Progress®



OpenEdge Database Tools

OpenEdge®

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Preface

Purpose

This book is a user guide for the OpenEdge® RDBMS basic database administration toolset for character-mode.

Audience

This book is intended for developers who want to use the character-mode Data Dictionary to manage the OpenEdge RDBMS.

Organization

Data Dictionary Basics on page 13

Describes how to access the Data Dictionary and its menu options.

Database Tasks on page 17

Describes how to perform database tasks.

Table Tasks on page 27

Describes how to perform administrative tasks for tables and files.

Field Tasks on page 43

Describes how to perform tasks to create and maintain fields.

Index Tasks on page 49

Describes how to perform tasks to create and maintain indexes.

Sequence Tasks on page 55

Describes how to perform tasks to create and maintain sequences.

Trigger Tasks on page 61

Describes how to perform tasks to create and maintain schema triggers.

Database Menu Reference on page 67

Describes the Database menu options and dialog boxes.

Schema Menu Reference on page 91

Describes the Schema menu options and dialog boxes.

Admin Menu Reference on page 121

Describes the Admin menu options and dialog boxes.

Advanced Menus Reference on page 167

Describes the menu options and dialog boxes for the Utilities and PRO/SQL menus.

Advanced Menus Reference on page 167

Describes the third-party references.

Documentation conventions

See Documentation Conventions for an explanation of the terminology, format, and typographical conventions used throughout the OpenEdge content library.

1

Data Dictionary Basics

Note: You cannot use the Data Dictionary to manipulate data from previous version databases.

For details, see the following topics:

- Start the Data Dictionary
- Data Dictionary menu bar

Start the Data Dictionary

Start the Data Dictionary in one of the following ways:

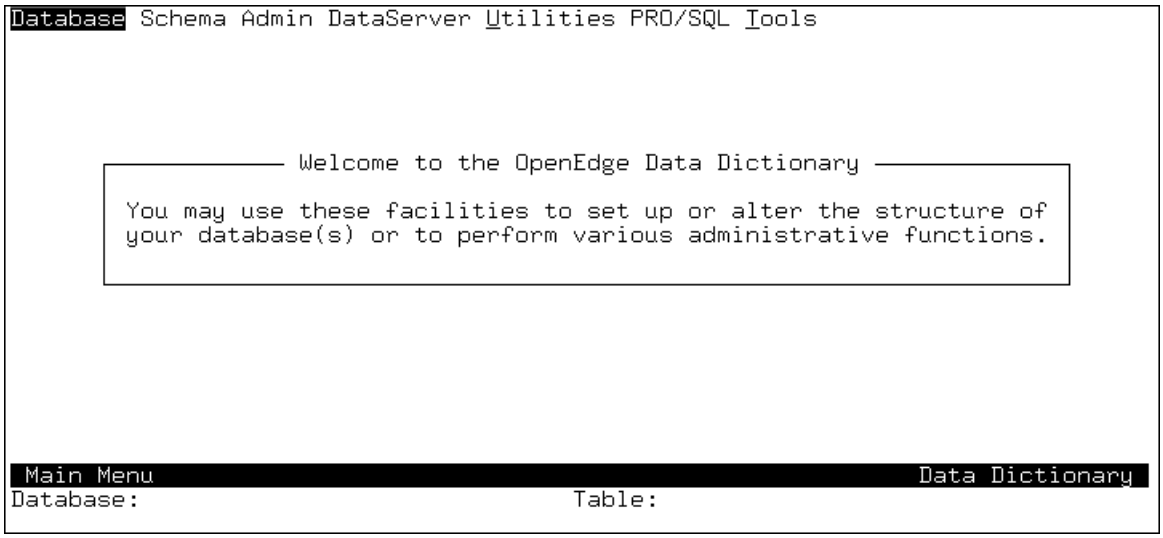
- At the command line, enter the following command:

```
pro -p dict.p
```

- From any of the Application Development tools, choose **Data Dictionary** > **Tools**.
- In the Procedure Editor, type `dict`. Then choose **Run** > **Compile** or press **GO**.

The Procedure Editor opens the Data Dictionary, as shown in the following figure:

Figure 1: Data Dictionary window

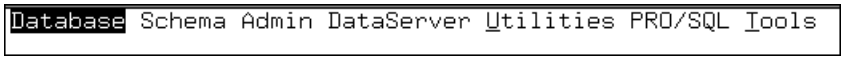


Once open, the Data Dictionary displays the name of the working database in the lower-left corner of the window (if you have at least one connected database). You can have multiple databases connected at any time, but only one is the current, *working database*. To select an existing working database, choose **Database** > **Select Working Database** from the menu bar.

Data Dictionary menu bar

The following figure shows the Data Dictionary menu bar.

Figure 2: Data Dictionary menu bar



The following table describes the pull-down menus and options available from the menu bar in the Data Dictionary.

Table 1: Data Dictionary menu

Option	Description
Database	Manages database creation, connection, and disconnection, and generates reports on schema, auditing, alternate buffer pool, and transparent data encryption; also exits the Data Dictionary
Schema	Modifies database structure, including defining tables, fields, indexes, sequences, and triggers
Admin	Dumps and loads data and definitions; defines security options for database access, auditing, and encryption; imports and exports data; allows enabling of large key entries; and defines Alternate Buffer Pool assignments
DataServer	Accesses utilities to view and maintain the schema images for non-OpenEdge databases

Option	Description
Utilities	Creates parameter files, freezes/unfreezes tables, prepares data for dumping and loading, and generates include files
PRO/SQL	Performs SQL-related tasks
Tools	Accesses the Procedure Editor, OS Shell, and Application Compiler

The menu bar provides access to all the available options. However, if you do not have a database connected, you can only access the options listed in the following table:

Table 2: Options available without a connected database

Menu option	Pull-down menu option	Task
Database	Create...	Creates a new database
	Connect...	Connects to an existing database
	Exit	Exits the Data Dictionary
Utilities	Editor for Parameter Files...	Creates or edits a parameter file
	Quoter Functions	Formats data files so they can read the data into an OpenEdge® database
	Information...	Displays session information
Tools	All options	Accesses the Procedure Editor, OS Shell, and Application Compiler

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Database Tasks

For details, see the following topics:

- Create a database
- Connect to a database
- Switch to another connected database
- Disconnect a database
- View session information
- Manage default areas
- Dump data definitions
- Dump Change Data Capture policies
- Create an incremental data definition file
- Create a parameter file
- Edit a parameter file
- Load data definitions
- Load Change Data Capture policies

Create a database

There are many ways to create an OpenEdge database. For a complete discussion about database creation, see *Manage the OpenEdge Database*.

To create a database using the Data Dictionary:

1. Choose **Database** > **Create**. The **Create Database** dialog box appears.
2. Enter the name of the new database.
3. Specify whether you want to create an empty database, a copy of the SPORTS database, a copy of the SPORTS 2020 database, or a copy of an existing database.
4. Select **Replace If Exists** to specify whether you want to overwrite an existing database with the same name.

   Note: If you do not choose the **Replace If Exists** button, and a database already exists with the same name, the Data Dictionary returns an error.

5. Select **New Instance** if you are making a copy of a database and want the Data Dictionary to create a unique DB identifier for the copied database.

   If you do not select **New Instance**, the Data Dictionary assigns the source database's DB Identifier to the copy.

   Note: If you want to create a copy of a database for backup purposes, do not select **New Instance**. If, however, the copy is of an audit-enabled database and will continue to store new audit data, select **New Instance**. All audit-enabled databases need unique DB Identifiers. For more information about audit-enabled databases, see *Learn about Security and Auditing*.

   If no database with that name exists, the Data Dictionary creates the database, or if one does and you chose the **Replace If Exists** button, the Data Dictionary overwrites the existing database and the **Database Connect** dialog box appears. Define the database attributes, as described in Connect to a database on page 18, then choose **OK**.

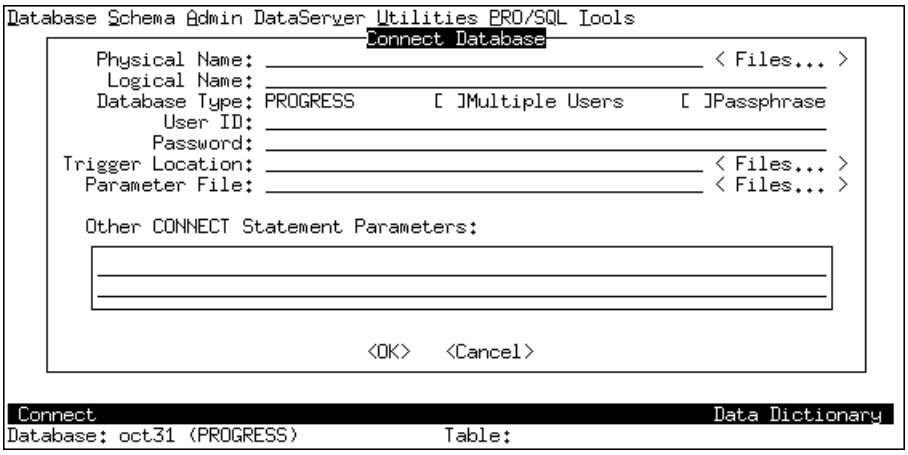
   If more than one database is connected, the **Select Working Database** dialog box appears. After you select a working database, the Data Dictionary main window reappears.

Connect to a database

There are many ways to connect to an OpenEdge database. For detailed information about connecting to a database, see *OpenEdge Data Management: Database Administration*.

To connect to a database using the Data Dictionary:

1. Choose **Database** > **Connect**. The **Connect Database** dialog box appears:



2. Specify the database name and any necessary database information, then choose **OK**. See the Connect option on page 70 for a complete description of the database attributes you can specify in the **Connect Database** dialog box.

Note: You **must** select the **Multiple Users** toggle-box if you are running multi-user and you are trying to connect as a self-service client.

Switch to another connected database

The Data Dictionary allows you to switch to a new working database.

To switch to another connected database:

1. Choose **Database** > **Select Working Database**. The Data Dictionary displays a list of the connected databases.
2. Highlight the database you want for the working database, then press **RETURN**.

Disconnect a database

There are many ways to disconnect a database. For detailed information of all disconnection methods, see *Manage the OpenEdge Database*.

To disconnect a database using the Data Dictionary:

1. Choose **Database** > **Disconnect**. If you have more than one database connected, the Data Dictionary displays the **Select Database to Disconnect** dialog box.
2. Select the database you want to disconnect from the database selection list, then press **RETURN**. The Data Dictionary displays an alert box prompting you to verify the disconnect.
3. Choose **Yes** to disconnect the selected database.

   If you have more than one database connected, the **Select Working Database** dialog box appears and lets you select another database as the working database.

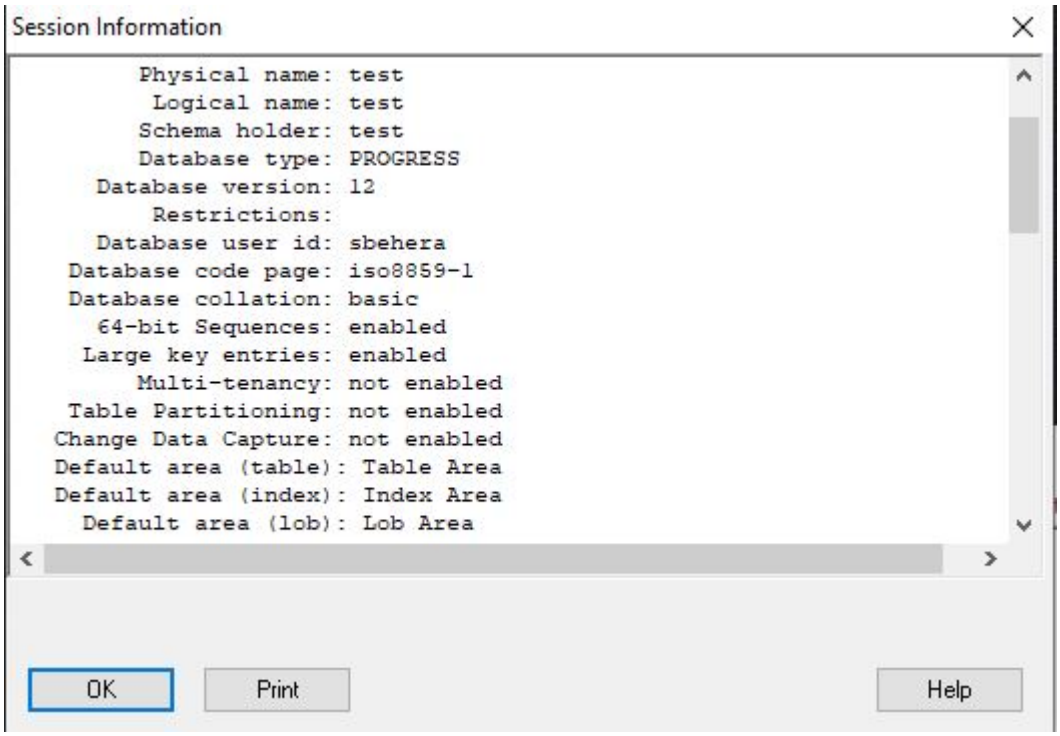
Note: If you disconnect a schema holder, the Data Dictionary also disconnects all of the schema holder's corresponding non-OpenEdge databases.

View session information

To display current database session information, choose **Utilities** > **Information**. The **Session Information** dialog box appears, which contains information such as how many databases are connected, the physical and logical names of the working database, the database type and version, whether 64-bit sequences and large key entries are enabled for the currently selected database.

The **Session Information** dialog box also displays whether features such as Multi-tenancy, Table Partitioning, and Change Data Capture are enabled for the selected database. OpenEdge and Operating System information, Environment and startup parameters, PROPATH values, and screen information is also displayed. (You might need to scroll down to see all the information.)

If default storage areas are defined for new object creation, the **Session Information** dialog box also displays them. The following example shows the default areas for creating tables, indexes, and LOBs.



Manage default areas

The Data Dictionary supports updating (set/reset) defaults area for table/index/lob. from DB properties dialog box (only in GUI). For more information, see 'Show default areas for creating database objects' in *Manage the OpenEdge Database*.

You can load objects into default areas using a data definition file (`.df`). For example, this sample file loads tables, lobs, and indexes into default areas.

```
ADD TABLE "tab1"
  AREA "Table Area"
  DUMP-NAME "tab1"

ADD FIELD "id" OF "tab1" AS integer
  FORMAT "->,>>>,>>9"
  INITIAL "0"
  POSITION 2
  MAX-WIDTH 4
  ORDER 10
  MANDATORY

ADD FIELD "name" OF "tab1" AS character
  FORMAT "x(8)"
  INITIAL ""
  POSITION 3
  MAX-WIDTH 16
  ORDER 20

ADD FIELD "clob1" OF "tab1" AS clob
  FORMAT "x(8)"
  INITIAL ?
  POSITION 4
  LOB-AREA "Lob Area"
  LOB-BYTES 104857600
  LOB-SIZE 100M
  CLOB-CODEPAGE "iso8859-1"
  CLOB-COLLATION "basic"
  CLOB-TYPE 1
  ORDER 30

ADD FIELD "blob1" OF "tab1" AS blob
  FORMAT "x(8)"
  INITIAL ?
  POSITION 5
  LOB-AREA "Lob Area"
  LOB-BYTES 104857600
  LOB-SIZE 100M
  ORDER 40

ADD INDEX "idx1" ON "tab1"
  AREA "Index Area"
  PRIMARY
  INDEX-FIELD "id" ASCENDING

.
PSC
cpstream=ISO8859-1
.
0000000795
```

Note: If `.df` is generated with previous OpenEdge version that did not support default areas, but loaded with a version that supports them, database objects will load into default areas. When the default area is not set and area is not mentioned in `.df` file, then tables and indexes are assigned to schema area and LOB field assigned to the table's area.

Dump data definitions

When you dump your database's data definitions, a data definition file (`.df`) is created. That file contains definitions for tables, fields, and indexes.

Note: The Data Dictionary allows you to dump data definition files (`.df`) greater than 2GB on platforms where ABL supports large files.

To dump data definitions:

1. Choose **Admin** > **Dump Data and Definitions** > **Data Definitions (.df file)**. The Data Dictionary alphabetically lists all the tables defined for your database.
2. You can select one or more tables as follows:
   - To select one table, highlight the table name and choose **OK**.
   - If your database is enabled for multi-tenancy, you can filter list of tables by choosing **All**, **Multi-tenant**, or **Shared**.
   - To select more than one table, choose **Select Some** and then choose **OK**. The **Select Tables by Pattern Match** dialog box appears. Type the table name, use the wildcard patterns, or type **ALL**. Then choose **OK**.
   - If you type **ALL**, the `.df` file will also contain the sequence and auto-connect record definitions, but not the collation/conversion table. The Data Dictionary displays a default name for the output file into which you can dump your data definitions (hidden tables are not dumped). This default file is the name of the dump file you specified when you created the table or, for multiple tables, the database name with the `.df` extension.

   Note: When you dump only one table, the table's dump name becomes the default for its corresponding contents dump file. For example, if you select the OrderLine table, the default filename for its corresponding contents dump file is `orderline.df`. If you choose to dump all the tables, the default name for the file contents is *db-name*`.df`. See Dump user table contents on page 34 for information about how to dump table contents.

   ---
3. Specify the filename or use the default value.
4. Specify the code page or accept the default, which is the value specified by the SESSION:STREAM or SESSION:CHARSET attribute, then choose `OK`. For more information on the SESSION:STREAM or SESSION:CHARSET attributes, see *Manage ABL Applications*.
5. Select the **Include POSITION for .r / Binary Load Compatibility** option if you want to maintain the sequential numbering of the fields in the file after you dump the table. Activating this option ensures that you are not required to recompile `.r` code against any new schema that is created by loading a new `*.df` file, and that data dumped with PROUTIL (binary dump) can be loaded into the database.
6. Choose **OK**. The Data Dictionary displays each object name as it writes its definition to the `.df` file. The Data Dictionary displays a status message and prompts you to continue.

Dump Change Data Capture policies

You can dump Change Data Capture (CDC) policies from your database into a `.cd` file using the Data Administration tool.

To dump CDC policies using the Data Administration tool:

1. In the Data Administration window, click **Admin** > **Dump Data and Definitions** > **Change Data Capture Policies (.cd) file**.

   The **Select Change Data Capture Policies for Dump** window appears with a list of current, pending, and previous CDC policies available for the connected database. The CDC policies are alphabetically sorted by their names.

   Note: The **Change Data Capture Policies (.cd file)** option is disabled for databases that are not enabled for CDC.

2. From the list, select the CDC policies that you want to dump.

   When selecting the CDC policies, you can:

   - Select an individual CDC policy.
   - Select the **All Current** check box to select all current CDC policies.
   - Select the **All Pending** check box to select all pending CDC policies.

   Note: When dumping multiple policies, you must specify only one policy per source table as the Data Administration tool does not allow selecting more than one policy per source table.

   Note: When dumping a previous policy, note that it is stored as a pending policy in the `.cd` file.

3. Click **OK**.

   The **Dump Change Data Capture Policies** window appears.

4. In the **Output File** field, specify a name for the `.cd` file or use the default name *db-name*`.cd`.
5. To change the default directory for the output file, click **Files** and then browse to the destination directory where you want to store the file.
6. In the **Code Page** field, specify the code page format in which you want the CDC policies to be dumped or use the default format `ISO8859-1`.
7. Click **OK**.

   A warning message appears if the code page differs from the database code page value. Click **OK** to continue. The Data Administration tool displays each item as it dumps the CDC policies, and a status message appears.

8. Click **OK** to complete the procedure.

Create an incremental data definition file

An incremental data definition file contains the differences in schema when you contrast OpenEdge databases.

Note that the Create Incremental `.df` file utility detects and allows fields of `INTEGER` data type to be changed to `INT64` without requiring a dump and load of the field's data. All other changes in data types will cause a generation of the `delta.df` file that will delete the existing field and recreate it with the new data type, requiring you to perform a dump and load. For more information about `INT64` and other data types, see Table 20: Field initial values on page 105.

Note: This utility can only be used with OpenEdge databases.

To create an incremental data definition file:

1. Choose **Database** > **Select Working Database**, then select the new database as the working database.
2. Choose **Admin** > **Dump Data and Definitions** > **Create Incremental .df File**. The Data Dictionary lists all your connected databases.
3. Select the database you want to compare the working database against (that is, the older version of the database). The Data Dictionary then prompts you for the filename to which you want to write the differences.
4. Enter the filename to which you want to write the differences. The default filename is `delta.df`.
5. Specify a code page.
6. Choose **OK**. The Data Dictionary displays the table, field, index, and sequence names as it compares the databases and prompts you to specify what you want to do with any differences it finds. The Data Dictionary displays a status message when it has completed dumping the table definitions.
7. Choose **OK** to return to the menu bar.

Create a parameter file

Parameter files are useful if you regularly use the same parameters when starting the OpenEdge RDBMS, or if you want to specify more parameters than can fit on the command line.

To create a parameter file:

1. Choose **Utilities** > **Editor for Parameter Files**. The Data Dictionary prompts you for the file you want to create.
2. Specify the filename. The Data Dictionary alphabetically lists all available startup parameters.
3. Specify which of the parameters you want in the file by entering **yes**, **no**, or the appropriate value, then press **GO**. The Data Dictionary prompts you for comments.
4. Enter any comments you want to include in the parameter file, and choose **OK**. The Data Dictionary window reappears.

Edit a parameter file

The Data Dictionary allows you to edit parameter files.

To edit a parameter file:

1. Choose **Utilities** > **Editor for Parameter Files**. The Data Dictionary prompts you for the file you want to edit.
2. Specify the name of an existing parameter file. The Data Dictionary alphabetically lists all available startup parameters with the values for the specified file.
3. Modify the file by entering **yes**, **no**, or the appropriate value, then press **GO**. The Data Dictionary prompts you for comments.
4. Enter any comments you want to include in the parameter file, and choose **OK**. The Data Dictionary window reappears.

Load data definitions

To load definitions into a database, you use a data definition (`.df`) file. The `.df` file contains definitions for tables, fields, and indexes. Based on the contents of the `.df` file, you can load either all the data definitions for a table or only those that have changed.

Note: The Data Dictionary allows you to load data definition files (`.df`) greater than 2GB on platforms where ABL supports large files.

Note: You can use a `.df` file to put objects of a certain type into default areas. For more information, see Manage default areas on page 20.

To load data definitions into a table:

1. Choose **Admin** > **Load Data and Definitions** > **Data Definitions (.df file)**. The Data Dictionary prompts you for the name of the file that contains the data definitions you want to load into your current working database.
2. Specify a filename or accept the default. The default filename is the working physical database name with a `.df` extension.
3. Specify whether you want to stop the load in the event a bad definition statement is encountered.
4. Specify if you prefer error message to be output as files.
5. Specify if you want to add database objects while online.
6. Specify whether to commit data definition changes, even if doing so will create an error message.
7. Specify if you prefer error messages output to your screen instead of a file.
8. Choose **OK**.

   If the data definitions file does not specify a code page, the Data Dictionary prompts you for one.

   The Data Dictionary displays each item as it loads the definitions for that object. It then displays a status message and prompts you to continue.

   If the definition file contains encryption policies, you must be authorized to load the file.

Load Change Data Capture policies

To load CDC policies using the Data Administration tool:

1. In the Data Administration window, click **Admin** > **Load Data and Definitions** > **Change Data Capture Policies (.cd file)**.

   The **Load Change Data Capture Policies** window appears.

2. In the **Input File** field, specify the file name or click **Files** to browse and select the `.cd` file that you want to load.

3. In the **Acceptable Error Percentage** field, type the error rate that is acceptable to the Data Administration tool to load a `.cd` file into a database.

   For example, if you specify an error rate of 10 percent, the Data Administration tool must successfully load 90 records from every set of 100 records. If the error rate exceeds, it terminates the loading process and places the bad records in the error `.e` file.

4. Click **OK**.

   The Data Administration tool displays each item as it loads the CDC policies, and a status message appears.

   Note: If the `.cd` file does not specify a code page, the Data Administration tool prompts you to specify the code page format.

5. Click **OK** to complete the procedure.

3

Table Tasks

This topic describes procedures for using the Data Dictionary to perform the following administrative tasks for tables and files:

For details, see the following topics:

- Create a table
- Modify a table
- Delete a table
- Freeze or unfreeze a table
- Generate a table report
- Dump table contents
- Load table contents
- Binary dump and load
- Create a bulk loader description file
- Generate an include file

Create a table

The Data Dictionary allows you to add a new table to existing storage areas.

To create a table:

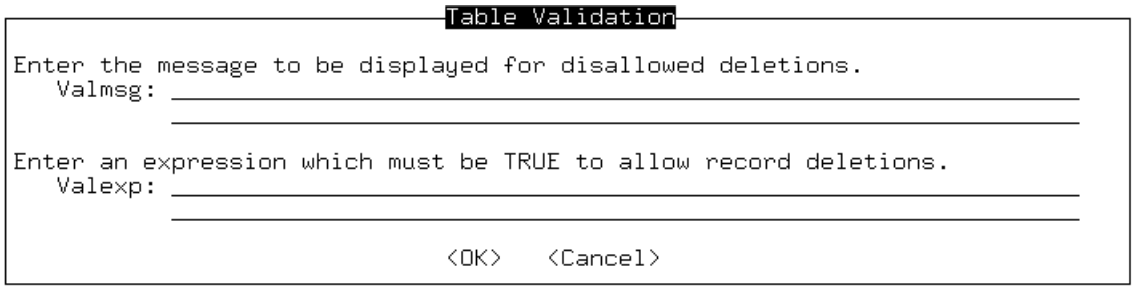
1. Choose **Schema** > **Add New Table**. The **Add New Table** dialog box appears.
2. Define the table attributes. For more information on the **Add New Table** dialog box, see Add New Table option on page 97.

Specify validation criteria

You use validation criteria to control which records can be deleted from the table.

To specify table validation criteria:

1. Choose the **Validation** button. The Data Dictionary displays the **Table Validation** dialog box:



2. Specify the message you want the Data Dictionary to display when a user tries an invalid deletion. There is no limit to the number of characters you can enter. A message up to 63 characters long can fit onto the two message lines without scrolling.
3. Specify the criteria for valid deletions. For example, in the customer table, to restrict deleting customers to those customers who have no outstanding orders, enter the following criteria:

```
NOT (CAN-FIND(FIRST order OF customer))
```

4. Choose **OK** to return to the **Add New Table** window.

Specify triggers

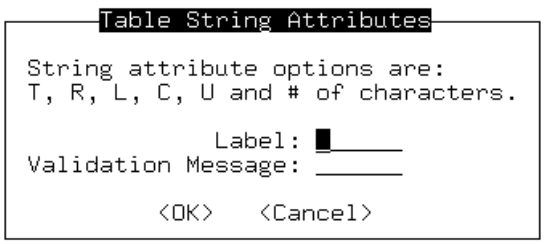
See Create a trigger on page 61 for more information about creating triggers.

Specify string attributes

By specifying string attributes, you control how much space is allocated within an r-code text segment for a string.

To specify table string attributes:

1. Choose the **String Attributes** button. The Data Dictionary displays the **Table String Attributes** dialog box:



2. Specify the attribute characters for the table label and the table validation message, as follows:

Character	Description
T	Specifies to remove trailing spaces during string display. The Data Dictionary does not physically remove the spaces from the string, but replaces them with null values. The Dictionary does not display null values.
R	Specifies to right-justify the string.
L	Specifies to left-justify the string.
C	Specifies to center the string.
U	Indicates that the Translation Manager and the compiler should not translate the string.
max-length	Specifies the amount of space allocated for the text segment. You can specify a numberfrom 1 to 999.

You can specify the characters in any order but can only use each character once. Also, you cannot use any of the letters in conjunction with each other, except for **U**. If you do not specify the maximum length, the Dictionary uses the length of the original string.

If you do not specify justification, the Compiler left-justifies the string by default, unless the string is a column label. If the string is a column label for a decimal or integer column or a side label, it is right-justified.

3. Choose **OK** to return to the **Add New Table** window.

Modify a table

When you modify a field, trigger, or index structure, you modify the table.

To modify a table definition:

1. Choose **Schema** > **Modify Table**. The Data Dictionary alphabetically lists all the tables defined for your database.
2. Select the table you want to modify. The Data Dictionary displays the **Modify Table** dialog box.
3. Modify the table definition.

Note: See Create a table on page 27 for information on specifying table validation and string attributes. See Modify a trigger on page 63 for information about modifying triggers.

4. Choose **OK**. A list of options appears.
5. Choose **A** to apply the changes to your database.

Delete a table

Before deleting a table, make sure that it is no longer needed.

To delete a table:

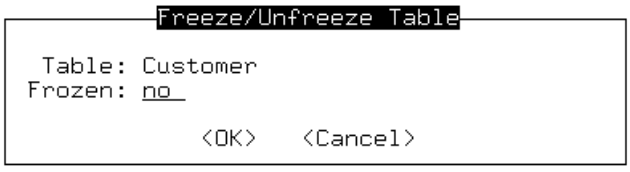
1. Choose **Schema** > **Delete Table(s)** from the menu bar. The Data Dictionary alphabetically lists all the tables defined for your database.
2. Select the table you want to delete or type **ALL** to delete all tables, then press **GO**. The Data Dictionary prompts you to verify that you want to delete the selected table.
3. Choose **Yes**. The Data Dictionary deletes the table from the database.

Freeze or unfreeze a table

The Data Dictionary's **Freeze/Unfreeze** utility helps you administer your database.

To freeze or unfreeze a table:

1. Choose **Utilities** > **Freeze/Unfreeze**. The Data Dictionary alphabetically lists all the tables defined for your database.
2. Select the table you want to freeze or unfreeze. The Data Dictionary displays the **Freeze/Unfreeze Table** dialog box, as shown:



3. Specify **yes** or **no** in the **Frozen** field.
4. Choose **OK** to return to the Data Dictionary window.

Generate a table report

This topic describes how to generate the following table reports:

- Detailed
- Quick
- Relations

Generate a Detailed Table Report

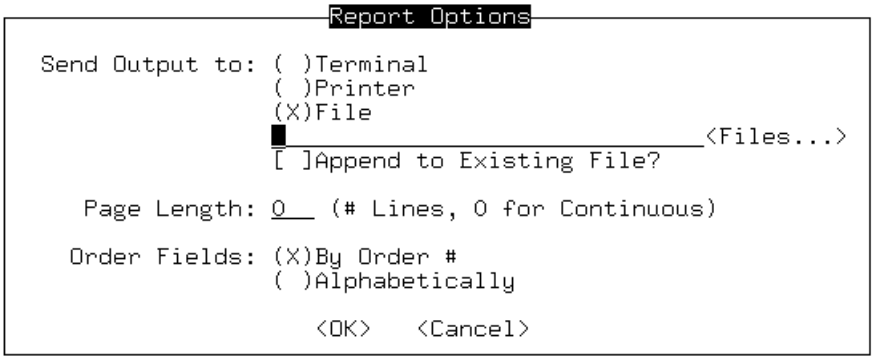
A Detailed Table Report gives the following information for each table in the database:

- Name
- Description
- Dump name
- Flags
- Field count
- Index count
- Labels
- Storage area name
- Trigger events
- Trigger procedure filenames
- A summary of each field, including:
  - Name
  - Order
  - Data type
  - Flags
  - Format
  - Initial value
  - Field label
  - Column label
- A summary of each index, including:
  - Name
  - Flags
  - Count
  - Field name
  - Storage area
- Details about each field, including:
  - Validation message
  - Validation expression
  - Description
  - Help text
  - Triggers
  - Trigger procedure filenames

- Whether the field is overridable
- Whether to check the CRC

To generate a Detailed Table Report:

1. Choose **Database** > **Reports** > **Detailed Table**. The Data Dictionary alphabetically lists all the tables defined for your database.
2. Select a table or type **ALL**. The **Report Options** dialog box appears:



3. Specify the report destination. You can display the report on your terminal, print it, or save it to a file. If you want to save the report to a file, specify the filename and whether to append the report to an existing file.
4. Specify the page length.
5. Specify whether to order the fields by order number or alphabetically, then choose **OK**.

   If you specified a file or printer, the Data Dictionary generates the report to the specified output destination. The Data Dictionary main window then reappears.

   If you sent the report to the terminal, the **Detailed Table Report** dialog box appears. You can choose **Change Field Order** to reorder the fields, choose **Print** to print the report or write it to a file, or choose **OK** to close the **Report Options** dialog box.

Generate a Quick Table Report

A Quick Table Report lists the name of each table in the database. The Quick Table Report also lists:

- Each table's area number
- The name of each table's dump file
- Any flags (such as **f** if the table is frozen or **s** for an SQL table)
- The number of fields
- The number of indexes
- The table's label, if applicable

To generate a Quick Table Report:

1. Choose **Database** > **Reports** > **Quick Table**. The **Quick Table Report** dialog box appears and displays information about all the tables in the working database.
2. Choose **Print** if you want to print the report or to write it to a file. The **Print Options** dialog box appears.

3. Specify the report destination. If you want to save the report to a file, specify the filename and whether to append the report to an existing file.
4. Specify the page length and choose **OK**. The Data Dictionary sends the report to the specified output destination and returns you to the **Quick Table Report** dialog box.
5. Choose **OK** to return to the main Data Dictionary window.

Generate a Table Relations Report

The Table Relations Report details the relations between tables.

To generate a Table Relations Report:

1. Choose **Database** > **Reports** > **Table Relations**. The Data Dictionary alphabetically lists all the tables defined for your database.
2. Select a table or type **ALL**. The Data Dictionary generates the report.
3. Choose **Print** if you want to print the report or write it to a file. The **Print Options** dialog box appears.
4. Specify the report destination. If you want to save the report to a file, specify the filename and whether to append the report to an existing file.
5. Specify the page length and choose **OK**. The Data Dictionary sends the report to the specified output destination and returns you to the **Table Relations Report** dialog box.
6. Choose **Switch Tables** to generate a table relations report for another table, or choose **OK** to return to the Data Dictionary window.

Dump table contents

When you dump table data, the Data Dictionary creates a contents file that contains data for each table you specify. Each file has a .d extension. The Data Dictionary uses contents files to load data into your database. The Data Dictionary creates a separate contents file for every table you dump.

Note: OpenEdge allows you to dump .d files exceeding 2GB when your operating system supports large files.

Binary dumps can be a more efficient way of dumping table contents. See the Binary dump and load topic for more information about performing a binary dump and load.

To dump table contents from a multi-tenant table:

1. Choose **Admin** > **Dump Data and Definitions** > **Table Contents (.d files)** from the menu bar. The Data Dictionary alphabetically lists all the tables defined for your database (hidden tables do **not** display).
2. Select the table names whose contents you want to dump. Use the **Select Some** and **Deselect Some** buttons to select or deselect groups of tables.
3. Press **GO**.

   If you selected a single table, the Data Dictionary displays a default name for the file that you can dump your table contents into. This default file name is always the dump name of the table definition file, with a .d extension. If you want to specify a file name other than the default file, type the name in the Output File field.

If you selected more than one table, the Data Dictionary prompts you for a directory name to write the contents files. If you do not specify a directory, the Data Dictionary creates the files in the current directory. The Data Dictionary names each contents file with the table's corresponding dump name.

4. Accept the default or enter a different name.
5. If your table contains large objects, accept the **Include LOB** default of **yes**; otherwise, choose **no**.
6. If you chose yes in Step 5, type in the LOB directory field the name of the directory that contains the LOB.
7. If you want to use character mapping, enter the character mapping, then choose **OK**. See *Internationalize ABL Applications* for information about character mapping, PROTERMCAP, and national language support.

Dump user table contents

To dump user table contents:

1. Choose **Admin** > **Dump Data and Definitions** > **User Table Contents**. The Data Dictionary prompts you for the file to which to write the user file contents. The default filename is _user.d.
2. Specify the filename or accept the default. After dumping the user file contents to the specified file, the Data Dictionary displays a status message and prompts you to continue.
3. Choose **OK** to return to the Data Dictionary main window.

Dump data from a multi-tenant database

If you are logged in as a super-tenant to a multi-tenant database, the process of dumping table data allows you to choose between all tables, multi-tenant tables, or shared tables. If you choose to dump the contents of a multi-tenant table, you are required you to specify an effective tenant, as follows:

To dump table contents from a multi-tenant table:

1. Choose **Admin** > **Dump Data and Definitions** > **Table Contents (.d files)** from the menu bar. The Data Dictionary alphabetically lists all the tables defined for your database (hidden tables do **not** display).
2. Select the table names whose contents you want to dump. Use the **Select Some** and **Deselect Some** buttons to select or deselect groups of tables. You can narrow your selection by choosing only **Multi-tenant** tables or only **Shared** tables.
3. Press **GO**.
4. Identify the **Effective Tenant** of the data being dumped. You can enter a name, or choose from a list with **Select Tenant**.
5. **Use Default Location** is selected by default, and indicates that data is to be dumped in a subdirectory named after the effective tenant. You can use the current directory as your starting point, or specify a different directory in the **Root Directory** field.

   If you deselect **Use Default Location**, then **Root Directory** is inactive, and you must specify the output file.

6. If your table contains large objects, accept the **Include LOB** default of **yes**; otherwise, choose **no**.
7. If you deselected **Use Default Location** in 5 on page 34step 5, type in the **LOB directory** field is active and allows you to specify a directory for your LOBs.
8. If you want to use character mapping, enter the character mapping, then choose **OK**. See *Internationalize ABL Applications* for information about character mapping, PROTERMCAP, and national language support.

9. Specify the code page or accept the default.
10. Choose OK to dump the data contents file(s). The Data Dictionary displays each table name as it writes the table contents to the table contents file. After dumping the table contents, the Data Dictionary displays a status message. Choose OK to return to the Data Dictionary window.

Note: For more information on multi-tenant databases, see *Introduction to Database Multi-tenancy*.

Load table contents

The Data Dictionary uses a contents (.d) file that you specify to load table data into your database. A contents file contains data for a table.

Note: OpenEdge allows you to load table contents files exceeding 2GB.

Remember the following when loading table contents:

- Table definitions must be in the database before you can load table contents.
- You must load your sequence values separately.

There are two ways to load the table contents (.d) files:

- Use the Data Dictionary.
- Use the Bulk Loader (PROUTIL BULKLOAD) utility. For information about using the Bulk Loader, see the topic on administration utilities in *Manage the OpenEdge Database*.

For information about performing a binary dump and load, see Binary dump and load on page 38.

To load table contents into a database:

1. Make sure that the working database is the target database where you want to load the table contents.
2. Choose **Admin** > **Load Data and Definitions** > **Table Contents (.d files)** from the menu bar. The Data Dictionary alphabetically lists all the tables defined for your database.
3. Select the table names whose contents you want to load. Use the **Select Some** and **Deselect Some** buttons to select or deselect groups of tables.

   The Data Dictionary prompts you for the name of the contents file or (if you choose multiple files) the directory that contains the contents files you want to load into your current database.

4. Specify the directory name, filename, or use the default value.

   When you load the contents of more than one table, enter a directory from which you want to load the contents files. If you do not specify a directory, the Data Dictionary loads the files from the current directory. The Data Dictionary loads each table from the corresponding *table-dumpname*.d filename.

5. If your load contains large objects, accept the **Include LOB** default of **yes**; otherwise, choose **no**.
6. If you chose **yes** in step 5, type in the **LOB directory** field the name of the directory that contains the LOB.
7. Specify the error rate.

As the Data Dictionary loads records from any files you designate, it might encounter data that cannot be loaded. The Data Dictionary does not load the record. It places all erroneous records in a *table*.e file (the name of the table with a .e extension). If you specify an error rate of 10 percent, the Data Dictionary must successfully load 90 records from every set of 100 records loaded.

8. Select **Output Errors to Screen** to view error messages generated while loading table data. The default output for errors is to a file.
9. Choose **OK**. After loading the table contents, the Data Dictionary displays a status message and prompts you to continue.
10. Choose **OK** to return to the Data Dictionary main window.

Load user table contents

To load user table contents:

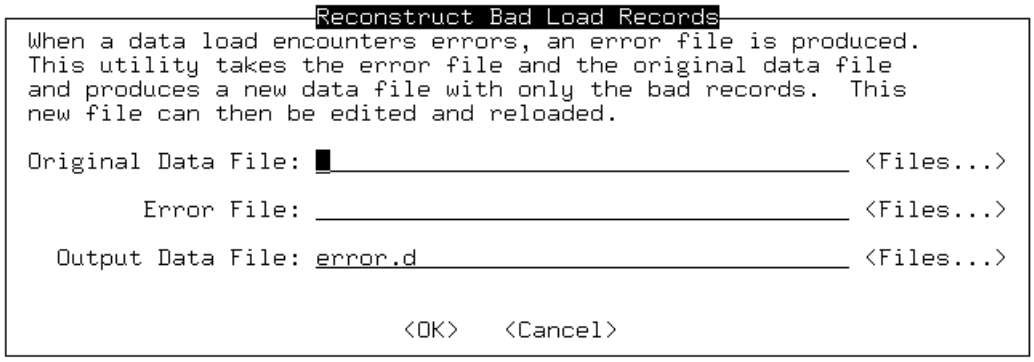
1. Choose **Admin** > **Load Data and Definitions** > **User Table Contents**. The Data Dictionary prompts you for the file from which you want to read the user file contents. The default filename is _user.d.
2. Specify the filename or accept the default. After loading the user file contents to the specified file, the Data Dictionary displays a status message and prompts you to continue.
3. Choose **OK** to return to the Data Dictionary main window.

Reconstruct bad load records

If the Data Dictionary encounters errors while loading a data file, it creates an error file. You can use this error file and the original data file to build a new data file for bad records.

To reconstruct bad load records:

1. Choose **Admin** > **Load Data and Definitions** > **Reconstruct Bad Load Records**. The **Reconstruct Bad Load Records** dialog box appears:



2. Specify the filename of the original data file, the error file, and the new data file. The default filename for the new data file is error.d.
3. Choose **OK**. The Data Dictionary displays a status message and prompts you to continue.

Load data into a multi-tenant database

If you are logged in as a super-tenant to a multi-tenant database, the process of loading table data allows you to load data for a specific tenant.

You can choose between all tables, multi-tenant tables, or shared tables. If you choose to dump the contents of a multi-tenant table, you are required you to specify an effective tenant, as follows:

To load table contents into a multi-tenant table:

1. Choose **Admin** > **Load Data and Definitions** > **Table Contents (.d files)** from the menu bar. The Data Dictionary alphabetically lists all the tables defined for your database (hidden tables do **not** display).
2. Select the table names whose contents you want to load. Use the **Select Some** and **Deselect Some** buttons to select or deselect groups of tables. You can narrow your selection by choosing only **Multi-tenant** tables or only **Shared** tables.
3. Press **GO**.
4. Identify the **Effective Tenant** of the data being loaded. You can enter a name, or choose from a list with **Select Tenant**.
5. **Use Default Location** is selected by default, and indicates that data is to be loaded from a subdirectory named after the effective tenant. You can use the current directory as your starting point, or specify a different directory in the **Root Directory** field.

   If you deselect **Use Default Location**, then **Root Directory** is inactive, and you must specify the input file.
6. If your load contains large objects, accept the **Include LOB** default of **yes**; otherwise, choose **no**.
7. If you chose **yes** in step 6, and also specified **Use Default Location**, the LOB directory field is inactive. If you did not specify **Use Default Location**, type in the **LOB directory** field the name of the directory that contains the LOB.
8. Specify the error rate.

   As the Data Dictionary loads records from any files you designate, it might encounter data that cannot be loaded. The Data Dictionary does not load the record. It places all erroneous records in a *table*.e file (the name of the table with a .e extension). If you specify an error rate of 10 percent, the Data Dictionary must successfully load 90 records from every set of 100 records loaded.
9. Select **Output Errors to Screen** to view error messages generated while loading table data. The default output for errors is to a file.
10. Choose **OK**. After loading the table contents, the Data Dictionary displays a status message and prompts you to continue.
11. Choose **OK** to return to the Data Dictionary main window.

