option has not been located in **ipldd07a.so**. The shared library extension is platform specific; for example, the **.so** extension is specific for Solaris and is probably different on other platforms.

**Action:** For information on how to configure the custom function library, see [Appendix E](#).



---

## Log-File Messages: D-Error describing...

Discarded *num\_bytes* null bytes from end of tape.

**Cause:** The tape data is not blocked in a multiple of the record size, so that the last block of data contained bytes that are discarded. This situation occurs on devices with stream cartridges that allow writing to the device only in whole blocks.

**Action:** If necessary, manually enter the discarded data.

Environment variable *variable\_name* expansion would overflow string.

**Cause:** A mapping option specifies an environment variable as the default value, but expansion of the environment variable requires more space than allocated to the column.

**Action:** Use a shorter default value, or expand the length of the column.

Error accepting socket connection: *errno=UNIX\_error\_num*.

**Cause:** A TCP socket cannot be accessed.

**Action:** See `/usr/include/errno.h`.

Error accessing *file\_name*.

**Cause:** An error occurred when **onpload** attempted to open the load or unload file.

**Action:** Check that the file exists. Check the file for permissions.

Error accessing format: SQL error *error\_num*, ISAM error *error\_num*.

**Cause:** An integrity problem exists in the **onpload** database. The format for the map does not exist, or a problem exists with the **format** or **formatitem** table.

**Action:** For an explanation, refer to the [Informix Error Messages](#) manual.

Error accessing map *map\_name*: SQL error *error\_num*, ISAM error *error\_num*.

- Cause:** The requested map for the load or unload does not exist, or a problem exists with the **onpload** database.
- Action:** For an explanation, refer to the [Informix Error Messages](#) manual.

Error accessing sysmaster: SQL error *error\_num*, ISAM error *error\_num*.

- Cause:** An access error occurred on the **sysmaster** database on the target server where **onpload** attempted to perform the load or unload job.
- Action:** Refer to the [Informix Error Messages](#) manual.

Error accessing table *table\_name*: SQL error *error\_num*, ISAM error *error\_num*.

- Cause:** The target database table cannot be accessed.
- Action:** Refer to the [Informix Error Messages](#) manual.

Error *error\_num* closing current database.

- Cause:** A server error occurred when **onpload** closed the **onpload** or target database.
- Action:** Refer to the [Informix Error Messages](#) manual.

Error *UNIX\_error\_num* closing file *file\_name*.

- Cause:** An error occurred when **onpload** closed the load or unload file.
- Action:** See `/usr/include/errno.h`.

Error *error\_num* converting record field *field\_name* to column *column\_name*.

**Cause:** A conversion error occurred when **onpload** attempted to convert the record data to the database column type.

**Action:** For an explanation of the conversion error, refer to the [Informix Error Messages](#) manual. If the load map indicates that the data field is mapped to the correct column, check that the supplied data is valid.

Error declaring cursor: could not get table info.

**Cause:** Cannot access information about the load table.

**Action:** Check the validity of the table in the target database.

Error declaring cursor: SQL Error *error\_num*, ISAM error *error\_num*.

**Cause:** The **onpload** utility is unable to use the autogenerated formats and maps to create entries in a table in the **onpload** database.

**Action:** For an explanation of the conversion error, refer to the [Informix Error Messages](#) manual.

Error describing unload query *query\_name*: SQL error *error\_num*, ISAM error *error\_num*.

**Cause:** The unload query cannot be processed.

**Action:** Refer to the [Informix Error Messages](#) manual.

---

## Log-File Messages: Error initializing...-Error setting

Error `error_num` initializing backend connection.

**Cause:** An internal error occurred in **onpload**. Probably the server went down.

**Action:** Note the circumstances and contact Informix Technical Support.

Error inserting into table `table_name`: SQL error `error_num`, ISAM error `error_num`.

**Cause:** The **onpload** utility is unable to use the autogenerated formats and maps to create entries in a table in the **onpload** database.

**Action:** Refer to the [Informix Error Messages](#) manual.

Error listening for TLI connection: `t_errno=t_error_num`  
`errno=UNIX_error_num`.

**Cause:** An error occurred listening on a TLI connection.

**Action:** See `/usr/include/tiuser.h` (`t_error_num`).

Error listening for socket connection: `errno=UNIX_error_num`.

**Cause:** A TCP socket cannot be accessed.

**Action:** See `/usr/include/errno.h`.

Error on close of server load session: SQL error `error_num`, ISAM error `error_num`.

**Cause:** An internal error occurred in **onpload**. Probably the server went down.

**Action:** Note the circumstances and contact Informix Technical Support.

Error *error\_num* on record *record\_num* converting column *column\_name* to record field *field\_name*.

**Cause:** A conversion error occurred when **onpload** attempted to convert the column data to the record field type.

**Action:** For an explanation of the conversion error, refer to the [Informix Error Messages](#) manual. Check the load map to verify that the column is mapped to the correct record field.

Error opening cursor: SQL Error *error\_num*, ISAM error *error\_num*.

**Cause:** An error occurred when **onpload** attempted to set up an insert cursor on the load table.

**Action:** Refer to the [Informix Error Messages](#) manual.

Error preparing query: SQL error *error\_num*, ISAM error *error\_num*.

**Cause:** The unload query cannot be processed.

**Action:** Refer to the [Informix Error Messages](#) manual.

Error preparing statement *statement\_name*: SQL error *error\_num*, ISAM error *error\_num*.

**Cause:** An internal error occurred when **onpload** attempted to access the **onpload** database.

**Action:** Refer to the [Informix Error Messages](#) manual.

## Log-File Messages: Error initializing...-Error setting

Error preparing unload query *query\_name*: SQL error *error\_num*, ISAM error *error\_num*.

**Cause:** The unload query cannot be processed.  
**Action:** Refer to the [Informix Error Messages](#) manual.

Error *error\_num* reading message queue.