Note: For more information on multi-tenant databases, see *Introduction to Database Multi-tenancy*.

Binary dump and load

The OpenEdge database utility PROUTIL allows you to move and reorganize data by performing a binary dump and load instead of the Data Dictionary ASCII dump and load. The binary method improves the dump and load performance significantly because the data remains in binary format during the process. Also, if security is a concern, for an encryption-enabled database you can encrypt the output of your binary dump.

Perform the binary dump

Use the following PROUTIL command to perform a binary dump:

```
proutil dbname -C dump tablename directory [ -index num ]
```

db-name

Specifies the database from which you want to dump. You must completely define the path.

tablename

Specifies the name of the table containing the data you want to dump.

directory

Specifies the name of the target directory into which the data will be dumped.

-index *num*

Specifies an index with which to dump the table's contents. If you choose not to use this option, the command uses the primary index to dump the table.

Note: Additional parameters to PROUTIL DUMP are available for security (encryption) and performance.

PROUTIL DUMPSPECIFIED provides the ability to dump portions of a table based on specified selection criteria.

For a complete descriptions and syntax, see *Manage the OpenEdge Database*.

The dump command writes the data to a dump file named *table*.bd, where *table* is the name of the table that was dumped. For example, if you dump data from the table named "customer," the procedure creates a dump file named customer.bd in the directory you specify in the command.

Each binary dump file contains a header and a description for each record in the table. The dump file appears in the following format:

Header	Record length	Table number	Binary record	Record CRC

The file header contains information that appears in the following order:

- Version number
- Date and time the file was created
- Name of the table being dumped

- Number of the table being dumped
- CRC of the table being dumped
- Number of fields in the table
- Name of the database in which the table resides
- Section number
- Number of the first record

When the dump procedure finishes, a screen message reports the number of records and the number of kilobytes of data that were dumped.

Perform the binary load

Use the following PROUTIL command to perform a binary load:

```
proutil dbname -C load filename
```

db-name

Specifies the database into which you want to load the data. You must completely define the path.

filename

Specifies the binary dump file that you want to load. You must completely define the path.

Note: Additional parameters to PROUTIL LOAD are available for security (encryption) and performance. For a complete description and syntax, see *Manage the OpenEdge Database*.

When the load procedure finishes, a screen message reports the number of records that were loaded.

Create a bulk loader description file

You use the bulk loader description file with the Bulk Loader utility to load data (`.d`) files into an OpenEdge database quicker than you can using the Data Dictionary Load utility.

You must create a bulk loader description file before you can run the Bulk Loader utility. For more information about bulk loader description files, see the topic on dumping and loading in *Manage the OpenEdge Database*.

To create a bulk loader description file:

1. Choose **Admin** > **Create Bulk Loader Description File**. The Data Dictionary alphabetically lists all the tables defined for your database.
2. Select the tables for which you want to create bulk loader description files and press **GO**. The Data Dictionary prompts you for the bulk load filename.
3. Specify a bulk load filename. The default filename is *table-name*`.fd`.
4. If your load contains large objects, accept the **Include LOB** default of **yes**; otherwise, choose **no**.
5. If you choose yes in step 4, type in the **LOB directory** field the name of the directory that contains the LOB.

6. Specify the code page.
7. Choose **OK**. After dumping the table contents to the specified file, the Data Dictionary displays a status message and prompts you to continue.

Generate an include file

You can generate include files for the following statements:

- ASSIGN
- FORM
- DEFINE WORK-TABLE

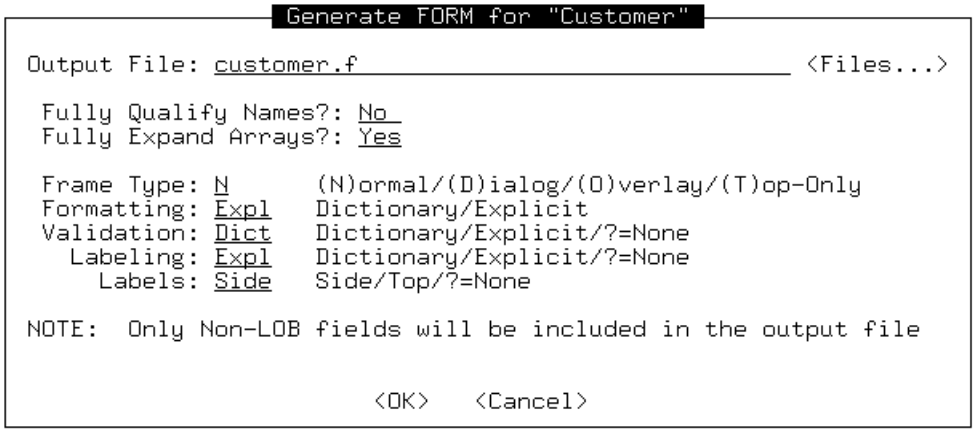
To create an ASSIGN statement include file:

1. Choose **Utilities** > **Generate Include Files** > **ASSIGN Statement**. The Data Dictionary alphabetically lists all the tables defined for your database.
2. Select the table for which you want to create the ASSIGN statement. The Data Dictionary prompts you for the filename of the output file.
3. Specify the filename. The default filename is *table-name*.i.
4. Choose **OK**. The Data Dictionary displays a status message and prompts you to continue.

Create a FORM statement include file

To create a FORM statement include file:

1. Choose **Utilities** > **Generate Include Files** > **FORM Statement**. The Data Dictionary alphabetically lists all the tables defined for your database.
2. Select the table for which you want to create the FORM statement. The **Generate FORM for "selected-table-name"** dialog box appears:



3. Enter the appropriate information in the fill-in fields, then choose OK. The Data Dictionary displays a status message and prompts you to continue.

Create a DEFINE WORK-TABLE statement include file:

To create a DEFINE WORK-TABLE statement include file:

1. Choose **Utilities** > **Generate Include Files** > **DEFINE WORK-TABLE statement**. The Data Dictionary alphabetically lists all the tables defined for your database.
2. Select the table for which you want to create the DEFINE WORK-TABLE statement. The Data Dictionary prompts you for the filename of the output file.
3. Specify the filename. The default filename is *table-name*.i.
4. Choose **OK**. The Data Dictionary displays a status message and prompts you to continue.

4

Field Tasks

This topic describes the following tasks involved in creating and maintaining fields:

For details, see the following topics:

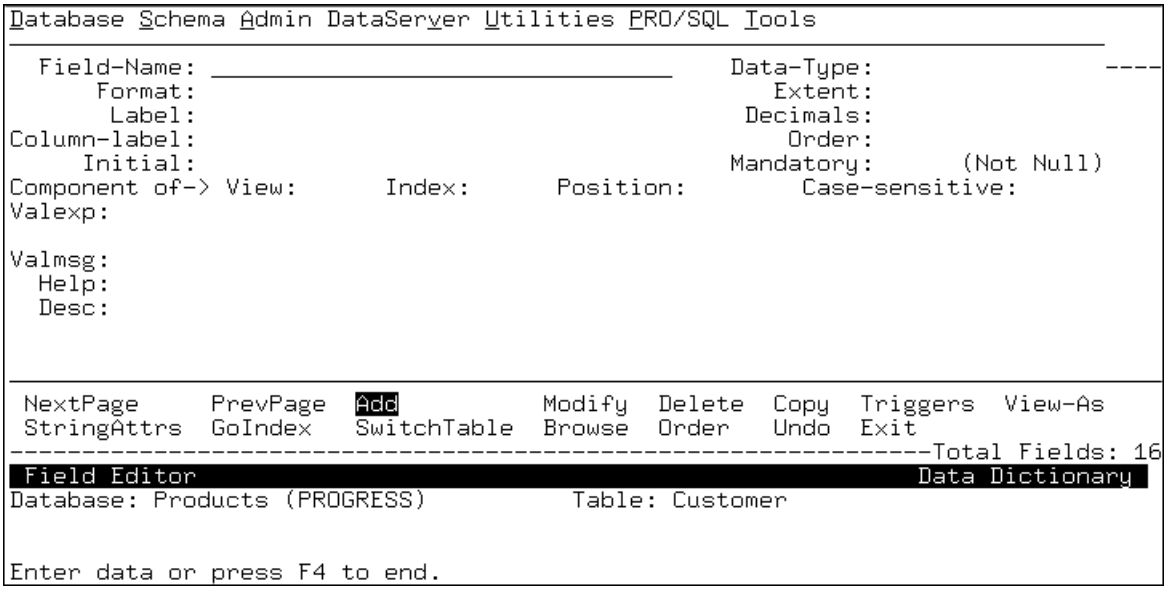
- Add a field
- Modify a field
- Change a field data type from integer to INT64
- Change a field name globally
- Copy a field
- Delete a field
- Change field order
- Generate a Quick Field Report
- Adjust the Field Width

Add a field

When you add a field, you modify the database's schema.

To add a field to a table:

1. Choose **Schema** > **Field Editor**. The Data Dictionary's **Field Editor** alphabetically lists all the tables defined for your database.
2. Select the table to which you want to add a new field. The **Field Editor** lists all the fields defined for the selected table.
3. Choose the Add option from the horizontal menu at the bottom of the window. A window similar to the following appears:



4. Define the field attributes. See Field Editor option on page 98 for more information about the fields in this window.
5. Press **RETURN** or **GO**.
6. Choose **Exit** to apply the change. The **Field Editor** displays an alert box asking if you want to apply or undo the changes to the database, or if you want to make other changes.
7. Choose **Apply Changes**. The main menu of the Data Dictionary main window reappears.

Modify a field

When you edit a field definition, you modify the database's schema. Changing a field's data type from `INTEGER` to `INT64` is a special case (for information, see Change a field data type from integer to INT64 on page 45).

To modify a field definition:

1. Choose **Schema** > **Field Editor**. The Data Dictionary's **Field Editor** alphabetically lists all the tables defined for your database.
2. Select the table that contains the field you want to modify. The **Field Editor** lists all the fields defined for the selected table.
3. Choose **Modify**.
4. Choose the field you want to modify. The **Field Editor** displays the field definition in the window. See Field Editor option on page 98 for information about the fields in this window.
5. Edit the field definition.
6. Press **RETURN** or **GO**.

7. Choose **Exit** to apply the change. An alert box appears, asking if you want to apply or undo the changes to the database, or if you want to make other changes.
8. Choose **Apply Changes**. The main menu of the Data Dictionary reappears.

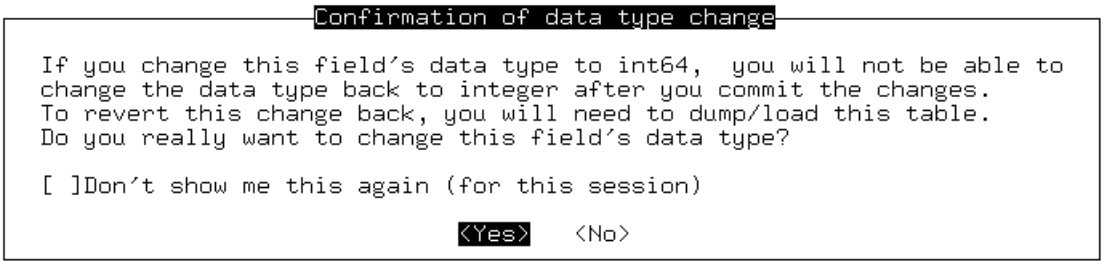
Change a field data type from integer to INT64

You can change the data type of a field from `integer` to `INT64`. No dump and load of the field's data is required.

Note: To change a field's data type from `INT64`**back to**`integer`, you must perform a dump and load of the field's data.

To change a field's data type from integer to INT64:

1. Choose **Schema** > **Field Editor**. The Data Dictionary's **Field Editor** alphabetically lists all the tables defined for your database.
2. Select the table that contains the field you want to modify. The **Field Editor** lists all the fields defined for the selected table.
3. Choose **Modify**.
4. Choose the field you want to modify. The **Field Editor** displays the field definition in the window. See Field Editor option on page 98 for information about the fields on this window.
5. Change the data type from `integer` to `int64`, and press **GO**. The **Confirmation of data type change** window appears:



6. Select the **Don't show me this again (for this session)** option to stop confirmation messages regarding changing the data type from appearing for the rest of the session.
7. Choose **Yes** to make the change, and then choose **A** to apply the changes.

Change a field name globally

The Data Dictionary allows you to rename a field throughout all tables.

To change a field name globally:

1. Choose **Global Field Name Change** > **Schema**. The **Global Field Name Change** dialog box appears.
2. Specify the current field name. Press **F5** to display a list of all field names.
3. Specify the new name.

4. Choose **OK**. The Data Dictionary displays an alert box prompting for verification of the global field name change.
5. Choose **Yes** to apply the change. The main menu of the Data Dictionary appears.

Copy a field

You can copy a field from one table to another table in the working database.

To copy a field from one table to another:

1. Choose **Schema** > **Field Editor**. The **Field Editor** alphabetically lists all the tables defined for your database.
2. Select the table to which you want to copy the field. The **Field Editor** lists all the fields defined for the selected table.
3. Choose the **Copy** option from the menu at the bottom of the window.
4. Select the table from which you want to copy the field. The **Field Editor** alphabetically lists all the fields defined for that table.
5. Select the fields you want to copy, then press **GO**. The **Field Editor** copies the specified fields into the table you selected. The main menu of the **Field Editor** reappears.
6. Choose **Exit** to apply the change. The Data Dictionary displays an alert box asking if you want to apply or undo the changes to the database, or if you want to make other changes.
7. Choose **Apply Changes**. The main window of the Data Dictionary reappears.

Note: If you are copying fields within a multi-tenant database, and you are copying a field from a multi-tenant table that has no default area, to either a shared table or a multi-tenant table with a default area, you are prompted to specify an area for the field or you can chose to skip copying the field.

Delete a field

When you delete a field, you modify the database's schema.

To delete a field:

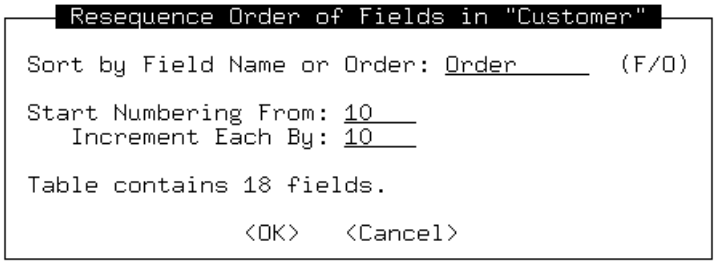
1. Choose**Schema** > **Field Editor**. The **Field Editor** alphabetically lists all the tables defined for your database.
2. Select the table that contains the field you want to delete. The **Field Editor** lists all the fields defined for the selected table.
3. Choose **Delete**.
4. Choose the field you want to delete, then press **RETURN**. The **Field Editor** prompts you to verify that you want to delete the field.
5. Choose **Yes**. The **Field Editor** main window reappears.
6. Choose **Exit** to apply the change. An alert box asking if you want to apply or undo the changes to the database, or if you want to make other changes, appears.
7. Choose **Apply Changes**. The main menu of the Data Dictionary reappears.

Change field order

To view the current order of a database's fields, run either a Detailed Table Report or a **Quick Field Report**.

To change field order:

1. Choose **Schema** > **Reorder Fields**. The tables defined for your database appear in alphabetical order.
2. Select the table for which you want to reorder the fields. A dialog box similar to the following appears:



3. Specify whether to order fields either by name or by order number.
4. Specify the starting number and the number by which to increment.
5. Choose **OK**. The Data Dictionary arranges the fields for the selected table in the specified order.
6. Choose **OK** to return to the Data Dictionary main window.

Generate a Quick Field Report

A **Quick Field Report** lists the following:

- Field name
- Order
- Data type
- Flags
- Format

To generate a Quick Field Report:

1. Choose **Database** > **Reports** > **Quick Field**. The Data Dictionary alphabetically lists all the tables defined for your database.
2. Select a table or type **ALL**. The Data Dictionary generates the report. The **Quick Field Report** dialog box appears, listing the fields in the table by order number.
3. Choose **Switch Tables** to generate a quick field report for another table. The Data Dictionary alphabetically lists all the tables for you to choose another table.
4. Choose **Change Field Order** to reorder the fields alphabetically.
5. Choose **Print** to print the report or write it to a file. The **Print Options** dialog box appears.
6. Specify the report destination. If you want to save the report to a file, specify the filename and whether to append the report to an existing file.

7. Specify the page length, then choose **OK**. The Data Dictionary sends the report to the specified output destination and returns you to the **Quick Field Report** dialog box.
8. Choose **OK** to return to the Data Dictionary window.

Adjust the Field Width

The Field Width property allows the ABL client to modify the field width of an SQL client. If you do not adjust the setting, the SQL client uses the default width property.

To adjust the Field Width:

1. Choose **Schema** > **Adjust Field Width**. A table name appears in the **Table Name** field, which is followed by a list of additional table names.
2. Choose the table you want; the name appears in the **Table Name** field.
3. Press **ENTER** to open the table. The width of the first field in the field name listing is highlighted.
4. Select the name of the field whose width you want to adjust, select its width setting, and make the adjustment.
5. Choose **OK**, then press **ENTER**.
6. Choose **Apply Changes**.

5

Index Tasks

This topic describes the following tasks involved in creating and maintaining indexes:

- Create an index on page 49
- Modify an index on page 51
- Delete an index on page 53
- Generate a Quick Index Report on page 53

For details, see the following topics:

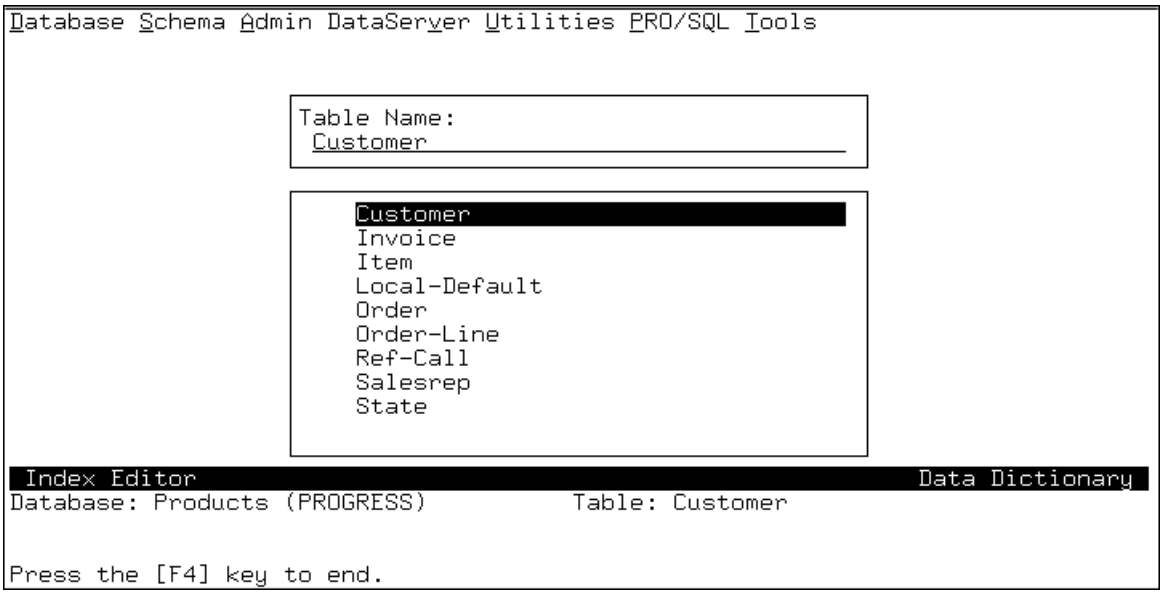
- Create an index
- Modify an index
- Delete an index
- Generate a Quick Index Report

Create an index

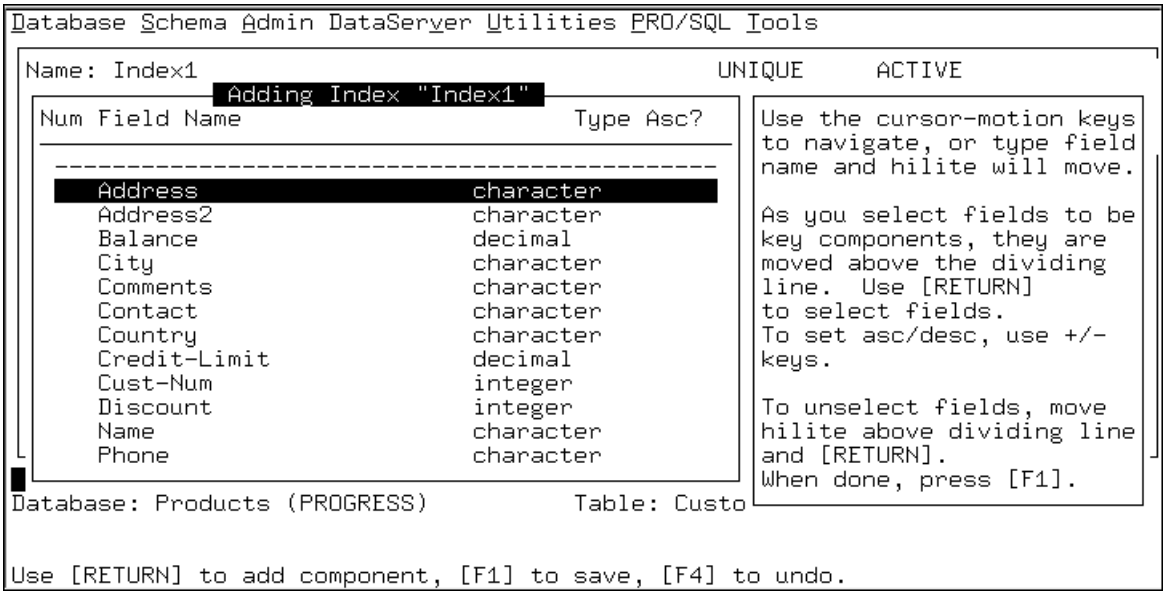
Adding an index modifies the database's schema.

To create an index:

1. Choose **Schema**|**Index Editor**. The **Index Editor** alphabetically lists all the tables defined for your database, as shown:



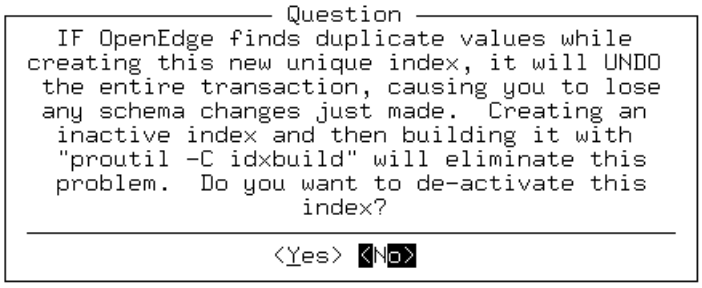
2. Select a table.
3. Choose Add.
4. Enter a name for the index. Specify whether the index is unique or non-unique, active or inactive, and a word index or a standard index.
5. Press **RETURN**.
6. Select an area in which to store the new index. (Scroll down to see available options.)
7. Press **GO**. The **Adding Index** window appears, listing the field names you can add to the new index:



8. Highlight the desired field and press **RETURN**. The **Index Editor** prompts you to specify whether you want this index component to be ascending or descending.
9. Specify **Yes** for ascending or **No** for descending. The **Index Editor** moves the selected field above the dividing line of the window. To change the sort order of a field above the dividing bar, highlight the field. Then press the plus sign (**+**) for ascending or the minus sign (**-**) for descending.
10. Select the next field. You can specify up to 16 fields to define an index.

11. When you are done choosing fields, press **GO**. If the index has a character field as the last index component, the **Index Editor** prompts you to specify whether you want to use the **Abbreviate** option.

    If you choose to use the **Abbreviate** option, the **Index Editor** displays the following **Question**:



12. Specify whether to deactivate the index. The **Index Editor** main window reappears and adds the new index to the list.
13. Choose `Exit`. The Data Dictionary displays an alert box asking if you want to apply or undo the changes to the database, or if you want to make other changes.
14. Choose `Apply Changes`. The Data Dictionary main window appears.

Modify an index

You can use the Data Dictionary to make an index the primary index for the table, rename an index, or deactivate an index.

Note: To change the component fields of an index, such as ascending or descending order or uniqueness, you must delete and then recreate the index.

Change the primary index for a table

To view which index is currently the primary index for a table, run a Detailed Table Report or a Quick Index Report. The primary index is flagged with a "**p**."

Note: A word index cannot be the primary index.

To change the primary index for a table:

1. Choose **Schema** > **Index Editor**. The **Index Editor** alphabetically lists all the tables defined for your database.
2. Select a table.
3. Select the index you want to make primary.
4. Choose **Change Primary**. The **Index Editor** prompts you to verify that you want to make the selected index the primary index for the table.
5. Choose **Yes** to make the selected index the primary index for the table. The main window of the **Index Editor** reappears.

6. Choose **Exit**. The Data Dictionary displays an alert box asking if you want to apply or undo the changes to the database, or if you want to make other changes.
7. Choose **Apply Changes**. The Data Dictionary main window appears.

Rename an index

Renaming an index modifies the database's schema.

To rename an index:

1. Choose **Schema** > **Index Editor**. The **Index Editor** alphabetically lists all the tables defined for your database.
2. Select a table. The **Index Editor** lists the indexes defined for that table.
3. Select the index you want to rename.
4. Choose **Rename**. The **Index Editor** prompts you for the new name.
5. Enter the new index name, then press **RETURN**. You cannot use the name of an existing index.
6. Choose **Exit**. The Data Dictionary displays an alert box asking if you want to apply or undo the changes to the database, or if you want to make other changes.
7. Choose **Apply Changes**. The main window of the Data Dictionary appears.

Deactivate an index

You can deactivate an active table index.

Note: To see which indexes are currently active, run a Detailed Table Report or a Quick Index Report. Inactive indexes are flagged with an "**i**."

To deactivate an index:

1. Choose **Schema** > **Index Editor**. The **Index Editor** alphabetically lists all the tables defined for your database.
2. Select a table. The **Index Editor** lists the indexes defined for that table.
3. Select the index you want to deactivate.
4. Choose **MakeInactive**. The **Index Editor** prompts you to verify that you want to make the selected index inactive.
5. Choose **Yes** to deactivate the index.
6. Choose **Exit**. The Data Dictionary displays an alert box asking if you want to apply or undo the changes to the database, or if you want to make other changes.
7. Choose **Apply Changes**. The Data Dictionary main window appears.

Note: For more information about indexes, see *Manage the OpenEdge Database*.

Delete an index

Deleting an index modifies a database's schema.

Note: You cannot delete the primary index. To delete the index that is currently the primary index, you must first make another index the primary index.

To delete an index:

1. Choose **Schema** > **Index Editor**. The **Index Editor** alphabetically lists all the tables defined for your database.
2. Select a table. The **Index Editor** lists the indexes defined for that table.
3. Select the index you want to delete. You cannot delete a primary index.
4. Choose **Delete**. The Data Dictionary prompts you to verify that you want to remove this index.
5. Choose **Yes** to delete the index. The **Index Editor** main window reappears.
6. Choose **Exit**. The Data Dictionary displays an alert box asking if you want to apply or undo the changes to the database, or if you want to make other changes.
7. Choose **Apply Changes**. The Data Dictionary main window appears.

Generate a Quick Index Report

A **Quick Index Report** lists the following:

- Flags that indicate if the index is:
  - Primary
  - Unique
  - Word
  - Abbreviated
  - Inactive
  - Ascending
  - Descending
- Index name
- Area number
- Field names

To generate a Quick Index Report:

1. Choose **Database** > **Reports** > **Quick Index**. The Data Dictionary alphabetically lists all the tables defined for your database.
2. Select a table or type **ALL**, then press **RETURN**. The Data Dictionary generates the report and displays the **Quick Index Report** dialog box.

3. Choose **Switch Tables** to generate a quick index report for another table. The Data Dictionary alphabetically lists all the tables.
4. Choose **Print** to print the report or write it to a file. The **Print Options** dialog box appears.
5. Specify the report destination. If you want to save the report to a file, specify the filename and whether to append the report to an existing file.
6. Specify the page length, then choose **OK**. The Data Dictionary sends the report to the specified output destination and returns you to the **Quick Index Report** dialog box.
7. Choose **OK** to return to the Data Dictionary main window.

6

Sequence Tasks

Information related to creating and maintaining sequences is described in this topic.

See *Manage the OpenEdge Database* for more information about dumping and loading sequences.

For details, see the following topics:

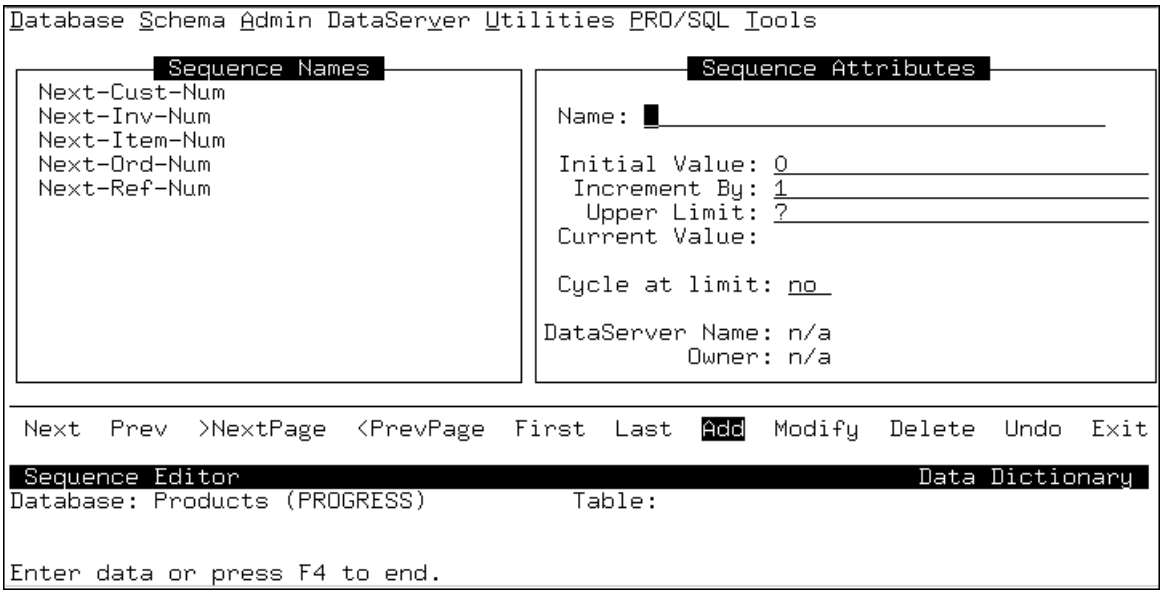
- Create a sequence
- Modify a sequence
- Delete a sequence
- Dump sequence definitions
- Dump sequence current values
- Load sequence current values
- Generate a sequence report

Create a sequence

Creating a sequence modifies a database's schema.

To create a sequence:

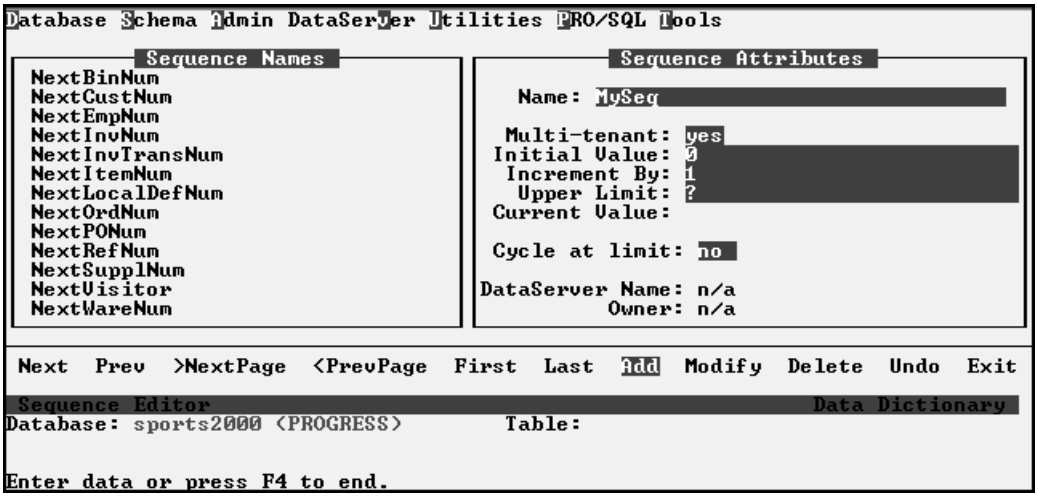
1. Choose **SchemaSequence Editor**. The **Sequence Editor** displays a list of the sequences defined for the working database and the attributes for the sequence that is selected.
2. Choose **Add**. The following window appears:



3. Define the sequence attributes, then press **GO**. The **Sequence Editor** main window appears.
4. Choose **Exit**. The Data Dictionary displays an alert box asking if you want to apply or undo the changes to the database, or if you want to make other changes.
5. Choose **Apply Changes**. The Data Dictionary main window appears.

   If your database is enabled for multi-tenancy, then you can create multi-tenant sequences. A multi-tenant sequence has a unique value for each tenant that is incremented independently. The Sequence Editor window is modified as shown in the following figure:

   Figure 3: Multi-tenant sequence editor



   If you select yes for **Multi-tenant**, then the **Current Value** displays <one value per tenant>.

Modify a sequence

Editing a sequence modifies a database's schema.

To modify a sequence:

1. Make sure that the database containing the sequences you want to modify is the current working database.
2. Choose **Schema** > **Sequence Editor**. The **Sequence Editor** lists all the sequences defined for the working database and the attributes for the sequence that is selected.
3. Select the sequence you want to modify.
4. Choose **Modify**.
5. Edit the sequence definition, then press **GO**.
6. Choose **Exit**. The Data Dictionary main window appears.

Delete a sequence

Deleting a sequence modifies a database's schema.

To delete a sequence:

1. Make sure that the database containing the sequences you want to delete is the current working database.
2. Choose **Schema** > **Sequence Editor**. The **Sequence Editor** lists all the sequences defined for the working database and the attributes for the sequence that is selected.
3. Select the sequence you want to delete.
4. Choose the **Delete** option from the menu at the bottom of the window. The **Sequence Editor** prompts you to verify that you want to remove the sequence.
5. Choose **Yes** to delete the sequence. The **Sequence Editor** main window appears.
6. Choose **Exit**. The Data Dictionary main window appears.

Dump sequence definitions

You can dump the sequence definitions for the current working database.

To dump sequence definitions:

1. Choose **Admin** > **Dump Data and Definitions** > **Sequence Definitions**. The **Dump Sequence Definitions** dialog box appears.
2. Specify the filename or use the default value. The default filename is `_seqdefs.df`.
3. Specify the code page or use the default value, then choose **OK**.

   After you dump the sequence values, the Data Dictionary displays a status message and prompts you to continue.
4. Choose **OK** to return to the Data Dictionary main window.

Dump sequence current values

You can dump the sequence values for the current working database.

To dump current sequence values:

1. Make sure that the database containing the sequence values you want to dump is the current working database.
2. Choose **Admin** > **Dump Data and Definitions** > **Sequences Current Values**. The **Dump Sequence Current Values** dialog box appears.
3. Specify the filename or use the default value. The default filename is `_seqvals.d`.
4. Specify the code page or use the default value, then choose **OK**.

   After you dump the sequence values, the Data Dictionary displays a status message and prompts you to continue.

5. Choose **OK** to return to the Data Dictionary main window.

Note: If you are dumping multi-tenant sequences from a multi-tenant database, you are prompted to specify an effective tenant to dump. You can specify the output location by choosing Use Default Location to have the Data Dictionary create the sequence output file in a subdirectory named for the tenant, or you can specify the output file directly.

Load sequence current values

The Data Dictionary uses a contents file that you specify to load sequence values into your database. Usually, this file is called `_seqvals.d` file.

The loading of sequence current values can accommodate 64-bit sequence values.

To load sequence values into a database:

1. Make sure that the working database is the target database where you want to load the sequence values.
2. Choose **Admin** > **Load Data and Definitions** > **Sequences Current Values**. The Data Dictionary prompts you for the filename from which you want to write the sequence values.
3. Specify the filename or use the default value, and choose **OK**. After the sequence values are loaded, the Data Dictionary displays a status message and prompts you to continue.
4. Choose **OK** to return to the Data Dictionary main window.

Note: If you are loading current values into a multi-tenant sequence, in a multi-tenant database, you are asked to specify an effective tenant for the sequence values being loaded. You can specify the input location by choosing Use Default Location to have the Data Dictionary look for the sequence file in a subdirectory named for the tenant, or you can specify the input file directly.

Generate a sequence report

A sequence report lists the sequence's:

- Name
- Initial value
- Incremental value

- Maximum and minimum value

It also indicates whether the sequence should cycle, and if connected to a multi-tenant database, if the sequence is a multi-tenant sequence.

To generate a sequence report:

1. Make sure that the working database is the target database for which you want to generate the report.
2. Choose **Database** > **Reports** > **Sequence**. The **Sequence Report** dialog box appears and displays information about all sequences defined for the working database.
3. Choose **Print** if you want to print the report. The **Print Options** dialog box appears.
4. Specify the report destination. If you want to save the report to a file, specify the filename and whether to append the report to an existing file.
5. Specify the page length, then choose **OK**. The Data Dictionary sends the report to the specified output destination and returns you to the **Sequence Report** dialog box.
6. Choose **OK** to return to the Data Dictionary main window.

7

Trigger Tasks

Tasks involved in creating and maintaining schema triggers are described in the following sections:

For details, see the following topics:

- Create a trigger
- Create a trigger from an existing field
- Create a DELETE trigger for a CDC change table
- Modify a trigger
- Delete a trigger
- Generate a trigger report

Create a trigger

There are two types of triggers: session and schema. You create session triggers as part of an ABL procedure, and you create schema triggers using the Data Dictionary.

There are two types of schema triggers:

- Table trigger
- Field trigger

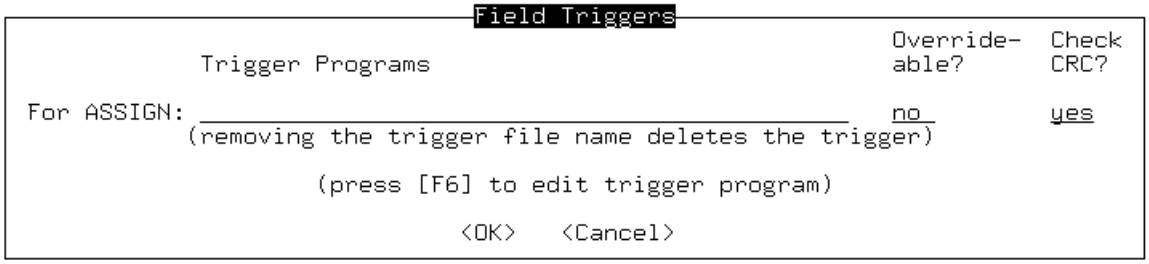
To create a table trigger:

1. Choose**Schema** > **Add New Table** or choose **Schema** > **Modify Table**. If you are adding a new table, specify a table name. If you are modifying a table, the Data Dictionary alphabetically lists all the tables defined for your database. Select the table for which you want to create the trigger.
2. Choose **Triggers**. The **Table Triggers** dialog box appears.
3. Define the trigger attributes. For more information on the **Table Triggers** dialog box and the trigger attributes, see Table Triggers option on page 94.
4. Specify whether a session trigger can override this schema trigger. For more information about session and schema triggers, see the topic on database triggers in *Develop ABL Applications*.
5. Specify whether the database engine checks the cyclical redundancy check (CRC) code for the trigger.
6. Press **PUT** to enter the trigger code. The Data Dictionary displays the **Trigger Code** dialog box.
7. Enter the trigger code.
8. Choose **OK** to return to the **Table Triggers** dialog box.
9. Choose **OK** to return to the **Add Table** or **Modify Table** window.

Create a trigger from an existing field

To create a field trigger from an existing field:

1. Choose **Schema Field Editor**. The **Field Editor** alphabetically lists all the tables defined for your database.
2. Select the table that contains the field for which you want to create the trigger. The **Field Editor** window appears.
3. Choose **Triggers**.
4. Select the field for which you want to define the trigger. The **Field Triggers** dialog box appears:



5. Specify the name of the trigger procedure, then press **PUT** to enter the trigger code. The **Trigger Editor** appears.
6. Specify whether a session trigger can override the schema trigger. For more information about session and schema triggers, see the topic on database triggers in *Develop ABL Applications*.
7. Specify whether the database engine verifies the cyclical redundancy check (CRC) code.
8. Choose **OK** to create the trigger and return to the **Field Editor**.

Note: To generate r-code for schema trigger definitions, you must define the trigger procedure in the Data Dictionary, then compile and save the r-code with the Application Compiler.

Create a DELETE trigger for a CDC change table

You can create only a DELETE trigger for a CDC change table using the **Table Triggers** option in the Data Dictionary.

To create a DELETE trigger:

1. In the Data Dictionary window, connect to the database that has the CDC change table.

   The Data Dictionary lists all the CDC change tables defined for your database.
2. Select the CDC change table for which you want to create the DELETE trigger, and then click **Table Properties**.

   The **Table Properties** window appears.
3. Click **Triggers**.

   The **Table Triggers** window appears.
4. Select **DELETE** from the **Event** drop-down options.
5. Either click **Files** under the **Procedure** option to choose a **.**p file or write the procedure for **DELETE**.
6. Click **OK**.

Modify a trigger

Editing either a table trigger or a field trigger modifies the database's schema.

Modify a table trigger

To modify a table trigger:

1. Choose **Schema** > **Modify Table**. The Data Dictionary alphabetically lists all the tables defined for your database.
2. Select the table for which you want to modify the trigger. The **Modify Table** window appears.
3. Choose **Triggers**. The **Table Triggers** dialog box appears.
4. Select the trigger you want to modify.
5. Press PUT to enter the trigger code. The **Trigger Code** dialog box appears.
6. Edit the trigger code.
7. Choose **OK** to return to the **Table Triggers** dialog box.
8. Choose **OK** to return to the **Modify Table** window.

Modify a field trigger

To modify a field trigger:

1. Choose **Schema** > **Field Editor**. The **Field Editor** alphabetically lists all the tables defined for your database.
2. Select the table for which you want to modify the trigger. The **Field Editor** appears.
3. Choose **Triggers**.
4. Select the field for which you want to modify the trigger. The **Field Triggers** dialog box appears.
5. Specify the name of the trigger procedure, then press **PUT** to enter the trigger code. The **Trigger Code** window appears.
6. Edit the trigger code.
7. Choose **OK** to return to the **Field Triggers** dialog box.
8. Choose **OK** to return to the **Field Editor**.

Delete a trigger

You can delete both table triggers or field triggers.

Note: When you delete a trigger from the Data Dictionary, you do not delete the trigger procedure itself.

Delete a table trigger

To delete a table trigger:

1. Choose **Schema** > **Modify Table**. The Data Dictionary alphabetically lists all the tables defined for your database.
2. Select the table for which you want to delete the trigger. The **Modify Table** dialog box appears.
3. Choose **Triggers**. The **Table Triggers** dialog box appears.
4. Delete the trigger filename for the trigger you want to remove.
5. Choose **OK** to return to the **Modify Table** dialog box.

Delete a field trigger

To delete a field trigger:

1. Choose **Schema** > **Field Editor**. The **Field Editor** alphabetically lists all the tables defined for your database.
2. Select the table for which you want to delete the trigger. The **Field Editor** appears.
3. Choose **Triggers**.
4. Choose the field for which you want to delete the trigger. The **Field Triggers** dialog box appears.
5. Delete the trigger filename for the trigger you want to remove.
6. Choose **OK** in the **Field Triggers** dialog box to return to the Field Editor.

Generate a trigger report

A trigger report lists:

- The table/field name
- The event
- The procedure filename

The report also indicates if the CRC should be checked and whether the trigger is overridable or has mismatched CRC, or if there is no r-code found.

To generate a trigger report:

1. Choose **Database** > **Reports** > **Trigger**. The **Trigger Report** dialog box appears.
2. Choose the **Print** button if you want to print the report. The **Print Options** dialog box appears.
3. Specify the report destination. If you want to save the report to a file, specify the filename and whether to append the report to an existing file.
4. Specify the page length, then choose **OK**. The Data Dictionary sends the report to the specified output destination and returns you to the **Trigger Report** dialog box.
5. Choose **OK** to return to the Data Dictionary main window.

8

Database Menu Reference

The Data Dictionary lets you create and modify database schema, including tables, fields, sequences, indexes, and triggers. You can also generate schema and auditing reports and perform database administration tasks.

For details, see the following topics:

- Database menu
- Select Working Database option
- Create option
- Connect option
- Disconnect option
- Reports option
- Exit option
- Database Properties

Database menu

From the **Database** menu you can:

- Select a working database
- Switch to a different working database
- Create new databases

- Connect databases
- Disconnect databases
- Generate schema or auditing reports
- Exit from the Data Dictionary

The following table describes the options that appear when you open the **Database** menu. The sections following the table contain detailed descriptions of these options.

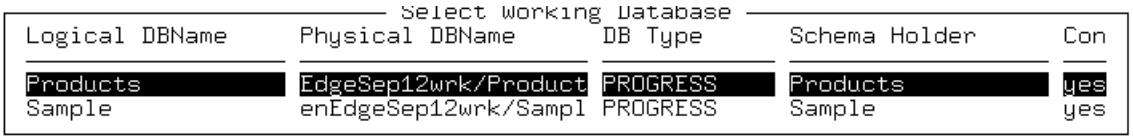
Table 3: Database menu

Menu option	Description
Select Working Database	Specifies the working database
Create	Creates a new database
Connect	Connects to an existing database
Disconnect	Disconnects a database
Reports	Generates reports about schema, and provides access to reports on the Alternate Buffer Pool, auditing, and encryption policies
Exit	Exits the Data Dictionary

Select Working Database option

The **Database** > **Select Working Database** menu option allows you to specify the working database if you have more than one database connected. When you choose this option, the **Select Working Database** dialog box appears, as shown in the following figure:

Figure 4: Select Working Database dialog box

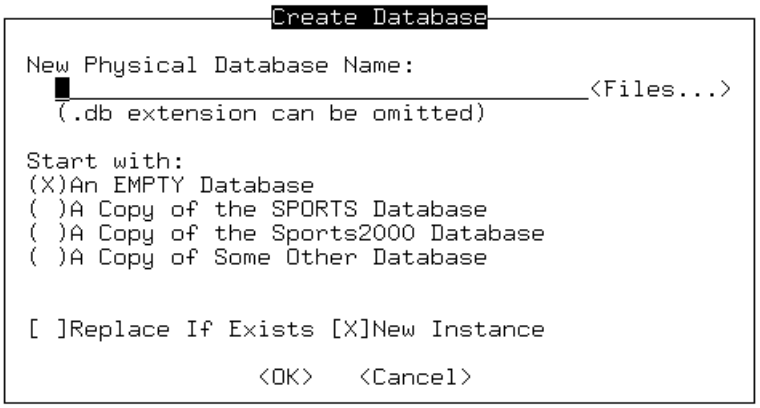


The Data Dictionary lists the available databases and basic database information. If you name a database with the PRO startup command, that database is connected and is the working database.

Create option

Use the **Database** > **Create** menu option to create an OpenEdge database. When you choose this option, the **Create Database** dialog box appears, as shown in the following figure:

Figure 5: Create Database dialog box



The **Create Database** dialog box contains the following fields:

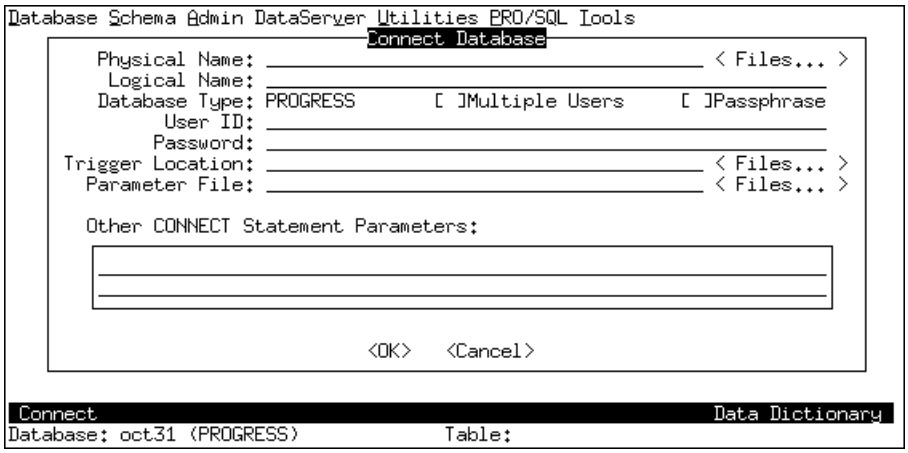
- **New Physical Database Name** — Specifies the actual name for the database on a disk. This name can contain an explicit path or it can be relative to your propath.
- **Files** — Displays a list of available options for its corresponding field. For example, when you choose Files next to the New Physical Database Name field, the Find Database File dialog box appears.
- **Start with** — Specifies the type of database you want to create. You can create:
  - An EMPTY Database
  - A Copy of the SPORTS Database
  - A Copy of the Sports 2020 Database
  - A Copy of Some Other Database
- **Replace If Exists** — Indicates that if you specify the name of an existing database, you want to replace the existing database with the one you are creating.
- **New Instance** — Indicates that the Data Dictionary will create a unique DB identifier for the created database, if it is a copy of another database. If you are starting with a copy of a database and do not select **New Instance**, the Data Dictionary assigns the source database's DB Identifier to the copy.

  Database copies created for backup purposes typically do not need to be created as new instances. If the copy is of an audit-enabled database and will be used for storing new audit data, select **New Instance**, as audit-enabled databases should have unique DB identifiers. For more information about auditing, see *Learn about Security and Auditing*.

Connect option

Use the **Database** > **Connect** menu option to connect to an existing database. After you choose the **Connect** option, the **Connect Database** dialog box, as shown in the following figure, appears. Note that the **ConnectDatabase** dialog box also appears after you create a database using the **Database** > **Create** menu option.

Figure 6: Connect Database dialog box



The **Connect Database** dialog box contains the following fields:

- **Physical Name** — Specifies the actual name of the database on a disk. This name can contain an explicit path or it can be relative to your propath.
- **Logical Name** — Specifies the database name that references a connected physical database. For example, if the physical database name is `mydb1.db`, the default logical database name is `mydb1`.
- **Database Type** — Specifies the database type. By default, the database type is PROGRESS.
- **Multiple Users** — Specifies if multiple users can access this database at the same time. The default is single-user. An **x** indicates multiple users can access the database. Before you can connect to a multi-user database, a server must be started for it using the PROSERVE command.

Note: You **must** select this option if you are running a multi-user server and you want to connect to a self-service client.

- **Passphrase —** For databases enabled for transparent data encryption, specifies that a user wants to be prompted for a key store passphrase.
- **User ID** — Identifies your user ID. Whether you enter a user ID and password depends on how your security is configured. If you created a new database from an empty database or the SPORTS database, you do not have to enter any values for user ID or password because, by default, the security for these databases is not enabled. However, if you created a database from a copy of another database that has a list of user IDs and passwords in the user list, you must specify a valid user ID and password.

  The Data Dictionary searches for the entered identification and passwords and if a match is found in the user list, it assigns the user ID to the new session. Otherwise, you will not be allowed you to connect to the database. For more information about user IDs and passwords, see *Manage the OpenEdge Database*.
- **Password** —Identifies your password.
- **Trigger Location** — Specifies the directory or r-code library containing the trigger code for the database.

- **Parameter File** — Specifies the parameter filename that contains the startup parameters for the database. The parameter file can include any number of startup parameters. For more information about parameter files, see *Manage the OpenEdge Database* and *Manage ABL Applications*.
- **Other CONNECT Statement Parameters** — Specifies any other startup parameters for the database that are not included in the parameter file. For example, enter any parameters you want to use that are not defined by this dialog box (or by the parameter file, if you included one in the **Parameter File** area).

  Internally, the Data Dictionary constructs and executes a CONNECT statement using the information you supply. Therefore, any rules that apply to the CONNECT statement also apply to database connections using the Data Dictionary. See *Develop ABL Applications* for more information about the CONNECT statement. For more information about connection parameters, see *Startup Command and Parameter Reference*.

Disconnect option

Choose this option to disconnect a database. When you have more than one database connected, the Data Dictionary displays the **Select Database to Disconnect** dialog box. After you select the database you want to disconnect, the Data Dictionary prompts you for verification. If you have two databases connected and you disconnect the working database, the Data Dictionary automatically switches to the other database. If you have more than two databases connected and you disconnect the working database, the Data Dictionary displays the **Select Working Database** dialog box and prompts you to select the new working database.

Reports option

The **Database** > **Reports** menu option allows you to generate reports about the schema in the database. The following table describes the submenu that appears when you choose this option.

Table 4: Reports menu

Report	Description
Detailed Table	Displays details about one or all tables in this database, including field, sequence, and index information
Quick Table	Displays a summary of all the tables in this database
Quick Field	Displays field information for one or all tables defined in the working database
Quick Index	Displays index information for one or all tables defined in the working database
PRO/SQL View	Displays PRO/SQL view information for all the views defined in the working database
Sequence	Displays sequence information for all the sequences defined in the working database
Trigger	Displays trigger information for all the triggers defined in the working database

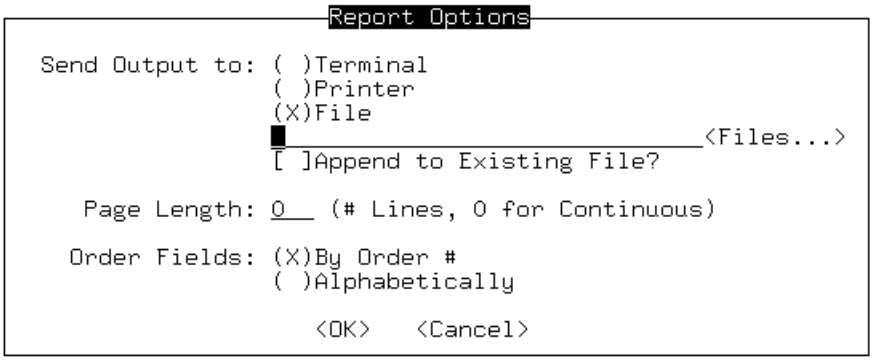
Report	Description
User	Displays the current database users, user IDs, and whether each user has a password
Table Relations	Displays the relations for one or all tables defined in the working database
Storage Areas	Displays the storage area information for all storage areas defined in the working database
Verify Data Width	Displays information about data that exceeds either the Data Dictionary format or width field
Alternate Buffer Pool	Displays information about ABL objects assigned to the Alternate Buffer pool
Auditing Reports	A submenu of auditing reports; see table Auditing reports table for a list of auditing reports
Encryption Policy Reports	A submenu of encryption policy reports; see Encryption Policy reports table for a list of encryption policy reports

Detailed Table Report option

Use the **Reports** > **Detailed Table** option to generate information about the structure of the selected table or of all the tables in the working database. This option creates a report that displays all information about the tables, including information about fields and indexes defined for the tables. Flags in the report indicate if the table is frozen, a SQL table, multi-tenant, cdc-enabled, or a change table.

When you choose this option and you select a table, the Data Dictionary displays the **Report Options** dialog box, as shown in the following figure:

Figure 7: Report Options dialog box



The **Report Options** dialog box contains the following fields:

- **Send Output to** — Allows you to send output to the screen, the default printer for your computer system, or a file.

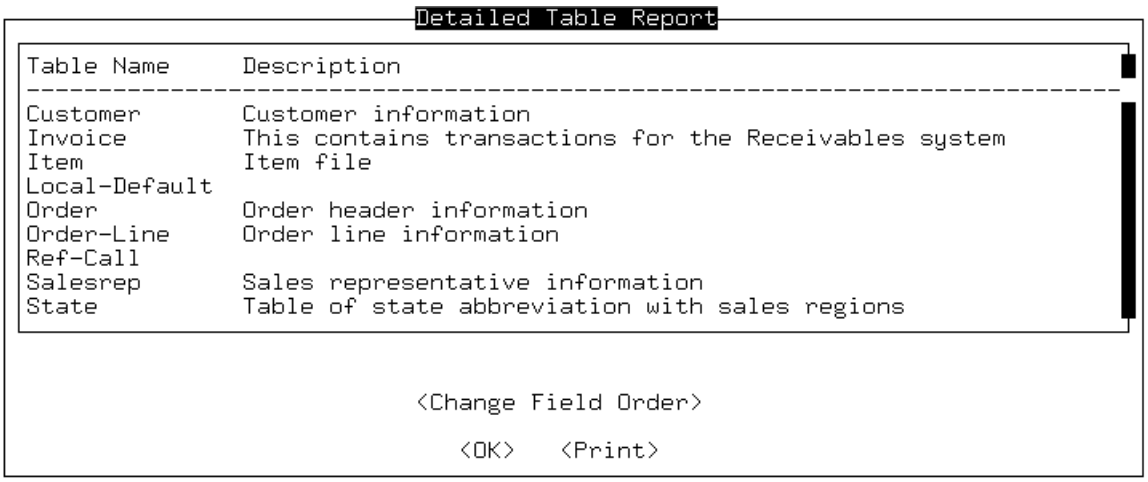
  If you choose to send output to a file, specify the filename and whether to append the report information to an existing file. Choose **Files** to display a list of existing files.

- **Page Length** — Specifies the number of lines per page. The default for the printer is 60 lines. For the terminal or a file, the default is **0** (continuous).

- **Order Fields** — Specifies whether to order the fields for the report by order number or alphabetically.

The following figure shows a portion of a Detailed Table Report for all the tables in the Sports database.

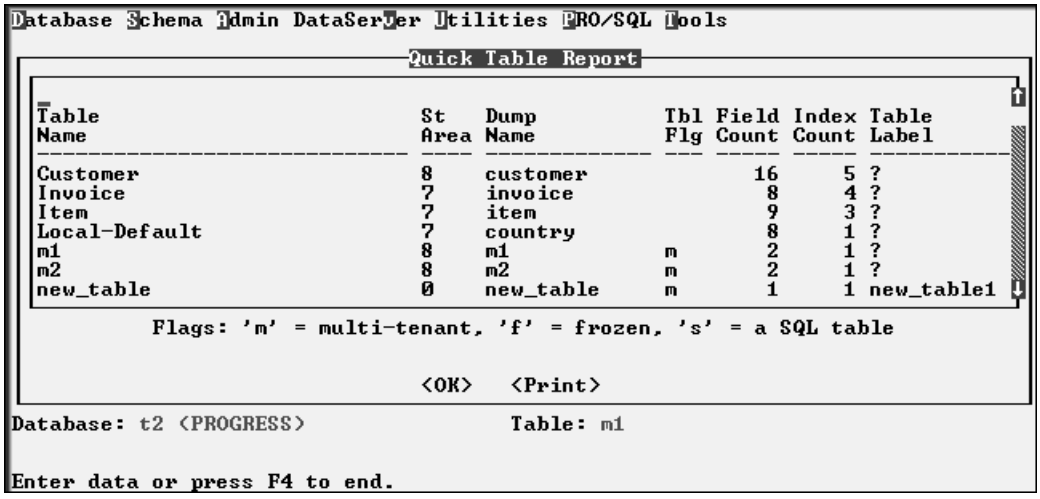
Figure 8: Detailed Table Report dialog box



Quick Table Report option

Choose the **Reports** > **Quick Table** option to display summary information about all the tables in the working database. For each table the **Quick Table Report** lists the table name, storage area number, dump name, table flags, field count, index count, and table label. Flags in the report indicate if the table is frozen, a SQL table, multi-tenant, cdc-enabled, or a change table. The following figure shows an example of a Quick Table Report for the Sports database.

Figure 9: Quick Table Report dialog box



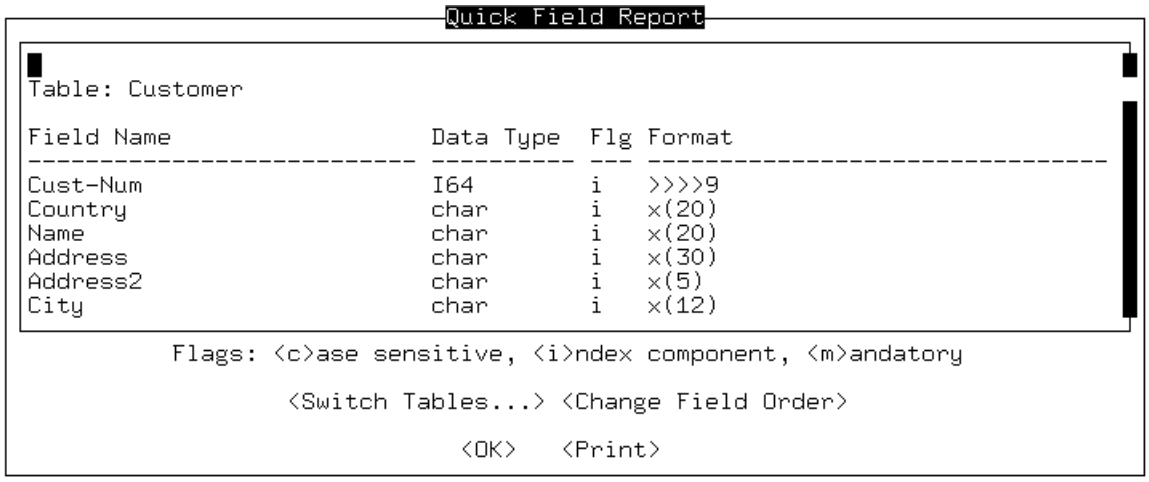
Quick Field Report option

Choose **Reports** > **Quick Field** to display information about the structure of fields in one or all tables in the working database. For each field, the report lists the order number, name, data type, flags, and format.

The **Data Type** column lists the first four characters of the field's data type. If the type is decimal, the report includes the number of stored decimals digits (for example, **deci–2**). If the field is an array, the report includes the extent (for example, **char[10]**). The **Flags** column indicates whether the field is case sensitive, mandatory, an index component, or a view component.

The following figure shows an example of a **Quick Field Report** for the customer table in the Sports database. The report includes the data type, flag, and format of each field.

Figure 10: Quick Field Report dialog box



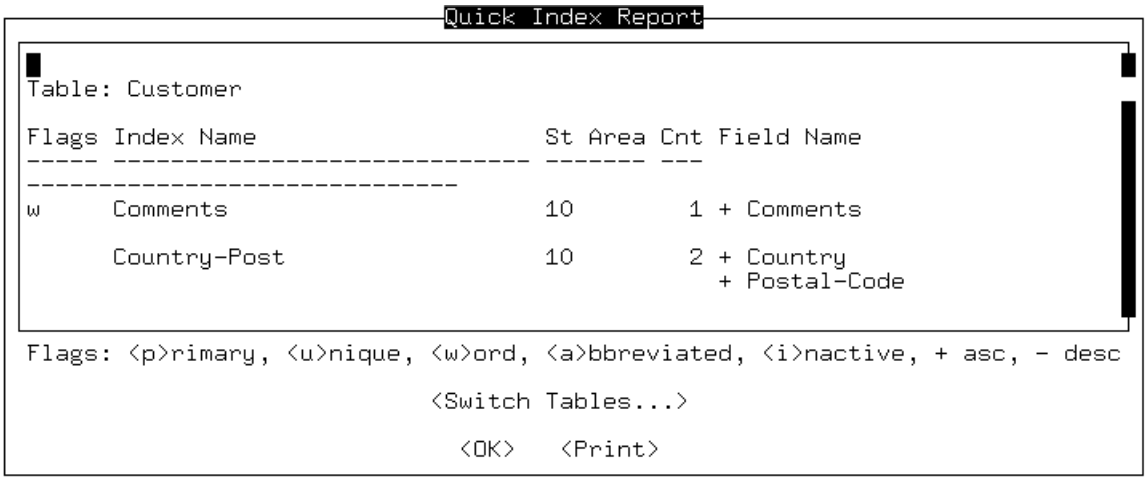
The **Quick Field Report** dialog box contains the following fields:

- **Switch Tables** —Returns you to the list of tables for the working database
- **Change Field Order** — Changes the sort order of the fields to either alphabetical by name or numeric by order
- **Print** — Enables you to print the report or write it to a file

Quick Index Report

Choose **Reports** > **Quick Index** to display information about the indexes defined in one or all tables in the working database. For each table, the report lists the index flags, name of the index, storage area number, and fields that define the index. The **Flags** column indicates whether the indexes are primary, unique, word, abbreviated, or inactive. A plus sign (**+**) or minus sign (**-**) next to the field name indicates if the index is ascending or descending. The following figure shows an example of a Quick Index Report for the customer table of the Sports database.

Figure 11: Quick Index Report dialog box



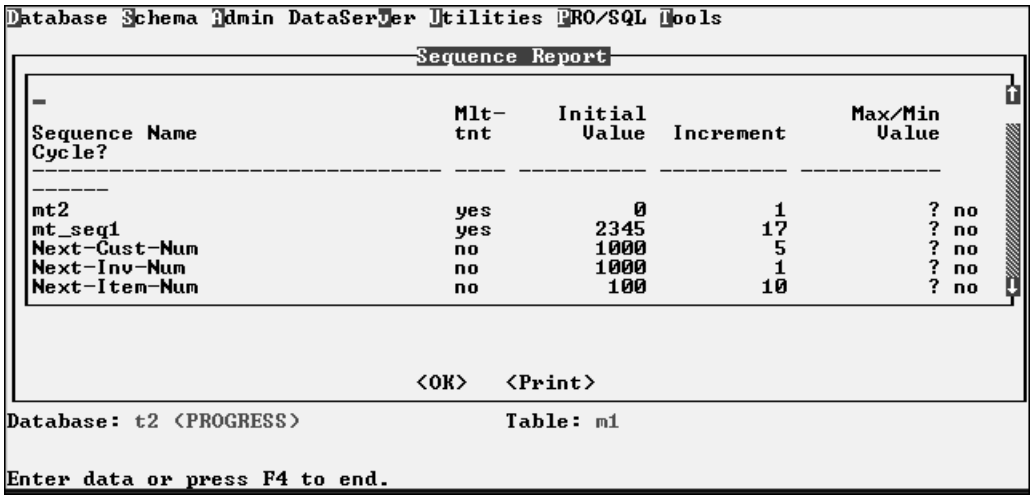
The **Quick Index Report** dialog box contains the following fields:

- **Switch Tables** —Returns you to the list of tables for the working database
- **Print** — Enables you to print the report or write it to a file

Sequence Report option

Choose **Reports** > **Sequence** to display information about all sequences defined in the current database. For each sequence, it shows the name of the sequence, if it is a multi-tenant sequence (for a multi-tenant database), its initial value, increment value, minimum or maximum value, and whether the sequence cycles or stops at the maximum value. The following figure shows an example of a Sequence Report for the Sports database.

Figure 12: Sequence Report dialog box

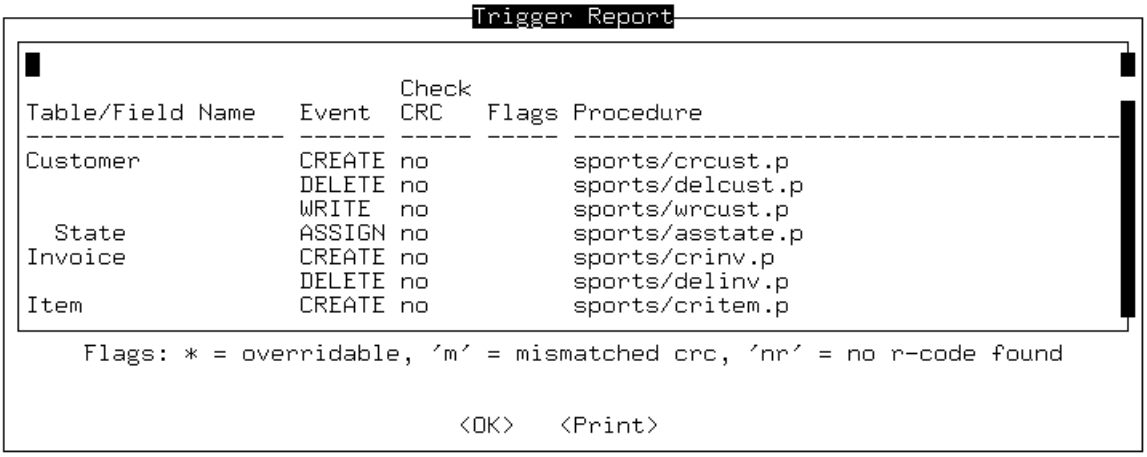


Choose **Print** to print the report or to write it to a file.

Trigger Report option

Choose **Reports** > **Trigger** to list in the report all tables and fields that have triggers defined for them. The report lists the table or field name for which the trigger is defined, the type of event that causes the trigger to fire; whether the Dictionary checks the cyclical redundancy check (CRC) code for the trigger procedure; the trigger flags; and the name of the procedure. The **Flags** column indicates if the trigger is overridable, has a mismatched CRC code, or has no r-code available. The following figure shows an example of a Trigger Report for the Sports database.

Figure 13: Trigger Report dialog box

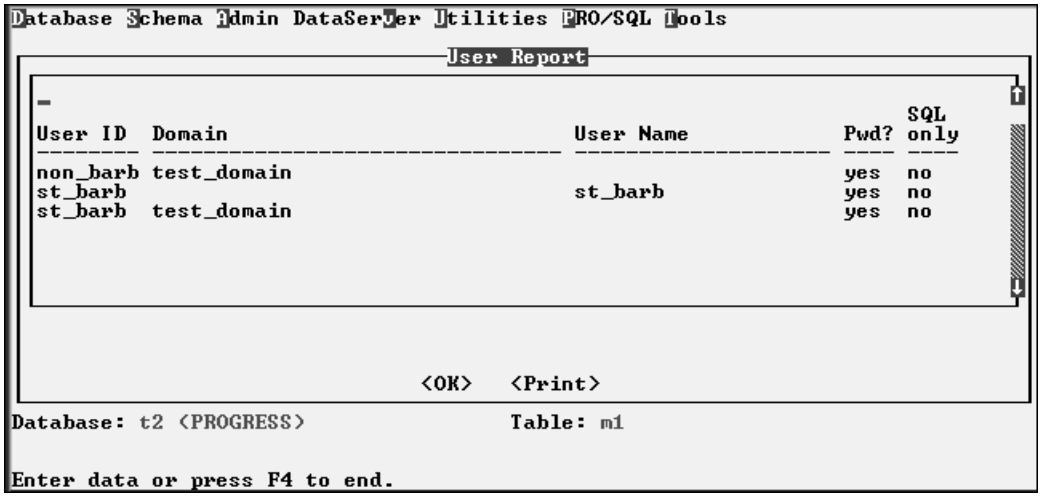


Choose **Print** to print the report or to write it to a file.

User Report option

Choose **Reports** > **User** to display the list of users who have permission to use the working database. This information is stored in the user list in the _User file. The following figure shows an example of a **User Report** window.

Figure 14: User Report dialog box

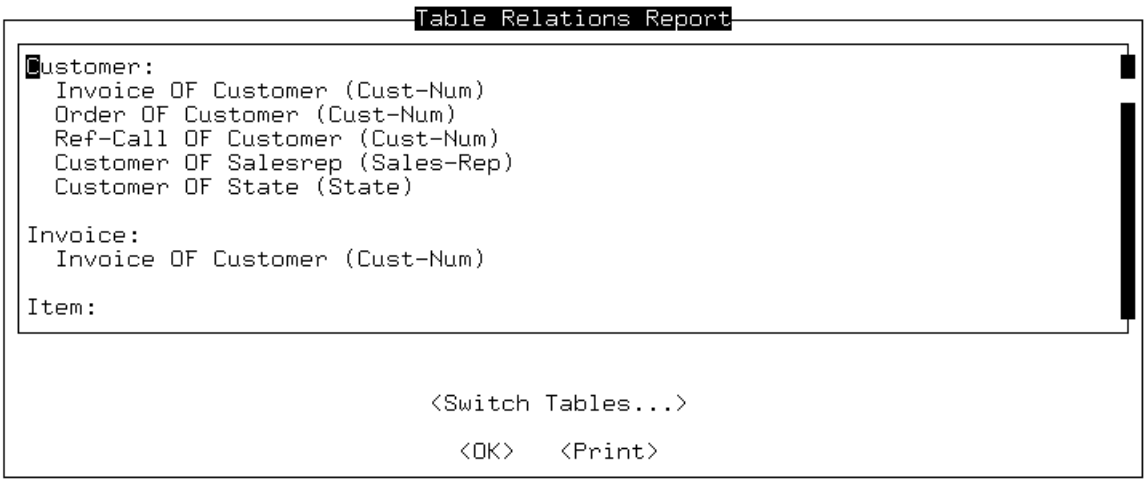


Choose **Print** to print the report or to write it to a file.

Table Relations Report option

Choose **Reports** > **Table Relations** to list the implicit join relations for one or all tables in the working database. The following figure shows an example of a **Table Relations Report** for the Customer table of the Sports database.

Figure 15: Table Relations Report dialog box



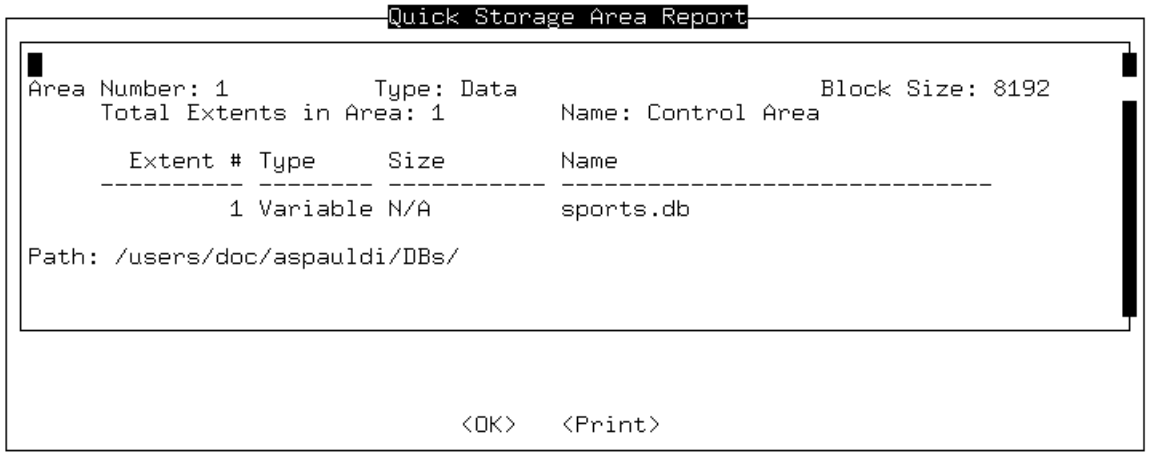
The **Table Relations Report** dialog box contains the following fields:

- **Switch Tables** — Returns you to the list of tables for the working database
- **Print** — Enables you to print the report or write it to a file

Storage Areas Report option

Choose **Storage Areas** > **Reports** to list the storage areas in the working database. The Storage Areas report lists storage area number, type, block size, total extents, and area name. The following figure shows an example of a Quick Storage Area Report for all tables of the Sports database.

Figure 16: Quick Storage Area Report dialog box

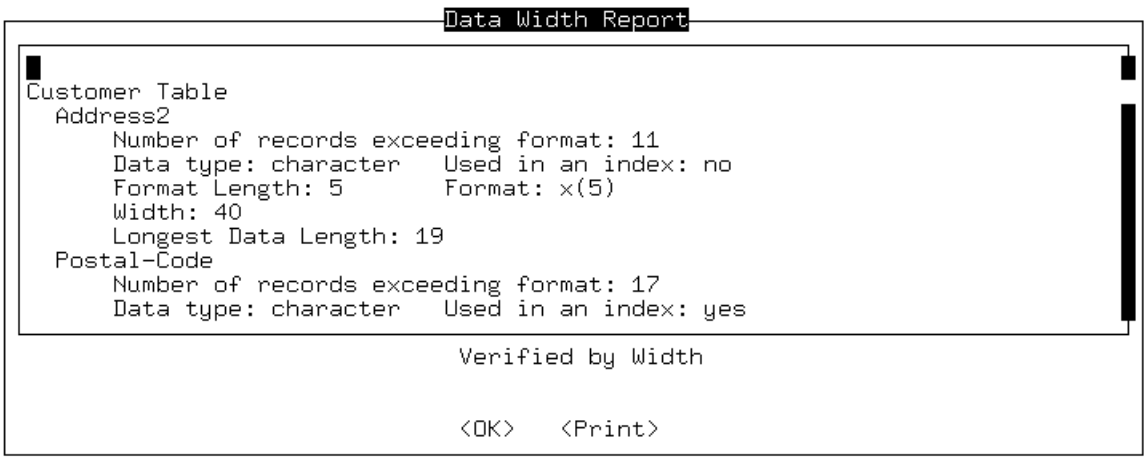


Choose **Print** to print a copy of the report.

Verify Data Width Report option

Choose **Reports** > **Verify Data Width** to compare the actual size of the data in a file to the definition of the corresponding field. The report shows the number of records that exceed the criteria selected, specifies the data type, and identifies the length of the longest element to exceed the length criteria. The following figure shows an example of a Data Width Report for all tables of the Sports database.

Figure 17: Data Width Report dialog box

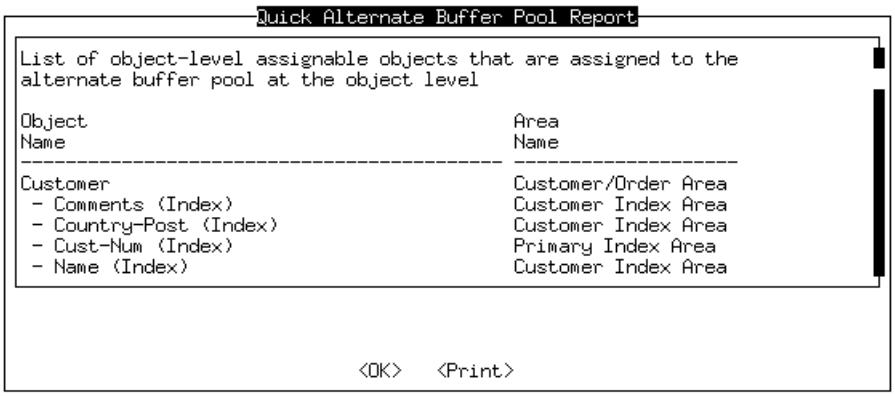


The **Print** option allows you to either print the report or write it to a file.

Alternate Buffer Pool Report option

Choose **Reports** > **Alternate Buffer Pool** to view the ABL objects assigned to the Alternate Buffer Pool. The report lists all the database objects that are assignable to the Alternate Buffer pool at the object-level and are currently assigned to the Alternate Buffer Pool.

Figure 18: Quick Alternate Buffer Pool Report



The **Print** option allows you to either print the report or write it to a file.

Objects are assigned to the Alternate Buffer Pool as follows:

- For ABL, objects use **Admin** > **Alternate Buffer Pool** > **Alternate Buffer Pool Maintenance**.
- For SQL, objects are assigned with SQL syntax. For information on the SQL syntax, see *OpenEdge SQL Reference*.
- For Type I and Type II areas, areas are assigned with the PROUTIL ENABLEB2 utility. For information on PROUTIL ENABLEB2, see *Manage the OpenEdge Database*.

For general information on the Alternate Buffer Pool, see *Manage the OpenEdge Database*.

Auditing Reports option

If you are connected to an audit-enabled database, you can access the **Auditing Reports** submenu by choosing **Reports** > **Auditing Reports**. For a description of each auditing report, see the following table. For a complete description of OpenEdge auditing events and event IDs, see *Learn about Security and Auditing*.

Table 5: Auditing reports

Report	Description
Track Audit Policy Changes	Details audit policy maintenance, commit, and dump/load events—events with the following IDs are tracked by this report: 300, 301, 10010, 10303, and 10304
Track Database Schema Changes	Details schema modification actions such as creating tables and modifying sequence definitions—events with IDs between 5000 and 5041 are tracked by this report

Report	Description
Track Audit Data Administration (Dump/Load)	Details the dump, load, and archival of audit data. Events with the following IDs are tracked by this report: 10300, 10301, and 10302
Track Application Data Administration (Dump/Load)	Details the dump and load of application data—events with the following IDs are tracked by this report: 10213 and 10214
Track User Account Changes	Details create, update, and delete events, as well as the user who made the changes—events with the following IDs are tracked by this report: 100, 101, and 102
Track Security Permissions Changes	Details role maintenance and permissions maintenance auditing events—events with IDs between 510 and 517 are tracked by this report
Track SQL Permissions Changes	Details create, update, and delete events, as well as the user who made the change—events with IDs of 210 through 212 and 400 through 422 are tracked by this report
Track Authentication System Changes	Details authentication system maintenance events and authentication system domain maintenance events—events with IDs between 500 and 507 are tracked by this report
Client Session Authentication Report	Details application access through authentication domains
Database Administration Report (Utilities)	Details activities performed by command-line database administration utilities—events with IDs between 10100 and 10212 are tracked by this report
Database Access Report (Login/Logout/etc)	Details login and logout events performed on an OpenEdge database—events with IDs between 10500 and 10611 are tracked by this report
Track Encryption Policy Changes	Reports any events related to encryption policy maintenance—events with IDs 11400-11402, 11500-11502, and 11600-11602 are tracked by this report
Track Key-store Changes	Reports any events related to the key store and autostart—events with IDs 11100-11114 and 11200-11207 are tracked by this report
Database Encryption Administration (Utilities)	Reports events such as enabling and disabling encryption for your database, and scan and update utilities—events with IDs 11000, 11001, 11300, and 11301 are tracked by this report
Custom Audit Data Filter Report	Allows you to limit the amount of custom audit data on which the Data Dictionary reports

Track Audit Policy Changes report

The **Track Audit Policy Changes** report details audit policy maintenance, commit, and dump/load events.

To generate a Track Audit Policy Changes report:

1. Choose **Reports** > **Auditing Reports** > **Track Audit Policy Changes**. The **Date Range** dialog box appears.
2. To specify a range of dates on which to report, select **Select Some** and enter the dates in the **Start Range** and **End Range** fields. To report on all audit policy records, select **Select All**.
3. Choose **OK**. The **OpenEdge Auditing Report Options** dialog box appears. See OpenEdge Auditing Report Options dialog box on page 85 for more information about the **OpenEdge Auditing Report Options** dialog box.

Track Database Schema Changes report

The **Track Database Schema Changes** report details schema modification actions such as creating tables and modifying sequence definitions.

To generate a Track Database Schema Changes report:

1. Choose **Reports** > **Auditing Reports** > **Track Database Schema Changes**. The **Date Range** dialog box appears.
2. To specify a range of dates on which to report, choose **Select Some** and enter the dates in the **Start Range** and **End Range** fields. To report on all audit policy records, choose **Select All**.
3. Choose **OK**. The **OpenEdge Auditing Report Options** dialog box appears. See OpenEdge Auditing Report Options dialog box on page 85 for more information about the **OpenEdge Auditing Report Options** dialog box.

Track Audit Data Administration (Dump/Load) report

The **Track Audit Data Administration (Dump/Load)** report details the dump, load, and archival of audit data.

To generate a Track Audit Data Administration (Dump/Load) report:

1. Choose the **Reports** > **Auditing Reports** > **Track Audit Data Administration (Dump/Load)**. The **Date Range** dialog box appears.
2. To specify a range of dates on which to report, choose **Select Some** and enter the dates in the **Start Range** and **End Range** fields. To report on all audit policy records, choose **Select All**.
3. Choose **OK**. The **OpenEdge Auditing Report Options** dialog box appears. See OpenEdge Auditing Report Options dialog box on page 85 for more information about the **OpenEdge Auditing Report Options** dialog box.

Track Application Data Administration (Dump/Load) report

The **Track Application Data Administration (Dump/Load)** report details the dump and load of application data.

To generate a Track Application Data Administration (Dump/Load) report:

1. Choose **Reports** > **Auditing Reports** > **Track Application Data Administration (Dump/Load)**. The **Date Range** dialog box appears.
2. To specify a range of dates on which to report, choose **Select Some** and enter the dates in the **Start Range** and **End Range** fields. To report on all audit policy records, select **Select All**.
3. Choose **OK**. The **OpenEdge Auditing Report Options** dialog box appears. See OpenEdge Auditing Report Options dialog box on page 85 for more information about the **OpenEdge Auditing Report Options** dialog box.

Track User Account Changes report

The **Track User Account Changes** report details changes to the `_User` table and lists the user ID of the user who made the changes.

To generate a Track User Account Changes report:

1. Choose **Reports** > **Auditing Reports** > **Track User Account Changes**. The **Date Range** dialog box appears.
2. To specify a range of dates on which to report, select **Select Some** and enter the dates in the **Start Range** and **End Range** fields. To report on all audit policy records, select **Select All**.
3. Choose **OK**. The **OpenEdge Auditing Report Options** dialog box appears. See OpenEdge Auditing Report Options dialog box on page 85 for more information about the **OpenEdge Auditing Report Options** dialog box.

Track Security Permissions Changes report

The **Track Security Permissions Changes** report details role maintenance and permissions maintenance events.

To generate a Track Security Permissions Changes report:

1. Choose **Reports** > **Auditing Reports** > **Track Security Permissions Changes**. The **Date Range** dialog box appears.
2. To specify a range of dates on which to report, select **Select Some** and enter the dates in the **Start Range** and **End Range** fields. To report on all audit policy records, select **Select All**.
3. Choose **OK**. The **OpenEdge Auditing Report Options** dialog box appears. See OpenEdge Auditing Report Options dialog box on page 85for more information about the **OpenEdge Auditing Report Options** dialog box.

Track SQL Permissions Changes report

The **Track SQL Permissions Changes** report details create, update, and delete events, as well as the user ID of the user who made the change.

To generate a Track SQL Permissions Changes report:

1. Choose **Reports** > **Auditing Reports** > **Track SQL Permissions Changes**. The **Date Range** dialog box appears.
2. To specify a range of dates on which to report, choose **Select Some** and enter the dates in the **Start Range** and **End Range** fields. To report on all audit policy records, select **Select All**.
3. Choose **OK**. The **OpenEdge Auditing Report Options** dialog box appears. See OpenEdge Auditing Report Options dialog box on page 85 for more information about the **OpenEdge Auditing Report Options** dialog box.

Track Authentication System Changes report

The **Track Authentication System Changes** report details authentication system maintenance events and authentication system domain maintenance events.

To generate a Track Authentication System Changes report:

1. Choose **Reports** > **Auditing Reports** > **Track Authentication System Changes**. The **Date Range** dialog box appears.
2. To specify a range of dates on which to report, choose **Select Some** and enter the dates in the **Start Range** and **End Range** fields. To report on all audit policy records, choose **Select All**.
3. Choose **OK**. The **OpenEdge Auditing Report Options** dialog box appears. See OpenEdge Auditing Report Options dialog box on page 85 for more information about the **OpenEdge Auditing Report Options** dialog box.

Client Session Authentication report

The **Client Session Authentication** report details application access through authentication domains.