**Cause:** This critical initialization error probably means that the UNIX kernel does not have enough shared memory or semaphores configured, or that the allocated shared memory has been removed.  
**Action:** Increase shared memory or semaphores. If the condition persists, contact Informix Technical Support.

Error *UNIX\_error\_num* reading TCP/TLI connection.

**Cause:** An error occurred reading a socket connection.  
**Action:** See `/usr/include/errno.h`.

Error *error\_num* setting isolation level.

**Cause:** An access error occurred when **onpload** attempted to set the isolation level for an unload job.  
**Action:** Refer to the [Informix Error Messages](#) manual.

---

## Log-File Messages: Error writing...-G

Error *error\_num* writing message on message queue.

**Cause:** This critical initialization error probably means that the UNIX kernel does not have enough shared memory or semaphores configured, or that the allocated shared memory has been removed.

**Action:** Increase shared memory or semaphores. If the condition persists, contact Informix Technical Support.

Error *UNIX\_error\_num* writing TCP/TLI connection.

**Cause:** An error occurred writing a socket connection.

**Action:** See `/usr/include/errno.h`.

Exhausted all attempts to allocate shared-memory key.

**Cause:** All the shared-memory keys in the key range tried by **onpload** are currently allocated.

**Action:** Wait until another **onpload** session finishes. If the problem persists, contact Informix Technical Support.

Fatal error: cannot execute *pipe\_name*.

**Cause:** An attempt to execute the PIPE type device in the device array failed.

**Action:** Make sure the PIPE entry in the device array is a valid, executable program.

Fatal error creating server load session: error *error\_num*.

**Cause:** Cannot start the load session with the server.

**Action:** Note the circumstances and contact Informix Technical Support.

Fatal error getting stream buffer from server.

**Cause:** An internal error occurred in **onpload**. Probably the server went down.

**Action:** Note the circumstances and contact Informix Technical Support.

Fatal error in server row processing: SQL error *error\_num*, ISAM error *error\_num*.

**Cause:** An internal communication problem exists between the server and **onpload**.

**Action:** Note the circumstances and contact Informix Technical Support.

File type device file *file\_name* is not a regular (disk) file.

**Cause:** The device array specifies that the file is a disk file, but it is not.

**Action:** Change the type of the file in the device-array definition, or make sure that the file is a disk file.

Got Interrupt: Shutting down.

**Cause:** An internal error occurred, or a user sent an interrupt to **onpload**.

**Action:** If a user did not generate this interrupt, contact Informix Technical Support.



---

## Log-File Messages: I-M

Internal error: cannot initialize AIO library.

**Cause:** This critical initialization error probably means that the UNIX kernel does not have enough shared memory or semaphores configured.

**Action:** Increase shared memory or semaphores. If the condition persists, contact Informix Technical Support.

Internal error: cannot send message.

**Cause:** An internal error occurred in **onpload**. The most likely cause is a lack of shared memory.

**Action:** Note the circumstances and contact Informix Technical Support.

Internal error: *error\_num*. Contact Tech Support.

**Cause:** A critical internal error occurred.

**Action:** Note the circumstances and contact Informix Technical Support.

Internal error: invalid message type *error\_num*.

**Cause:** A critical internal error occurred.

**Action:** Note the circumstances and contact Informix Technical Support.

Internal error *error\_num* reading queue.

**Cause:** This critical initialization error probably means that the UNIX kernel does not have enough shared memory or semaphores configured.

**Action:** Increase shared memory or semaphores. If the condition persists, contact Informix Technical Support.

Invalid code-set character: cannot convert.

**Cause:** The data being loaded or unloaded has invalid character data.

**Action:** Make sure that you specified the correct data type on the format definition.

Invalid HEXASCII simple large object or Ext Type representation in *fieldname*, record *record\_num*.

**Cause:** The simple large object or Ext Type data field being loaded was classed as HEXASCII, but the data contains a non-HEXASCII character.

**Action:** Fix the data.

Invalid session ID *id\_number*.

**Cause:** The command line specified an invalid session ID for the job to run. An entry for the entered session ID must exist in the **session** table of the **onpload** database in order to run the job.

**Action:** Make sure the session ID on the command line matches the correct session ID in the **session** table.

Method not supported by current driver.

**Cause:** An internal error occurred in **onpload**.

**Action:** Note the circumstances and contact Informix Technical Support.

MT cannot bind to vpid.

**Cause:** This critical initialization error probably means that the UNIX kernel does not have enough shared memory or semaphores configured.

**Action:** Increase shared memory or semaphores. If the condition persists, contact Informix Technical Support.

MT internal failure.

**Cause:** This critical initialization error probably means that the UNIX kernel does not have enough shared memory or semaphores configured.

**Action:** Increase shared memory or semaphores. If the condition persists, contact Informix Technical Support.

MT failure putting CPU on-line.

**Cause:** This critical initialization error probably means that the UNIX kernel does not have enough shared memory or semaphores configured.

**Action:** Increase shared memory or semaphores. If the condition persists, contact Informix Technical Support.

---

## Log-File Messages: N-S

No insert permission on table *table\_name*.

**Cause:** You cannot load the indicated table because the DBA has not granted permission for you to do so.

**Action:** Make sure that you have insert permissions on the table.

No mapping to simple large object or Ext Type field *field\_name*.

**Cause:** The record format specifies a simple large object or Ext Type field type, but no column from the query is mapped to the record field.

**Action:** Map a column to the field, or remove the field from the record format.

onpload terminated by signal.

**Cause:** Either an internal error occurred or a user sent **onpload** a termination signal.

**Action:** If the signal is not SIGKILL, SIGTERM, or SIGQUIT, note the circumstances and contact Informix Technical Support.

Pipe type device file *file\_name* is not a regular file.