To generate a Client Session Authentication report:

1. Choose **Reports** > **Auditing Reports** > **Client Session Authentication**. The **Date Range** dialog box appears.
2. To specify a range of dates on which to report, select **Select Some** and enter the dates in the **Start Range** and **End Range** fields. To report on all audit policy records, select **Select All**.
3. Choose **OK**. The **OpenEdge Auditing Report Options** dialog box appears. See OpenEdge Auditing Report Options dialog box on page 85 for more information about the **OpenEdge Auditing Report Options** dialog box.

Database Administration Utilities report

The **Database Administration Utilities** report details activities performed by command-line database administration utilities.

To generate a Database Administration Utilities report:

1. Choose **Reports** > **Auditing Reports** > **Database Administration Report (Utilities)**. The **Date Range** dialog box appears.
2. To specify a range of dates on which to report, select **Select Some** and enter the dates in the **Start Range** and **End Range** fields. To report on all audit policy records, select **Select All**.
3. Choose **OK**. The **OpenEdge Auditing Report Options** dialog box appears. See the **OpenEdge for more information about the OpenEdge Auditing Report Options** dialog box.

Database Access report (Login/Logout/etc)

The **Database Access** report details login and logout events performed on an OpenEdge database.

To generate a Database Access report (Login/Logout/etc):

1. Choose **Reports** > **Auditing Reports** > **Database Access Report (Login/Logout/etc)**. The **Date Range** dialog box appears.
2. To specify a range of dates on which to report, choose **Select Some** and enter the dates in the **Start Range** and **End Range** fields. To report on all audit policy records, choose **Select All**.
3. Choose **OK**. The **OpenEdge Auditing Report Options** dialog box appears. See OpenEdge Auditing Report Options dialog box on page 85 for more information.

Track Encryption Policy Changes report

The **Track Encryption Policy Changes** report details encryption policy maintenance changes.

To generate a Track Encryption Policy Changes report:

1. Choose **Reports** > **Auditing Reports** > **Track Encryption Policy Changes**. The **Date Range** dialog box appears.
2. To specify a range of dates on which to report, select **Select Some** and enter the dates in the **Start Range** and **End Range** fields. To report on all audit policy records, select **Select All**.
3. Choose **OK**. The **OpenEdge Auditing Report Options** dialog box appears. See OpenEdge Auditing Report Options dialog box on page 85 for more information about the **OpenEdge Auditing Report Options** dialog box.

Track Key-store Changes report

The **Track Key-store Changes** report details any changes to the key store and the autostart configuration.

To generate a Track Key-store Changes report:

1. Choose **Reports** > **Auditing Reports** > **Track Key-store Changes**. The **Date Range** dialog box appears.
2. To specify a range of dates on which to report, select **Select Some** and enter the dates in the **Start Range** and **End Range** fields. To report on all audit policy records, select **Select All**.
3. Choose **OK**. The **OpenEdge Auditing Report Options** dialog box appears. See OpenEdge Auditing Report Options dialog box on page 85 for more information about the **OpenEdge Auditing Report Options** dialog box.

Database Encryption Administration (Utilities) report

The **Database Encryption Administration (Utilities)** report details events such as enabling and disabling encryption, and running the encryption policy scan and update utilities.

To generate a Database Encryption Administration (Utilities) report:

1. Choose **Reports** > **Auditing Reports** > **Database Encryption Administration (Utilities)**. The **Date Range** dialog box appears.
2. To specify a range of dates on which to report, select **Select Some** and enter the dates in the **Start Range** and **End Range** fields. To report on all audit policy records, select **Select All**.
3. Choose **OK**. The **OpenEdge Auditing Report Options** dialog box appears. See OpenEdge Auditing Report Options dialog box on page 85 for more information about the **OpenEdge Auditing Report Options** dialog box.

Custom Audit Data Filter report

The **Custom Audit Data Filter** report allows you to limit the amount of audit data reported on by the Data Dictionary.

To generate an audit report using the Custom Audit Data Filter:

1. Choose **Reports** > **Auditing Reports** > **Custom Audit Data Filter Report**. The **Custom Audit Data Filter** dialog box appears.
2. To filter based on an audit date range, complete the following fields:
   - **From Date** — The date of the earliest audit transaction that you want reported
   - **To Date** — The date of the last audit transaction that you want reported
3. To filter based on audit event ID range, complete the following fields:
   - **From Id** — The first ID that you want reported
   - **To Id** — The last ID that you want reported
4. To report on audit events associated with a user ID, enter the ID into the **Miscellaneous User Id** field.
5. To report on audit events associated with a transaction ID, enter the ID into the **Miscellaneous Transaction Id** field.
6. To filter on event context information, complete the desired context field:
   - **System Context** — The system context that you want reported. The system context is typically the name of a table. Select **SEP** to insert a separator character. The separator character indicates a delimited string.
   - **Policy Context** — The policy context that you want reported. Select **SEP** to insert a separator character. The separator character indicates a delimited string.

   Use the **BEGINS**, **MATCHES**, and **EQUALS** options to filter the Event Context information.

   Note: If you filter on Event Context information, the report may take a long time to generate.

OpenEdge Auditing Report Options dialog box

The **OpenEdge Auditing Report Options** dialog box allows you to set display characteristics for your auditing report. The **OpenEdge Auditing Report Options** dialog box appears, and contains the following fields:

- **Send Output to** — Choose the output destination from the radio set: **Terminal**, **File (XML)**, or **File (Text)**.
- **File Name** — If **File (XML)** or **File (Text)** is the selected output destination, enter a file name for the report or browse for a file using **Files**.
- **Append to Existing File** — Select to append an existing file. If you do not select the append option, an existing file may be overwritten.
- **Page Length** — Enter a number. Zero (0) creates continuous output with no line breaks. The default is 60 lines per printed page. The default for a terminal is the number of lines displayed on the screen.
- **Orientation** — Select the report's orientation: **Detail** or **Summary**. Select **Detail** if you want details for each of the report's entries. Select **Summary** if you only want to print summary information.

Encryption Policy Reports option

If you are connected to an encryption-enabled database, you can access the **Encryption Policy Reports** submenu by choosing **Reports** > **Encryption Policy Reports**. You cannot access encryption policy reports for a remote database; you must have a local connection. For a description of the encryption policy reports see the following table. For more information on encryption policies, see *Learn about Security and Auditing*.

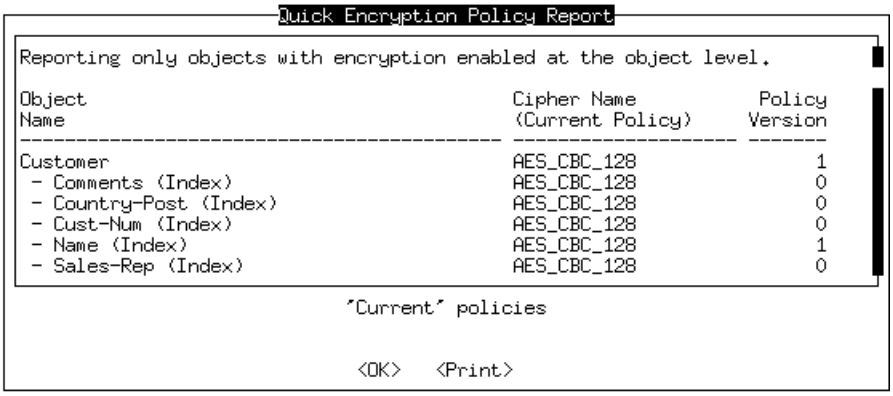
Table 6: Encryption Policy reports

Report	Description
Quick Encryption Policies	For ABL objects encrypted at the object level in a Type II area, this report details the cipher name and policy version of object's current encryption policy.
Detailed Encryption Policies	For all encryptable ABL objects at the object level in a Type II area: • If the object is encrypted, the policy version, cipher name, and policy state is reported. • If the object is not encrypted, "No policy information available for object" is reported. **Note:** If ALL is selected, only encrypted objects are reported.

Quick Encryption Policies report

Choose **Reports** > **Encryption Policy Reports** > **Quick Encryption Policies** to generate a Quick Encryption Policy report. The report details the cipher name and policy version of an ABL object's current encryption policy. The following figure shows an example of a Quick Encryption Policy report.

Figure 19: Quick Encryption Policy Report dialog box



The **Print** option allows you to either print the report or write it to a file.

Detailed Encryption Policies report

Choose **Reports** > **Encryption Policy Reports** > **Detailed Encryption Policies** to generate a Detailed Encryption Policy report. For all encryptable ABL objects at the object level, the detailed report contains the following information:

- If the object is encrypted, the policy version, cipher name, and policy state is reported
- If the object is not encrypted, "No policy information available for object" is reported

To generate a Detailed Encryption Policy report:

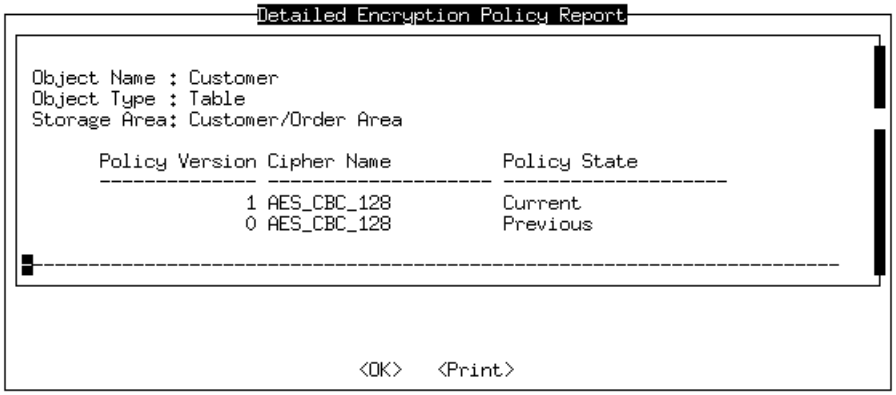
1. Choose **Reports** > **Encryption Policy Reports** > **Detailed Encryption Policies**.
2. Select either a table name or **ALL**.

   Note: If **ALL** is selected, only encrypted objects are reported.

3. Select the report destination: terminal, printer, or file. Click **OK**.
4. The report is generated. If you chose terminal as the destination, the **Print** option allows you to either print the report or write it to a file.

   The following figure shows an example of a Detailed Encryption Policy Report.

   Figure 20: Detailed Encryption Policy Report dialog box

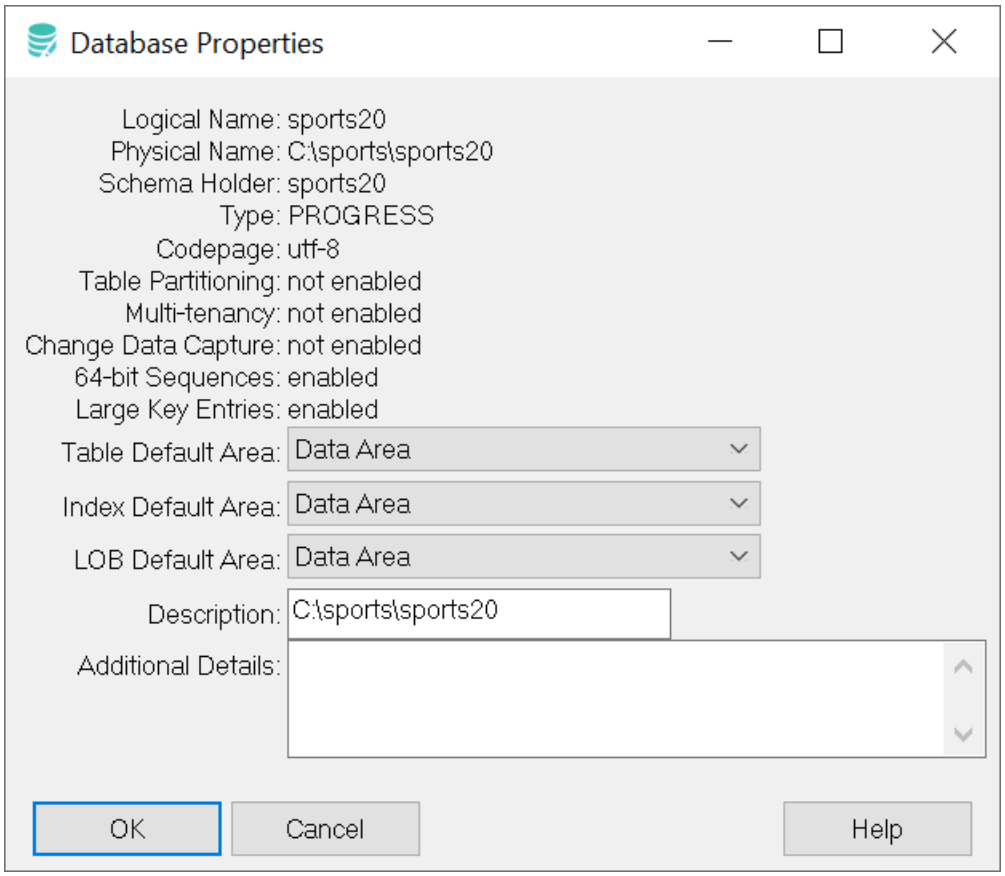


Exit option

Choose this option to close the Data Dictionary and you return to where you started the Dictionary. For example, if you started the Dictionary from the Procedure Editor, you return there.

Database Properties

The **Database Properties** window displays the schema definitions that define the database, such as the database name and the database type of the working database. To access this window, click the **Database Properties** button on the main window.


Database Properties
Logical Name: sports20
Physical Name: C:\sports\sports20
Schema Holder: sports20
Type: PROGRESS
Codepage: utf-8
Table Partitioning: not enabled
Multi-tenancy: not enabled
Change Data Capture: not enabled
64-bit Sequences: enabled
Large Key Entries: enabled
Table Default Area: Data Area
Index Default Area: Data Area
LOB Default Area: Data Area
Description: C:\sports\sports20
Additional Details:
OK
Cancel
Help

The **Database Properties** window contains the following fields:

- **Logical Name**—Displays the logical name for the working database.
- **Physical Name**—Displays the physical name for the working database, as specified at connect time.
- **Schema Holder**—Displays the schema of the working database.
- **Type**—Displays the database type for the working database.
- **Code Page**—Displays the code page for the working database.
- **Table partitioning**—Indicates if table partitioning is enabled or disabled.
- **Multi-tenancy**—Indicates if multi-tenancy is enabled or disabled.
- **Change Data Capture**—Indicates if Change Data Capture is enabled or disabled.
- **64-bit Sequences**—Indicates if 64-bit sequences are enabled or disabled.
- **Large Key Entries**—Indicates if large key entries are enabled or disabled.
- **Table Default Area**—Displays the name of the default area for creating tables if set, or displays the string `n/a` if not set. A new default area can be set from the options in the drop-down list. If the default area is set to blank, then the default area uses a null value.
- **Index Default Area**—Displays the name of the default area for creating indexes if set, or displays the string `n/a` if not set. A new default area can be set from the options in the drop-down list. If the default area is set to blank, then the default area uses a null value.
- **LOB Default Area**—Displays the name of the default area for creating large objects (LOBs) if set, or displays the string `n/a` if not set. A new default area can be set from the options in the drop-down list. If the default area is set to blank, then the default area uses a null value.
- **Description**—Allows you to enter a description of the database. Use this field to differentiate between databases that share the same name but have unique database identifiers.
- **Additional Details**—Allows you to enter additional information about the database. Use this field to differentiate between databases that share the same name but have unique database identifiers.

9

Schema Menu Reference

Schema menu commands are used to modify the structure of a database.

For details, see the following topics:

- Schema menu
- Modify Table option
- Add New Table option
- Delete Table(s) option
- Field Editor option
- Reorder Fields option
- Global Field Name Change option
- Index Editor option
- Sequence Editor option
- Adjust Field Width option

Schema menu

The *schema* of the database is the definition of its structure: the tables it contains, the fields within the tables, sequences, etc. In addition to database structure, schemas contain validation expressions and validation messages.

Use the Schema options to add, update, or delete table, field, index, or sequence definitions. The following table lists the **Schema** menu options and gives a brief description of each. The sections following the table contain detailed descriptions of these schemas.

Table 7: Schema menu

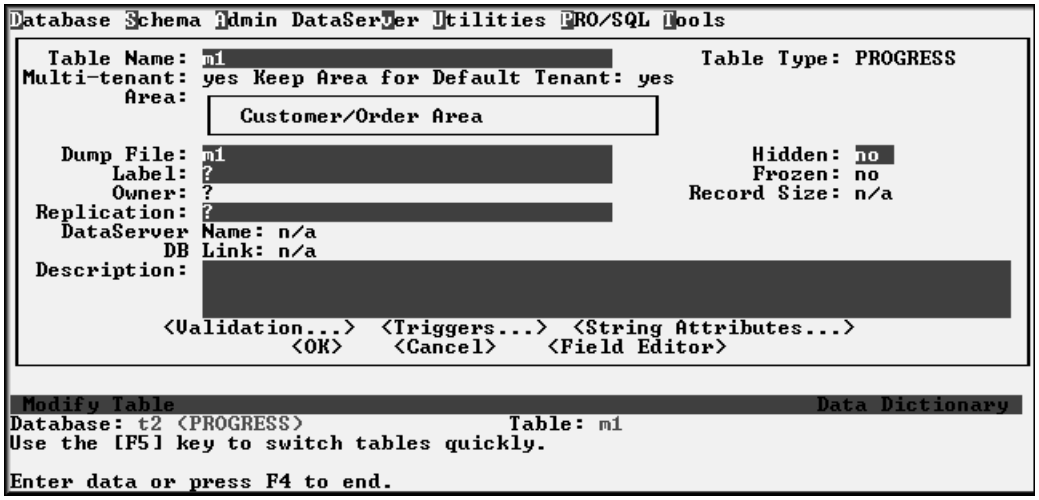
Schema	Description
Modify Table...	Changes information defined for an existing table
Add New Table...	Creates a new table definition
Delete Table(s)...	Removes one or more table definitions
Field Editor...	Adds, alters, or removes fields from a table definition
Reorder Fields...	Resequences the fields into alphabetical order, or resets the order numbers of the fields
Global Field Name Change...	Changes a field name throughout the database
Index Editor...	Adds, alters, or removes indexes in a table
Sequence Editor...	Adds, alters, or removes sequences in a table
Adjust Field Width...	Alters field width value in a table

Modify Table option

The **Schema** > **Modify Table** option allows you to change the structure of a table.

When you choose this option, the Data Dictionary alphabetically lists all the tables defined for your database. After you select a table, a window similar to the one shown in the following figure appears.

Figure 21: Modify Table window



The **Modify Table** window contains the following fields:

- **Table Name** —Specifies the name of the table. Table names can be up to 32 characters long and can consist of alphabetic characters, digits, and the characters $, &, #, %, -, and _. In addition, table names must begin with a letter (A–Z or a–z). You cannot use reserved ABL keywords as table names. Table names are not case sensitive.
- **Multi-tenant** — For databases enabled for multi-tenancy, yes for a multi-tenant table, no otherwise.
- **Keep Area for Default Tenant** — For databases enabled for multi-tenancy, yes if there is an area for the default tenant.
- **Area** — Displays the name of the storage area. The area name is assigned to a table when it is created. Because the table name cannot be modified, this field cannot be edited.

  After you set a default area name for a table, the new area name appears in the **Area** field.

  Example:

  ```
  proutil db-name -C setobjectdefaultarea area-name table
  ```

- **Dump File** — Specifies the file to which you want to dump the table contents. The name must be unique among the other tables in the database and can be up to 32 characters long. The default filename is the table name.
- **Table Type** — Displays the table type.
- **Hidden** — Specifies if the table is a hidden table. The default value is **no**.
- **Label** — Specifies the label used in error messages.
- **Frozen** — Specifies if the table is frozen. You can freeze or unfreeze a table using the **Freeze/Unfreeze** option from the **Utilities** menu. When a table is frozen, you can only view its properties. The actual record data is not frozen, only the data definitions.
- **Owner** — Displays the user ID of the table owner. This information is necessary for manipulating certain DataServers.
- **Record Size** — Specifies the size of the record used for DataServers with fixed-length records.
- **Replication** — Specifies the name of the procedure that performs the replication for this table. For more information, see the topic on data replication in *Manage the OpenEdge Database*.
- **DataServer Name** — Specifies the table name in the appropriate DataServer database if the table is not an OpenEdge table.
- **DB Link** — Specifies the link name for the distributed ORACLE database.
- **Description** — Describes the table contents.

The following sections describe the options that appear at the bottom of the window.

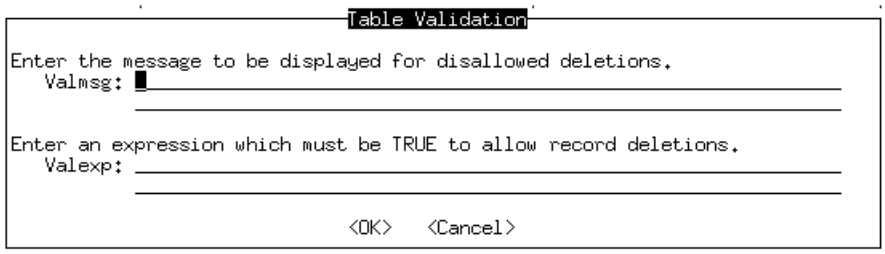
Validation option

The **Validation** option in the **Modify Table** dialog box allows you to specify validation criteria and a message for record deletions.

Note: You should use table validation for backward compatibility for procedure-driven applications. For event-driven programs, use table delete triggers instead of table validation.

If you choose **Validation**, the **Table Validation** dialog box shown in the following figure appears.

Figure 22: Table Validation dialog box



The **Table Validation** dialog box contains the following fields:

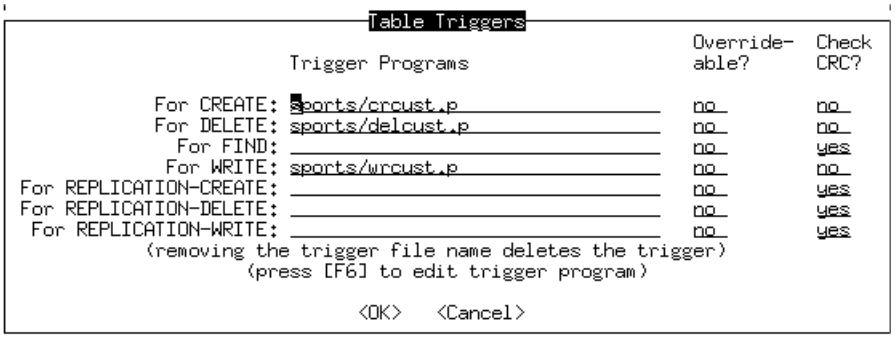
- **Valmsg** —Specifies the message that appears when a user tries an invalid deletion. There is no limit to the number of characters you can enter, but a message up to 63 characters long can fit onto the two message lines without scrolling.
- **Valexp** — Specifies the criteria for valid deletions. For example, to restrict deleting customers in the Customer table to those customers who have no outstanding orders, enter the following:

```
NOT (CAN-FIND(FIRST order OF customer))
```

Table Triggers option

The **Table Triggers** option in the **Modify Table** dialog box allows you to define schema triggers for a table. If you choose **Table Triggers**, the **Table Triggers** window shown in the following figure appears.

Figure 23: Table Triggers dialog box



The **Table Triggers** dialog box contains the following fields:

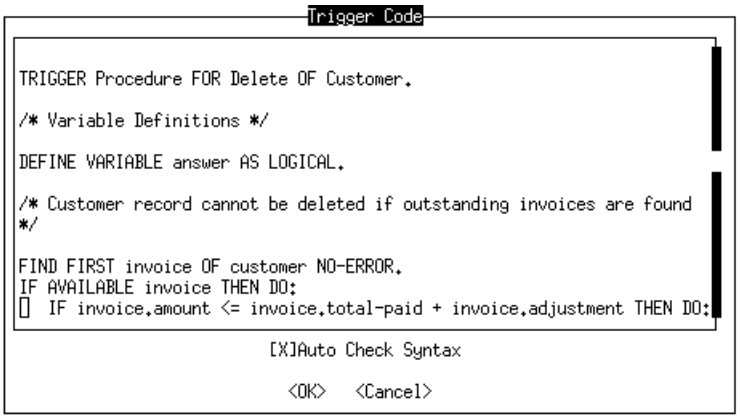
- **Overrideable** — Specifies whether a session trigger can override the schema trigger. The default value is **no**. See *Develop ABL Applications* for more information about schema and session triggers.
- **Check CRC** — Specifies whether the database engine verifies the cyclical redundancy check (CRC) code. The default value is **yes**. If this option is on, then the AVM stores in the metaschema, along with the trigger procedure name, a unique Cyclic Redundancy Check (CRC) identifier for the **compiled** version of the trigger procedure. The AVM raises an error if the r-code file it encounters at run time does not match or if there is no compiled version of the procedure.
- **Trigger Programs** — Choose the database event for the trigger you want to create. The following table lists the available database events.

Table 8: Table Trigger events

Event	Description
CREATE	Specifies that the trigger executes every time a CREATE or INSERT statement executes for the table you are modifying.
DELETE	Specifies that the trigger executes every time a DELETE statement executes for the table you are modifying.
FIND	Specifies that the trigger executes every time a record in the table you are modifying is read using a FIND statement or a FOR EACH loop. Only records that satisfy the full search conditions (such as a WHERE clause) cause a FIND trigger to execute. The CAN-FIND statement does not cause a FIND trigger to execute.
WRITE	Specifies that the trigger executes every time OpenEdge RDBMS validates a record. OpenEdge RDBMS automatically validates a record when it releases it. **Note:** OpenEdge RDBMS does not compare the new record with the old record when determining if it should fire the WRITE trigger. Even temporary changes to a table (as when a field is changed, then changed back to its original value) cause WRITE to fire. If it is necessary to handle this situation, use the NEW BUFFER and OLD BUFFER options in your trigger procedure to compare the values and detect a "dummy" change case.
	Specifies the trigger that executes immediately following the execution of the CREATE trigger (if you specify a CREATE trigger). The purpose of the trigger is to replicate the creation of records to another database.
REPLICATION- DELETE	Specifies the trigger that executes immediately following the execution of the DELETE trigger (if you specify a DELETE trigger). The purpose of the trigger is to replicate the deletion of records to another database.
REPLICATION- WRITE	Specifies the trigger that executes immediately following the execution of the WRITE trigger (if you specify a WRITE trigger). The purpose of the trigger is to replicate updated records to another database.

Press **F6** to display the trigger code dialog box. The following figure shows an example of a delete trigger procedure.

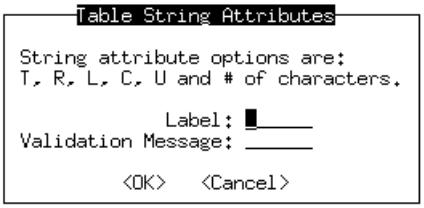
Figure 24: Example of a delete trigger procedure



String Attributes option

The **String Attributes** option allows you to control how much space is allocated within an r-code text segment for a string. It is important when you translate a string that you specify enough space for the translated string. String attributes can also specify the text justification within the r-code and whether or not the Translation Manager should translate the string. When you choose **String Attributes**, the **Table String Attributes** dialog box shown in the following figure appears.

Figure 25: Table String Attributes dialog box



The **Table String Attributes** dialog box contains the following fields:

- **Label** — Specifies the string attribute characters for the table label
- **Validation Message** — Specifies the string attribute characters for the table validation message

Use the following character and number combinations to enter the string attribute label:

```
[ R | L | C | T ][ U ][max-length]
```

See Specify string attributes on page 28 for details about the control characters you can enter in the label field.

The following table lists several examples of string attributes.

Table 9: String attribute examples

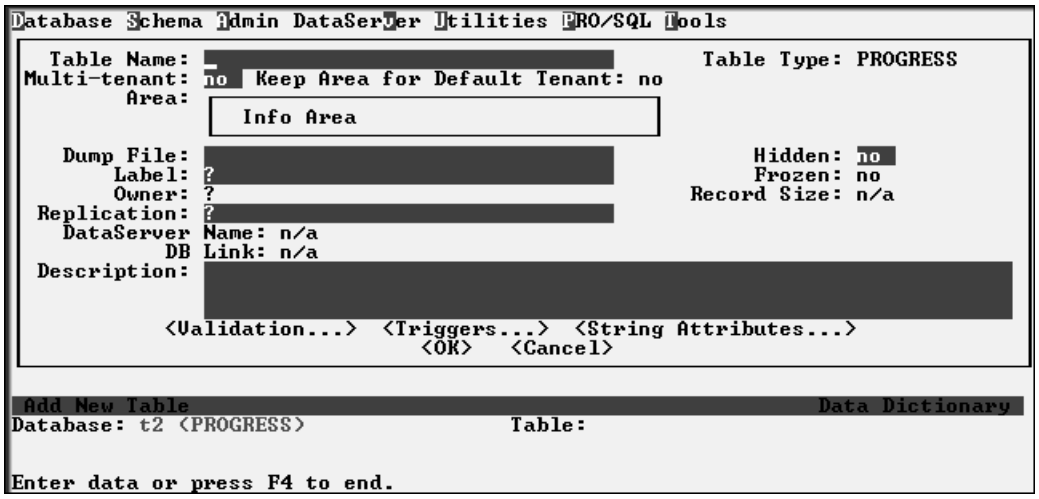
Example	Meaning
L15	Specifies a width of 15 characters within the r-code text segment and left-justifies the string within the allocated space
15R	Specifies a width of 15 characters within the r-code text segment and right-justifies the string within the allocated space
T20	Specifies a width of 20 characters and trims the leading and trailing spaces within the allocated space
UC20	Specifies a width of 20 characters and centers the string within the allocated space, and also indicates that the Translation Manager should not translate the string
20RU	Specifies a width of 20 characters and right-justifies the string within the allocated space, and also indicates that the Translation Manager should not translate the string
30	Specifies a width of 30 characters

See *OpenEdge SQL Reference* for more information about string attributes and string translation.

Add New Table option

Use the **Schema** > **Add New Table** menu option to create a new table definition. When you choose this option, the window shown in the following figure appears.

Figure 26: Add New Table window



See Modify Table option on page 92 for a description of this window's fields.

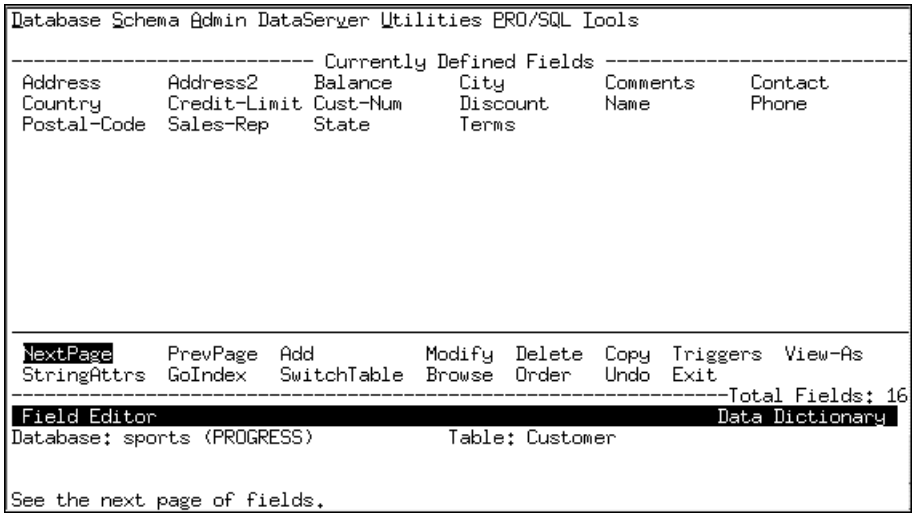
Delete Table(s) option

Use the **Schema** > **Delete Table(s)** menu option to delete one or more tables from the working database. The Data Dictionary prompts you for verification before it deletes the tables you select.

Field Editor option

Use the **Schema** > **Field Editor** menu option to modify schema definitions for a field. When you choose this option, the **Field Editor** alphabetically lists all the tables defined for your database. When you select the table you want to edit, the **Field Editor** lists all the fields defined for the selected table. The following figure shows the fields defined for the customer table.

Figure 27: Field Editor window



You can add, edit, delete, or view field attributes defined for the current table from the **Field Editor**. The following table describes the options for the **Field Editor**.

Table 10: Field Editor options

Option	Description
NextPage	Displays the next page of fields.
PrevPage	Displays the previous page of fields.
Add	Adds a new field.
Modify	Updates field attributes. **Note:** You can modify the **Data Type** field **only** if the field is an `integer` and you want to change it to `INT64`. For all other data types, the field is read-only. For more information, see Change a field data type from integer to INT64 on page 45.

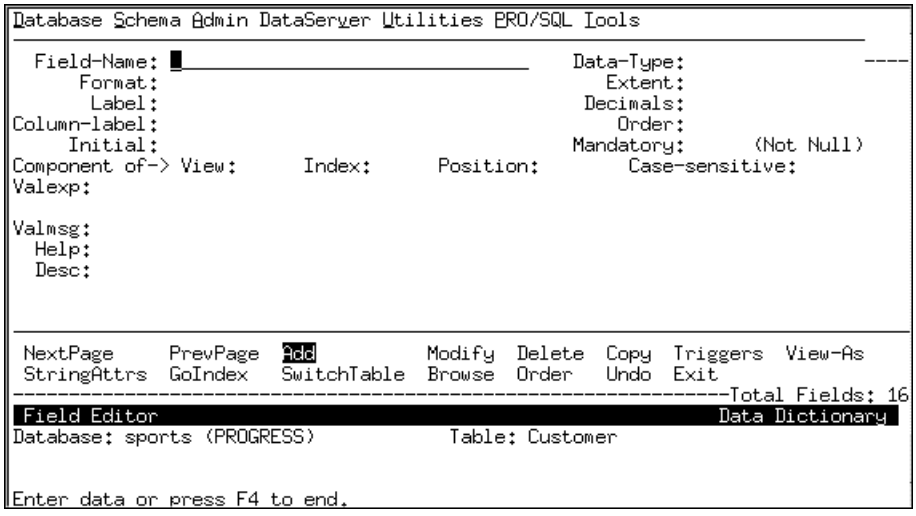
Option	Description
Delete	Deletes a field.
Copy	Copies fields from table definitions.
Triggers	Defines or modifies triggers.
View-As	Defines the View-As phrase for field widget type.
StringAttrs	Defines or modifies string attributes.
GoIndex	Opens the Index Editor.
SwitchTable	Switches to a different table.
Browse	Displays the field attributes.
Order	Toggles between displaying fields in alphabetical order or in the order defined by the values in their _Order fields. The Field Editor displays a message at the bottom of the window indicating how the fields are currently ordered.
Undo	Undoes any changes you made to the field attributes for this Field Editor session.
Exit	Saves your changes, exits the Field Editor, and returns to the Data Dictionary Main Menu.

To use the **Field Editor**, choose an option, then select the field you want to edit. The following sections describe the **Add**, **Triggers**, **View-As**, and **GoIndex** options in more detail.

Add option

Use the **Add** option from the **Field Editor** dialog box to create a new field in the selected table. When you choose this option, a window similar to the one shown in the following figure appears.

Figure 28: Field Editor Add option window



The **Field Editor Add option** window contains the following fields:

- **Field-Name** — Specifies the field name. Names can be up to 32 characters long and can consist of alphabetic characters, digits, and the characters $, &, #, %, -, and _. Field names must begin with A–Z or a–z. You cannot use ABL keywords as field names. Field names are not case sensitive.
- **Format** — Specifies the length of a field and the way the data is shown on the screen and in printed reports. The **Field Add Option** window automatically supplies a default format for each data type, but you can change it. You can also override formats you define in the Data Dictionary by using the FORMAT option with the Format phrase. For more information about formatting, see *Develop ABL Applications*.

  A description of the default format for each of the data types follows:

  - **Character** — The default format for a character field is **x(8)**. The **x** represents an alphanumeric character position and the **8** indicates the number of characters to display. The following table describes the different symbols you can use to define a character format.

Table 11: Character format symbols

Symbol	Description
x	Represents any character.
n	Represents a digit or a letter. A space is not allowed.
a	Represents a letter. A space is not allowed.
!	Represents a letter that is converted to uppercase during input. A space is not allowed.
9	Represents a digit. A space is not allowed.
(*n*)	A number that indicates how many times to repeat the previous format character. For example, !(5) is the same as !!!!! and represents 5 characters that are to be converted to uppercase when entered.
fillchar	Represents any character or characters you want to fill a display. For example, if you display the value abc with a format of x(3)***, the displayed value is abc***. To use X, N, A, !, and 9 as fill characters, you must precede the character with a tilde (~). To use a left parenthesis (( ) as a fill character after a non-fill character, you must precede it with a tilde (~). See *Develop ABL Applications* for more information about fill characters.

The following table shows examples of the different formats of a character field.

Table 12: Character display format examples

Format	Value in field	Display
xxxxxxxx	These are characters	These ar
x(9)	These are characters	These are
x(20)	These are characters	These are characters
xxx	These are characters	The

Format	Value in field	Display
AAA–9999	abc1234	abc–1234
(999) 999–9999	6172754500	(617) 275-4500
!!	ma	MA

Trailing spaces are truncated in character fields. If a character field contains only one space, it is truncated to a null value. You can use the TRIM function to truncate leading and trailing spaces.

- **Integer, INT64,** and **decimal** — The default display format for an `integer` or an `INT64` field is –>,>>>,>>9. The default display format for a decimal field is –>>.>>9.99. The following table describes the format characters for numeric display formats.

Table 13: Decimal and integer format characters

Character	Description
( )	The Data Dictionary displays parentheses if the number is negative. If you use one parenthesis (left or right), you must use the other.
string1	A string made up of any characters except plus (+), minus (-), greater than (>), less than (<), comma (,), digits (0–9), letter z (z or Z), asterisk (*), or period (.).
+	The Data Dictionary replaces this character with a plus sign if the number is positive, and a negative sign if the number is negative. You can also use only one plus or minus sign or CR, DR, or DB, or one set of parentheses in a numeric data format. The position of the plus sign in the number format can also hold a digit if the number is positive.
–	When you use this character to the left of the decimal point, the Data Dictionary replaces this character with a minus sign if the number is negative and a space or null if the number is positive. When you use this character to the right of the decimal point, the Data Dictionary replaces this character with a minus sign if the number is negative and a space if the number is positive.
>	The Data Dictionary replaces this character with a digit if that digit is not a leading zero. If the digit is a leading zero, the Data Dictionary replaces this character with a null and moves characters to the left one space to the right, if you are using top labels. If you are using side labels, the Data Dictionary left-justifies the characters.
,	The Data Dictionary displays this character as a comma unless it is preceded by a > or Z. If the comma is preceded by a > and the > is replaced by a leading zero, the Data Dictionary replaces the comma with a null. If the comma is preceded by a Z and the Z is replaced by a space, the Data Dictionary replaces the comma with a space.
9	The Data Dictionary replaces this character with a digit, including cases where the digit is a leading zero.

Character	Description
Z	The Data Dictionary replaces this character with a digit. If the digit is a leading zero, Z suppresses that digit and puts a space in its place.
*	The Data Dictionary replaces this character with a digit. If the digit is a leading zero, the Data Dictionary replaces that zero with an asterisk (*).
.	This character represents a decimal point and is displayed as a period (.).
<	The Data Dictionary uses this character in conjunction with > to implement floating-decimal format. The < character (up to 10) must appear to the right of the decimal and be balanced by an equal or greater number of > characters left of the decimal. The Data Dictionary displays a digit in a position formatted with < when the corresponding > is a leading zero (and the stored value has the required precision).
DR, CR, DB	The Data Dictionary displays these characters if the number is negative. If the number is positive, the Data Dictionary displays spaces in place of these characters. The Data Dictionary does not treat these characters as sign indicators when you specify *string2*; the Data Dictionary considers them part of *string2*.
string2	A string made up of any characters except plus (+), minus (-), greater than (>), comma (,), any digit (0–9), letter z (z or Z), or asterisk (*).

When specifying a numeric data format, you must use at least one of the following characters: 9, Z, *, or >.

The following table shows examples of the different formats for a numeric field.

Table 14: Numeric display format examples

Format	Value in field	Display
9999	123	0123
9,999	1234	1,234
$zzz9	123	$123
$>>>9	123	$123 **Note:** This display value is right-justified if it has a column label, and left-justified if it has a side label.
$–>,>>9.99	1234	$1,234.00
$>,>>9.99	1234	$1,234.00
#–zzz9.999	–12.34	#–12.340

Format	Value in field	Display
Tot=>>9Units	12	Tot=12Units
$>,>>9.99	–12.34	????????? **Note:** There is a negative sign in the value –12.34, but the display format of $>,>>9.99 does not accommodate that sign.
$>,>>9.99	1234567	????????? **Note:** The value 1234567 is too large to fit in the display format of $>,>>9.99
>>,>99.99<<<	12,345.6789	12,345.68[11]
>>,>99.99<<<	1,234.5678	1,234.568 [1]
>>,>99.99<<<	123.45	123.45[1]
>>,>99.99<<<	12.45678	12.45678[1]

Note: If you use the European Numeric Format (-E) startup parameter, the Data Dictionary interprets commas as decimal points and decimal points as commas when displaying or prompting for numeric values. However, always enter formats in the Data Dictionary as described in the following table. For more information about formatting in procedures, see *Develop ABL Applications*.

- **Date** — The default date format is mm/dd/yy. Date formats specify a two-digit month and a two-digit day. You can use a slash (/) or a hyphen (-) as a separator. You can specify a year with two or four digits.

  When -yy is set at 1950, the default, the Data Dictionary determines if the two-digit value in the date is greater or less than 50. If the date value is greater than 50, the Data Dictionary writes the date for the twentieth century. If the date value is less than 50, the Data Dictionary writes the date for the twenty-first century. For example, if you start the Data Dictionary with -yy 1950, years 50-99 are treated as 1950-1999, and years 00-49 are treated as 2000-2049.

  The following table shows some date display format examples.

Table 15: Date display format examples

Format	Value in field	Display
99/99/99	8/10/2001	08/10/01

[1] Floating-decimal display format. The < character must follow the decimal point and be balanced by an equal or greater number of > characters. The full value is displayed if it can fit in the display format. If the value is too large to fit in the display format, the decimal portion of the value will be rounded so that the value can fit.

Format	Value in field	Display
99/99/9999	08/10/2090	08/10/2090
99-99-99	08/10/1993	08-10-93
99-99-99	08/10/2090	???????? **Note:** The value 8/10/2090 is too large to fit into the display format. If a field's value does not fit in the display format, then the Data Dictionary displays each integer as a ?.
999999	08/10/1997	081097
999999	08/10/01	081001
99999999	08/10/2001	08102001

- **DATETIME** — Stores date values as year, month, and day. Stores time values as hours, minutes, seconds and milliseconds. The following table shows a DATETIME display format example.

Table 16: DATETIME display format examples

Format	Value in field	Display
99/99/99 HH:MM:SS.SSS	8/10/01/11:09.32.213	08/10/01/11:09.32.213

- **DATETIME-TZ** — Stores date and time values as offset from the Coordinated Universal Time. The following table shows a DATETIME-TZ display format example.

Table 17: DATETIME-TZ display format example

Format	Value in field	Display
99/99/9999HH:MM:SS.SSS+HH:MM	8/10/2003/11:09.32.213+02:00	Same as value in field

- **Logical** — The default logical format is YES/NO. You can define any strings to represent those TRUE/FALSE values. If you define your own logical values, the false value cannot begin with "y" or "t", and a true value cannot begin with "n" or "f". If input is coming from a file and you have defined a format for a logical field that is something other than TRUE/FALSE or YES/NO, you can still use TRUE/FALSE or YES/NO as input to that logical field. The following table shows logical display format examples.

Table 18: Logical display format examples

Format	True	False
yes/no	yes	no

Format	True	False
Yes/No	Yes	No
true/false	true	false
shipped/waiting	shipped	waiting

- **Label** — Specifies the label that represents the field in windows or in printed reports. The default value is a question mark (?). If you leave the question mark and do not supply a label, the Data Dictionary uses the field names as the label. If you replace the question mark with a space, the Data Dictionary uses no label for the field. Labels can be up to 30 characters long. The following table shows field label examples.

  Table 19: Field label examples

Format	Label you define	Label displayed
Name	?	Name
Curr-bal	Unpaid Bal	Unpaid Bal
Sales-rep	space	–

  You can override the labels you define in the Data Dictionary by using LABEL, NO-LABEL, or COLUMN-LABEL options in a Format phrase, or NO-LABEL in a Frame phrase. The COLUMN-LABEL is used only for fields that do not have SIDE-LABEL. See *Develop ABL Applications* for more information about these phrases.

- **Column-label** — Specifies that you want to use a different label when the data are listed in columns. If you do not specify a column label, the Data Dictionary uses the label specified in the **Label** field. If you do not enter a label, the Data Dictionary uses the field name. You can override these labels by using NO-LABEL or COLUMN-LABEL options in a Format phrase, or NO-LABEL in a Frame phrase.

  If you want the column label to have more than one line (stacked), separate each line of the label with an exclamation point (!). For example, if you want the label for the **Curr-bal** field to be Unpaid Balance, with the word "Unpaid" displayed above the word "Balance," enter **Unpaid!Balance** for the column label. If you want to use the exclamation point as one of the characters in a column label, you must use two exclamation points (!!). Any spaces to the right or left of the exclamation point become part of the label.

- **Initial** — Defines the initial value for the field. Each data type has an initial value. When you create a new record for a table, each field contains this initial value. You can change a field's default initial value when you define the field. The following table lists the default initial values for each data type.

  Table 20: Field initial values

Data type	Initial value
BLOB	`Unknown value (?)`
Character	Null string (displays spaces)
CLOB	`Unknown value (?)`

Data type	Initial value
DATETIME	?
DATETIME-TZ	?
Integer	0
INT64	0
Decimal	0
Logical	no (false)
Date	`Unknown value (?)` (displays spaces)
Raw	Null string (displays spaces)
RECID	`Unknown value (?)` (displays spaces)

You can use a question mark (?) as a special character to represent an Unknown value. This lets you handle data even when some critical item of information is not yet known. If you put a single question mark in any field, the Data Dictionary treats the item of data as an `Unknown value (?)`.

You can also use TODAY as the initial value for a date field. When you create a new record, the Data Dictionary fills in the current date as the initial value for the field.

- **Component of View** — Displays information only. It tells you whether the field is used in an SQL view. When you use a field as a component of an SQL view, you cannot delete it.
- **Component of Index** — Displays information only. It tells you whether the field is a component of an index.
- **Position** — Displays the order number.
- **Data-Type** — Determines the kind of data values the field can store. The following table describes the available data types.

Table 21: Data types

Data type	Description
BLOB	Binary Large Object. A collection of binary data stored as a single unit in a database management system. BLOBs are mainly used to store large objects such as image, sound or video files. BLOBs are a column value in a record. The BLOB column is occupied by a locator that points to a separate assigned area in the database where the BLOB resides.
Character	Contains data of any kind. Character data can include uppercase and lowercase characters and can consist of alphabetic characters, digits, and the characters $, &, #, %, –, and _. Although the Data Dictionary allows character field display formats of up to 255 characters, restrict the format length of a character field to the input/output line width of your terminal (typically 80 characters) by specifying the appropriate length in the **Format** field.

[2] This data type is currently not available on supported on the ODBC DataServer.

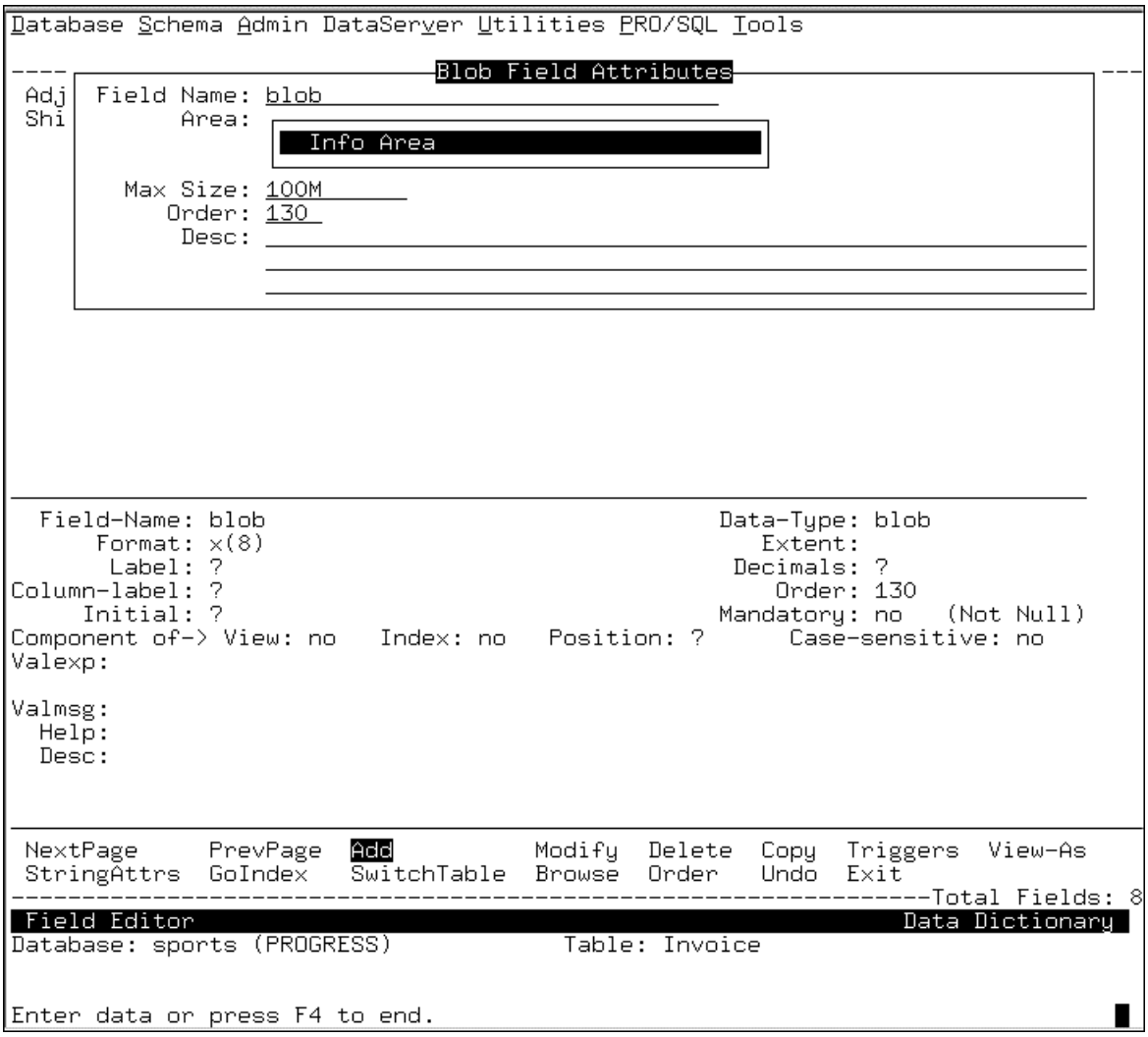
Data type	Description
CLOB	Character Large Object. Similar to a BLOB, the CLOB differs in that it consists solely of character data. There are two types of CLOBS. A DBCODE PAGE CLOB has all of its records in the dbcodepage and uses the dbcollation for comparisons.
Date	Contains dates from 1/1/32768 B.C. to 12/31/32767 A.D., inclusive. You can specify dates in this century with a two-digit year, such as 8/9/03, or a four-digit year, 8/9/2003. Dates in other centuries require a four-digit year. If you enter dates without the year, the Data Dictionary assumes the current year. If you supply spaces as the value of a date field, the Data Dictionary stores that field as an `Unknown value (?)` and displays it as spaces.
DATETIME	Maps to SQL "timestamp" data type. Stores date values as year, month, and day. Stores time values as hours, minutes, seconds and milliseconds. DATETIME value limits for dates are 1/1/32768 B.C. to 12/31/32767 A.D. DATETIME value limits for time are 00:00:00.000 to 23:59:59.999.
DATETIME-TZ	Maps to SQL "timestamp with time zone" data type. Stores date and time values as offset from the Coordinated Universal Time.
Integer	Contains only whole numbers. They can be positive or negative, from –2,147,483,648 through 2,147,483,647, inclusive. If you enter spaces as the value of an integer field, the Data Dictionary stores the value of that field as 0. The default initial value for the field is 0.
INT64	Contains only whole numbers. They can be positive or negative, from -9,223,372,036,854,775,808 through 9,223,372,036,854,775,807, inclusive. If you enter spaces as the value of an **INT64** field, the OpenEdge RDBMS stores the value of that field as 0. The default initial value for the field is 0.
Decimal	Contains decimal numbers up to 50 digits. You can use up to 10 digits to the right of the decimal point. If you enter spaces as the value of a **Decimal** field, the Data Dictionary stores the value of that field as 0. When you choose decimal as the data type, the Data Dictionary enables the **Decimal** field. You specify the number of decimal places in the **Decimal** field.
Logical	Contains logical values such as yes/no or true/false.
Raw	Contains the value of a field from a non-OpenEdge database that has a data type with no equivalent in the OpenEdge development environment. When you want to work with Raw data, you generally work with the data at the byte level. A Raw value cannot be displayed.
Recid	Contains the record ID.

- **BLOB** — If you specify a data type of BLOB or CLOB, the Data Dictionary prompts you for more information.

[3] This data type is currently not available on supported the ODBC DataServer.

When you assign the BLOB data type to the field you are adding to a table, the **Blob Field Attributes** dialog box appears, as shown in the following figure.

Figure 29: Blob Field Attributes dialog box



The **Blob Field Attributes** dialog box contains the following fields:

- **Field Name** — Enter the name of the field.
- **Area** — Scroll through the list of available areas of the database to which you can assign the BLOB. After a new default area name is set, the **Area** field displays that name.

  Example:

  ```
  proutil db-name -C setobjectdefaultarea area-name lob
  ```

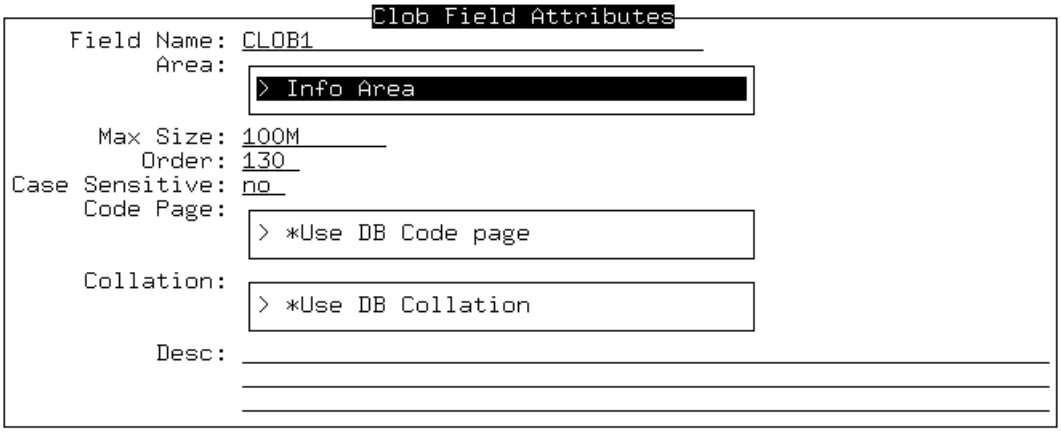
- **Max Size** — Enter the maximum size of the BLOB. Specify any number between 1 and 1073741823 bytes.

  Note: You can enter the size of the BLOB in bytes, kilobytes, megabytes, or gigabytes. However, if you enter only numbers, the Data Dictionary assumes you've entered the BLOB's size in bytes.

- **Order** — Define the BLOB's order or accept the default value.

- **Desc** — Provide a description of the field.
- **CLOB** — When you assign the CLOB data type to the field you are adding to a table, the **Clob Field Attributes** dialog box appears, as shown in the following figure:

  Figure 30: Clob Field Attributes dialog box



  The **Clob Field Attributes** dialog box contains the following fields:

  - **Field Name** — **Enter the name of the field.**
  - **Area** — Scroll through the list of available areas of the database to which you can assign the CLOB. After a new default area name is set, the **Area** field displays that name.

    Example:

    ```
    proutil db-name -C setobjectdefaultarea area-name lob
    ```

  - **Max Size** — Enter the maximum size of the CLOB. Specify any number between 1 and 1073741823 bytes.

    Note: You can enter the size of the CLOB in bytes, kilobytes, megabytes, or gigabytes. However, if you enter only numbers, the Data Dictionary assumes you have entered the CLOB's size in bytes.

- **Order** — Define the CLOB's order or accept the default value.
- **Case Sensitive** — Specify either **yes** or **no**.
- **Code Page** — Specify a code page for the CLOB. Make a selection by choosing the default database code page or scroll through the list of available code pages to make another selection.
- **Collation** — Specify database collation.
- **Desc** — Provide a description of the field.
- **Extent** — Defines the extent of an array field. Most fields represent a single value. However, array fields contain multiple elements. For example, the **Mnth-shp** field of the time table is an array field. It contains 12 elements, one for every month of the year. The extent is the number of elements contained in an array. If you define a field with an extent greater than 0, that field is an array field.
- **Decimals** — Defines the decimal places for a field. When you define a decimal field, you must define the number of digits to the right of the decimal point. For example, **Max-credit** has been defined for two digits

to the right of the decimal point to accommodate dollars and cents. If the field is not a decimal, you cannot enter a value.

- **Order** — Specifies the default display order of a field. By default, the Data Dictionary numbers fields in the order you enter them, by increments of 10. This defines where the Data Dictionary lists the field in the field selection list in this table. You can set the order for this field in the table. This display order is not related to the order in which the data are stored in your database. In addition, you can override the Data Dictionary display order of fields in your procedures by naming the fields in the order you want to display them.

  The default order numbering is in increments of 10 to let you insert fields in between. The numbers do not have to be contiguous, nor do they have to follow in even-numbered increments. For example, if you decide to add a field called **Category** to the customer table, and you want it to appear by default on your window between **Cust-num** and **Name**, you might assign 15 as its order value. If you want to change the order number increments to 20, you can do so by choosing the **Reorder Fields** option of the **Schema** menu. From the same menu option, you can also change the order values to reflect the alphabetical order of the table names.

- **Mandatory** — Specifies if the field is mandatory. If you define a field as mandatory, it cannot contain the `Unknown value (?)`. However, it can have a space as its value. The default value for mandatory is **no**. If you accept no for this field, you indicate that the `Unknown value (?)` is an allowed value for the field.

- **Case-sensitive** — Specifies if the field is case sensitive. The default value is **no**. Because case-sensitive fields depart from the OpenEdge standard, they are not recommended. However, if you require strict adherence to the ANSI SQL standard or if you are using a DataServer that supports case sensitive fields, you might have to define all character fields as case sensitive. Once you define a field as case sensitive, you can redefine it, unless it is a component of an index. If a field is a component of an index, you cannot change its case sensitivity unless the index is undone.

  You can index case-sensitive fields and group them with case-insensitive field components in an index. With case-sensitive indexes, JOHN, John, and john are all unique values. However, they do not sort next to each other. All uppercase letters sort ahead of all lowercase letters. Define case-sensitive variables to hold values moving to and from case-sensitive fields.

- **Valexp** — Specifies the validation criteria for the field. You can enter up to 63 characters on each of the four lines. For messages that exceed 252 characters, you can specify an include file enclosed in brackets (use the syntax: *`filename`*`.i`). There is no default value.

  Note: You should use field validation for backward compatibility for procedure-driven applications. For event-driven programs, use field ASSIGN triggers instead of field validation.

  When a user enters a value for a field, you might want to test it to make sure it is a valid entry for the field. The **Valexp** option lets you define a test or validation expression. The expression must be logical; that is, it must be a valid ABL expression that produces a true or false result.

  For example, the validation expression for the **Cust-num** field in the customer table is cust-num > 0. When the user enters a customer number, it is validated against valexp. If the number is greater than 0, valexp is true, and the validation succeeds. If the number is less than 0, the validation fails. The text is then displayed in the **Valmsg** option.

  When you write procedures, you can override any validation expressions you define in the Data Dictionary. If you define validation for an array field in the Data Dictionary, the validation only works if you update the entire array. The validation does not work if you update the array elements individually.

- **Valmsg** — Defines the validation message for a field. You can enter up to 63 characters on each line. You cannot define (and do not need) a validation message unless you specify a validation criteria for a field. If the result of **Valexp** is false (the validation fails), OpenEdge displays the text specified in **Valmsg**. For

example, the validation expression for the **Cust-num** field in the customer table is cust-num > 0. When the user enters a `0` for the customer number, OpenEdge displays this message:

```
Customer number must be greater than zero.
```

Because ABL treats the message you define as constant (literal) text, it cannot contain references to the number of the fields or variables. If you want to use fields, variables, or expressions in validation messages, use this VALIDATE option in a Frame phrase.

- **Help** — Defines help information for the field. For certain fields, users might be unsure of the kind of data they need to enter. Therefore, you can specify a help message to indicate what information to enter. OpenEdge displays this message whenever users are prompted for input to the field. For example, the **State** field in the customer table displays this help message:

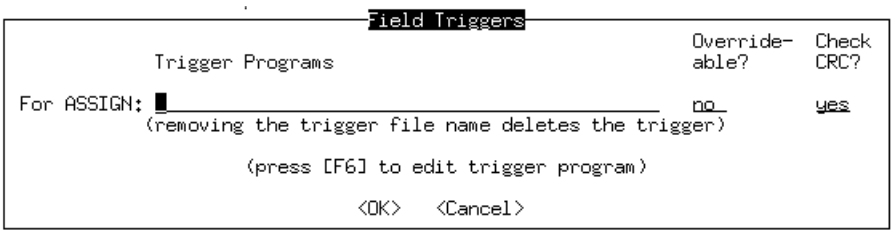
```
Enter standard state abbreviation.
```

- **Desc** — Describes the field. You might want to document the purpose of a field just as you might supply a description for a table. OpenEdge does not use this option when running procedures; it is strictly to help you document your application.

Field Triggers

Choose **Triggers** from the **Field Editor** to define ASSIGN trigger programs for the field. ASSIGN triggers execute when you assign a value to a database field. When you choose **Triggers**, a **Field Triggers** dialog box similar to the one shown in the following figure appears.

Figure 31: Field Triggers dialog box



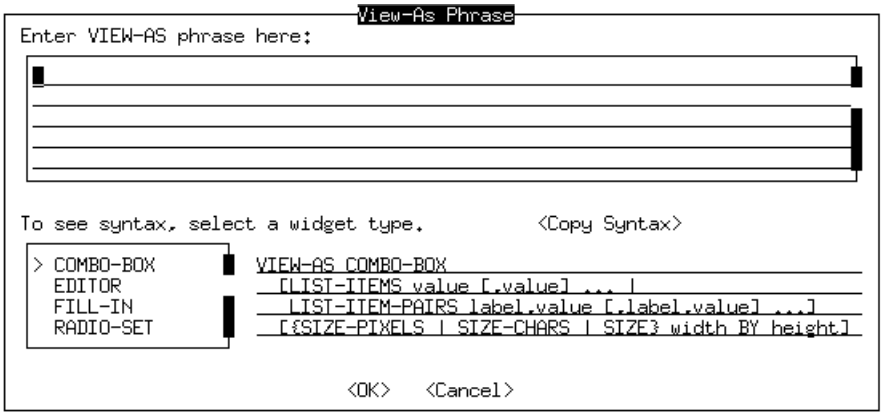
The **Field Triggers** dialog box contains the following fields:

- **For ASSIGN** — Specifies the name of the trigger procedure. If you want to create or edit the procedure, press **PUT** and a trigger editor appears.
- **Overrideable** — Specifies whether a session trigger can override the schema trigger. The default value is **no**. For more information about session and schema triggers, see the topic on database triggers in *Develop ABL Applications*.
- **Check CRC** — Specifies whether the database engine verifies the cyclical redundancy check (CRC) code. The default value is **yes**. If this option is on, then the AVM stores in the metaschema, along with the trigger procedure name, a unique Cyclic Redundancy Check (CRC) identifier for the **compiled** version of the trigger procedure. The AVM raises an error if the r-code file it encounters at run time doesn't match or if there is no compiled version of the procedure.

View As

Choose **View As** from the **Field Editor** to define the View-As phrase for the type of field widget. When you choose this option, the **View-As Phrase** dialog box appears, as shown in the following figure:

Figure 32: View-As Phrase dialog box



The list of available widgets depends on the data type of the field. The following table lists which widgets you can use for each data type. The numeric data type refers to the decimal, integer, `INT64`, and date data types.

Table 22: View As widgets

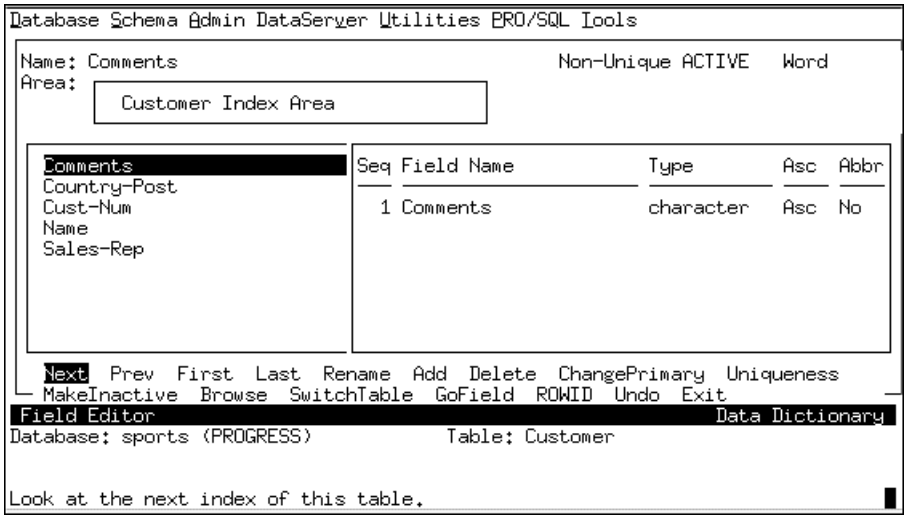
Widget type	Data type		
	Character	Numeric	Logical
Combo-box	Yes	Yes	Yes
Editor	Yes	–	–
Fill-in	Yes	Yes	Yes
Radio-set	Yes	Yes	Yes
Selection-list	Yes	–	–
Text	Yes	Yes	Yes

When you select a widget type, the appropriate View-As phrase syntax for the field appears. Choose the `Copy Syntax` button to copy the syntax to and overwrite any existing text in the editor area of the dialog box. After you edit the View-As phrase, press **GO** to compile the code. If there are errors in your code, the Data Dictionary displays the code and lists the errors. If the code is syntactically correct, the Data Dictionary stores the value and returns you to the **Field Editor**. When you use this field in an application, it appears as the specified widget type.

GoIndex option

Use the **GoIndex** option to access the **Index Editor**. When you choose this option, a window similar to the one shown in the following figure appears.

Figure 33: GoIndex option window

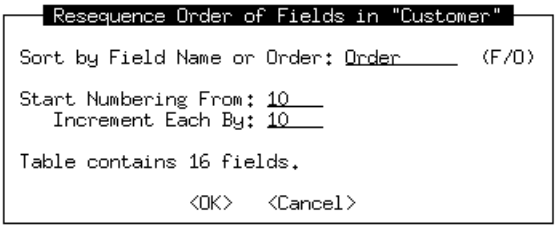


For more information about the Index Editor, see Index Editor option on page 114.

Reorder Fields option

Use the `Reorder Fields` menu option to resequence your database's fields alphabetically by name or numerically by order number. When you choose this option, the Data Dictionary alphabetically lists all the tables defined for your database. Select the table whose fields you want to reorder. The Data Dictionary displays a **Resequence Order of Fields** dialog box similar to the one shown in the following figure:

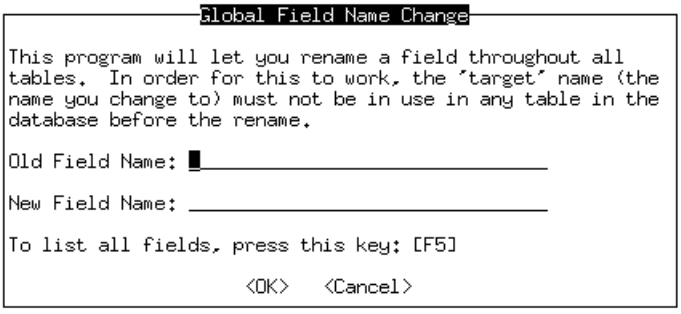
Figure 34: Resequence Order of Fields dialog box



Global Field Name Change option

Use the `Global Field Name Change` option to change the name of a field in all occurrences in the working database. This option is available only when there is a working database. When you choose this option, the Data Dictionary displays the **Global Field Name Change** dialog box shown in the following figure:

Figure 35: Global Field Name Change dialog box



Specify the current field name and the new name. When you specify the old field name, the Data Dictionary checks for a field with the old field name in the working database. If none exists, a message tells you so. If you specify an existing field name, you can enter the new field name.

If you try to change the name of a field to a name that is already in use somewhere in the database, the Data Dictionary displays an error message and does not accept the new field name.

To view a list of all the fields in the database, press **F5**. You can pick a field from the list that appears. To remove the list without picking a field, press **F4**.

Once you specify acceptable field names in both fields and choose OK, the Data Dictionary prompts you to verify the change.

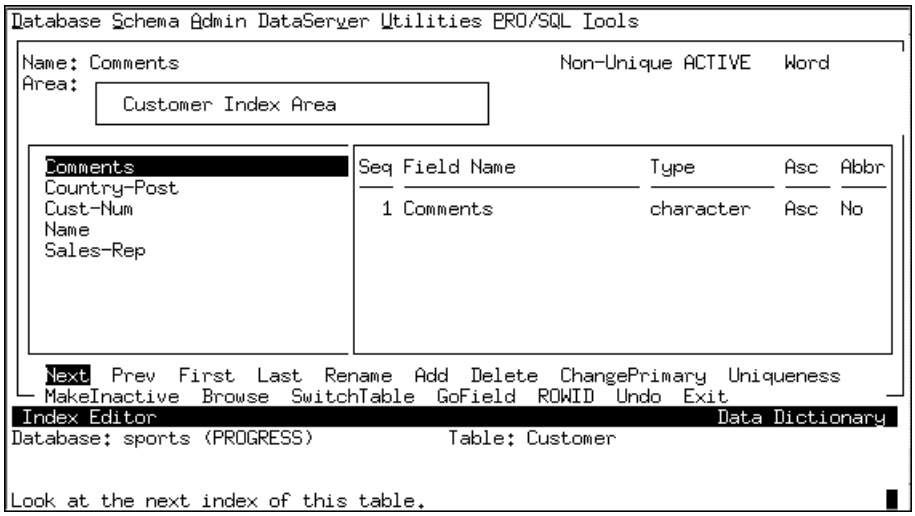
Index Editor option

Use the **Index Editor** option to define, rename, or delete indexes for the selected table. An index is a field or combination of fields used to rapidly retrieve a particular record in a table. A single index can be made up of multiple fields. For example, if you know you are always going to access the order-line table by using a combination of the **Order-num** and **Line-num** fields, you might want to create an index with those two fields as its components.

Note: The current table must contain fields before you can define an index.

When you choose this option, the Data Dictionary alphabetically lists all the tables defined for your database. When you select a table, a window similar to the one shown in the following figure appears.

Figure 36: Index Editor window



Use the **Index Editor** to display the existing indexes and their information for the selected table.

The **Index Editor** window contains the following fields:

- **Name** — Specifies the index name. It does not have to be the same name as the field name. Index names can be up to 32 character long and can consist of alphabetic characters, digits, and the characters $, &, #, %, –, and _. In addition, index names must begin with a letter (A–Z or a–z). You cannot use reserved ABL keywords as index names. Index names are not case sensitive.
- **Unique/Non-Unique** — Defines whether every entry in the index must be different. Enter **yes** if only one record in a table has a particular index value. For example, the customer table cannot contain two records with the same customer number, so customer number can be a unique index. Conversely, since many customers might be in the same sales region, sales-region should not be a unique index.
- **Area** — Displays the name of the storage area. The area name is assigned to an index when it is created. Because the table name cannot be modified, this field cannot be edited.

  After you set a default area name for an index, the new area name appears in the **Area** field.

  Example:

  ```
  proutil db-name -C setobjectdefaultarea area-name index
  ```

- **ACTIVE** — Defines whether the index is initially active, that is, whether it updates itself every time a new record is created, deleted, or modified. If you are defining an index in a very large table, it is more efficient to define the index as initially inactive. (When an index is inactive, you cannot use it to retrieve or order records.) You can subsequently activate the index by running the PROUTIL utility with the IDXBUILD qualifier. This is much faster than building the index from within the Data Dictionary when the database contains a large amount of data. For more information about PROUTIL, see *Manage the OpenEdge Database*.
- **ROWID** — For non-OpenEdge databases only. See the applicable OpenEdge DataServer guide for more information on the `ROWID` property.
- **Word** — Defines whether you can search on any word within a field. A word index contains all the words from a text field or array of text fields; thus, you can search for records that contain specific words or phrases. All words in the field are index entries. For more information about word indexes, see the topic on database access in *Develop ABL Applications*.

- **Seq** — Defines the order in which fields form the index. For example, cust-order is a compound index, formed by the Cust-num and the Order-num fields. The Cust-num field has a sequence number of 1, and the Order-num field has a sequence number of 2.
- **Field Name** — Displays the field name.
- **Type** — Specifies the field data type. See Field Editor option on page 98 in this topic for more information about data types.

  Note: BLOB and CLOB data types cannot participate in indexes.

- **Asc/Dsc** — Specifies how the index sorts records. Value is either asc for ascending or dsc for descending.
- **Abbr** — Specifies that you can search an index using the first few characters of a field without using the BEGINS phrase, if the field is a character data field. Indexes not comprised of character data require an exact match. If the index has more than one field, this setting applies only to the last field.

Besides the fields previously described, the **Index Editor** also lists options at the bottom of its display. The following table describes these options.

Table 23: Index Editor options

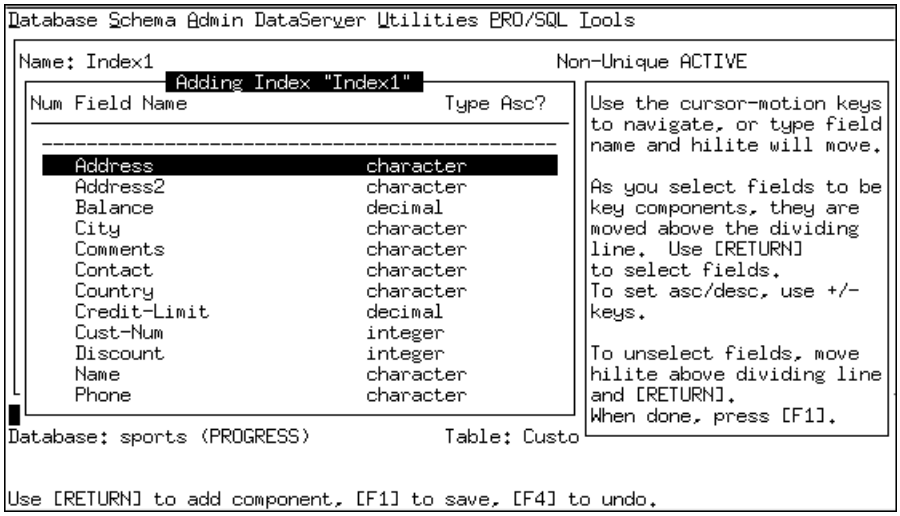
Option	Description
Next	Displays the next index in the table.
Prev	Displays the previous index in the table.
First	Displays the first index in the table.
Last	Displays the last index in the table.
Rename	Renames the selected index. The name you enter cannot already be used to name an index in the current database.
Add	Adds a new index to the table.
Delete	Deletes the selected index. You cannot delete a primary index without making another index the primary index.
ChangePrimary	Changes the primary index for the table.
Uniqueness	(Not supported for OpenEdge databases.)
MakeInactive	Makes an active index inactive. (When an index is inactive, you cannot use it to retrieve or order records.) To reactivate an index, you must run PROUTIL with the IDXBUILD qualifier.
Browse	Browses through the entire index component list. This is especially helpful when the index is made up of multiple fields.
SwitchTable	Shows the list of tables in the database, then switches to another table to edit its indexes.
GoField	Accesses the **Field Editor**.

Option	Description
Undo	Undoes changes you made to the index attributes during this session.
Exit	Saves your changes, exits the **Index Editor**, and returns to the Data Dictionary main menu.

Choose the field you want to edit, then choose a menu option. When you choose Add from the **Index Editor**, the **Index Editor** prompts you for the name of the new index.

When you enter data in the **Name**, **Unique**, **Active**, and **Word** fields, the **Adding Index** dialog box appears, as shown in the following figure:

Figure 37: Adding Index dialog box



The **Index Editor** lists the available fields and their data types. When you choose a field, the **Index Editor** prompts you to specify whether you want the index component to be ascending or descending. After you specify the sort order, the **Index Editor** lets you choose more fields. You can specify up to 16 fields to define an index.

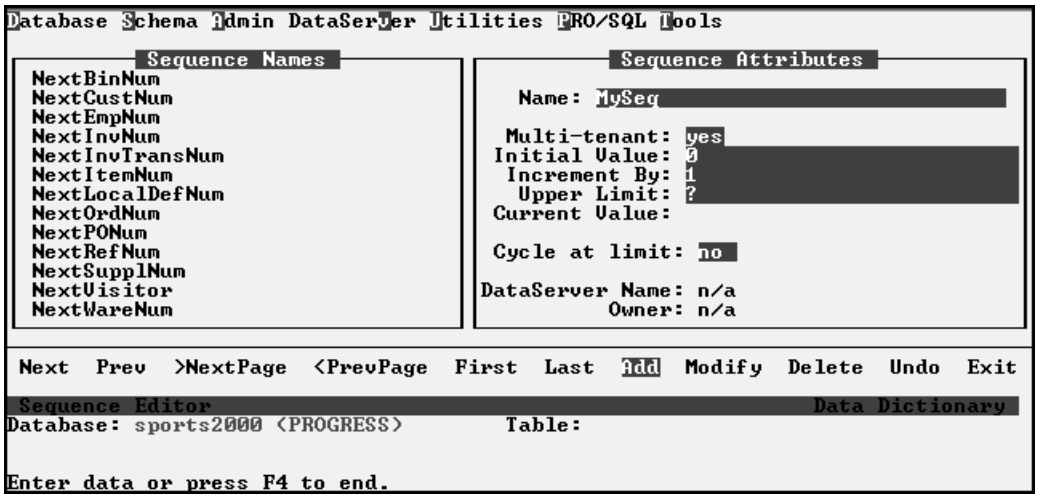
The **Index Editor** lists the selected fields above the divider line on the window. Select all fields, then press **GO**. The **Index Editor** prompts you to specify whether you want to use the **Abbreviate** option for character fields then returns you to the main **Index Editor** window and adds the new index to the list.

Sequence Editor option

Use the **Sequence Editor** option to view, define, modify, and delete sequences. *Sequences* are database objects that provide sequential values within any integer range and with your choice of increment.

When you choose this option, a window similar to the one shown in the following figure appears.

Figure 38: Sample Sequence Editor window



The **Sequence Editor** displays the existing sequences. When you define or modify a sequence, you provide information in the following attribute fields:

- **Name** — Enter a valid identifier as a name for your sequence. The name can be up to 32 characters long.
- **Multi-tenant** — For databases enabled for multi-tenancy, yes if the sequence is multi-tenant.
- **Initial Value** — Enter an initial integer value for the sequence, or accept the default of **0**. The initial value becomes the lower limit if the **Increment By** value is positive and becomes the upper limit if the **Increment By** value is negative. You cannot specify an initial value that is greater than your upper limit or less than your lower limit, if defined.
- **Increment By** — Enter a positive or negative integer value by which you want to change the sequence value at each increment, or accept the default of **1**. If you enter a positive value, then each increment increases the sequence toward a defined upper limit. If you enter a negative value, then each increment decreases the sequence toward a defined lower limit, and the **Upper Limit** label changes to **Lower Limit**.
- **Upper Limit or Lower Limit** — Enter an **INT64** (if 64-bit sequences are enabled) or **integer**value to define the upper or lower limit of the sequence, or accept the default value of unknown (?). If you specify a positive value for the **Increment By** field, you can only define an upper limit. If you specify a negative value, you can only specify a lower limit. You cannot specify an upper limit that is less than the initial value. Likewise, you cannot specify a lower limit that is greater than the initial value. If you accept the default, the **Sequence Editor** uses the maximum integer value on your system as the defined upper limit and the minimum integer value as the defined lower limit.
- **Cycle at limit** — Indicates whether the sequence becomes a cycling or terminating sequence. A cycling sequence restarts at the initial value when it reaches the upper limit or decrements beyond its lower limit, providing non-unique values for the life of the sequence. A terminating sequence stops incrementing when it reaches the upper limit or stops decrementing when it reaches its lower limit, providing unique values as long as you do not explicitly reset it. The default is **no**, indicating a terminating sequence.
- **DataServer Name** — For non-OpenEdge databases only. Displays the name of the corresponding non-OpenEdge sequence, if there is one.
- **Owner** — For non-OpenEdge databases only. Displays the name of the user who has permission to access the sequence.

Besides the attribute fields previously listed, the **Sequence Editor** lists options along the bottom of its display. The following table describes these options.

Table 24: Sequence Editor options

Option	Description
Next	Displays the next sequence
Prev	Displays the previous sequence
>NextPage	Displays the next set of sequences
<PrevPage	Displays the previous set of sequences
First	Displays the first sequence
Last	Displays the last sequence
Add	Adds a new sequence
Modify	Updates sequence attributes
Delete	Deletes the selected sequence
Undo	Undoes the changes you made to the sequence structures during this session
Exit	Saves your changes, exits the Sequence Editor, and returns to the Data Dictionary main window

Adjust Field Width option

The Field Width property allows the ABL client to modify the field width of an SQL client. If you do not adjust the setting, the SQL client uses the default width property.

See Adjust the Field Width on page 48 for more information about this menu option.

10

Admin Menu Reference

This topic describes the **Admin** menu and dialog boxes. From the **Admin** menu you can dump and load database definitions and files, implement security, create bulk loader description files, and enable support for large key entries.

For details, see the following topics:

- Admin menu
- Dump Data and Definitions option
- Load Data and Definitions option
- Database Identification option
- Security option
- Export Data option
- Import Data option
- Create Bulk Loader Description File option
- Database options
- Enabling large key entries
- Alternate Buffer Pool Maintenance

Admin menu

The following table describes the **Admin** menu's options. The sections following the table contain detailed descriptions of these options.

Table 25: Admin menu

Menu option	Task performed
Dump Data and Definitions	Dumps data definitions, table contents, SQL views, user table contents, collation/conversion tables, auto-connect records, sequence definition, and sequence current values
Load Data and Definitions	Loads data definitions, table contents, SQL views, auto-connect records, user table contents, and sequence values; also reconstructs bad load records
Database Identification	Maintains and generate DB Identifiers and DB Passkeys for databases
Security	Specifies database security options
Export Data	Exports data files in a specific format to the specified directory
Import Data	Imports data in a specific format to the working database
Create Bulk Loader Description File...	Creates a bulk loader description file
Database Options	Maintains auditing and security options
Enable Large Key Entries	Increases the index key width limit substantially on the database
Alternate Buffer Pool	Performs Alternate Buffer Pool maintenance, such as specifying ABL objects for the Alternate Buffer Pool, or removing objects from the Alternate Buffer Pool

Dump Data and Definitions option

The following table describes the menu that appears when you choose **Dump Data and Definitions**. More detailed descriptions of the options follow the table.

Note: The Data Dictionary allows you to dump data definition files (`.df`) greater than 2GB on platforms where ABL supports large files.

Table 26: Dump Data and Definitions menu

Menu option	Task performed
Data Definitions (.df file)...	Dumps the table definitions
Table Contents (.d file)...	Dumps table contents
SQL Views...	Dumps view contents
User Table Contents...	Dumps user information
Security Domains	Dumps contents of the security authentication system and domain tables
Security Permissions	Dumps roles and granted permissions records
Auto-Connect Records Only...	Dumps auto-connect records
Collation Tables...	Dumps collation or translation tables
Sequences Definitions...	Dumps sequence definitions
Sequences Current Values...	Dumps sequence values
Database Identification Properties	Dumps database identification information
Database Options	Dumps database security and auditing settings
Audit Policies	Dumps audit data as XML or text or to dump application audit events
Audit Data	Dumps recorded audit data
Create incremental .df File...	Compares the schema of two OpenEdge databases and creates a `.df` file that contains any differences

Data Definitions (.df file) option

Choose this option to dump table definitions for an individual table or for all the tables in the database. The definition file contains the definitions of tables, which include fields, indexes, and all their characteristics. The Data Dictionary alphabetically lists all the tables defined for your database. If you choose **ALL**, the definition file also contains the sequence and auto-connect record definitions. If your database is enabled for multi-tenancy, you can filter the table list such that only multi-tenant or shared tables are displayed.

Note: The `.df` file can exceed 2GB on platforms where the ABL client supports large files.

After you select the tables you want to dump, the Data Dictionary displays a default name for the file into which it dumps your data definitions (hidden tables are not dumped). This default file is the dump file name you specified when you created the table, or the database name with a `.df` extension. Dump file names can be up to 32 characters in length.

Specify the filename or use the default value. The Data Dictionary displays each object name as it writes its definition to the definition file. When it has dumped the data definitions, the Data Dictionary displays a status message and prompts you to continue.

Note: When a menu option prompts you for a filename only, you can specify a complete pathname.

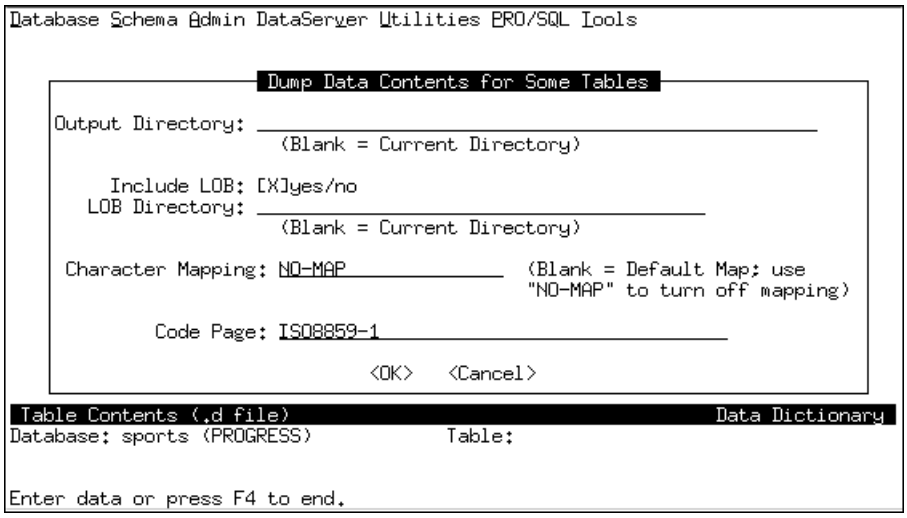
Table Contents (.d file) option

Choose this option to dump table contents. The Data Dictionary alphabetically lists all the tables defined for your database.

Note: The `.d` file can exceed 2GB on platforms where the ABL client supports large files.