**Cause:** The device array specifies that the file is a pipe (executable program) file, but it is not.

**Action:** Change the type of the file in the device-array definition, or make sure that the file is an executable disk file.

Query contains unmapped simple large object or Ext Type column *column\_name*: cannot proceed.

**Cause:** The unload query is extracting a simple large object or Ext Type column that is not mapped to the record field.

**Action:** Modify the unload query so that it does not reference the simple large object or Ext Type column, or map it to a field in the record format.

Query for unload is not a select query.

**Cause:** The unload query does not contain a SELECT statement.

**Action:** Modify the query so that it contains a SELECT statement.

Record is too long to process: recnum *record\_num*, length *record\_length*, bufsize *buffer\_size*.

**Cause:** The record size exceeds the size of the **onpload** buffers (AIOBUFSIZE). This error can occur when a delimited record contains simple large objects or Ext Types, and a format specification for a field is missing, which causes a simple large object or a Ext Type to be treated as a regular field.

**Action:** Increase the size of AIOBUFSIZE for this record, or check that the format specification for the field matches the input file.

Server interface error; expected *num\_input* but got *num\_received* instead.

**Cause:** An **onpload**/server interface error occurred.

**Action:** Note the circumstances and contact Informix Technical Support.

Server stream buffer corrupted.

- Cause:** An internal error occurred in **onpload**.  
**Action:** Note the circumstances and contact Informix Technical Support.

Server stream buffer row data corrupted.

- Cause:** An internal error occurred in **onpload**.  
**Action:** Note the circumstances and contact Informix Technical Support.

SQL error *error\_num*, ISAM error *error\_num* executing statement *statement\_name*.

- Cause:** An internal error occurred when **onpload** accessed the **onpload** database.  
**Action:** Refer to the [Informix Error Messages](#) manual.

Simple large object conversion error occurred on record *record\_num*.

- Cause:** The SQLBYTE simple large object or Ext Type data could not be converted to HEXASCII, or the SQLTEXT simple large object or Ext Type has invalid character data (characters not in the code set).  
**Action:** Remove the invalid characters from the input data.

Start record *record\_num* is greater than number of records *total\_num* read from input *file\_name*.

- Cause:** A start record was specified for the load, but fewer records are in the input file than the indicated number of records to skip.  
**Action:** Specify the start-record number again.

---

## Log-File Messages: T-Z

Table *table\_name* will be read-only until level-0 archive.

**Cause:** After an express-mode load, a level-0 archive is needed to make the table available for update.

**Action:** Perform a level-0 archive.

Tables with simple large objects or Ext Types cannot be loaded in express mode.

**Cause:** You attempted to use express mode to load a table that contains simple large object or Ext Type data. Express mode does not support this condition.

**Action:** Perform the load in deluxe mode.

Tables with simple large objects or Ext Types cannot be processed with no conversion (-fn).

**Cause:** You attempted a no-conversion load on a table with simple large object or Ext Type columns. This action is not allowed.

**Action:** Remove the no-conversion specification, and run the job again.

Tape header is larger than I/O buffer: tape *header\_length*, I/O *buffer\_size*.

**Cause:** A tape header size is too large to fit into a memory buffer.

**Action:** Increase AIOBUFSIZE in **plconfig** to at least the value specified for tape I/O.

Tape type device file *file\_name* is not a character-special or block-special file.

**Cause:** The device array specifies that the file is a tape device, but it is not.

**Action:** Change the type of the file in the device-array definition, or make sure that the file is a tape device.

There is no mapping to column *column\_name*, which cannot accept null values.

**Cause:** The specified column has a NOT NULL constraint, but in the definition of the load map, no field is mapped to the column.

**Action:** Correct the load map or drop the NOT NULL constraint.

Unable to load locale categories for locale *locale\_name*: error *error\_num*.

**Cause:** The GLS locale specified in CLIENT\_LOCALE or DB\_LOCALE cannot be loaded, or if these variables are not set, **en\_US.819** cannot be loaded.

**Action:** Check the \$INFORMIXDIR/gls installation to ensure that the locale files are present.

Unload query select item for the *query\_item* expression needs to be assigned a name.

**Cause:** A SELECT statement contains a column name that might not be unique.

**Action:** Modify the SELECT statement to contain a name for each column expression. For example:

```
SELECT Max(I) Mcol FROM table x
```



---

## Pop-Up Messages

Cannot attach to server shared memory.

**Cause:** If the server is on, a permissions problem exists.

**Action:** Check that the following permissions and ownership of **onload** are set:

```
-rwsr-sr-x 1 informix informix
```

Cannot create shared-memory message queue: error *error\_num*.

**Cause:** A critical initialization error occurred. Probably the UNIX kernel does not have enough shared memory or semaphores configured.

**Action:** Increase shared memory or semaphores. If the condition persists, contact Informix Technical Support.

Cannot create shared-memory pool: errno *UNIX\_error\_num*.

**Cause:** The operating system shared-memory system cannot be accessed.

**Action:** See **/usr/include/errno.h**.

Cannot initialize multithreaded library.

**Cause:** A critical initialization error occurred. Probably the UNIX kernel does not have enough shared memory or semaphores configured.

**Action:** Increase shared memory or semaphores. If the condition persists, contact Informix Technical Support.

Cannot initialize shared memory: errno *UNIX\_error\_num*.

**Cause:** The operating system shared-memory system cannot be accessed.

**Action:** See **/usr/include/errno.h**.

Cannot open.  
Enter (r)etry, (c)ontinue, (q)uit job when ready

**Cause:** An internal error occurred when **onpload** attempted to open the load or unload file.

**Action:** Press R to try to access the load or unload file again. Press C to skip the file indicated and continue to process the rest of the files. Press Q to stop the job.

Cannot open log file *log\_file\_name*.