When you select only one table, the Data Dictionary displays the **Dump Data Contents** dialog box for that table. If you select multiple tables, the Data Dictionary displays the **Dump Data Contents for Some Tables** dialog box, as shown in the following figure:

Figure 39: Dump Data Contents for Some Tables dialog box



The **Dump Data Contents for Some Tables** dialog box contains the following fields:

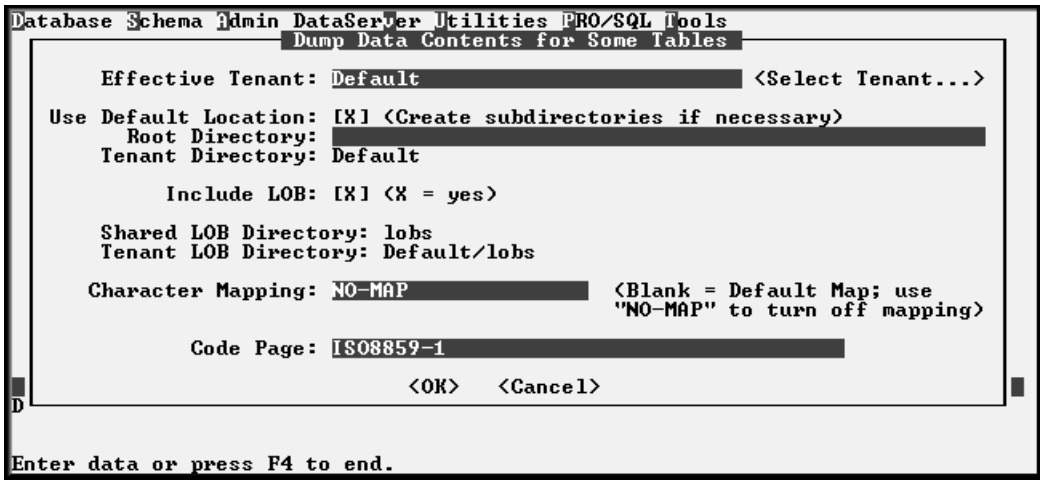
- **Output Directory or Output File** — Specifies the output directory if you choose to dump multiple tables. Specifies the output file if you choose to dump only one table. The default filename for each table is the dump filename you specified when you created the table, or *`table-name`*.d.
- **Include LOB** — The Data Dictionary also provides the option of dumping LOBs.
- **LOB Directory** — If you select **yes** in the **Include LOB** field, you must specify the name of the LOB directory.
- **Character Mapping** — Specifies the type of character mapping:
  - **Default Map** — Specifies the default mapping.
  - **Map** — Specifies the character mapping. Enter the type of mapping in the fill-in field. For example, `MAP laserwriter/french` or `MAP hp2/spanish/italian`.
  - **NO MAP** — Specifies not to perform any character mapping.

- **Code Page** — Specifies the default code page (character set). A code page maps characters to numbers (code-points) and defines the character's visual representation (glyph). Code pages usually represent a particular language's alphabet, such as the ibm861 code page (Icelandic).

The Data Dictionary displays each table name as it writes the table contents to the file's contents file. The Data Dictionary displays a status message and prompts you to continue.

If your database is enabled for multi-tenancy, you can dump your data on a per-tenant basis. The Dump Data Contents for Some Tables dialog is modified as shown in the following figure:

Figure 40: Dump Data Contents for Some Tables (multi-tenant)



The **Dump Data Contents for Some Tables** dialog box, when your database is enabled for multi-tenancy, contains the following fields:

- **Effective Tenant —** Specifies the tenant of the data. Enter a name or choose **Select Tenant** to select a tenant from a list.
- Use Default Location — Check box to indicate that the data should be dumped to the identified default location based on the tenant name.
- **Root Directory** — Enter a directory name to dump data contents for the selected tables in the identified subdirectories. The default filename for each table is either the dump filename you specified when you created the table or *table-name*.d.
- **Include LOB** — The Data Dictionary also provides the option of dumping LOBs.
- **Shared LOB/Tenant LOB Directory** — If you select **yes** in the **Include LOB** field, and you are not using the default location, you must specify the name of the LOB directories.

SQL Views option

Choose this option to dump SQL view contents. The Data Dictionary prompts you for the filename to which it writes the view. The default filename is `_view.d`. Specify the filename. The Data Dictionary displays a status message and prompts you to continue.

User Table Contents option

Choose this option to dump user information. The Data Dictionary prompts you for the filename to which it writes the user table contents. The default filename is `_user.d`. Specify the filename. The Data Dictionary displays a status message and prompts you to continue.

Security Domains option

Choose this option to dump the contents of the `_sec-authentication-system` and the `_sec-authentication-domain` tables. These tables contain details about third party authentication systems and domains used to authenticate users who connect to your database through their applications.

When you choose this option, the **Dump Security Domains** dialog box appears, and contains the following fields:

- **Output Directory** — Specifies the directory into which the Data Dictionary dumps `_sec-authentication-system.d` and `_sec-authentication-domain.d`.
- **Character Mapping** — Specifies the type of character mapping:
  - **Default Map** — Leave the **Character Mapping** field blank to use the default mapping.
  - **MAP** — Enter the type of character mapping (for example, `MAP laserwriter/french` or `MAP hp2/spanish/italian`).
  - **NO MAP** — Specifies not to perform any character mapping.
- **Code Page** — Specifies the default code page (character set).

Note: The connected user must be a DBA to access the **Dump Security Authentication Records** option.

Security Permissions option

Choose this option to dump the contents of the `_sec-role`, `_sec-granted-role`, and `_sec-granted-role-condition` tables. These tables store information about user-defined and OpenEdge-defined security roles including auditing role definitions, audit-privilege to user account mappings, and whether users have permission to grant privileges.

When you choose this option, the **Dump Security** Permissions dialog box appears, and contains the following fields:

- **Output Directory** — Specifies the directory into which the Data Dictionary dumps `_sec-role.d`, `_sec-granted-role.d`, and `_sec-granted-role-condition.d`.
- **Character Mapping** — Specifies the type of character mapping:
  - **Default Map** — Leave the **Character Mapping** field blank to use the default mapping.
  - **MAP** — Enter the type of character mapping (for example, `MAP laserwriter/french` or `MAP hp2/spanish/italian`).
  - **NO MAP** — Specifies not to perform any character mapping.
- **Code Page** — Specifies the default code page (character set).

Note: The connected user must be a DBA to access the **Dump Security Permissions** option.

Auto-Connect Records Only option

Choose this option to dump auto-connect records. The Data Dictionary prompts you for the filename to which it writes the auto-connect records. The default filename is `_auto.df`. Specify the filename and the code page. The Data Dictionary displays a status message and prompts you to continue.

Note: The Data Dictionary does not have a separate option for loading auto-connect records. When you choose **Load** > **Data Definitions** from the menu bar, the Data Dictionary automatically loads all the table definitions, regardless of the table type.

Collation Tables option

Choose this option to dump collation tables, case conversion tables, and translation tables. The Data Dictionary prompts you for the filename to which it writes the tables. The default filename is `_tran.df`. Specify the filename and the code page. The Data Dictionary displays a status message and prompts you to continue.

Note: The Data Dictionary does not have a separate option for loading the collation, case conversion, or translation tables. When you choose **Load** > **Data Definitions** from the menu bar, the Data Dictionary automatically loads all the table definitions, regardless of the table type.

Sequences Definitions option

Choose this option to dump sequence definitions. The Data Dictionary prompts you for the name of the file to which it writes the sequence definitions. The default filename is `_seqdefs.df`. Specify the filename and the code page. The Data Dictionary displays a status message and prompts you to continue.

Note: The Data Dictionary does not have a separate option for loading sequence definitions. When you choose **Load** > **Data Definitions** from the menu bar, the Data Dictionary automatically loads all the table definitions, regardless of the table type.

Sequences Current Values option

Choose this option to dump sequence values. The Data Dictionary prompts you for the filename to which it writes the sequence values. The default filename is `_seqvals.d`. Specify the filename and the code page. The Data Dictionary displays a status message and prompts you to continue. For more information, see Dump sequence current values on page 57.

Note: The Table Contents (`.d` file) option dumps only the table contents. You must dump the sequence values separately.

Database Identification Properties option

Choose this option to dump the contents of the `_db-detail` table. The `_db-detail` table contains information about audit-enabled databases, including the globally unique identifier (GUID), the database description, and the database's Passkey (if available).

When you choose this option, the **Dump Database Identification Properties** dialog box appears, and contains the following fields:

- **Output File** — Specifies the name of the dump file. The default is `_db-detail.d`
- **Character Mapping** — Specifies the type of character mapping:
  - **Default Map** — Leave the **Character Mapping** field blank to use the default mapping
  - **MAP** — Enter the type of character mapping (for example, `MAP laserwriter/french` or `MAP hp2/spanish/italian`)
  - **NO MAP** — Specifies not to perform any character mapping
- **Code Page** — Specifies the default code page (character set)

Note: The connected user must be a DBA to access the **Dump Database Identification Properties** option.

Database Options

Choose this option to dump the contents of the `_db-option` table. The `_db-option` table contains user-defined information about the database.

When you choose this option, the **Dump Database Options** dialog box appears, prompting you to specify the **Output File.** The default file is `_db-option.d`.

Note: The connected user must be a DBA to access the **Dump Database Options** option.

Audit Policies option

The **Audit Policies** submenu allows you to dump audit data as XML or text or to dump application audit events.

Dump as XML

When you choose the **Dump as XML (.xml file)** option from the **Audit Policies** submenu, the **Select Audit Policies for Dump** dialog box appears, containing the names and descriptions of all audit policies.

After you select the policies you want to dump and click **OK**, the **Dump Audit Policies as XML** dialog box appears, and contains the following fields:

- **Output File** — The name of the output file. The default is `_audit-policies.xml`.
- **Code Page** — Indicates that the file will be dumped in the UTF-8 format. You cannot change the code page when dumping audit policies.

If the Data Dictionary encounters an error, it places an error file (`_dmpsec.e`) in the intended dump directory. If the dump directory does not exist, the Data Dictionary places `_dmpsec.e` in the session's current working directory.

Note: The connected user must have Audit Administrator permissions in order to access the **Dump as XML** option. For information about granting Audit Administrator permissions, see Edit Audit Permissions option on page 148**.**

Dump as Text

When you choose the **Dump as Text (.ad file)** option from the **Audit Policies** submenu, the **Select Audit Policies for Dump** dialog box appears, containing the names and descriptions of all audit policies.

After you select the policies you want to dump and click **OK**, the **Dump Audit Policies as Text** dialog box appears, and contains the following fields:

- **Output Directory** — The name of the directory into which the Data Dictionary places the dumped files. Leave this field blank to use the current directory. The dumped files are named for the tables from which they are dumped with a `.ad` extension.
- **Code Page** — Indicates that the file will be dumped in the UTF-8 format. You cannot change the code page when dumping audit policies.

If the Data Dictionary encounters an error, it places an error file (`_dmpsec.e`) in the intended dump directory. If the dump directory does not exist, the Data Dictionary places `_dmpsec.e` in the session's current working directory.

Note: The connected user must have Audit Administrator permissions in order to access the **Dump as Text** option. For information about granting Audit Administrator permissions, see Edit Audit Permissions option on page 148**.**

Application Audit Events

Choose the **Application Audit Events** option from the **Audit Policies** submenu to dump the contents of the `_aud-event` table. The `_aud-event` table defines supported audit events for the database.

The **Dump Application Audit Events** dialog box appears and contains the following fields:

- **Output File** — Specifies the name of the output file, with a `.ad` extension. The default is `_aud-event.ad`.
- **Code Page** — Specifies the default code page (character set).

Note: The user must have Audit Archiver privileges to access the **Dump Application Audit Events** option. For information about granting Audit Archive permissions, see Edit Audit Permissions option on page 148.

Audit Data option

Choose this option to dump audit data. In an audit-enabled database, audit data is stored in multiple tables. When dumping audit data, the Data Dictionary dumps each table into a separate file named with the table name and a `.ad` extension. To ensure the integrity of the audit data, the Data Dictionary creates a data seal for each dumped file. Each file is part of a set of files that can only be loaded together.

When you select the **Audit Data** option from the **Dump Data and Definitions** menu, the **Dump Audit Data Filter** dialog box appears, and contains the following fields:

- **Select All** — Indicates that all audit data tables will be dumped.
- **Select Some** — Allows you to specify a date range. When you choose **Select Some**, the Data Dictionary activates the **Start Date** and **End Date** fields:
  - **Start Date** — Enter the date of the first audit transaction you want to dump. The default entry is the earliest audit transaction stored in the database.

- **End Date** — Enter the date of the last audit transaction you want to dump. The default entry is the most recent audit transaction stored in the database.

After you click **OK** in the **Dump Audit Data Filter** dialog box, the **Dump Audit Data** dialog box appears, and contains the following fields:

- **Output Directory** — The name of the directory into which the Data Dictionary places the dumped files. Leave this field blank to use the current directory. The dumped files are named for the tables from which they are dumped with a `.ad` extension.
- **Character Mapping** — Specifies the type of character mapping:
  - **Default Map** — Leave the **Character Mapping** field blank to use the default mapping
  - **MAP** — Enter the type of character mapping (for example, `MAP laserwriter/french` or `MAP hp2/spanish/italian`)
  - **NO MAP** — Specifies not to perform any character mapping
- **Code Page** — Indicates that the file will be dumped in the `UTF-8` format. You cannot change the code page when dumping audit data.

Note: The user must have Audit Archiver permissions in order to access the **Audit Data** option. If a user without Audit Archiver permissions selects the **Audit Data** option, the Data Dictionary creates an error file named `_aud-audit-data.e` in the dump directory.

If the Data Dictionary encounters an error while validating the file or directory name or when verifying that the database is connected, it places a file named `_dmpsec.e` in the intended dump directory. If the intended dump directory does not exist, the Data Dictionary places `_dmpsec.e` in the session's current working directory.

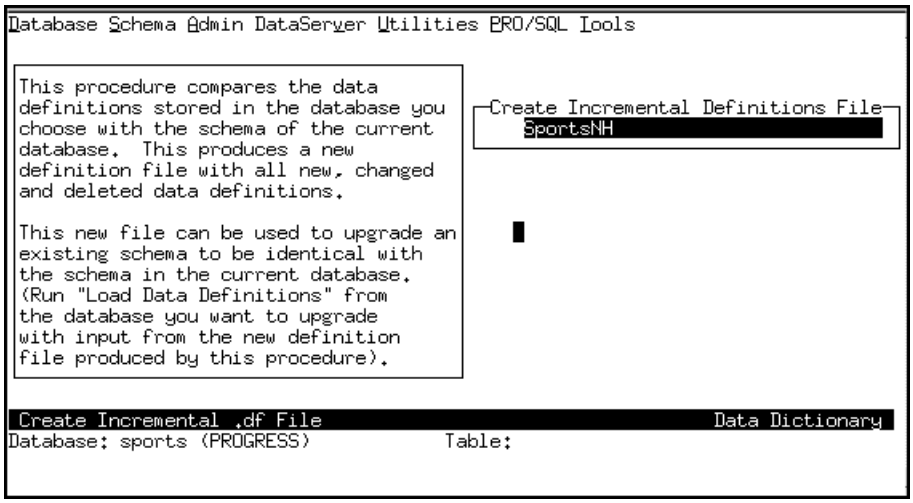
Create Incremental .df File option

Use this option to compare two databases' schemas and create a `.df` file that contains any differences. You can then use the new `.df` file to upgrade a database to the current schema.

Note: You need at least two databases connected to create an incremental `.df` file.

When you choose this option, the **Create Incremental .df File** window appears, as shown in the following figure:

Figure 41: Create Incremental .df File window



The Data Dictionary lists all connected databases except the working database (which should be the database that has the newest version of the database schema). If you have more than two other databases connected, select the database that has the older version of the database schema. The Data Dictionary then prompts you for the filename to which you want to write the differences. The default filename is `delta.df`. The Data Dictionary displays the file, field, and index names as it compares the databases.

You can then use this file to apply schema changes to an existing database.

Note: If you use this option to create a `.df` file in conjunction with an object file to update schema changes, you must load the `.df` file and recompile before you can run the new r-code. You must recompile because the Data Dictionary reorders the indexes during the dump and load procedure.

Dump incremental delta.df supporting online schema changes

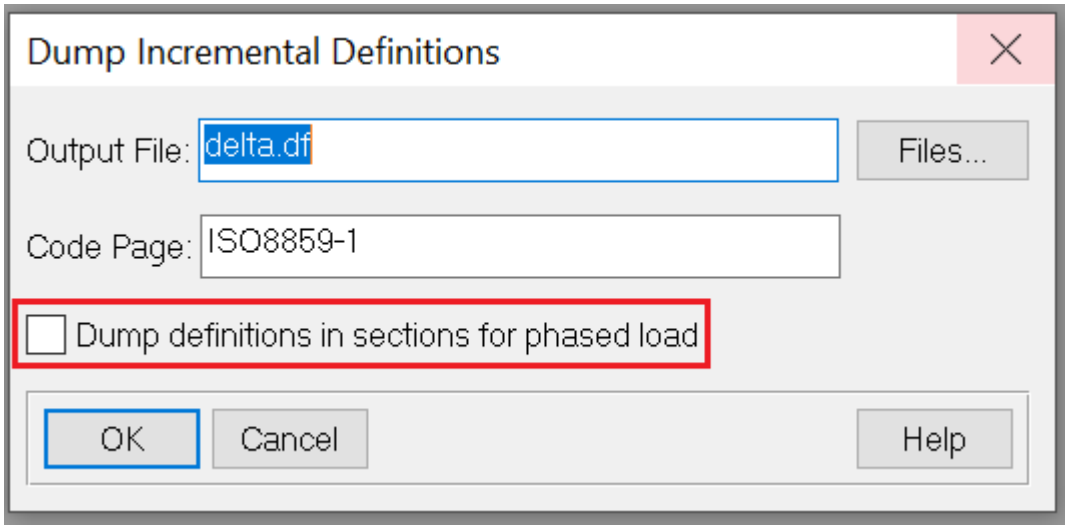
The **Data Administration** tool is used to make changes in the database schema. This tool compares two databases and looks for differences in the schema definitions.

The Data Administration tool connects the two databases, compares the schemas, and generates a `.df` file that contains the changes required in order for the first database schema to match the second database schema. This is referred to as the `delta.df`.

The `delta.df` file has four sections. The sections describe the operations that are performed before and after the deployment of an application:

Sections	Description
PreDeploy	This section contains all non-disruptive online operations and items such as: • Allow the field data type to change from **Integer** to **Int64**. • Modify the existing non-structural schema fields. • Rename a field in an existing table.
Trigger	This section contains all the trigger definition changes such as add, delete, and modify. The database triggers have r-code and are deployed before the trigger schema changes. The trigger r-code is executed after the PreDeploy changes are made.
PostDeploy	This section contains all online disruptive operations. These schema change operations are applied to the production system after confirming that the objects are not used in any other version of the running application.
Offline	This section contains all schema change operations. These schema change operations cannot be carried out online and therefore require the following exclusive schema locks on the database: • Drop an inactive index from an existing table. • Drop a non-indexed field from an existing table.

You can dump the `delta.df` file in both the old and new formats. To dump the `delta.df` file in the new format, select the **Dump definitions in sections for phased load** checkbox.



If the new format is selected, then four sections are added to the `delta.df` file.

The following code is the new `delta.df` file format:

```
# BEGIN PRE_Deploy_Section
Add Table
Update Table
Delete Table
Add Field
Update Field
Add Sequence
Add InActive-Index
# END PRE_Deploy_Section

# BEGIN Trigger_Section
Table-Trigger DELETE
Table-Trigger OVERRIDE/NO-OVERRIDE
Table-Trigger NEW
# END Trigger_Section

# BEGIN Post_Deploy_Section


# END Post_Deploy_Section

# BEGIN OffLine_Section
Add Active Index
Update Active Index
Delete Active Index
Drop InActive-Index
Update InActive-Index
Rename InActive-Index
Update Sequence
Delete Sequence
Add Constraints
Update Constraints
Delete Constraints
Delete Table
Update Table
Update Field etc.
# END OffLine_Section
```

Note: Some of the *Update Table* and *Update Field* operations are available for both PreDeploy and Offline sections.

Note: The new triggers are added to the Trigger section only for an existing table and existing field. New triggers for a new table and new field are added to the PreDeploy section.

Batch Incremental utility

This command line utility creates a `.df` file from comparing two OpenEdge databases. A new file called `prodict/dump_inc.p` is parallel to `prodict/dump_df.p` and `prodict/load_df.p`. Procedure `dump_inc.p` will query the following environmental variables:

- **DUMP_INC_DFFILE** — Name of file to dump to.
- **DUMP_INC_CODEPAGE** — Output code page.
- **DUMP_INC_INDEXMODE** — Index mode for newly created indexes; allowed values are `active` or `inactive`.
- **DUMP_INC_DUMPSECTION** — Dump the sections that support online schema changes. For old format, the value is `No`.

The following code is the new format batch script:

```
#!/bin/sh
DUMP_INC_DFFILE=/tmp/delta.df
DUMP_INC_CODEPAGE=iso8859-2
DUMP_INC_INDEXMODE=active
DUMP_INC_DUMPSECTION=No
DUMP_INC_RENAMEFILE=/tmp/master.rf
DUMP_INC_DEBUG=2
export DUMP_INC_DFFILE DUMP_INC_CODEPAGE DUMP_INC_INDEXMODE DUMP_INC_DUMPSECTION
DUMP_INC_RENAMEFILE DUMP_INC_DEBUG

$DLC/bin/_progres -b -db master -db slave -p prodict/dump_inc.p/tmp/dump_inc.log
```

Note: By default, **DUMP_INC_DUMPSECTION** is set to `No`. Also, if no value is specified, then the old format `.df` file is used.

- **DUMP_INC_RENAMEFILE** — Name of the file that contains rename information. The format of this file is:
  - `T`, *<old-table-name>*,*<new-table-name>*
  - `F`, *<table-name>*,*<old-field-name>*,*<new-field-name>*
  - `S`,*<old-sequence-name>*,*<new-sequence-name>*

Note: There is no need to rename indexes because the code compares index elements and changes them automatically.

- **DUMP_INC_DEBUG**
  - **0** = debug off, only errors and important warnings
  - **1** = all the above plus warnings
  - **2** = all the above plus configuration information

The first connected database is the source database and automatically receives the alias `DICDB`.

Use the following code to call the "`dump_inc.p`" procedure:

```
OpenEdge-install-dir/bin/_progres -b -db
source-db -db target-db -p prodict/dump_inc.p
```

The resulting `delta.df` file can then be applied to the target database, giving it the same definitions as the source database.

Change Data Capture Policies (.cd file) option

Choose this option to dump Change Data Capture (CDC) policies from your database into a `.cd` file. You can select an individual CDC policy, a list of CDC policies, or all CDC policies irrespective of their state—current, pending, or previous—to dump, and the destination directory where you want to dump them. You can also select all the current or pending CDC policies defined for your database and dump them at once.

When you dump CDC policies, a `.cd` file is created with the name of the database, *db-name*`.cd`, from which the policies are dumped, and stored in the current OpenEdge work directory. However, you can specify a name and destination directory for the file. The `.cd` file contains the dump data of CDC table policies that you selected and their corresponding field policies. You can use this `.cd` file to load data into a database.

In case of a failure in dumping the data, an error `.e` file is created with the name of the database, *db-name*`.e`, and stored in the same directory where the `.cd` file is stored.

Load Data and Definitions option

Choose this option to load table definitions for specified tables or for all the tables in the database.

Note: The Data Dictionary allows you to load data definition files (`.df`) greater than 2GB on platforms where ABL supports large files.

When a menu option prompts you for a filename only, you can specify a complete pathname.

The following table describes the menu that appears when you choose this option. More detailed descriptions of the options follow the table.

Table 27: Load Data and Definitions menu

Menu options	Task performed
Data Definitions (.df file)...	Loads table, auto-connect record, sequence, and collation table definitions
Table Contents (.d file)...	Loads table contents
SQL Views...	Loads SQL view contents
User Table Contents...	Loads user table contents
Security Authentication Records	Loads data into the security authentication system and domain tables
Security Permissions	Loads roles and granted permissions records
Sequences Current Values...	Loads sequence values
Reconstruct Bad Load Records...	Uses the error file and the original data file to build a new data file for bad records
Database Identification Properties	Loads database identification information
Database Options	Loads database security and auditing settings
Audit Policies	Loads audit policies as XML, text, or load application audit event data
Audit Data	Loads recorded audit data

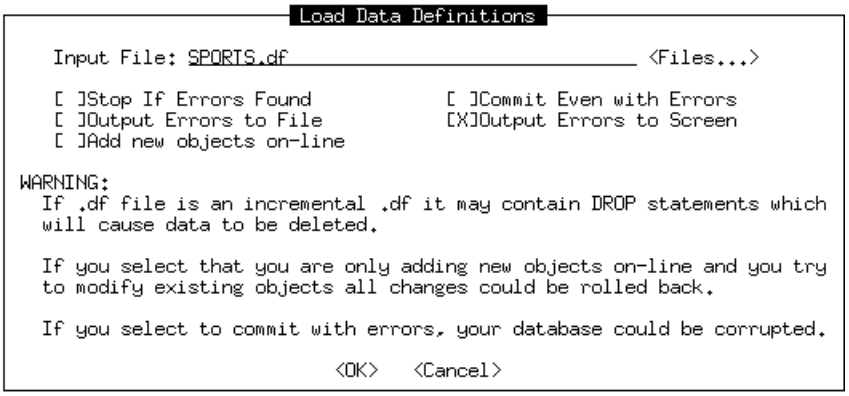
Data Definitions (.df file) option

Choose this option to load table and sequence definitions. The `.df` file contains the definitions of tables, which can include fields and indexes, sequences, auto-connect records, collate/translate tables, and all their characteristics.

Note: The `.df` file may exceed 2GB on platforms where the ABL client supports large files.

When you choose this option, the **Load Data Definitions** dialog box shown in the following figure appears.

Figure 42: Load Data Definitions dialog box



The **Load Data Definitions** dialog box contains the following fields:

- **Input File** — The Data Dictionary prompts you for the filename that contains the data definitions you want to load into your current working database. The default file is the working physical database name with a `.df` extension.
- **Stop If Errors Found** — Specifies if you want to stop the load in the event a bad definition statement is encountered.
- **Output Errors to File** — Specifies if you prefer error messages to be output as files.
- **Add New objects on-line** — Specifies if you want to add database objects while online.
- **Commit Even with Errors** — Specifies whether or not to commit data definitions, even if doing so will create a error message.
- **Output Errors to Screen** — Specifies if you prefer error message outputs to your screen instead of a file.

When you are through selecting your options, choose **OK**. The Data Dictionary displays each item as it loads the definitions for that object. The Data Dictionary displays a status message and prompts you to continue.

Note: When you choose **Load Data Definitions** > **Data Definitions** from the menu bar, the Data Dictionary automatically loads all the table definitions, including any collation or translation tables. If you change the collate/translate tables, you must rebuild your indexes.

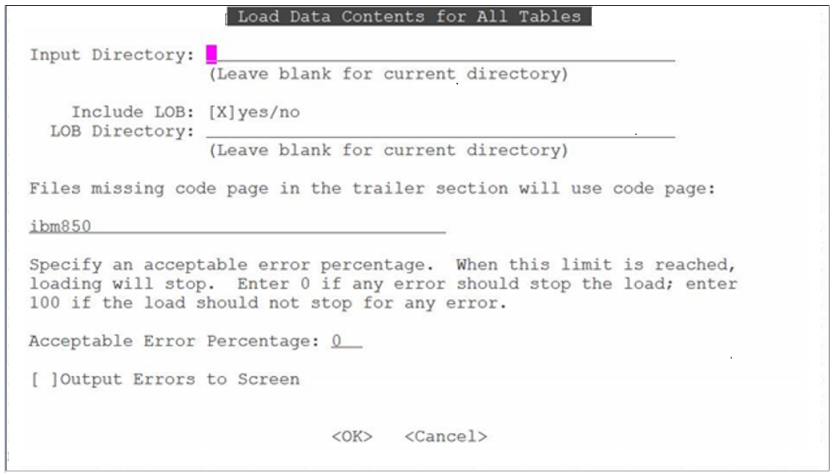
Table Contents (.d file) option

Choose this option to load table contents. The Data Dictionary alphabetically lists all the tables defined for your database.

Note: The .d file may exceed 2GB on platforms where the ABL client supports large files.

After you select the table or tables, the Data Dictionary opens the **Load Data Contents for All Tables** dialog box, as shown in the following figure:

Figure 43: Load Data Contents for All Tables dialog box



The **Load Data Contents for All Tables** dialog box contains the following fields:

- **Input Directory** — If you load table contents for a single table, the Data Dictionary displays a default name for the file from which you can load your table contents. This default file is always the name of the table dump file, usually the table name with a .d extension.

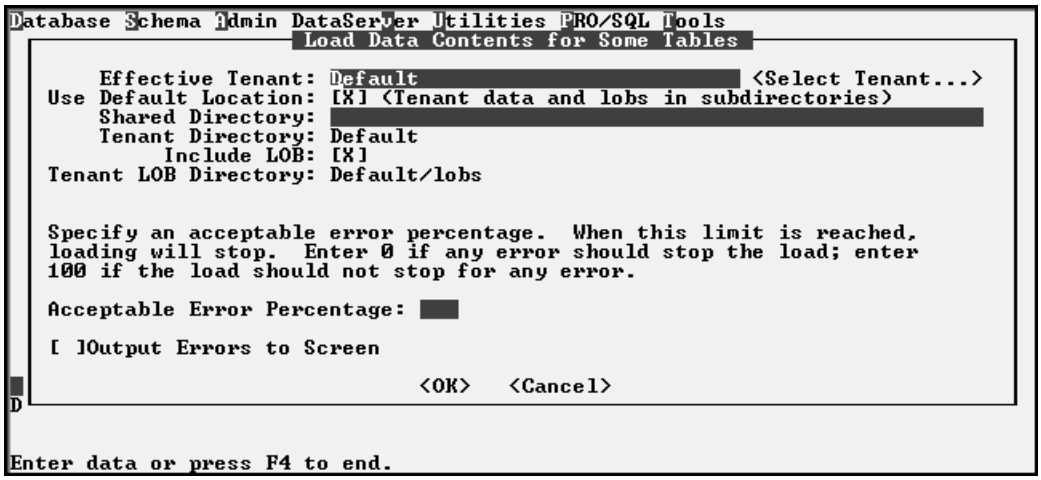
  When you load the contents of more than one table, the Data Dictionary prompts you for a directory from which it loads the contents files. If you do not specify a directory, the Data Dictionary loads the files from the current directory. The Data Dictionary loads each table from the corresponding *table-name*.d file.

- **Include LOB** — The Data Dictionary provides the option of specifying an LOB directory.
- **LOB Directory** — If you select **yes** in the **Include LOB** field, you must specify the name of the LOB directory.
- **File Missing Code page**— When you load the content of multiple files with a .d extension, the Data Dictionary searches for a code page in the files. The Data Dictionary also assigns a default code page in cases where any of the files is missing a code page. This field displays the default code page which will be considered while loading data from those files. By default, the value of this code page will be set to the session's code page.
- **Acceptable Error Percentage** — The Data Dictionary prompts you for an acceptable error rate. As the Data Dictionary loads records from any files you designate, it might encounter data that cannot be loaded. For example, a record might have data that would cause a duplicate value to be stored for a unique key field. The Data Dictionary does not load the record. If you specify an error rate of 10 percent, the Data Dictionary must successfully load 90 records from every set of 100 records loaded. If the error rate exceeds the specified rate, the Data Dictionary terminates the load. The Data Dictionary places bad records in the *table-name*.e file.
- **Output Errors to Screen** — The Data Dictionary provides you with the option to display error messages to your screen.

Note: You can move and reorganize data by performing a binary dump and load. The binary method improves the dump and load performance significantly because the data remains in binary format during the process. For more information about performing a binary dump and load, see Database Tasks on page 17.

If your database is enabled for multi-tenancy, you can load data contents on a per-tenant basis. The **Load Data Contents for Some Tables** dialog box is modified as shown in the following figure:

Figure 44: Load Data Contents for Some Tables (multi-tenant)



When your database is enabled for multi-tenancy, **Load Data Contents for Some Tables** dialog box contains the following fields:

- **Effective Tenant —** Specifies the tenant of the data. Enter a name or choose **Select Tenant** to select a tenant from a list.
- **Use Default Location** — Check box to indicate that the data to be loaded is located in subdirectories based on the identified default location.
- **Shared Directory** — If you are loading both shared and multi-tenant tables, enter a directory name where the contents of shared tables is located.
- **Tenant Directory** — Enabled if you did not specify **Use Default Location**, enter the directory where the tenant data is located.
- **Include LOB** — Check to load LOB data.
- **Tenant LOB Directory** — If you select **yes** in the **Include LOB** field, and you are not using the default location, you must specify the name of the LOB directory.

SQL Views option

Choose this option to load SQL view contents. The Data Dictionary prompts you for the filename from which it reads the view contents. The default filename is `_view.d`. Specify the filename. The Data Dictionary displays a status message and prompts you to continue.

User Table Contents option

Choose this option to load user information. The Data Dictionary prompts you for the filename from which it reads the user table contents. The default filename is `_user.d`. Specify the filename. The Data Dictionary displays a status message and prompts you to continue.

Security Domains option

Choose this option to load data into the _sec-authentication-system and the _sec-authentication-domain tables. The _sec-authentication-system table defines supported and trusted authentication systems for the database. The _sec_authentication-domain table contains valid authentication system domains used to authenticate and validate the authentication of a user account.

When you choose this option, the **Load Security Domains** dialog box appears and prompts you to enter an **Input Directory**.

Note: The connected user must be a DBA to access the **Load Security Authentication Records** option.

Security Permissions option

Choose this option to load data into the _sec-role, _sec-granted-role, and _sec-granted-role-condition tables. These tables store information about user- and OpenEdge-defined security roles including auditing role definitions, audit-privilege to user account mappings, and whether users have permission to grant privileges.

When you choose this option, the **Load Security** Permissions dialog box appears and prompts you to enter an **Input Directory**.

Note: The connected user must be a DBA to access the **Load Security Authentication Records** option.

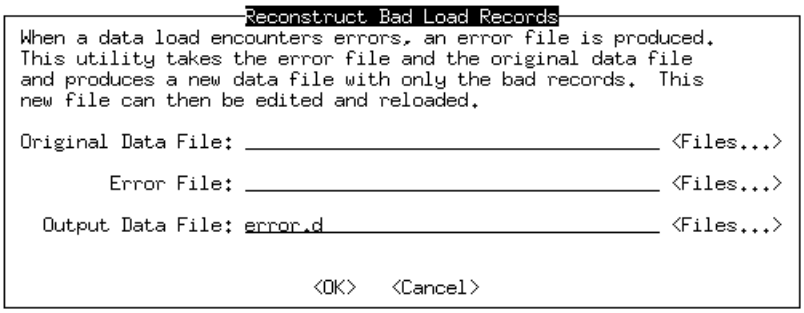
Sequences Current Values option

Choose this option to load sequence values. The Data Dictionary prompts you for the filename from which it reads the sequence values. The default filename is _seqvals.d. Specify the filename. The Data Dictionary displays a status message and prompts you to continue.

Reconstruct Bad Load Records option

Choose this option to build a new data file for bad records from the error file and original data file. If the Data Dictionary encounters errors while loading a data file, it creates the error file. When you choose this option, the **Reconstruct Bad Load Records** dialog box shown in the following figure appears.

Figure 45: Reconstruct Bad Load Records dialog box



The **Reconstruct Bad Load Records** dialog box contains the following fields:

- **Original Data File** — Specifies the name of the file that contains the original data
- **Error File** — Specifies the name of the error file
- **Output Data File** — Specifies the name of the new data file—the default filename is `error.d`

After you complete the **Reconstruct Bad Load Records** dialog box's fields and select **OK**, the Data Dictionary builds the new file. You can use a text editor to edit the new data file and fix the bad records after the Data Dictionary builds the new file. Once you have fixed the records, you can reload the file.

Database Identification Properties option

Choose this option to load data into the `_db-detail` table. The `_db-detail` table contains information about audit-enabled databases, including the globally unique identifier (GUID), the database description, and the database's Passkey (if available).

When you choose this option, the **Load Database Identification Properties** dialog box appears, and contains the following fields:

- **Input File** — The filename that contains the data you want to load into your current working database. The default file is `_db-detail.d`.
- **Acceptable Error Percentage** — The Data Dictionary prompts you for an acceptable error rate. As the Data Dictionary loads records from any files you designate, it might encounter data that cannot be loaded. For example, a record might have data that would cause a duplicate value to be stored for a unique key field. The Data Dictionary does not load the record. If you specify an error rate of 10 percent, the Data Dictionary must successfully load 90 records from every set of 100 records loaded. If the error rate exceeds the specified rate, the Data Dictionary terminates the load. The Data Dictionary places bad records in the *`table-name`*.e file.
- **Display Errors to Screen** — Select this option to display error messages on your screen.

Note: The connected user must be a DBA to access the **Load Database Identification Properties** option.

Database Options option

Choose this option to load data into the `_db-option` table. The `_db-option` table contains user-defined information about the database.

When you choose this option, the **Load Database Options** dialog box appears, and contains the following fields:

- **Input File** — The filename that contains the data you want to load into your current working database. The default file is `_db-option.d`.
- **Acceptable Error Percentage** — The Data Dictionary prompts you for an acceptable error rate. As the Data Dictionary loads records from any files you designate, it might encounter data that cannot be loaded (for example, a duplicate value for a unique key field). The Data Dictionary does not load the record. If you specify an error rate of 10 percent, the Data Dictionary must successfully load 90 records from every set of 100 records loaded. If the error rate exceeds the specified rate, the Data Dictionary terminates the load. The Data Dictionary places bad records in the *`table-name`*.e file.
- **Display Errors to Screen** — Select this option to display error messages on your screen.

Note: The connected user must be a DBA to access **Load Database Options**.

Audit Policies option

The **Audit Policies** submenu allows you to load audit data as XML or text or load application audit event data.

Load as XML

When you choose the **Load as XML (.xml file)** option from the **Load Audit Policies** submenu, the **Load Audit Policies XML** dialog box appears, and contains the following fields:

- **Input File** — The name of the file that contains the data you want to load into your current working database. The default file is `_audit-policies.xml`.
- **Overwrite Duplicate Policies** — Select if you want the Data Dictionary to overwrite existing policies with the loaded data. If you do not select this option and the Data Dictionary detects duplicate policies, it will display a list of the duplicates and ask you if you want to overwrite them. If the load is running in Batch Mode, the Data Dictionary creates an error file that lists the duplicate policies.

Note: The connected user must have Audit Archiver permissions in order to access the **Load Audit Policies XML** option.

If the Data Dictionary encounters errors when validating the file or directory name or when verifying that the database is connected, it creates an error file called `_lodsec.e` and places it in the intended load directory. If the load directory doesn't exist, the Data Dictionary places `_lodsec.e` in the session's current working directory.

If the Data Dictionary encounters errors during the load process, it creates an error file named *`audit-policies-xml`*`.e`.

Load as Text option

When you choose the **Load as Text (.ad file)** option from the **Load Audit Policies** submenu, the **Load Audit Policies Text** dialog box appears, prompting you to enter the name of an **Input Directory**. The **Input Directory** is the directory where the `.ad` files are stored.

Note: The connected user must have Audit Archiver permissions in order to access the **Load Audit Policies Text** option. If a user without Audit Archiver permissions selects this option, the Data Dictionary creates the `_aud-audit-policy.e` file in the intended load directory.

If the Data Dictionary encounters errors when validating the file or directory name or when verifying that the database is connected, it creates an error file called `_lodsec.e` and places it in the intended load directory. If the load directory does not exist, the Data Dictionary places `_lodsec.e` in the session's current working directory.

If the Data Dictionary encounters errors during the load process, it creates an error file in the intended load directory. The Data Directory names the error file for the table it encountered the error on and gives it a `.e` extension.

Application Audit Events option

Choose the **Application Audit Events** option from the **Load Audit Policies** submenu to load data into the `_aud-event` table. The `_aud-event` table defines supported audit events for the database.

The **Load Application Audit Events** dialog box prompts you for an **Input File**. The default is `_aud-event.ad`.

Note: The user must have Audit Archiver privileges to access the **Load Application Audit Events** option. For information about granting Audit permissions, see Edit Audit Permissions option on page 148.

If the Data Dictionary encounters errors during the load process, it creates an error file named for the table with a `.e` extension.

Audit Data option

Choose this option to load audit data. In an audit-enabled database, audit data is stored in multiple tables. When dumping audit data, the Data Dictionary dumps each table into a separate file named with the table name and a `.ad` extension. To ensure the integrity of the audit data, the Data Dictionary creates a data seal for each dumped file. Each file is part of a set of files that can only be loaded together.

When you select the **Audit Data** option from the **Load Data and Definitions** menu, the **Load Audit Data** dialog box appears, prompting you to enter an **Input Directory**. During the load, the Data Dictionary searches the specified directory for appropriate `.ad` files.

Note: In order to access the **Load Audit Data** option, the user must have Audit Archiver permissions.

If the Data Dictionary encounters errors during the load process, it creates an error file named for the table with a `.e` extension.

If the Data Dictionary encounters errors when validating the file or directory name or when verifying that the database is connected, it creates an error file called `_lodsec.e` and places it in the intended load directory. If the load directory doesn't exist, the Data Dictionary places `_lodsec.e` in the session's current working directory.

Change Data Capture Policies (.cd file) option

Choose this option to load Change Data Capture (CDC) policies into a database. You can use the `.cd` file that contains the dump data of CDC table policies that you selected while dumping and their corresponding field policies, and load it into a database.

In case of a failure in loading the data, an error `.e` file is created with the name of the database, *db-name*`.e`, and stored in the same directory where the `.cd` file is stored.

Database Identification option

Choose the **Database Identification** menu option to maintain and generate identification information for audit-enabled databases.

The following table describes the options that appear when you choose this menu. More detailed descriptions of the options follow the table. For more information about enabling auditing for databases, see *Manage the OpenEdge Database*. For more information about auditing, see *Learn about Security and Auditing*.

Table 28: Database Identification menu

Menu option	Task performed
Database Identification Maintenance	Maintains and updates the DB Identifier, the DB Passkey, the description, and the details for an audit-enabled database
Database Identification History	Manages historical information about audit archive databases

Database Identification Maintenance option

Choose the **Database Identification Maintenance** option to maintain fields in the `_db-detail` table. The `_db-detail` table contains information about audit-enabled databases, including the globally unique identifier (GUID), the database description, and the Passkey (if available).

Note: Only DBAs may access the **Database Identification Maintenance** dialog box.

The **Database Identification Maintenance** dialog box contains the following fields:

- **DB Identifier** — Displays the DB Identifier.
- **DB Passkey** — A password field.
- **DB Description** — A description of the database.
- **Additional Details** — A field for entering additional information about the database.
- **New DB Passkey/Identifier** — Select this option to generate a new DB Identifier or to change the DB Passkey. When you select this option, the Data Dictionary displays the **New Database Passkey/Identifier** dialog box. For information about the **New Database Passkey/Identifier** dialog box, see New Database Passkey/Identifier dialog box on page 143.

Note: Every time the **New Database Passkey/Identifier** dialog box launches, the Data Dictionary generates a new database identifier.

New Database Passkey/Identifier dialog box

The **New Database Passkey/Identifier** dialog box displays a newly generated DB Identifier and allows you to modify the existing DB Passkey. Access this dialog box from the Data Dictionary's **Admin** menu (**Admin** > **Database Identification** > **Database Identification Maintenance**). From the **Database Identification Maintenance** dialog box, select **New DB Passkey/Identifier**. The **New DB Passkey/Identifier** dialog box appears, and contains the following fields:

- **DB Identifier** — A read-only field displaying the DB Identifier.
- **DB Passkey** — The new DB Passkey. If you want to update the DB Passkey, you must first select **Change Passkey**.