**Cause:** The log file for the job cannot be opened.

**Action:** See **/usr/include/errno.h**.

Cannot start I/O.  
Enter (r)etry, (c)ontinue, (q)uit job when ready

**Cause:** An internal error occurred when **onpload** attempted to open the load or unload file.

**Action:** Press R to try to access the load or unload file again. Press C to skip the file indicated and continue to process the rest of the files. Press Q to stop the job.

Fatal error: shared memory will conflict with server.

**Cause:** The shared-memory segment allocated to **onpload** is located below the shared memory segment of the server, and the size needed to run the job would cause the **onpload** shared memory to overlap the shared memory of the server.

**Action:** Reduce the size and number of buffers allocated to **onpload** on **\$INFORMIXDIR/etc/plconfig**, or increase the start address for the shared memory location of the server.

Logging facility failed (*error\_type*). Unsent message:  
*error\_string*.

- Cause:** A memory-allocation failure prohibited the logging of a message. Probably no shared memory is available.
- Action:** Configure more shared memory. If the problem persists, contact Informix Technical Support.

Write error.  
Enter (r)etry, (c)ontinue, (q)uit job when ready

- Cause:** An internal error occurred when **onpload** attempted to open the load or unload file.
- Action:** Press R to try to access the load or unload file again. Press C to skip the file indicated and continue to process the rest of the files. Press Q to stop the job.



# Index

---

## A

Active Job window 2-30, 11-8, 11-9, 12-10, 13-9, 13-10, 13-15

AIO error code 27 12-11

AIOBUFFERS parameter  
affecting onpload processes 15-11  
description of B-2  
example 15-15

AIOBUFSIZE parameter  
affecting onpload process 15-11  
description of B-3  
example 15-15

Alter table schema 15-14

ALTER TABLE statement  
format to use 13-12

ANSI compliance  
level Intro-15

ASCII. *See* Code set.

Assigning records to devices 6-3

Autogenerate Unload Components  
window 2-35, 13-5, 13-7

---

## B

Binary data, format of 5-10

Binary type, of computer A-9

BLOB data type. *See* Extended Types.

Simple large objects  
*See also* Express-mode limitations.

Blobs. *See* Simple large objects.

Block size of tape 16-10

BOOLEAN data type. *See* Extended Types.

Browse option  
description of 14-3  
description of fields 14-5  
log file 14-10

Browsers menu  
description of 3-5  
Logfile option 14-10  
Record option 14-4  
Violations option 14-8

Buffer size  
I/O, with onpload 16-10  
server stream buffer 16-10

Bulk loader. *See* High Performance Loader.

BYTE data type. *See* Simple large objects.

Byte  
number to transfer 9-16  
order of binary information 5-7, 5-12  
order, specification of A-9  
size of variables 5-12

Bytes 7-9

---

## C

cadiload threads 1-16

Carriage returns, in fixed  
format 7-11

Case conversion 9-16, A-17  
in ipload 16-13

Changing unload job options 12-13

CHAR data type 15-17

- Character
    - case conversion 16-13
    - invalid entries 3-9
    - set, to modify 7-23, 7-24
    - See also* Code set.
    - See also* Case conversion.
  - CLOB data type. *See* Extended Types.
  - COBOL format
    - creating 7-20
    - records 7-19
    - used with generate 13-12
  - COBOL Format definition window 7-19
  - Code set
    - defaults table A-2
    - GLS 5-7, 7-22, 7-24, 10-11
    - of data file 5-7
    - of database 5-7
    - to modify 7-23, 7-24
    - with delimited formats 7-24
    - with Fixed and COBOL formats 7-22
    - See also* Character.
  - Code-set conversion 10-11
  - Collection data types. *See* Extended Types.
  - Column
    - characteristics of 9-20
    - default values 9-16
    - drop, add, modify 15-14
    - offset, in mapping options 9-17
  - Column Selection window 8-8, 8-9
  - Command line. *See* onpload command.
  - Command-line conventions
    - elements of Intro-10
    - example diagram Intro-12
    - how to read Intro-12
  - Comment icons Intro-9
  - Commit interval
    - effect on performance 15-19
    - in onpload database A-17
    - load job 12-13
  - Communication configuration file. *See* ONCONFIG configuration file.
  - Comparison of express and deluxe modes 15-8
  - Compliance, with industry standards Intro-15
  - Components menu
    - description of 3-5
    - devices 6-5
    - filter 10-5
    - Formats 7-5
    - generate 13-14
    - maps 9-7, 9-11
    - query 8-4, 8-13
  - Computer
    - configuration, reorganize 15-13
    - description, modifying 5-10
  - Configuration file
    - conventions B-2
    - HPL 16-10, 16-13, B-1
    - onpload 1-13
  - Configuration parameter
    - AIOBUFFERS B-2
    - AIOBUFSIZE B-3
    - and thread control 15-11
    - CONVERTTHREADS B-3
    - CONVERTVPS B-4
    - descriptions B-1
    - STRMBUFFERS B-5
    - STRMBUFSIZE B-5
    - See also* each parameter listed under its own name.
  - Configure menu 3-6
  - Configuring ipload 5-3
  - Confirm delete window 3-25
  - Confirmation window
    - delete 3-25
    - file overwrite 8-16
  - Connect Server window 5-4
  - Constraint
    - checking 15-4
    - violations 15-9
  - Conversion functions, custom E-1
  - Converter threads 1-15, 15-17, 16-13
  - CONVERTTHREADS parameter
    - affecting onpload process 15-11
    - description of B-3
    - example 15-15
  - CONVERTVPS parameter
    - affecting onpload process 15-11
    - description of B-4
    - example 15-15
  - Copy Data window
    - illustration 3-24
    - using 3-24
  - Copy existing format 3-23
  - cron job 11-4, 12-4
  - Custom conversion functions E-1
  - Custom driver
    - adding 5-10
    - creating F-1
  - Custom file handling software 5-8
  - Custom input to pipes 5-8
- 
- ## D
- Data conversion, with onpload 16-6
  - Data file
    - formats supported by ipload 7-3
    - structure of 7-3
  - Data load. *See* Load job.
  - Data masking 9-17
  - Data source, for onpload 16-6, 16-7
  - Data types
    - COBOL 7-19
    - fixed format 7-7
    - values in onpload database A-7
  - Database
    - create for example 2-4
    - onpload A-1
    - onpload *See* onpload database.
    - unloading records 11-6
  - Database code set 5-7
  - Database code set. *See* Code set.
  - Database name, override in onpload 16-13
  - Database server 2-4
    - limitations 12-4
    - name. *See* dbservername.
    - selecting 5-3
    - target server 11-4, 12-4
  - Database Views window 8-17
  - Data, unload using onpload 16-7
  - DATE data type 15-17
  - dbaccessdemo7 script Intro-6