Note: When you select **Change Passkey**, the Data Dictionary enables the **Blank** toggle, which hides the existing value in the **DB Passkey** field.

- **Verify Passkey** — Verify the new DB Passkey by re-entering it. Note that the value is hidden.

When you select **OK**, the Data Dictionary dismisses this dialog box and passes the new values back to the **Database Identification Maintenance** dialog box.

Database Identification History option

Choose the **Database Identification History** option to manage history information about audit-enabled databases by modifying descriptions of audit archive databases (by indicating why a new DB Identifier or DB Passkey was generated, for example). The **Database Identification History** dialog box appears, and contains the following fields:

- **DB Identifier** — Displays the DB Identifier for the selected database
- **DB Description** — A description of the selected database
- **Additional Details** — A field for entering additional information about the audit archive database (for example, to annotate cycles in the life of the database)
- **Has Passkey** — Indicates if the selected database has a passkey assigned to it

When the Data Dictionary opens this dialog box, it lists the DB Identifier of the current `_db-detail` record first.

Note: Only DBAs may view or edit the information in this dialog box.

Security option

Choose the **Security** menu option to perform the following tasks:

- Define access permissions for the tables and fields in your database
- Set up a security administrator
- Set up Audit Administrators, Audit Archivers, and Audit Application Event Inserters
- Define and maintain user IDs and passwords
- Perform Authentication system maintenance
- Create and maintain encryption policies

The following table describes the options that appear when you choose this menu. See *Manage the OpenEdge Database* for more information on security administration.

Table 29: Security menu

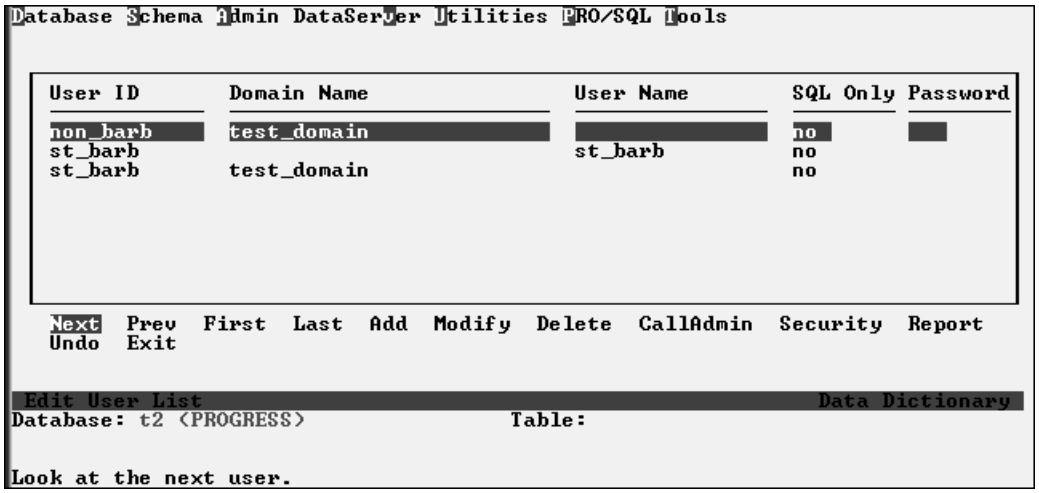
Menu option	Task performed
Edit User List...	Modifies the user list
Change Your Password...	Changes your password
Edit Data Security...	Defines access to security tables and fields
Edit Audit Permissions	Grants, updates, and revokes audit-related permissions
Security Administrators...	Designates security administrators

Menu option	Task performed
Disallow Blank Userid Access...	Denies blank user IDs access to the working database
User Report...	Displays or prints user information
Domain Maintenance	Creates and maintains authentication systems and authentication system domains
Encryption Policies	Creates and maintains encryption policies for an encryption-enabled database

Edit User List option

Choose **Security** > **Edit User List** to add or delete users from the user list. You can also change the user name. When you choose this option, the **Edit User List** dialog box shown in the following figure appears.

Figure 46: Edit User List dialog box



The **Edit User List** dialog box contains the following fields:

- **User ID** —Lists the users defined for the working database
- **Domain Name** — Lists the domain of the user.
- **User Name** —Displays the user name of the selected user
- **SQL Only** — Yes if the user is a SQL-only user
- **Password** — Indicates whether the selected user has been assigned a password

The following table describes the options at the bottom of the **Edit User List** dialog box.

Table 30: Edit User List dialog box options

Option	Action
Next	Highlights the next user in the user list
Prev	Highlights the previous user in the user list

Option	Action
First	Highlights the first user in the user list
Last	Highlights the last user in the user list
Add	Adds a new user
Modify	Modifies the selected user's name
Delete	Deletes the selected user ID
CallAdmin	Accesses the **Security Administrators** dialog box
Security	Accesses the **Data Security** option dialog box
Report	Generates a user report for the working database
Undo	Discards any changes you made and exits to the Data Dictionary window
Exit	Exits, saves changes, and returns to the Data Dictionary window

Note: Once you designate security administrators, only they can edit the user list.

Change your password

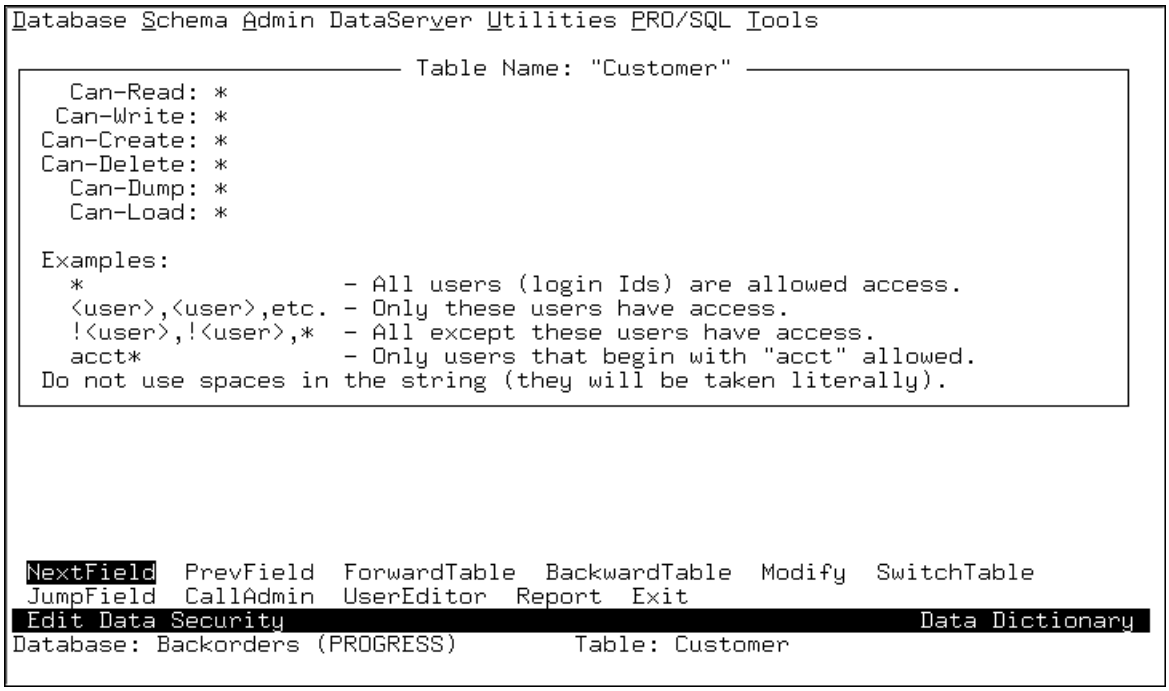
Choose this option to change your password. The Data Dictionary prompts you for your new password. Enter your new password, then choose **OK**. Remember that passwords are case sensitive. The Data Dictionary prompts you to verify the new password.

The OpenEdge RDBMS allows all users to change their own passwords.

Edit Data Security

Choose **Security** > **Edit Data Security** to define compile-time security for an application database. The Data Dictionary alphabetically lists the names of the tables defined for the working database. When you select a table, the Data Dictionary displays the current permissions lists for the table. the following figure shows the default permissions for the customer table.

Figure 47: Edit Data Security dialog box



The upper section of the **Edit Data Security** dialog box displays the six levels of security permissions for the table. By default, the Data Dictionary initializes all levels with an asterisk (*), which means that all users are allowed to modify table permissions. The lower section describes the fields for the permissions lists.

The six levels of security permissions for tables are:

- **Can-Read** —Specifies the users who have permission to read a table. The default is an asterisk (all users).
- **Can-Write** — Specifies the users who can write to a table or update records. The default is an asterisk (all users).
- **Can-Create** — Specifies the users who can create new records. In order to create a new record, a user must have Can-Write privileges. The default is an asterisk (all users).
- **Can-Delete** — Specifies the users who can delete records from a table. The default is an asterisk (all users).
- **Can-Dump** — Specifies if you can dump database or table definitions and data with triggers disabled. The default is an asterisk (all users).
- **Can-Load** — Specifies if you can load database or table definitions and data with triggers disabled. The default is an asterisk (all users).

The following table describes the values you use to define the permissions for a table.

Table 31: Access restrictions for tables

Expression	Indicates
*	All users are allowed access.
user	Only this user has access.
*!user, **	All users have access except this user. **Note:** Do not place the asterisk (*) before `!user`. If you do, all users are allowed access.
`acct*`	User IDs that begin with `acct` have access.

The following table describes the options at the bottom of the **Edit Data Security** dialog box.

Table 32: Edit Data Security dialog box options

Option	Action
NextField	Displays the next field defined for the specified table
PrevField	Displays the previous field defined for the specified table
ForwardTable	Displays the permissions for the next table defined for the working database
BackwardTable	Displays the permissions for the previous table defined for the working database
Modify	Modifies the permissions for a table or field
SwitchTable	Displays the list of tables again so you can select a new table
JumpField	Displays a list of all the fields defined for the current table
CallAdmin	Accesses the **Security Administrators** dialog box
UserEditor	Accesses the **Edit User List** dialog box
Report	Generates a user report for the working database
Exit	Exits, saves changes, and returns to the Data Dictionary window

Once you designate security administrators, only they can use this option.

Edit Audit Permissions option

Choose this option to control which users can access audit data.

Until a user has been granted the Audit Administrator permission with grant rights, only the DBA may grant audit-related permissions. Once an Audit Administrator is established, he grants specific rights to other users and determines whether to give these users grant rights. The DBA maintains the right to revoke and/or delete the Audit Administrator's permissions until the Audit Administrator has granted Audit Administrator permissions to at least one other user.

Note: For a complete explanation of audit security, see *Learn about Security and Auditing*.

To edit audit permissions for a user, from the **Edit Audit Permissions** dialog box select a user from the browser and edit the fields described below:

- **UserId** — The ID of the user to whom you grant permissions.
- **Permission** — Description of the permission being granted. This menu is populated with the permissions you are permitted to set. If you are an Audit Administrator with grant rights for Audit Administrator, all available audit-related permissions appear in this drop-down menu. There are four possible audit security permissions:
  - **Audit Administrator** — An authenticated user who has privileges to create, update, and delete audit policies and manage audit data
  - **Application Audit Event Inserter** — An authenticated user who has privileges to generate application audit events
  - **Audit Data Archiver** — An authenticated user who has privileges to maintain (truncate, dump, or load) audit data
  - **Audit Data Reporter** — An authenticated user who has privileges to read audit data
- **Grantor** — The current user's userid. The Data Dictionary automatically populates this field.
- **Comments** — Additional information about the user or granted permission.
- **Can Grant Permissions for** — If selected, indicates that the user can grant permissions to other users for the specified permission.

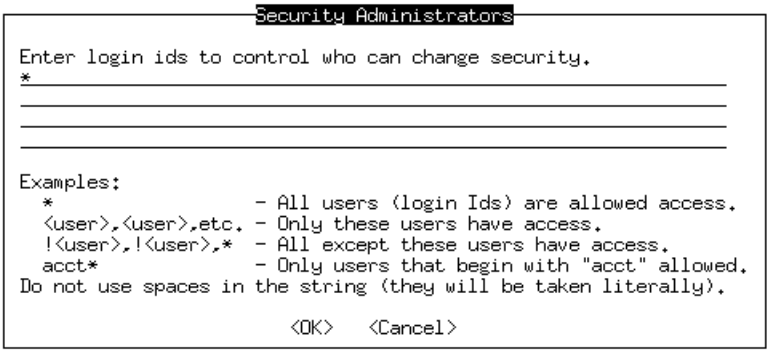
The following control options appear on the **Edit Audit Permissions** dialog box:

- **Done** — Closes the dialog box. This option is disabled until you select **Save** or **Cancel**.
- **Grant** — Grants the permission displaying the **Permission** field to the selected userid.
- **Save** — Saves changes to the current record and resets the fields for input.
- **Cancel** — Cancels current changes to the record. Note that this option is disabled until you edit one of the fields for an existing record. If you click **Cancel** while creating a new record, the Data Dictionary displays the previously selected record.
- **Revoke** — Revokes the permission displayed in the **Permissions** field from the selected userid, after prompting for verification. If you revoke a permission from a userid, the next userid in the browser appears. If you revoke all permissions from all existing userids, the Data Dictionary clears the **Edit Audit Permission** dialog box's fields.

Security Administrators option

Choose **Security** > **Security Administrators** to designate a security administrator. The Security Administrators dialog box shown in the following figure:

Figure 48: Security Administrators dialog box



You can enter many user IDs here, but you must include your own user ID. Separate the user IDs with commas, but no spaces. When you are done entering the user IDs, choose **OK**. The Data Dictionary prompts you to verify the entries you made.

Once you designate security administrators, only they can use this option.

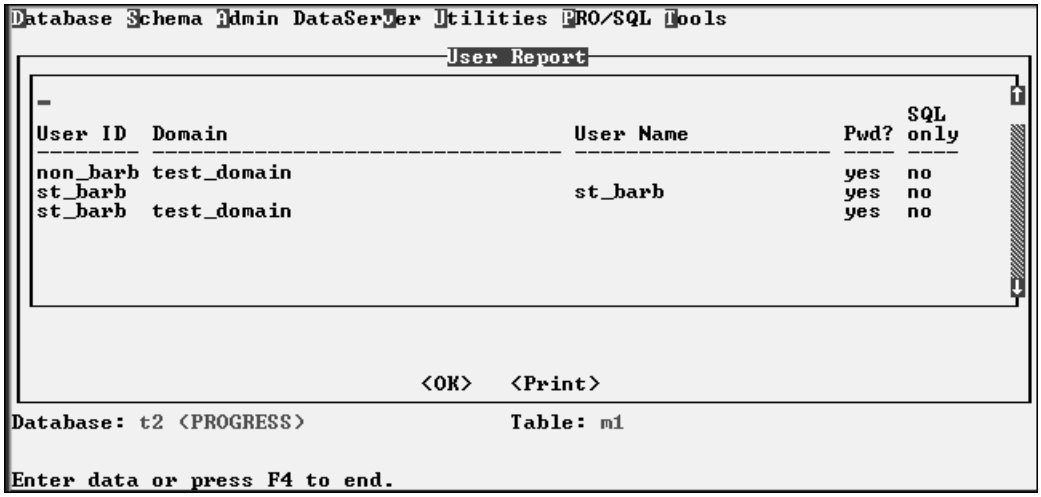
Disallow Blank User Access option

Choose this option to prevent users who are not listed in the user list from accessing the working database. When you choose this option, the Data Dictionary displays an alert box prompting you to verify that you want to prevent blank user ID access to the database.

User Report option

Choose **Security** > **User Report** to display or print a list of user IDs and user names, as well as to determine which user IDs are protected by passwords. When you choose this option, the Data Dictionary displays the user ID list in the **User Report** dialog box, as shown in the following figure:

Figure 49: User Report dialog box



To send the report to a file or printer, choose **Print**. The Data Dictionary prompts you for the printer or filename, whether you want to append the report to an existing file, and the page length.

Domain Maintenance option

The options of the **Domain Maintenance** submenu allow you to specify details about third party authentication systems and modules used to authenticate users who connect to your database through their applications. For more information about authentication and application security, see *Learn about Identity Management*.

The **Authentication System Maintenance** submenu provides two options, as described in the following sections:

- Authentication Systems on page 151
- Domains on page 152

Authentication Systems

Use the **Authentication Systems** dialog box to define authentication systems for use with your ABL applications.

Note: The connected user must be a DBA to access this dialog box.

When you select the **Authentication Systems** option from the **Domain Maintenance** submenu, the **Authentication Systems** dialog box appears. The browser at the top of the dialog box contains the following fields:

- **Domain Type** — Displays the type of authentication system (for example, LDAP, KERBOS, RSA, KEON, Internal)
- **Description** — Description of the authentication system

To create a new authentication system record, select **Create** and enter information into the following fields:

- **Domain Type** — The type of authentication system (LDAP, KERBOS, RSA, KEON, Internal, for example)

  Note: This field is enabled only when you are creating a new system. You cannot edit an existing domain type. To change the domain type of an existing system, delete the current system record and add a new one.

- **Description** — Description of the authentication system
- **Comments** — Specific authentication system details

To update an authentication system record, select it in the browser and edit the **Description** and **Comment** fields.

The following control options appear on the **Authentication Systems** dialog box:

- **Done** — Closes the dialog. This option is disabled until you select **Save** or **Cancel**.
- **Create** — Creates a new authentication system record and resets the fields for input.
- **Save** — Saves changes to the current authentication system record and resets the fields for input.
- **Cancel** — Cancels current changes to the authentication system record. Note that this option is disabled until you select **Create** or edit one of the fields for an existing record. If you select **Cancel** while creating a new record, the previously selected record displays.
- **Delete** — Deletes the current administration system record after prompting for verification. If you delete a record, the next record in the browser appears. If you delete the last record, the Data Dictionary clears all of the fields in the **Authentication Systems** dialog box.

The following table describes the hot keys used with the Authentication Systems dialog box.

Table 33: Authentication Systems dialog box hot keys

Hot key	Description
CTRL+A	Selects **Create**, if the option is enabled
CTRL+N	Selects **Cancel**, if the option is enabled
DEL	Selects **Delete**, if the option is enabled **Note:** This hot key applies only if an authentication system record is selected in the browser.
F1/GO	Selects **Save**, if the option is enabled; otherwise, selects **Done**

Domains

Use the **Domains** dialog box to define authentication system domains for use with your ABL applications.

Note: The connected user must be a DBA to access this dialog box.

When you select the **Domains** option from the **Domain Maintenance** submenu, the **Domains** dialog box appears.

The browser at the top of the dialog box contains the following fields for databases enabled for multi-tenancy:

- **Name** — Displays the logical name of a single authentication system that can be used to authenticate or validate the authentication of a user account
- **Tenant Name** — The tenant associated with the domain

If the database is not enabled for multi-tenancy, the browser displays the following fields:

- **Name** — Displays the logical name of a single authentication system that can be used to authenticate or validate the authentication of a user account
- **System Type** — Displays the type of authentication system
- **Description** — Description of the authentication domain

To update an authentication system domain, select it in the browser and edit the fields described below. To create a new authentication system domain, select **Create** and enter information into the following fields:

- **Name** — The domain name
- **Tenant name** — For databases enabled for multi-tenancy, the tenant to associate with the domain
- **System Type** — The type of authentication system. This field is enabled only when you are creating a new domain. You cannot edit an existing domain type. To change the existing domain, delete the current domain record and add a new one.
- **Access Code** — Encrypted access code phrase used to validate the identity and integrity of any `CLIENT-PRINCIPAL` issued by the authentication system represented by this domain
- **Audit Context** — The audit record context value when a `_client-session` record is recorded to the database
- **Runtime Options** — A comma delimited list of runtime options for use with the domain's ABL Virtual Machine (AVM)
- **System Options** — Command options used by a Domain's authentication system at runtime to control its user authentication and/or ABLClient-Principal validation. See your authentication system documentation for a list of the supported options.
- **Description** — Description of the authentication domain
- **Comments** — Specific authentication domain details
- **Domain Enabled** — Activate to specify the current domain is enabled

The following control options appear on the **Domain** dialog box:

- **OK** — Closes the dialog. This option is disabled until you select **Save** or **Cancel**.
- **Create** — Creates a new authentication system domain record and resets the fields for input.
- **Save** — Saves changes to the current authentication system domain record and resets the fields for input.
- **Cancel** — Cancels current changes to the authentication system domain record. Note that this option is disabled until you select **Create** or edit one of the fields for an existing record. If you select **Cancel** while creating a new record, the previously selected record displays.
- **Delete** — Deletes the current administration system domain record after prompting for verification. If you delete a record, the next record in the browser appears. If you delete the last record, the Data Dictionary clears all of the fields in the **Domains** dialog box.

The following table describes the hot keys used with the Authentication Systems Domains dialog box.

Table 34: Authentication System Domains dialog box hot keys

Hot key	Description
CTRL+A	Selects **Create**, if the option is enabled
CTRL+N	Selects **Cancel**, if the option is enabled
DEL	Selects **Delete**, if the option is enabled **Note:** This hot key applies only if an authentication system record is selected in the browser.
F1/GO	Selects **Save**, if the option is enabled. Otherwise, selects **Done**

Encryption Policies

The options of the **Encryption Policies** submenu allow you to create, update, and view encryption policies for ABL objects in Type II areas.

Note: Encryption policy maintenance for Type I areas must be performed with PROUTIL EPOLICY. Encryption policy maintenance for SQL objects must be performed with OpenEdge SQL syntax, such as CREATE TABLE and ALTER TABLE. For more information on PROUTIL EPOLICY, see *Manage the OpenEdge Database*. For more information on OpenEdge SQL syntax, see *OpenEdge SQL Reference*.

The **Encryption Policies** submenu provides three options, as described in the following sections:

- Edit Encryption Policy on page 154
- Generate Encryption Keys on page 156
- Encryption Policy History on page 157

For details on encryption and encryption policies, see *Learn about Security and Auditing*.

Edit Encryption Policy

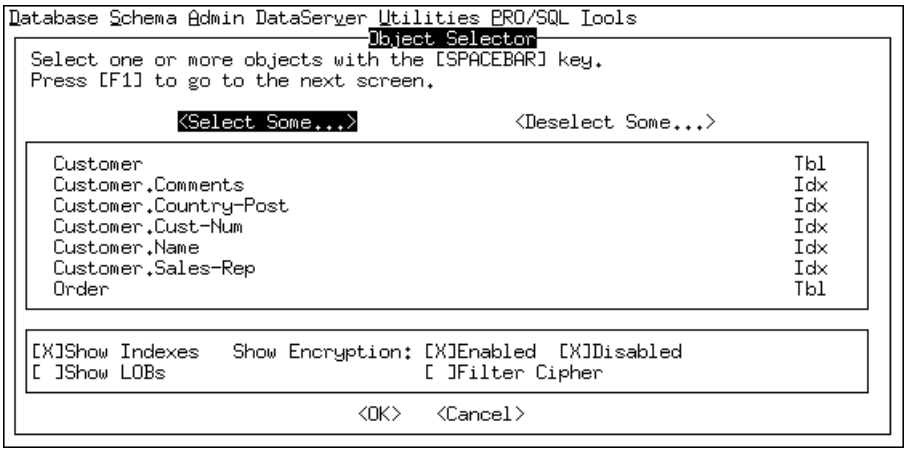
Create and update encryption policies with the **Edit Encryption Policy** dialog box.

The **Edit Encryption Policy** dialog box allows you to:

- Enable or disable encryption for an object
- Generate a new encryption key for an encrypted object
- Copy encryption policies to multiple objects

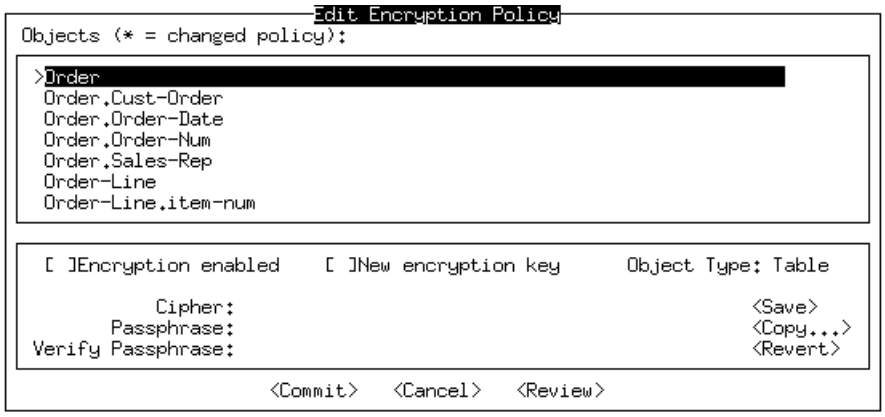
To create an encryption policy for a database object:

1. From the **Data Dictionary**, choose **Admin** > **Security** > **Encryption Policies** > **Edit Encryption Policy**. The **Object Selector** dialog box appears:



The initial view displays the tables and indexes of the connected database with encryption both enabled and disabled. You can change the list to view different sets of objects by checking and unchecking the **Show** boxes. For example, to also see LOBs, check **Show LOBs**; to only see objects with an existing encryption policy, for **Show Encryption** check **Enabled**, and uncheck **Disabled**.

2. Scroll through the list, selecting objects, or click **Select Some** to bring up the **Select Objects by Pattern Match** dialog box to refine the list. Enter the object name or pattern in the **Object Name** fill-in and click **OK**. When you return to the **Object Selector** dialog box, any objects matching the pattern are added to the selected objects.
3. If you selected too many objects, clicking **Deselect Some** brings up the **Deselect Objects by Pattern Match** dialog box, allowing you to enter an object name or pattern to deselect. Click **OK** to return to the **Object Selector** dialog box with any objects matching the specified pattern deselected.
4. Once you have selected all the objects, click **OK** to proceed. The **Edit Encryption Policy** dialog box appears:

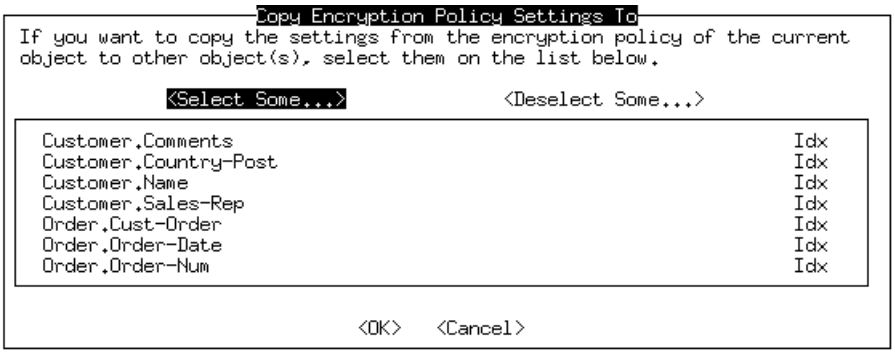


Note: Passphrase and **Verify Passphrase** are always disabled.

5. Select an object and check **Encryption enabled**. The default cipher, AES_CBC_128, is selected. Change the cipher if desired. Click **Save** to save the change, or **Reset** to undo the change.

Note: The change is not committed to the database until you click **Commit**.

6. When you have save a change, the **Copy** button is activated. Click **Copy** to propagate your change to multiple objects at once. Clicking **Copy** brings up the **Copy Encryption Policy Setting To** dialog box, as shown:



   You can select a single object or multiple objects. When you have selected all you want to copy the setting to, click **OK** to return to the **Edit Encryption Policy** dialog box.

7. Continue selecting and modifying object settings until you have specified all the objects you want to change. An asterisk (*) in front of the object name indicates you made changes to it. Click **Review** at any time to view the status of your changes.

8. When your changes are complete, click **Commit** to commit the changes to the database, or **Revert**, to cancel all your changes. If you choose to commit your changes, you are asked to confirm; click **Yes** to commit your changes.

Generate Encryption Keys

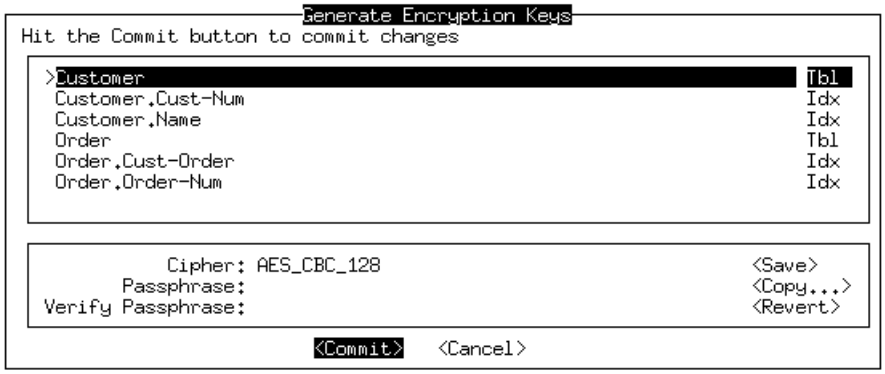
Generate new encryption keys for existing encryption policies with the **Generate Encryption Key** dialog box. Periodically generating a new encryption key (rekeying) for an existing policy is part of the recommended encryption policy maintenance best practices.

To generate a new encryption key for an existing encryption policy:

1. From the **Data Dictionary**, choose **Admin** > **Security** > **Encryption Policies** > **Generate Encryption Keys**. The **Object Selector** dialog box appears.

   By default, only tables and indexes with existing encryption policies are shown. You can also show LOBs with encryption policies by checking **Show LOBs**. You can refine the list by filtering by cipher if you check **Filter Cipher** and choose a cipher.

2. Select the object or objects you want to generate new encryption keys for and click **OK**. The **Generate Encryption Keys** dialog box appears:

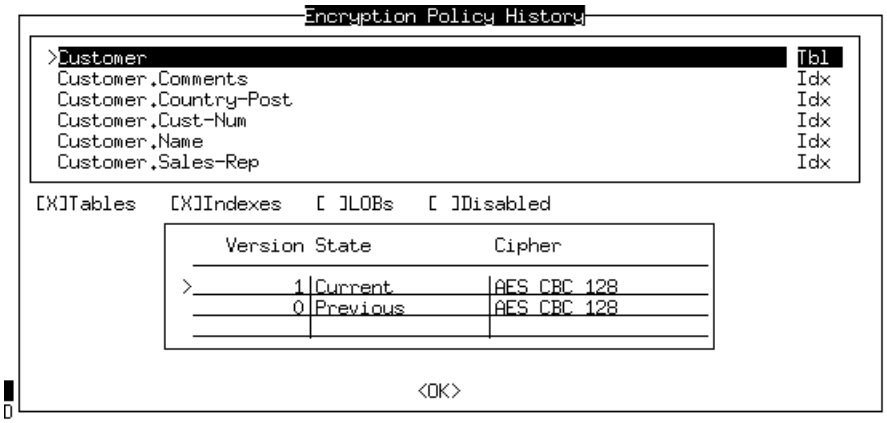


Note: The **Save**, **Copy**, and **Revert** buttons are disabled, as well as the **Passphrase** and **Verify Passphrase** fill-ins.

3. Click **Commit** to generate new keys for all the objects listed in the **Generate Encryption Keys** dialog box, or click **Cancel** to not generate any keys.
4. If you click **Commit**, you are asked to confirm your decision.

Encryption Policy History

You can view the history of encryption policies. Choose **Admin** > **Security** > **Encryption Policies** > **Encryption Policy History**, and the **Encryption Policy History** dialog box appears:



For the selected object, the encryption policy history displays the following information for the selected object:

- **Version** — The version number of the encryption policy. Numbering starts at 0 and increases with every policy change.
- **State** — The state of the policy, either Current or Previous.
- **Cipher** — The encryption policy cipher. For objects with encryption disabled, the cipher column lists Disabled.

Export Data option

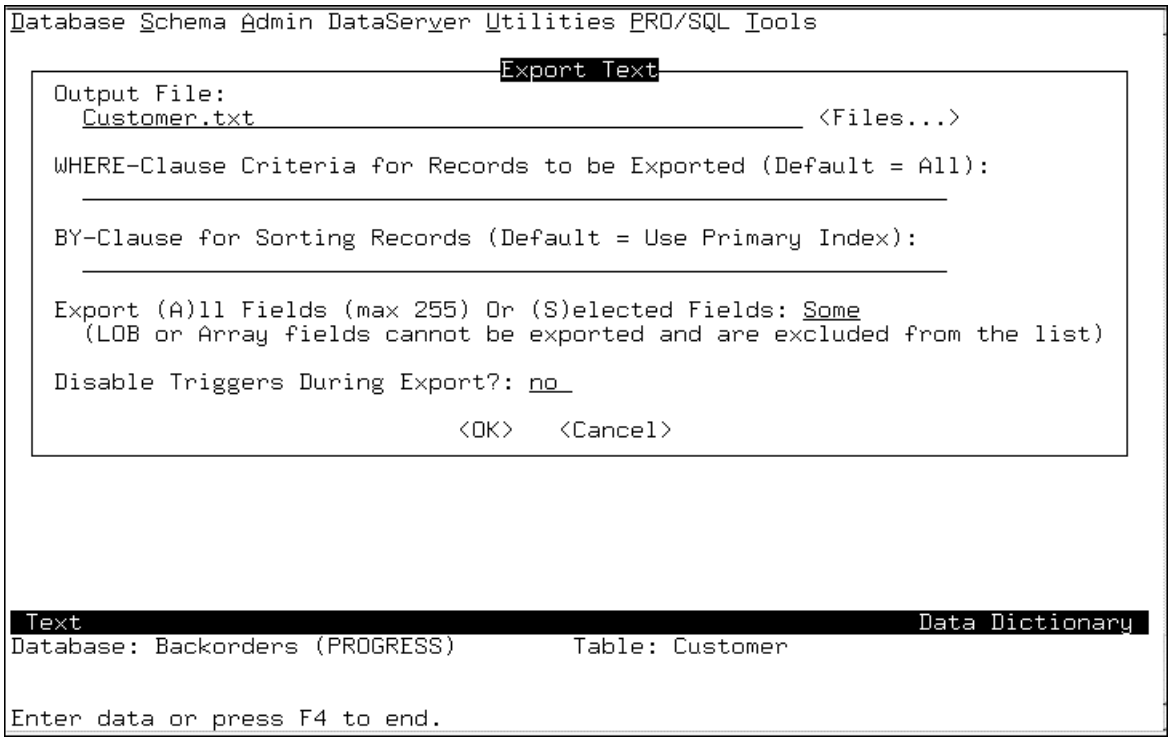
Choose this option to export data in different formats. The following table describes the menu that appears when you choose this option.

Table 35: Export Data menu

Menu option	Description
DIF ...	Exports data records in DIF format
SYLK ...	Exports data records in SYLK format
Text ...	Exports data records in plain text format
Microsoft Word Merge Data...	Exports data records to Microsoft Word in text format

Choose these options to export data in the specified format. When you choose the desired format, the Data Dictionary alphabetically lists all the tables defined for your database. When you select a table, a dialog box similar to the one shown in the following figure appears.

Figure 50: Export Text dialog box



The **Export Text** dialog box contains the following user-interface elements:

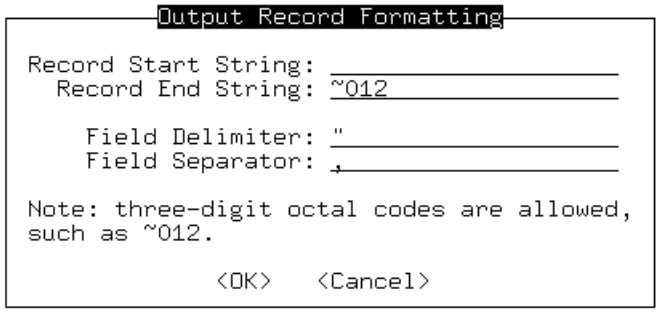
- **Effective Tenant** — For databases enabled for multi-tenancy, the tenant of the data being exported (not shown in the following figure).
- **Output File** — Specifies the name of the destination file. The following table lists the export format file extensions.

Table 36: Export format file extensions

File format	Extension
DIF	`.dif`
SYLK	`.sl`
Text	`.txt`
WordStar	`.txt`
Microsoft Word	`.doc`
WordPerfect	`.txt`

If your output is to text format, the **Output Record Formatting** dialog box shown in the following figure appears.

Figure 51: Output Record Formatting dialog box



The **Output Record Formatting** dialog box contains the following user-interface elements:

- **Record Start String** — Specifies the character that indicates the beginning of a record. Enter the appropriate three-digit code.
- **Record End String** — Specifies the character that indicates the end of a record. The default is a carriage return (~012).
- **Field Delimiter** — Specifies the character that surrounds a field. The default is a quotation mark (").
- **Field Separator**— Specifies the character that separates fields. The default is a comma (,).

  Note: Do not use an escape character, tilde (~), or backslash (\) as a field delimiter or field separator.

  For all formats, the Data Dictionary informs you of the number of records it dumped in specified format and prompts you to continue.
- **WHERE-Clause** — Specifies the record selection criteria (for example, `WHERE cost > 100`). A record becomes a row in a worksheet, and the worksheet starting point is always row 1, column 1. The default is to select all the records.
- **BY-Clause** — Specifies that you want to sort the records using a BY clause (for example, `BY name`). The default is to use the primary index.
- **Export Fields** — Specifies the fields you want to export. The default value is **Some**. Each field corresponds to a worksheet column.

  If you specify **Selected Fields**, the Data Dictionary lists all the fields in the specified file. To select a field, press **SPACEBAR** to highlight the field, than press **RETURN**. Select the fields in the order you want to export them into your destination file. To skip a column in the worksheet, do not press **RETURN** while the field is highlighted. Press **GO** to export the fields.
- **Disable Triggers During Export** — Specifies whether to disable triggers during the export.

Import Data option

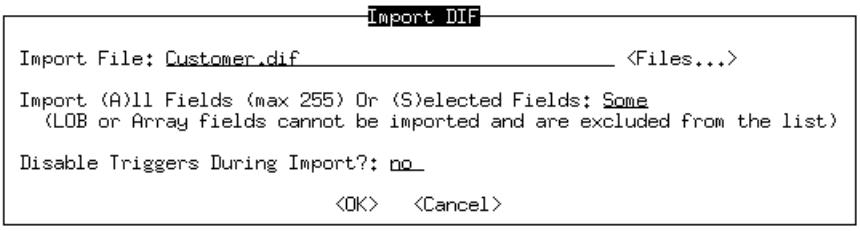
Choose this option to import data with different file formats to the working database. The following table describes the menu that appears when you choose this option.

Table 37: Import Data menu

Menu option	Description
DIF ...	Imports files with DIF format
SYLK ...	Imports files with SYLK format
Delimited Text ...	Imports files with text format
Fixed-Length ...	Imports files in fixed-length file format
dBASE Definitions ...	Imports dBASE II, III, III+, and IV file structures
dBASE File Contents ...	Imports files with dBASE format

Choose **Import Data**. Then choose the **DIF**, **SYLK**, **Delimited Text**, or **dBASE File Contents** option to import data in the specified format. When you choose the desired format, the Data Dictionary alphabetically lists all the tables defined for your database. When you select a table, a dialog box similar to the one shown in the following figure appears.

Figure 52: Import DIF dialog box



The **Import DIF** dialog box contains the following fields:

- **Effective Tenant** — For databases enabled for multi-tenancy, the tenant of the data being imported (not shown in the following figure).
- **Import File** — Specifies the load file.
- **Import** — Specifies the fields you want to import. The default value is **Some**. Each field corresponds to a worksheet column. Each row in the worksheet becomes a record in the table. For each row, the Data Dictionary loads worksheet values column by column into the specified record fields.

  If you specify **Selected Fields**, the Data Dictionary lists all the fields in the specified file. To select a field, press **SPACEBAR** to highlight the field, than press **RETURN**. Select the fields in the order you want to import them into your file. To skip a column in the worksheet, do not press **RETURN** while the field is highlighted. Press **GO** to import the fields.

- **Disable Triggers During Import** — Specifies whether to disable triggers during the import.

Note: To import a file in delimited text format, you must also specify the field separation character. To import dBASE file contents, you must also specify if the file originated on an IBM PC or compatible.

Fixed-Length option

Choose **Import Data** > **Fixed-Length** to import data in fixed-length format. When you choose this option, the Data Dictionary alphabetically lists all the tables defined for your database. When you select a table, the **Import Fixed-Length** dialog box shown in the following figure appears.

Figure 53: Import Fixed-Length dialog box

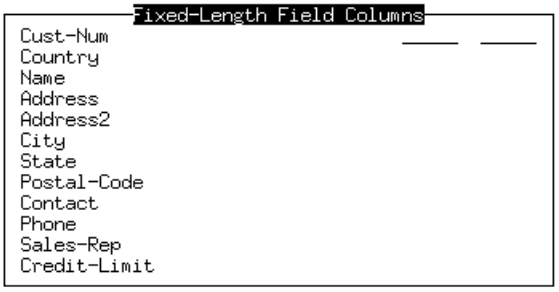


The **Import Fixed-Length** dialog box contains the following user-interface elements:

- **Effective Tenant** — For databases enabled for multi-tenancy, the tenant of the data being imported (not shown in the following figure).
- **Import File** —Specifies the load file
- **Disable Triggers During Import** — Specifies whether to disable triggers during the import

After you choose **OK** from the **Import Fixed-Length** dialog box, the **Fixed-Length Field Columns** dialog box shown in the following figure appears.

Figure 54: Fixed-Length Field Columns dialog box

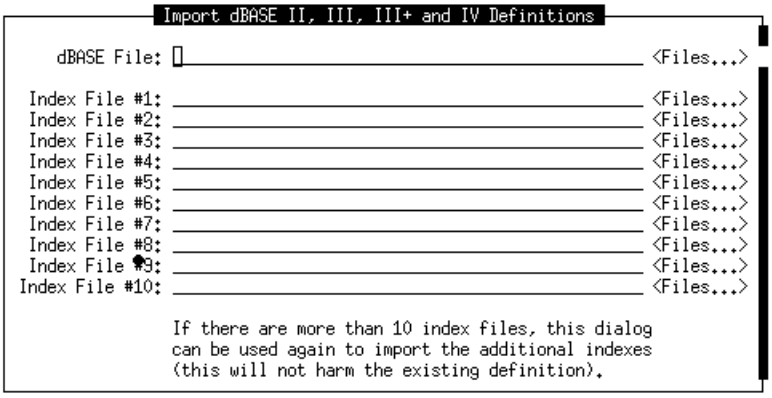


The **Fixed-Length Field Columns** dialog box lists the fields you can import.

dBASE Definitions option

Choose **Import Data** > **dBASE Definitions** to import dBASE II, III+, and IV file structures. When you choose this option, the **Import dBASE II, III, III+ and IV Definitions** dialog box shown in the following figure appears.

Figure 55: Import dBASE II, III, III+ and IV Definitions dialog box



Specify the DBF filename and up to 10 index (NDX) names. If you want to import more than 10 indexes, you must rerun the option and specify the remaining indexes.

Create Bulk Loader Description File option

You use the bulk loader description file with the Bulk Loader utility to load data files into an OpenEdge database more quickly than you can using the Data Dictionary Load utility. See Create a bulk loader description file on page 39 for more information about this menu option.

Database options

Choose this option to maintain auditing and security options for your database. When you choose this option, the **Database Options** dialog box appears, divided into two sections: **Auditing Options** and **Security Options**.

The **Auditing Options** section contains the following fields:

- **Use Application User Id for Auditing** — Overrides the database connection's user ID for recording audit user ID and uses the application level user ID (if set) for auditing
- **Enforce Audit Insert Privilege** — Requires that users of applications that use Application Auditing, and that set Auditing Context, have the Application Audit Event Inserter privilege granted to them

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Note: If auditing is not enabled for the database, the Data Dictionary disables the **Auditing Option** fields.