DBDELIMITER environment variable 7-25

DBONPLOAD environment variable

- description of 1-13
- mentioned 5-5

DB\_LOCALE environment variable 5-7

Debugging information A-16

DECIMAL data type 15-17

Decimals 7-9

Default

- changing the values 5-7
- column values 9-16
- data code set 5-7
- HPL database name 5-5
- machine type 5-7
- name of log file 14-9
- name of rejects file 14-9
- project name 4-3
- server name 5-6
- settings for onpload 5-5
- used as server name 5-6
- values in onpload database A-2
- values, for example 2-6

Default locale Intro-5

defaults table, in onpload database A-2

Defaults window 3-19, 5-6

Define format

- delimited records 7-16, 7-20
- editing a format 7-9
- fixed-length records 7-5
- modifying a format 7-22

Define mapping options 9-14

Delete existing format 3-25

Delimited format

- creating 7-16, 7-20
- in formats table A-8
- modifying options 7-24
- using simple large objects 7-17, 7-18

Delimited Format window 2-16, 7-18

Delimited record, definition of 7-16

Delimiter characters

- changing 7-24
- description 7-16

Delimiter Options window 7-24

delimiters table, in onpload database A-3

Deluxe mode

- choosing from load options 12-13
- compare to express 15-8
- description of 15-4
- INSERT statement 15-4
- list of characteristics 15-4
- mentioned 15-3
- speed of 15-4

Demonstration database Intro-6

Device array

- definition of 6-3
- device types 6-3, 6-6
- editing 6-8
- elements of, in onpload database A-3
- example 2-10
- improving performance 15-12
- speed of 15-12
- steps for defining 6-8
- tape parameters 6-7
- use with onpload 16-6

Device Array Selection window 2-11, 3-8, 6-4

device table of onpload database A-3

Device-array definition window 2-12, 3-11, 6-6, 6-7

Dirty read isolation level 11-11

Distinct data types. *See* Extended Types.

Documentation conventions

- command-line Intro-10
- icon Intro-9
- screen-illustration Intro-12
- typographical Intro-7

Documentation notes Intro-15

Documentation, types of

- documentation notes Intro-15
- error message files Intro-14
- machine notes Intro-15
- on-line help Intro-14
- on-line manuals Intro-13
- printed manuals Intro-13
- release notes Intro-15

Driver

- class, format type of 5-9
- creating custom driver F-1
- modifying 7-23
- name of custom driver 5-10
- to modify 7-24

Drivers window

- illustration 5-9
- using 5-13

---

## E

EBCDIC data, generating 13-12

Editing a format 7-9

Environment variable

- DBDELIMITER 7-25
- DBONPLOAD 1-13
- DB\_LOCALE 5-7
- INFORMIXDIR 1-12
- INFORMIXSERVER 1-12
- LD\_LIBRARY\_PATH 1-12
- ONCONFIG 1-12
- PLCONFIG 1-13

en\_us.8859-1 locale Intro-5

Error code 197 1-18, 12-11

Error code 27 12-11

Error message files Intro-14

Errors

- constraint violations 15-10
- maximum number 16-10
- maximum number allowed 11-11, 12-13
- See also* Error code.
- See also* Log file.

Exporting a query 8-13

Express mode

- choosing from load options 12-13
- compare to deluxe 15-8
- description of 15-4
- foreign key constraints 15-7
- level-0 backup 12-11
- limitations 15-5
- list of characteristics 15-5
- load example 15-16
- mentioned 15-3
- page size limitation 15-5
- sequence of events 15-6
- speed of 15-4

Ext Types. *See* Extended Types.  
Extended types  
  as fixed-width data 7-13  
  as inline data 7-13  
  in delimited records 7-17, 7-18  
  viewing specific data type 9-21

---

## F

Fast format 7-21  
Fast Job Startup window 13-15  
Fast job, definition of 7-21  
Feature icons Intro-9  
Features, product Intro-6  
Field  
  set minimum/maximum 9-17  
  set offset 9-17  
Figure  
  extracting data from a table 8-3  
  foreign-key constraints 15-7  
  load and unload modes 15-3  
  mapping options symbol 9-15  
  maps found by a search 9-24  
  use of a map 9-3  
  using OK and Cancel 3-32  
  view indicator 9-19  
File  
  COBOL 7-19  
  configuration for HPL B-1  
  default onpload  
    configuration 1-13  
  .ftl 15-9  
  import/export queries 8-13  
  onpload.std 1-13  
  pathname for I/O 16-5  
  plconfig 16-10, 16-13  
  sqlhosts. *See* sqlhosts file.  
File descriptor, COBOL 7-20  
Fill character, mapping  
  options 9-17  
Filter  
  conversion of code set 10-11  
  creating 10-5  
  defining 10-5  
  description of 10-3  
  editing 10-8, 10-9  
  example 10-3  
  match conditions 10-7