The **Security Options** section contains the following fields:

- **Trust Application Domain Registry** — Overrides the database connection's domain registry settings and uses the application level domain registry settings
- **Disallow Blank UserId** — Blocks database connections with blank user IDs
- **Record Authenticated Client Sessions** — Record user login sessions

- **Use Runtime Permissions Checking** — Applies `CAN-WRITE` and `CAN-READ` permissions at runtime, rather than at compile time

Enabling large key entries

For databases of 4K and 8K block size, large key entries are enabled by default on newly created databases, providing a substantial increase in the index key width limits. Large key entries are not available for databases that are read-only, non-OpenEdge, either 1K or 2K in block size, or served by a database server from an earlier OpenEdge release.

You must be a database administrator to enable large key entries on a connected database. Large key entry support cannot be disabled. From the Data Dictionary, choose **Admin** > **Enable Large Key Entries**. For OpenEdge Release 10.1C and higher databases, a message appears informing you that large key entries are already enabled. For pre-OpenEdge Release 10.1C databases, a message asking you to confirm that you do want to enable large key entries appears.

Alternate Buffer Pool Maintenance

The Alternate Buffer Pool is a collection of buffers in shared memory that are logically separate from the primary buffer pool. Management of the buffers in the Alternate Buffer Pool is independent of the primary buffer pool. Assigning specific database areas or objects to occupy buffers from the Alternate Buffer Pool might improve your buffer hit rate, thereby reducing the need to read and write buffers to and from disk, and possibly improving performance.

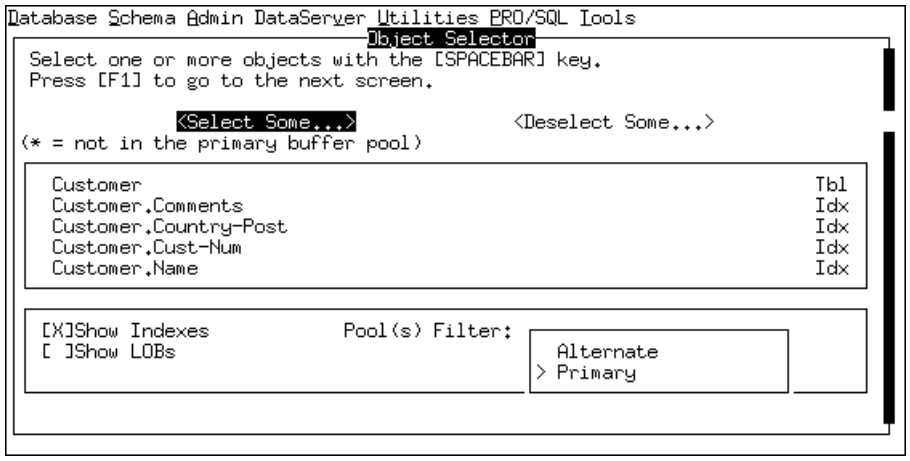
Specifying the best objects for the Alternate Buffer Pool is application-specific. Tables considered "hot" (very active) are good candidates, as are their related indexes. Tables and indexes that are governed by an encryption policy are also considered good candidates because the cost of encrypting and decrypting blocks as they are written and read from disk can be high.

Choose **Admin** > **Alternate Buffer Pool** > **Alternate Buffer Pool Maintenance** to identify objects for the Alternate Buffer Pool. The objects must reside in a Type II area to be individually designated for the Alternate Buffer Pool. Object-level assignments can be made either while the database is online, or while the database is in single-user mode.

Note: Alternate Buffer Pool assignments for SQL objects are made with OpenEdge SQL syntax. For more information, see *OpenEdge SQL Reference*. Alternate Buffer pool assignments for Type I and Type II areas are made with PROUTIL ENABLEB2. For more information, see *Manage the OpenEdge Database*.

To select objects for the Alternate Buffer Pool:

1. Choose **Admin** > **Alternate Buffer Pool** > **Alternate Buffer Pool Maintenance**. The **Object Selector** dialog box appears, as shown:



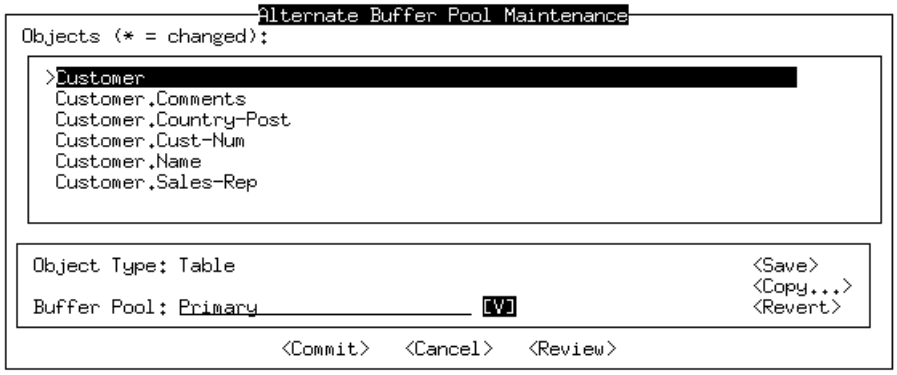
2. Scroll through the list in the **Object Selector** dialog box, to select objects, or click **Select Some** to bring up the **Select Objects by Pattern Match** dialog box to refine the list. The initial view displays the tables and indexes of the connected database that are currently assigned to the Primary buffer pool.

   You can change the list to view objects in the Alternate Buffer Pool by selecting **Alternate** from the **Pool(s) Filter**, or you can select both **Primary** and **Alternate**. Objects not in the Primary buffer pool have an asterisk before the object type.

3. If you selected too many objects, clicking **Deselect Some** brings up the **Deselect Objects by Pattern Match** dialog box, which allows you to enter an object name or pattern you want to deselect.

4. Once you have selected all the objects, click **OK** to proceed. The **Alternate Buffer Pool Maintenance** dialog box appears, as shown in the following figure.

   Figure 56: Alternate Buffer Pool Maintenance dialog box

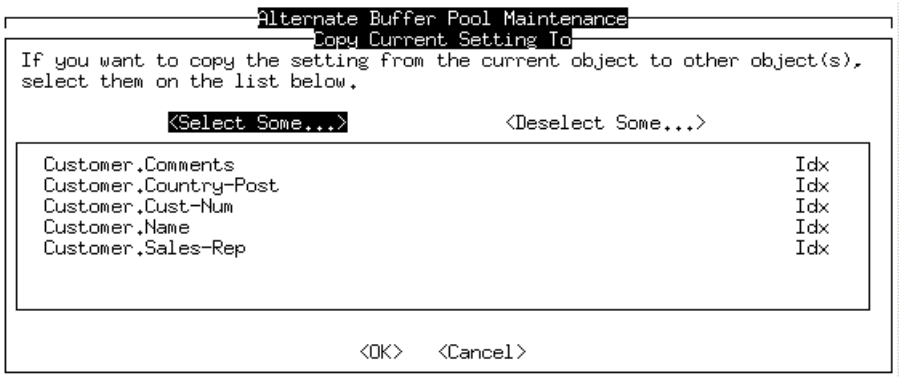


5. Select an object, and change the **Buffer Pool** selection to **Alternate**. Click **Save** to make the change, or click **Reset** to undo the change.

Note: The change is not committed to the database until you click **Commit**.

6. Once you save a change, the **Copy** button is activated. Click **Copy** to propagate your change to multiple objects at once with the **Alternate Buffer Pool Maintenance Copy Current Setting To** dialog box, shown in the following figure.

   Figure 57: Alternate Buffer Pool Maintenance Copy Current Setting To dialog box



7. Continue selecting and modifying object settings until you have specified all the objects you want to change. An asterisk (*) in front of the object name indicates you made changes to that object. Click **Review** at any time to view the status of your changes.
8. When you complete your changes, click **Commit** to commit the changes to the database, or click **Revert**, to cancel all the changes. If you choose to commit your changes, you are asked to confirm your choice.

   To remove objects from the Alternate Buffer Pool, follow the same steps as the procedure to select objects for the Alternate Buffer Pool, except in Step <> 5, specify **Primary** for the **Buffer Pool** assignment.

11

Advanced Menus Reference

This topic provides details about the **Utilities** menu and the **PRO/SQL** menu, and also directs you to where you can find more information about the **DataServer** menu and the **Tools** menu.

For details, see the following topics:

- DataServer menu
- Utilities menu
- PRO/SQL menu options
- Tools menu

DataServer menu

Choose the **DataServer** menu to manage your DataServers. The following table describes the menu that appears when you choose this option. For more information on these menu options, see the applicable DataServer documentation:

- For the DataServer for MS SQL Server, see *Use the Microsoft SQL Data Server*
- For the DataServer for Oracle, see *Use the Oracle Data Server*
- For the DataServer for ODBC, see *OpenEdge Data Management: DataServer for ODBC*

Table 38: DataServer menu

Menu option	Task performed
MS SQL Server Utilities->	Accesses utilities for managing MS SQL Server DataServers
ODBC Utilities->	Accesses utilities for managing ODBC DataServers
ORACLE Utilities->	Accesses utilities for managing ORACLE DataServers

Utilities menu

Options on the **Utilities** menu allow you to edit parameter files, freeze and unfreeze database tables, access the Quoter utility, generate include files for use with ABL, edit auto-connect lists, deactivate indexes, and view information about the database and the current session parameters.

The following table describes the menu that appears when you choose this option. The sections that follow provide more detailed descriptions of the options.

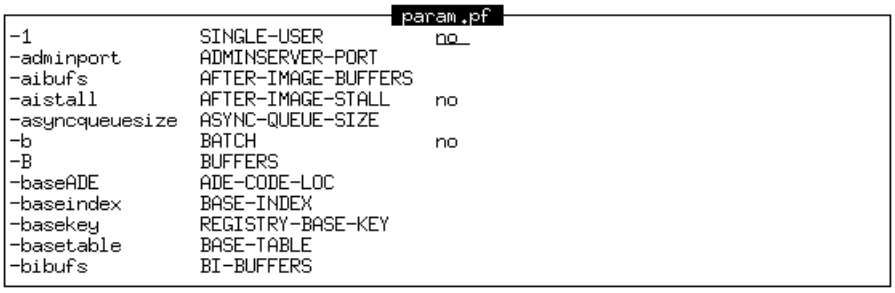
Table 39: Utilities menu

Menu option	Task performed
Editor for Parameter Files...	Edits a parameter file
Quoter Functions->	Formats a data file so that OpenEdge can read the data into an OpenEdge database
Generate Include Files->	Generates an include file
Edit OpenEdge Auto-Connect List...	Prepares a list of secondary OpenEdge databases to which OpenEdge connects automatically, as required when you run a procedure from a primary database
Freeze/Unfreeze...	Freezes or unfreezes a table
Index Deactivation...	Deactivates indexes
Information...	Displays general information about the database and the OpenEdge product you are using

Editor for Parameter Files option

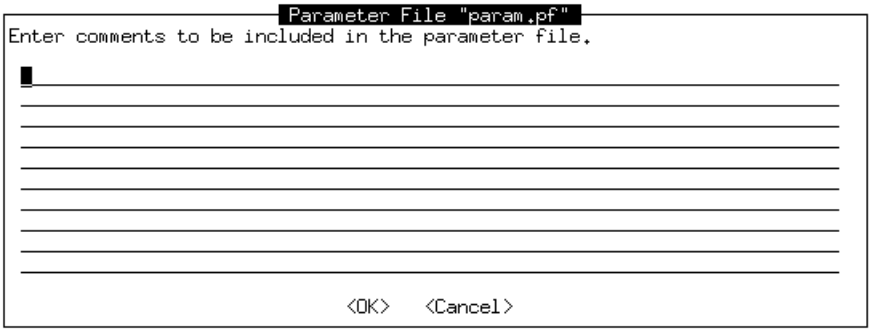
Choose **Utilities** > **Editor for Parameter Files** to view a complete list of startup parameters, fill in the desired values, and write out a `.pf` file (rather than typing in the parameter file with an ordinary text editor). When you choose this option, the Data Dictionary prompts you for the name of the `.pf` file to edit or create. After you specify the filename, the **Edit Parameter File (param.pf)** dialog box shown in the following figure appears.

Figure 58: Edit Parameter File dialog box



Specify the parameters you want, then press **GO**. The Data Dictionary displays a dialog box similar to the one shown in the following figure. Enter comments, then choose **OK**.

Figure 59: Parameter File Comments dialog box



Quoter Functions option

Choose this option to format a data file so that the Data Dictionary can read the data into an OpenEdge database. For more information about the quoter utility, see *OpenEdge Programming Interfaces*.

The following table describes the menu that appears when you choose this option. The sections that follow provide more detailed descriptions of the options.

Table 40: Quoter Functions menu

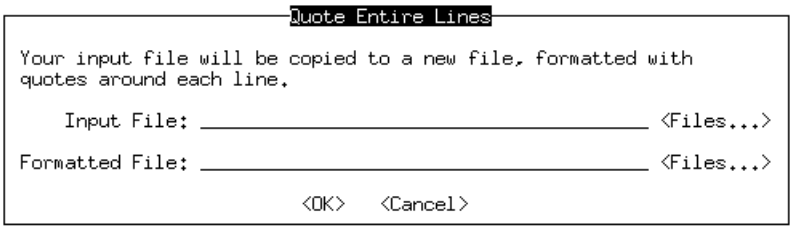
Menu option	Task performed
Entire Lines...	Copies your input file to a new file formatted with quotes around each line
By Delimiter...	Copies your input file to a new file formatted with quotes around each delimited field

Menu option	Task performed
By Column Ranges...	Copies your input file to a new file formatted with quotes around each column-defined field
Quoter Include File...	Creates an include file that contains a quoter command

Entire Lines option

Choose **Quoter Functions** > **Entire Lines** to copy your input file to a new file formatted with quotes around each line, ready for input. When you choose this option, the **Quote Entire Lines** dialog box shown in the following figure appears.

Figure 60: Quote Entire Lines dialog box



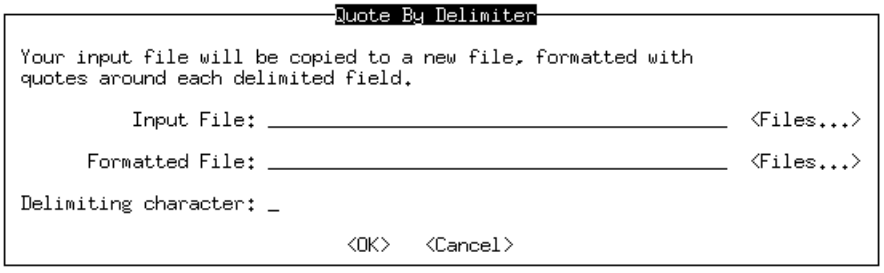
The **Quote Entire Lines** dialog box contains the following fields:

- **Input File** —Specifies the filename of the input file to format
- **Formatted File** — Specifies the filename of the new formatted file
- **Files** — Displays a dialog box that lets you select a file from a list of existing files

By Delimiter option

Choose **Quoter Functions** > **By Delimiter** to copy your input file to a new file formatted with quotes around each delimited field, ready for input. When you choose this option, the **Quote By Delimiter** dialog box shown in the following figure appears.

Figure 61: Quote By Delimiter dialog box



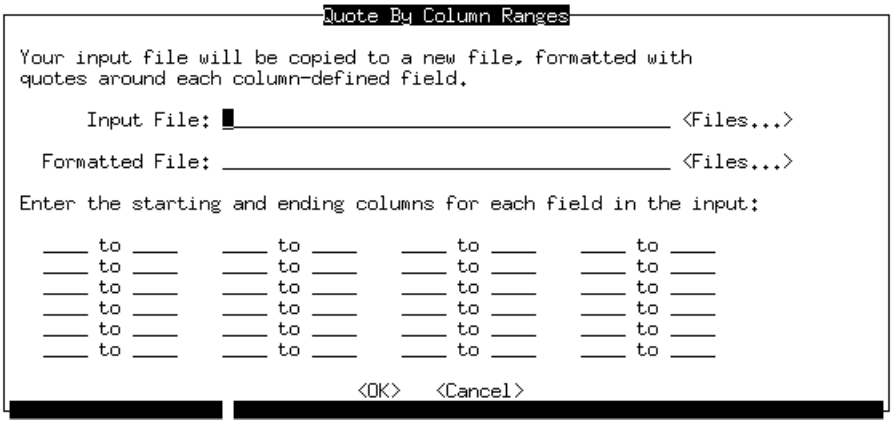
The **Quote By Delimiter** dialog box contains the following fields:

- **Input File** — Specifies the filename of the input file to format
- **Formatted File** — Specifies the filename of the new formatted file
- **Delimiting Character** — Specifies the character with which to delimit each field
- **Files** — Displays a dialog box that lets you select a file from a list of existing files

By Column Ranges option

Choose **Quoter Functions** > **By Column Ranges** to copy your input file to a new file formatted with quotes around each column-defined field, ready for input. When you choose this option, the **Quote By Column Ranges** dialog box shown in the following figure appears.

Figure 62: Quote By Column Ranges dialog box



The **Quote By Column Ranges** dialog box contains the following fields:

- **Input File** — Specifies the filename of the input file to format
- **Formatted File** — Specifies the filename of the new formatted file
- **Files** — Displays a dialog box that lets you select a file from a list of existing files

Generate Include Files option

Choose this option to quickly prepare an include file to store language statements. Because the ASSIGN, FORM, and DEFINE WORK-TABLE statements can be long and complicated, you might want to store them in an include file. Also, particular instances of these statements are often repeated in different procedures, and using an include file lets you easily insert them into any ABL procedure. See the following reference entries in *OpenEdge ABL Reference on page 1* for more information: { }Include File, ASSIGN statement, FORM statement, and DEFINE WORK-TABLE statement.

The following table describes the menu that appears when you choose the **Generate Include Files** option. The sections that follow provide more detailed descriptions of the options.

Table 41: Generate Include Files menu

Menu option	Task performed
ASSIGN Statement ...	Generates an ASSIGN statement to copy a table
FORM Statement ...	Generates a FORM statement for a table
DEFINE WORK-TABLE Statement ...	Generates a WORK-TABLE statement for a table

ASSIGN Statement option

Use this option to generate an ASSIGN statement to copy a table. The Data Dictionary alphabetically lists all the tables defined for your database. When you choose a table, the Data Dictionary prompts you for the filename of the output file. The default filename is *table-name*.i. The Data Dictionary creates an output file that contains an ASSIGN statement to copy each field of the table from one buffer record to another and prompts you to continue.

The following figure shows an example of the ASSIGN statement generated for the Customer table in the Sports database.

Figure 63: ASSIGN statement example

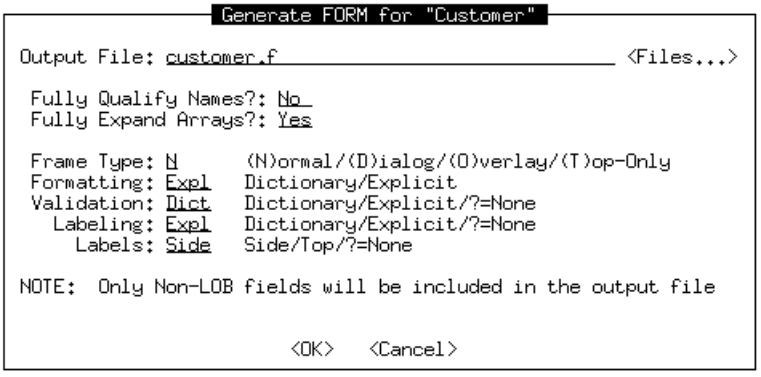
```
/* 22/09/06 COPY assignment */

DO:
  ASSIGN
    {1}.Cust-Num      = {2}.Cust-Num
    {1}.Country       = {2}.Country
    {1}.Name          = {2}.Name
    {1}.Address       = {2}.Address
    {1}.Address2      = {2}.Address2
    {1}.City          = {2}.City
    {1}.State         = {2}.State
    {1}.Postal-Code   = {2}.Postal-Code
    {1}.Contact       = {2}.Contact
    {1}.Phone         = {2}.Phone
    {1}.Sales-Rep     = {2}.Sales-Rep
    {1}.Credit-Limit  = {2}.Credit-Limit
    {1}.Balance       = {2}.Balance
    {1}.Terms         = {2}.Terms
    {1}.Discount      = {2}.Discount
    {1}.Comments      = {2}.Comments.
END.
```

FORM Statement option

Choose **Generate Include Files** > **FORM Statement** to generate a FORM statement for a table. The Data Dictionary alphabetically lists all the tables defined for your database. When you select a table, the **Generate FORM for "selected-table-name"** dialog box appears, as shown in the following figure appears.

Figure 64: Generate FORM for "Customer" dialog box



The **Generate FORM** dialog box contains the following fields:

- **Output File** — Specifies the filename of the output file. The default filename is the table name with a .f extension.
- **Fully Qualify Names** — Specifies whether to qualify field names with table names (for example, *table-name.field-name*). The default value is **No**.

- **Fully Expand Arrays** — Specifies whether to fully expand arrays. For example, X[1] is expanded and X is not expanded. The default value is **Yes**.
- **Frame Type** — Specifies the type of frame to use. The options are **Normal**, **Dialog**, **Overlay**, or **Top-Only**. The default value is **Normal**.
- **Formatting** — Specifies the formatting to use. The options are **Dictionary** or **Explicit**. **Dictionary** specifies to use the Data Dictionary default formats without listing them in the FORM statement. **Explicit** specifies to explicitly list the format definitions in the FORM statement. The default value is **Explicit**.
- **Validation** — Specifies what type of validation to use. The options are **Dictionary**, **Explicit**, or **None**. The default value is **Dictionary**. **Dictionary** specifies to use the Data Dictionary default validation without listing them in the FORM statement. **Explicit** specifies to explicitly list the validation definitions in the FORM statement. **None** specifies that you do not want to use validation from the Dictionary or from FORM statements.
- **Labeling** — Specifies what type of labeling to use. The options are **Dictionary**, **Explicit**, or **None**. The default value is **Explicit**. **Dictionary** specifies to use the Data Dictionary default labels without listing them in the FORM statement. **Explicit** specifies to explicitly list the label definitions in the FORM statement. **None** specifies that you do not want to use any labels.
- **Labels** — Specifies the label position. The options are **Side**, **Top**, or **None**. The default value is **Side**.

The following figure shows an example of the FORM statement generated for the Customer table in the Sports database.

Figure 65: FORM statement example

```
/* 22/09/06 FORM LIKE table Customer */

FORM
  Cust-Num FORMAT ">>>>9"
  Country FORMAT "x(20)"
  Name FORMAT "x(20)"
  Address FORMAT "x(30)"
  Address2 FORMAT "x(5)"
  City FORMAT "x(12)"
  State FORMAT "x(20)"
  Postal-Code FORMAT "x(5)"
  Contact FORMAT "x(20)"
  Phone FORMAT "x(20)"
  Sales-Rep FORMAT "X(4)"
  Credit-Limit FORMAT "->,>>>,>>9"
  Balance FORMAT "->,>>>,>>9.99"
  Terms FORMAT "x(20)"
  Discount FORMAT ">>9%"
  Comments FORMAT "x(60)"
  WITH FRAME customer SIDE-LABELS.
```

DEFINE WORK-TABLE Statement option

Use this option to generate a DEFINE WORK-TABLE statement for a table. The Data Dictionary alphabetically lists all the tables defined for your database. When you choose a table, the Data Dictionary prompts you for the filename of the output file. The default filename is *table-name*.i. The Data Dictionary displays a status message and prompts you to continue.

The following figure shows an example of the DEFINE WORK-TABLE statement generated for the Customer table in the Sports database.

Figure 66: DEFINE WORK-TABLE statement example

```
/* 22/09/06 workfile definition for table Customer */
/* {1} = "", "NEW" or "NEW SHARED" */
/* {2} = "" or "NO-UNDO" */

DEFINE {1} WORK-TABLE wcustomer {2} /* LIKE Customer */
  FIELD Address      AS CHARACTER   FORMAT "x(30)"
  FIELD Address2     AS CHARACTER   FORMAT "x(5)"
  FIELD Balance      AS DECIMAL     DECIMALS 2 FORMAT "->,>>>,>>9.99"
  FIELD City         AS CHARACTER   FORMAT "x(12)"
  FIELD Comments     AS CHARACTER   FORMAT "x(60)"
  FIELD Contact      AS CHARACTER   FORMAT "x(20)"
  FIELD Country      AS CHARACTER   FORMAT "x(20)" INITIAL "USA"
  FIELD Credit-Limit AS DECIMAL     DECIMALS 2 FORMAT "->,>>>,>>9" INITIAL 1500
  FIELD Cust-Num     AS INTEGER     FORMAT ">>>>9"
  FIELD Discount     AS INTEGER     FORMAT ">>9%"
  FIELD Name         AS CHARACTER   FORMAT "x(20)"
  FIELD Phone        AS CHARACTER   FORMAT "x(20)"
  FIELD Postal-Code  AS CHARACTER   FORMAT "x(5)"
  FIELD Sales-Rep    AS CHARACTER   FORMAT "X(4)"
  FIELD State        AS CHARACTER   FORMAT "x(20)"
  FIELD Terms        AS CHARACTER   FORMAT "x(20)" INITIAL "Net30".
```

Edit OpenEdge Auto-Connect List option

Choose **Utilities** > **Edit Auto-Connect List** to create or modify the auto-connect list. The *auto-connect list* is a list of secondary databases (with connection parameters) that are connected automatically as required during program execution on a primary database. You can define one list for each OpenEdge database.

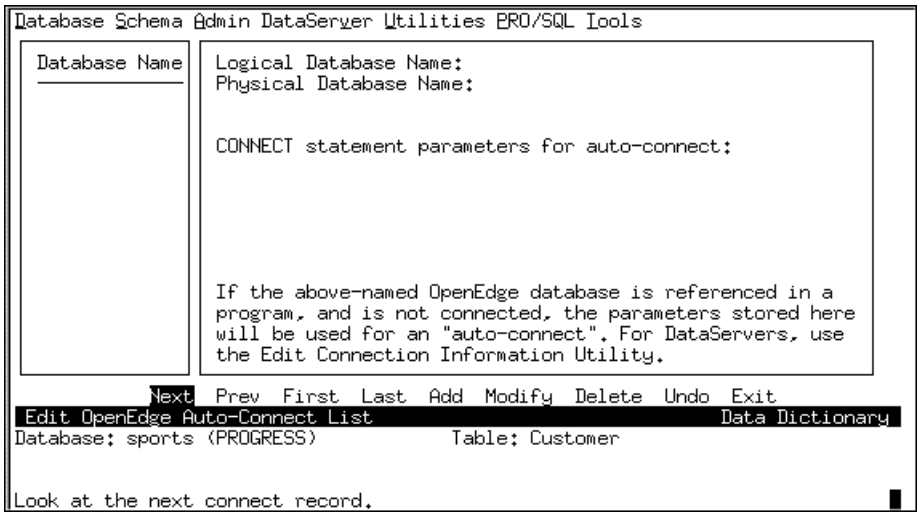
Note: To use the Auto-Connect feature for non-OpenEdge databases, use the **Edit Connection Parameters** option under the appropriate DataServer submenu option. See the appropriate DataServer manual for information on auto-connecting to non-OpenEdge databases.

The auto-connect feature uses information stored in a primary application database to connect to a secondary application database. The primary application database contains the database connection information for the secondary database. When data from the second database is referenced in a compiled application at run time, the primary application database must already be connected before the database engine can execute the auto-connect for the secondary application database. The database engine executes an auto-connect immediately prior to running a procedure that accesses a database on the auto-connect list.

If you connect a database with the CONNECT statement, and that database also has an auto-connect entry in an already connected database, the CONNECT statement uses the information from the auto-connect list; however, the explicit connection information in the CONNECT statement takes precedence. For more information about auto-connect, see the topic on database access in *OpenEdge Programming Interfaces*.

When you choose this option, the **Edit OpenEdge Auto-Connect List** dialog box shown in the following figure appears.

Figure 67: Edit OpenEdge Auto-Connect List dialog box



The **Edit OpenEdge Auto-Connect List** dialog box contains the following user-interface elements:

- **Database Name** —Displays the list of databases to which the database engine connects automatically
- **Logical Database Name** — Specifies the logical name of the database highlighted in the **Database Name** list
- **Physical Database Name** — Specifies the physical name of the database highlighted in the **Database Name** list
- **CONNECT statement parameters for auto-connect**— Specifies any other startup parameters for the database that are not included in the parameter file

The following table describes the buttons on the **Edit OpenEdge Auto-Connect List** dialog box.

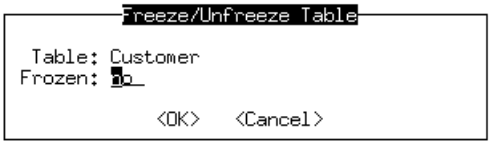
Table 42: Edit OpenEdge Auto-Connect List options

Option	Task performed
Next	Displays the next connect record
Prev	Displays the previous connect record
First	Displays the first connect record
Last	Displays the last connect record
Add	Adds a new connect record
Modify	Modifies the selected connect record
Delete	Deletes the selected connect record
Undo	Exits and undoes all changes you made in this session to the Auto Connect list
Exit	Exits and saves changes

Freeze/Unfreeze Table option

Choose **Utilities** > **Freeze/Unfreeze** to freeze or unfreeze a database table. Freezing a database table prevents users from changing the table, field, or index definitions for the table. The Data Dictionary alphabetically lists all the tables defined for your database. When you select a table, the **Freeze/Unfreeze Table** dialog box shown in the following figure appears.

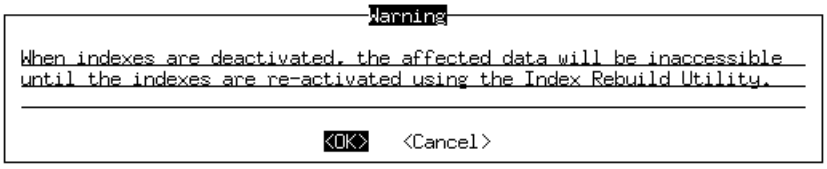
Figure 68: Freeze/Unfreeze Table dialog box



Index Deactivation option

Choose **Utilities** > **Index Deactivation** to deactivate indexes. When you choose this option, the **Index Deactivation Warning** dialog box shown in the following figure appears.

Figure 69: Index Deactivation Warning dialog box



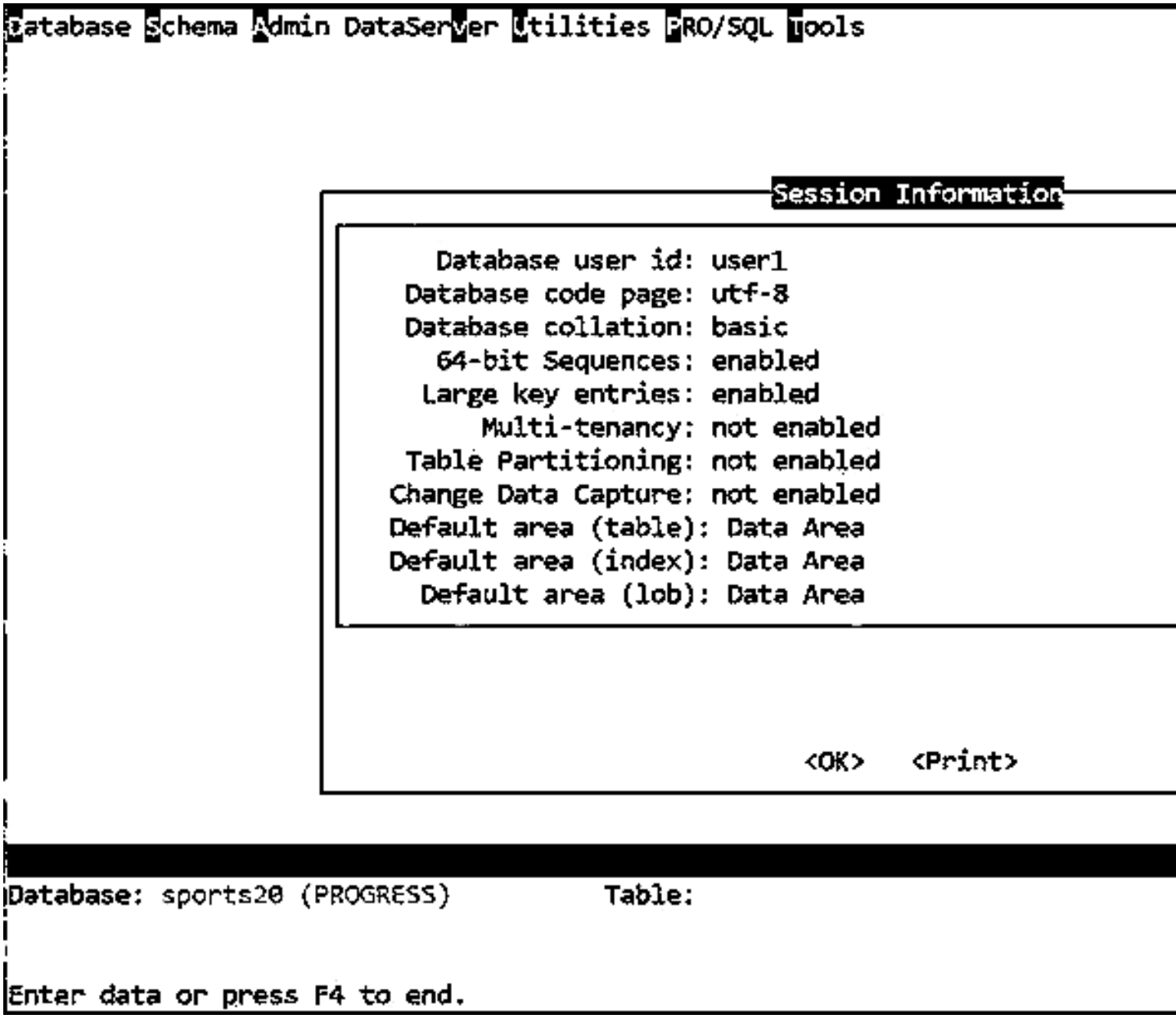
After you read the information, choose OK. The Data Dictionary alphabetically lists all the tables defined for the database. Select the table for which you want to deactivate indexes or enter ALL to deactivate all your indexes. If you specified an individual table, the Data Dictionary lists the indexes defined for that table. Select the indexes you want to deactivate, then press **GO**. The Data Dictionary prompts you to verify your entry.

Information option

Choose **Utilities** > **Information** to display general information about the database and the OpenEdge product you are using. Information displayed includes the number of connected databases, physical and logical names of the selected database, whether the selected database is connected, and if 64-bit sequences and large key entries are enabled. To send the report to a file or printer, choose `Print`. The Data Dictionary prompts you for the printer or filename, whether you want to append the report to an existing file, and the page length.

To exit the **Information** window, choose OK. The Data Dictionary displays the video attribute settings that determine how the information appears on the monitor.

Figure 70: Session Information



PRO/SQL menu options

Choose the **PRO/SQL** menu options to manage views created with Progress/SQL statements.

The following table describes the menu that appears when you choose this option. The sections that follow provide more detailed descriptions of the options.

Table 43: PRO/SQL menu

Menu option	Task performed
PRO/SQL View Report...	Lists information stored for views
Dump as CREATE VIEW Statement...	Generates SQL CREATE VIEW statements
Dump as CREATE TABLE Statement...	Generates SQL CREATE TABLE statements

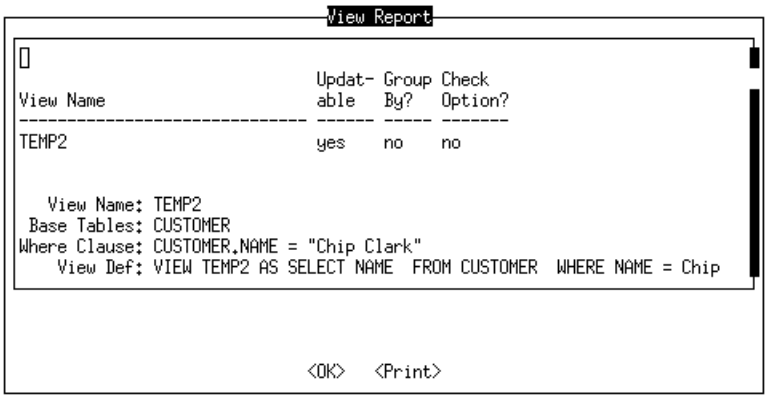
PRO/SQL View Report option

Choose this option to see the information about all SQL views defined for the working database.

Note: Views of non-OpenEdge databases are treated as tables. To display information for these views, use the table reports option. See Database Menu Reference on page 67 for more information on generating a table report.

When you choose **PRO/SQL** > **PRO/SQL View Report**, the Data Dictionary alphabetically lists all the views defined for your database. Select the views for which you want information. The following figure shows the first portion of a **View Report** window.

Figure 71: View Report dialog box



The **View Report** window contains the following fields:

- **View Name** —The name of the view
- **Updatable** — Whether the view is updatable
- **Group By** — Whether the view is defined with a `GROUP BY` clause
- **Check Option** — Whether the view is defined with a `CHECK OPTION WHERE` clause
- **View Name** — View name of the currently displayed view
- **Base Tables** — Tables from which the view gets its information
- **Where Clause** — The `WHERE` clause
- **View Def** — The SQL statement executed when defining the view
- **Can-Read** — Users who can read the rows of the view
- **Can-Write** — Users who can update records of the view

- **Can-Create** — Users who can create new records
- **Can-Delete** — Users who can delete records from the view
- **Order** — Order of the columns within the view
- **View Column Name** — Names of the columns that comprise the view
- **Base Columns** — Base table field names for each view column

To send the report to a file or printer, choose **Print**. The Data Dictionary prompts you for the printer or filename, whether you want to append the report to an existing file, and the page length.

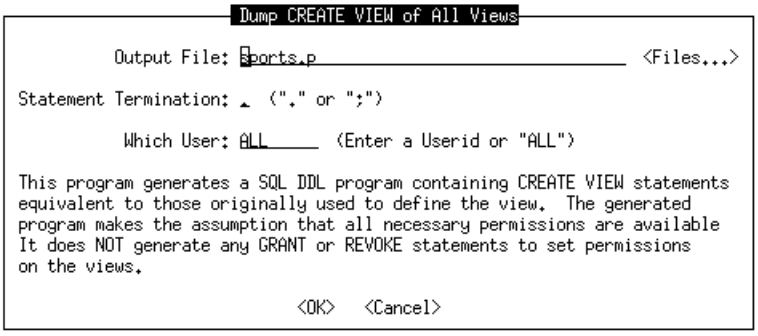
Dump as CREATE VIEW Statement option

Choose **PRO/SQL** > **Dump as CREATE VIEW Statement** to generate an SQL DDL program that contains CREATE VIEW statements equivalent to those originally used to define the selected view.

Note: Views of non-OpenEdge databases are treated as tables. To display information for these views, use the table reports option. See Reports option on page 71 for more information on generating a table report.

When you choose this option, the Data Dictionary alphabetically lists all the views defined for your database. Select the views for which you want make CREATE VIEW statements. The **Dump CREATE VIEW of All Views** dialog box shown in the following figure appears.

Figure 72: Dump CREATE VIEW of All Views dialog box



The **Dump CREATE VIEW of All Views** dialog box contains the following fields:

- **Output File** — Specifies the filename to which you want to write the CREATE VIEW statements. The default filename is either the view or database name with a .p extension.
- **Statement Termination** — Specifies the statement termination character. The options are a period (.) or a semi-colon (;). The default value is a period (.).
- **Which User** — If all views are selected, specifies all users or the User ID of the single user for whom you want to dump the views. The default value is **All Users**.

After generating the file, the Data Dictionary prompts you to continue.

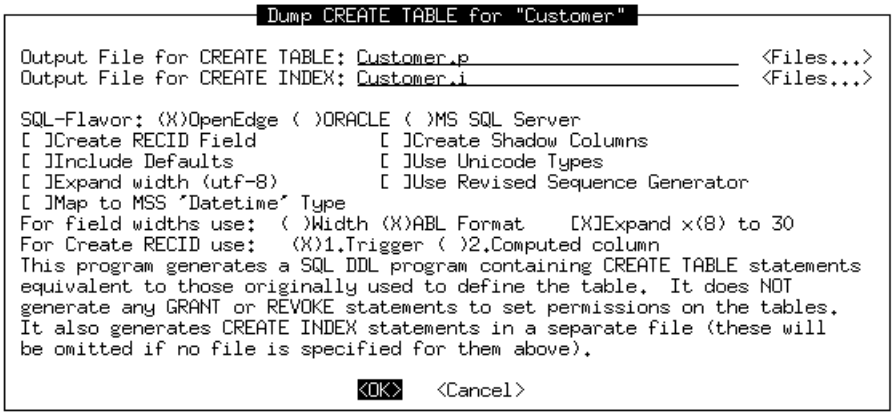
Dump as CREATE TABLE Statements option

Choose **PRO/SQL** > **Dump as CREATE TABLE** and **CREATE INDEX** statements to generate an SQL DDL program that contains CREATE TABLE statements equivalent to those originally used to define the selected table.

Note: This option also works with non-OpenEdge databases.

When you choose this option, the Data Dictionary alphabetically lists all the tables defined for your database. Select the table for which you want to make CREATE TABLE statements. The **Dump CREATE TABLE** dialog box appears, as shown in the following figure:

Figure 73: Dump CREATE TABLE dialog box



The **Dump CREATE TABLE** dialog box contains the following fields:

- **Output File for CREATE TABLE** — Specifies the filename to which you want to write the CREATE TABLE statements. The default filename for a single table is *table-name*.p. If you specify all tables, the default filename is *database-name*.p.
- **Output File for CREATE INDEX** — Specifies the filename to which you want to write the CREATE INDEX statements. The default filename for a single table is *table-name*.i. If you specify all tables, the default filename is *database-name*.i. If you do not specify a filename, the Data Dictionary writes the CREATE INDEX statements to the CREATE TABLE output file.
- **SQL-Flavor** — Specifies the type of SQL you want to use: OpenEdge, ORACLE, or MS SQL Server. When ORACLE is selected, any field defined as INT64 is converted to the NUMBER data type. When MS SQL Server is selected, any field defined as INT64 is converted to BIGINT data type.
- **Create Recid Field** — Select this option if your database currently contains the PROGRESS_RECID field. Selecting this option will maintain the use of PROGRESS_RECID in any new tables added by this utility.
- **Create Shadow Columns** — If your DataServer is configured with a case sensitive code page, this box is available for selection. Selecting it provides case insensitivity compatible with the behavior of an OpenEdge database.
- **Include Defaults** — Select if you want the OpenEdge initial value used as the default in the SQL script.
- **Use Unicode Types** — Select if you want Unicode data types preserved.
- **Expand Width (utf-8)** — Select if you want field widths expanded to hold utf-8 encoded characters.
- **Use Revised Sequence Generator** — Select if you want sequences to be revised.
- **Map to MSS 'Datetime' type** — Select if you have dates you want converted to the MS SQL Server Datetime data type.
- **For field widths use Width** — Select if your OpenEdge database contains data that is larger than the display format. Change the width to the proper size. The utility will use the **Width** field instead of the display format.
- **For field widths use ABL Format** — Select if you want the Data Dictionary to use the display format instead of the field's width.

- **Expand x(8) to 30** — If selected, indicates that fields with FORMAT set to x(8) will be given a default width of 30 characters.
- **For Create RECID use 1.Trigger** — Select if you want a trigger to determine the RECID value.
- **For Create RECID use 2.Computed column** — Select if you want a computed column to determine the RECID value.

After generating the file, the Data Dictionary prompts you to continue.

Tools menu

The **Tools** menu lets you access other OpenEdge tools. See *OpenEdge Development: Basic Development Tools* for more information about the menu options.

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