  mode, with constraints 15-10  
  onpload database A-5  
  rejected records 15-9  
Filter Views window 10-10  
filteritem table, in onpload  
  database A-5  
filters table, in onpload  
  database A-5  
Filters window 10-5  
Find button 9-18  
Find Node window 9-19  
Fixed binary format 13-12  
Fixed format  
  data types 7-7  
  definition of 7-4  
  in formats table A-8  
  using carriage returns 7-11  
  using simple large objects 7-12  
Fixed Format definition  
  window 7-6, 7-12, 7-14  
Fixed Format edit window 7-6  
Fixed Format Options  
  window 7-23  
Fixed internal format  
  mentioned 7-21  
  used in generate 13-12  
FLOAT data type 15-17  
.flt file 15-9  
Foreign key constraints 15-7  
Format  
  COBOL 7-19, 13-12  
  copy 3-23  
  create 7-5  
  definition of 7-3  
  delete 3-25  
  fast job 7-21  
  fast, definition 7-21  
  fixed internal 13-12  
  performance 15-17  
  steps for editing 7-9, 7-10, 7-11  
  testing 14-3  
  types supported by HPL 7-3  
  types used by generate 13-12  
Format Views window 2-14, 3-17,  
  3-18, 7-26  
formatitem table, in onpload  
  database A-6  
formats table, in onpload  
  database A-8

Fragmenter threads 1-16  
Function  
  custom conversion E-1  
  user-defined in mapping  
    options 9-17

---

## G

Generate  
  assumptions 13-13  
  description of 13-3  
  EBCDIC data 13-12  
  format types 13-12  
  from unload job 13-6  
  no-conversion job 13-14  
  types of tasks 13-3  
Generate window 13-11, 13-14  
Global Language Support  
  (GLS) Intro-5, 5-7, 7-22, 7-24,  
  10-11  
GLS  
  *See* Global Language Support  
  (GLS).  
GLS code set  
  *See* Code set.

---

## H

Help  
  menu description 3-6  
  using on-line help 3-33  
High-Performance Loader  
  configuration file B-1  
  managing 15-3  
  modes 1-7, 15-3  
  usage models 15-13  
HPL configuration file 16-10, 16-13  
HPL main window 2-5  
HPL. *See* High-Performance  
  Loader.

---

## I

Icons  
  comment Intro-9  
  feature Intro-9  
Importing a query 8-13



Import/Export File Selection window 8-14  
Industry standards, compliance with Intro-15  
Informix internal format. *See* Internal format.  
SINFORMIXDIR/etc/sqlhosts. *See* sqlhosts file.  
INFORMIXDIR environment variable 1-12  
INFORMIXDIR/bin directory Intro-6  
INFORMIXSERVER environment variable 1-12  
Input, starting record 16-11  
INSERT statement 15-4  
INT data type 15-17  
Internal format limitations 7-21  
use with generate 13-14  
Invalid characters in entry fields 3-9  
ipload utility  
command 3-4  
configuration 5-3  
creates onpload database A-1  
example 2-3  
purpose of 1-9  
starting 2-5, 3-4  
ISO 8859-1 code set Intro-5  
Isolation level, in unload option 11-11  
I/O  
buffer size 16-10  
number of tapes to load 16-11  
tape block size 16-10

---

## J

Jobs menu, description of 3-5  
Justification of data in mapping options 9-16

---

## L

language table, in onpload database A-9  
LD\_LIBRARY\_PATH environment variable 1-12  
Least significant byte 5-12  
Level-0 backup in express mode 2-31, 15-6  
Limitations, database server 12-4  
Load data with onpload 16-6  
Load job  
browsing options 14-3  
changing options 12-14  
commit interval 12-13  
components 12-3  
creating 12-7, 12-15  
description of 12-3  
device array speed 15-12  
example 2-3, 2-7  
from the command line 16-3  
generate violations records 12-13  
log file 14-9  
maximum errors 12-13  
mode options 12-13  
multiple jobs 11-4, 12-4  
number of records 12-13  
onpload database A-15  
preview records 14-3  
run example 2-29, 2-37  
running 12-10, 12-15  
server considerations 11-4, 12-4  
starting record 12-13  
status log 12-10  
tapes, number of 12-13  
using cron 11-4, 12-4  
Load Job Select window  
command line information 12-12  
illustration 2-8, 12-8  
Load Job window 2-9, 2-18, 2-27, 3-14, 12-9  
Load log, examining 14-9  
Load map  
definition of 9-3  
how to create 9-4  
Load mode, description of 1-7, 15-3

Load Options window 2-28, 12-14  
Load Record Maps window 2-22, 9-7  
Load/unload session  
maximum errors 16-10  
Locale Intro-5  
Lock table. *See* Table locking.  
Log file  
created by ipload 12-7  
for load job 14-9  
messages 12-11, H-1  
sample entry 14-11  
setting 11-8  
Log-file messages. *See* Log file.  
Lowercase conversion 9-16, 16-13  
LSB 5-12  
LVARCHAR data type. *See* Extended Types.

---

## M

Machine notes Intro-15  
Machine type  
default 5-7  
modifying 5-10, 7-23  
machines table, in onpload database A-9  
Machines window  
illustration 5-11  
using 5-12  
Major features Intro-6  
Managing the HPL 15-3  
Map  
columns and fields of same name 9-6, 9-12  
definition of 9-3  
for inline simple large objects 7-15  
for simple large objects in separate files 7-15  
Map Views window 2-21, 9-22, 9-23  
Map-definition window 2-24, 2-25, 2-26, 9-5, 9-9, 9-13, 9-19  
Map-edit window  
description of 9-5  
purpose 9-4  
using the find button 9-18

- mapitem table, in onpload
  - database A-10
- mapoption table, in onpload
  - database A-11
- Mapping options
  - bytes to transfer 9-16
  - case conversion 9-16
  - column offset 9-17
  - default column value 9-16
  - defining 9-14
  - field minimum/maximum 9-17
  - field offset 9-17
  - fill character 9-17
  - function, user-defined 9-17
  - justification 9-16
  - picture format 9-17
  - steps to define 9-14
  - summary 9-14
  - symbol 9-15
- Mapping Options window 9-14, 9-15
- maps table, in onpload
  - database A-12
- Masking data 9-17
- Match conditions
  - definition of 10-3
  - in a filter 10-7
  - of WHERE clause 8-12
- Maximum number of errors 11-11
- Message log file, pathname in onpload 16-14
- Message log, categories of messages H-2
- Message window 3-20
- Mode options, load job 12-13
- Modify format
  - COBOL 7-22
  - delimited 7-24
  - fixed 7-22
- MONEY data type 15-17
- Most significant byte 5-12
- MSB 5-12
- Multiple load or unload jobs 11-4, 12-4

---

## N

- No-conversion job
  - changing computer
    - configuration 15-13
  - definition of 7-21
  - load example 15-15
  - option 13-14
  - restrictions 7-21
  - run fast job 13-15
  - running the job 13-14
  - using onpload 16-6
- Non-printable field delimiter
  - values A-3
- NOT NULL violation 15-9
- Notes window 3-26
- Number of conversion
  - threads 16-13
- Number of records in a load
  - job 12-13
- Number of records to process
  - assigned in onpload 16-11
- Number of tapes to load 16-11

---

## O

- ONCONFIG environment
  - variable 1-12
- ONCONFIG file parameters. *See* Configuration parameter.
- On-line help Intro-14
  - how to use 3-33
  - menu 3-6
- On-line manuals Intro-13
- onpload command
  - d option 16-8
  - generated for Load Job 12-12
  - generated for Unload Job 11-10
  - i option 16-11
  - starting 16-3
  - syntax 16-4
  - usage 16-3
- onpload configuration file 1-13

- onpload database
  - connection to 5-3
  - creating 5-5
  - creation of 2-5
  - default settings 5-5
  - location of 1-9
  - multiple 1-12
  - select server 5-3
  - table
    - defaults A-2
    - delimiters A-3
    - device A-3
    - filteritem A-5
    - filters A-5
    - formatitem A-6
    - formats A-8
    - language A-9
    - machines A-9
    - mapitem A-10
    - mapoption A-11
    - maps A-12
    - progress A-14
    - query A-14
    - session A-15
    - table descriptions A-1
- onpload utility. *See* onpload command.
- onpload, load data 16-6
- onpload.std file 1-13
- onstat utility 15-12
- Opaque data types. *See* Extended Types.
- Options
  - load job 12-13
  - unload job 11-11
- Options symbol 9-15

---

## P

- Page size in express mode 15-5
- Parallel loader. *See* High-Performance Loader.
- Performance
  - converter threads 15-17
  - hints 15-16
  - improving 15-10
  - VPs 15-17
- Permissions. *See* Privileges.

Picture description, COBOL 7-20  
Picture format, in mapping  
  options 9-17  
Pipe command  
  in a device array 6-7  
  starting 6-3  
Pipe device arrays 5-8  
Pipe, use with onpload 16-7  
plconfig configuration file 16-10,  
  16-13  
plconfig configuration file.  
  See Configuration file  
  See Configuration file parameters  
PLCONFIG environment  
  variable 1-13  
PLCONFIG file  
  override I/O buffer size 16-10,  
  16-13  
pl\_wkr threads 1-16  
Print button 3-28  
Printed manuals Intro-13  
Privileges 12-4  
Problems during a load job 11-9,  
  12-11  
Project  
  creating a new project 4-7  
  default name 4-3  
Project name, in onpload 16-5  
project table, in onpload  
  database A-14  
Projects window 4-6  
Proper name case conversion 16-13  
Proper name conversion 9-16

---

## Q

Query  
  description of 8-3  
  export to a file 8-13, 8-15  
  for unload map 9-10  
  import from a file 8-13  
  steps for defining 8-4  
  use of the table button 8-7  
  using the Table button 8-7  
query table, in onpload  
  database A-14  
Query window 8-5

Query-definition window 8-6, 8-10,  
  8-11  
Quiet, suppress output A-16

---

## R

Raw load/unload 7-21, 13-14  
Record Browser window 14-4, 14-5  
Record filter 16-13  
Record Formats window 2-15, 3-27,  
  7-5  
Record map, assigned by  
  onpload 16-5  
Records, number to process 16-11  
Rejected records 15-9  
  conversion errors 15-9  
  filter conditions 15-9  
  reviewing 14-6  
Release notes Intro-15  
Reorganize computer  
  configuration 15-13  
Repeatable read isolation  
  level 11-11  
Row types. See Extended Types.

---

## S

Schema, of database table 13-3  
Screen-illustration  
  conventions Intro-12  
sdriver threads 1-15  
SELECT clause, preparing 8-6  
Selection Type box 3-9  
Server name, default 5-6  
Server. See Database server.  
session table, in onpload  
  database A-15  
SET CONSTRAINTS statement  
  DISABLED 15-7  
  ON 15-10  
setrw threads 1-16  
Simple large objects  
  as inline data 7-13  
  in delimited records 7-16, 7-17,  
  7-18  
  in fixed format 7-12  
  in separate files 7-15

Simple LOs. See Simple large  
  objects.  
Single-CPU, performance B-4  
SMFLOAT data type 15-17  
Software dependencies Intro-5  
Specifications window 9-20  
Specs button 3-22, 9-20  
Speed  
  of deluxe mode 15-4  
  of express mode 15-4  
Splash screen 3-4  
SQL query. See Query.  
SQL statement, use in HPL 8-3  
sqlhosts file 5-4  
Start record for input 16-11  
Start record, for load job 12-13  
Statistics. See onstat utility.  
Status log. See Log file.  
Steps  
  to add a custom driver name 5-10  
  to change load job options 12-14  
  to create a device array 6-5  
  to create a fixed-length format 7-5  
  to create a load job 12-8, 12-15  
  to create a load map 9-7  
  to create an unload map 9-11  
  to define a device array 6-8  
  to define a filter 10-5  
  to define a query 8-4  
  to define fixed-length file 7-5  
  to define mapping options 9-14  
  to edit a device array 6-8  
  to edit a filter 10-8, 10-9  
  to edit a format 7-9, 7-10, 7-11  
  to generate components  
    menu 13-13  
  to modify delimited formats 7-24  
  to modify format options 7-23  
  to review rejected records 14-7  
  to review source records for  
    load 14-4  
  to select a database server 5-4  
  to specify onpload defaults 5-7  
  to use Map Views window 9-22  
  to use Specifications  
    window 9-21  
  to use the Fast Job window 13-15  
  to view load log 14-10  
  to view violations table 14-8

stores7 database Intro-6  
Stream threads 1-16  
STRMBUFFERS parameter  
  affecting onpload process 15-11  
  description of B-5  
  example 15-15  
STRMBUFFSIZE parameter  
  affecting onpload process 15-11  
  example 15-15  
STRMBUFSIZE parameter  
  description of B-5  
Structured query language. *See* SQL statement.  
Suppress message output A-16  
Swap bytes A-17  
swap bytes 16-10  
Symbol, mapping options 9-15  
Synonyms 1-4, 8-7, 9-8  
Syntax, onpload utility Intro-4, 16-3

---

## T

table descriptions A-1  
Table locking  
  deluxe mode 15-4  
  express mode 15-4  
Table, create for example 2-4  
Tape I/O threads 1-15  
Tape parameters, specifying 6-7  
Tapes  
  number of 12-13, A-17  
  number to load 16-11  
Tape, block size 16-10  
Target server 5-3, 11-4, 12-4  
Testing formats 14-3  
TEXT data type. *See* Simple large objects.  
Thread  
  cadiload 1-16  
  convert 1-15  
  fragmenter 1-16  
  pl\_wkr 1-16  
  sdriver 1-15  
  setrw 1-16  
  stream 1-16  
  tape I/O 1-15

ulstrm 1-20  
  unload-stream 1-20  
  worker 1-15  
Trace level A-16  
Transfer bytes, in mapping  
  options 9-16

---

## U

ulstrm threads 1-20  
Universal Server 2-4  
Unload data  
  using onpload 16-7  
Unload job  
  changing the options 11-11  
  components of 11-3  
  creating 11-5  
  definition of 11-3  
  example 2-32  
  from the command line 16-3  
  generate option 13-6  
  log file 14-9  
  mode 15-3  
  multiple jobs 11-4, 12-4  
  onpload database A-15  
  options 11-11, 12-13  
  options, how to change 12-13  
  using cron 11-4  
Unload Job Select window  
  command line information 11-10  
  illustration 11-6  
Unload Job window 2-34, 2-36, 11-7, 13-8  
Unload map  
  definition of 9-3, 9-10  
  how to create 9-10  
  steps to create 9-11  
Unload Options window 11-12  
Unload Record Maps window 9-11  
Uppercase conversion 9-16, 16-13  
Usage description, COBOL 7-20  
Usage models for HPL 15-13  
User defined types  
  in fixed format 7-8  
Utility, onpload. *See* onpload utility.

---

## V

VARCHAR data type 15-17  
Variable, binary size of 5-12  
View icon, description 3-29  
View indicator, figure 9-19  
Views 1-4, 8-7  
Violations table  
  generate from load job 12-13  
  viewing 14-7  
Violations Table Browser  
  window 14-8, 14-9  
Violations, description of 15-9  
VPs, performance 15-17

---

## W

WHERE clause  
  match conditions 8-12  
  preparation 8-11  
Whitespace in configuration  
  file B-2  
Window  
  Active Job 2-30, 11-9  
  Autogenerate Unload  
    Components 2-35, 13-5, 13-7  
  Browse Logfile 14-10  
  COBOL Format definition 7-19  
  Column Selection 8-8, 8-9  
  confirm delete 3-25  
  Confirm file-overwrite 8-16  
  Connect Server 5-4  
  Copy Data 3-24  
  Database Views 8-17  
  Defaults 3-19, 5-6  
  Delimited Format 2-16  
  Delimited Format definition 7-18  
  Delimiter Options 7-24  
  Device Array Selection 2-11, 3-8, 6-4  
  device-array definition 2-12, 3-11, 6-6, 6-7  
  Drivers 5-9  
  Fast Job Startup 13-15  
  Filter Views 10-10

- Filters 10-5
- Find Node 9-19
- Fixed Format 7-6
- Fixed Format definition 7-12, 7-14
- Fixed Format definition
  - window 7-6
- Fixed Format Options 7-23
- format definition 2-16
- Format Views 2-14, 3-17, 3-18, 7-26
- Generate 13-11, 13-14
- HPL main window 2-5
- Import/Export File Selection 8-14
- Load Job 2-9, 2-18, 2-27, 3-14, 12-9
- Load Job Select 2-8, 12-8, 12-12
- Load Options 2-28, 12-14
- Load Record Maps 2-22, 9-7
- Machines 5-11
  - map definition 2-24, 2-25, 2-26
- Map Views 2-21, 9-22, 9-23
- map-definition 9-5, 9-9, 9-13, 9-19
- Mapping Options 9-14, 9-15
- Message 3-20
- notes 3-26
- Projects 4-6
- Query 8-5
  - query-definition 8-10
  - query-definition 8-6, 8-11
- Record Browser 14-4, 14-5
- Record Formats 2-15, 3-27, 7-5
- Specifications 9-20
- Unload Job 2-34, 2-36, 11-7, 13-8
- Unload Job Select 11-6
- Unload Options 11-12
- Unload Record Maps 9-11
- Violations Table Browser 14-8, 14-9
- Worker threads 1-15

---

## X

- X/Open compliance
  - level Intro-15

