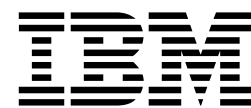


IBM File Export for z/OS



User's Guide

Version 1 Release 1



IBM File Export for z/OS



User's Guide

Version 1 Release 1

Note: Before using this information and the product it supports, be sure to read the general information under Notices.

Third Edition (January 2005)

This edition applies to Version 1 Release 1 of IBM File Export for z/OS (product number 5697-I12) and to all subsequent releases and modifications until otherwise indicated in new editions.

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About this book

This book provides instructions for using IBM File Export for z/OS.

This book is designed to help those responsible for creating and maintaining test data understand the role of IBM File Export for z/OS when used with Sequential or VSAM data, IMS data, or DB2 data.

Always check the DB2 and IMS Tools Library page for the most current version of this publication: www.ibm.com/software/data/db2imstools/library.html

Who should read this book

This book is intended for those persons responsible for customizing and using IBM File Export for z/OS and assumes a working knowledge of:

- The OS/390® or z/OS® operating system
- ISPF
- SMP/E
- IMS
- DB2

Conventions used in this book

This book uses the following highlighting conventions:

- **Boldface type** indicates commands or user interface controls such as names of fields, folder, icons, or menu choices.
- **Monospace type** indicates examples of text that you enter exactly as shown.
- *Italic type* indicates variables that you should replace with a value. It is also used to indicate book titles and to emphasize significant words.

The following labels identify significant elements within this book:

- **Definition:** is used to identify and define terminology unique to this product.
- **Example:** is used to identify example code or scenarios.
- **In this chapter:** is used to identify the significant subsections within each chapter.
- **Recommendation:** is used to provide guidance when more than one option is available.
- **Related reading:** is used to refer you to other publications that contain relevant information.
- **Restriction:** is used to identify a restriction or limitation with this product or an associated procedure.

Terminology used in this book

In this book, IBM File Export for z/OS is referred to as “IBM File Export.” In cases where the context makes the meaning clear, IBM File Export is referred to as “File Export.”

The following terms are used as indicated:

DB2® Represents either the DB2 licensed program or a particular DB2 subsystem.

IMS Represents the IMS licensed program.

In general, for simplicity, the term *file* as used in this manual refers to IMS, VSAM or sequential files, as well as DB2 tables, unless these are specifically differentiated.

Service updates and support information

To find service updates and support information, including software Fix Packs, PTFs, Frequently Asked Question (FAQs), technical notes, troubleshooting information, and downloads, refer to the following Web page:

<http://www.ibm.com/software/awdtools/fileexport/>

Using LookAt to obtain message explanations

LookAt is an online facility that displays explanations for most messages that you encounter, as well as for some system abends and codes. You can access LookAt:

- From the Internet at:
www.ibm.com/eserver/zseries/zos/bkserv/lookat/
- From anywhere in z/OS where you can access a TSO/E command line (for example, a TSO/E prompt, ISPF, or z/OS UNIX System Services running OMVS). To use LookAt as a TSO/E command, LookAt must be installed on your host system. Obtain the LookAt code for TSO/E from a disk on your z/OS Collection (SK3T-4269) or from the LookAt ftp site:
[ftp.software.ibm.com/ps/products/ibmreader/tools/lookat/ZOS](ftp://ftp.software.ibm.com/ps/products/ibmreader/tools/lookat/ZOS)
- From your Palm™ VIIx personal data assistant (PDA). To use LookAt from your Palm VIIx PDA, LookAt must be installed on the PDA. Obtain the LookAt code from a disk on your z/OS Collection (SK3T-4269) or from the LookAt ftp site:
[ftp.software.ibm.com/ps/products/ibmreader/tools/lookat/PALM/](ftp://ftp.software.ibm.com/ps/products/ibmreader/tools/lookat/PALM/)

Where to find information

The Web page listed below provides the most current product documentation that you can view, print, and download.

<http://www.ibm.com/software/awdtools/fileexport/>

Accessibility features

Accessibility features help a user who has a physical disability, such as restricted mobility or limited vision, to use a software product successfully. The major accessibility features in IBM File Export enable users to:

- Use assistive technologies such as screen readers and screen magnifier software. Consult the assistive technology documentation for specific information when using it to access z/OS interfaces.
- Customize display attributes such as color, contrast, and font size.
- Operate specific or equivalent features using only the keyboard. Refer to the z/OS ISPF User's Guide for information about accessing ISPF interfaces. This guide describes how to use ISPF, including the use of keyboard shortcuts or function

keys (PF keys), includes the default settings for the PF keys, and explains how to modify their functions.

How to send your comments

Your feedback is important in helping to provide the most accurate and high-quality information. If you have any comments about this book or any other IBM File Export documentation, print and fill out the reader comment form located at the back of this book. You can use the following methods to return the form:

- Give it to your local IBM branch office or IBM representative.
- Send it to the address printed on the reader comment form.
- Send your comments by e-mail to comments@us.ibm.com.

Part 1. Introduction

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This part contains an overview of IBM File Export for z/OS.

Chapter 1. Introduction

IBM File Export for z/OS is a high performance data gathering, manipulation, and file- or table-generation solution used to export related sets of existing data from similar or dissimilar sources. Use IBM File Export to extract DB2, IMS, VSAM, and sequential data from one or more sources and create one or more targets. (In general, for simplicity, the term file as used in this manual refers to IMS, VSAM, or sequential files, as well as DB2 tables, unless these are specifically differentiated.)

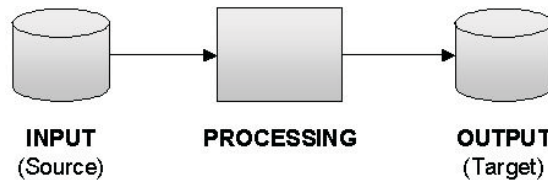
IBM File Export for z/OS design objectives:

- Simplify application development
- Expedite development testing
- Improve productivity by saving time

Overview

Application developers typically know and understand their data and that data's relationships. However, integrating data from different sources can be a problem. The term *source* refers to input data, such as an existing DB2 table or an existing IMS, VSAM, or sequential file.

IBM File Export for z/OS gathers data from the sources you designate, applies data manipulation rules that you specify, and then generates the desired output targets. The term *target* refers to output data.



IBM File Export offers highly selective data copying capabilities designed to simplify the complex problem of populating test environments or migrating applications to new or additional environments. IBM File Export permits you to:

- Support DB2, IMS, VSAM, and sequential sources in one product
- Automatically export all or a subset of your production data for use in your test environment using highly-flexible data selection and manipulation rules
- Extract or create files or tables that demonstrate one-to-one, one-to-many, and many-to-one relationships
- Define application relationships between dissimilar file types
- Support DB2-defined and application-defined referential integrity (RI)
- Expedite data migration and simplify data consolidation. An occasion where you might want to do this is the case where Company X has acquired Company Y and they use different databases.
- Modify the content of files or tables during export, including the ability to augment field values and age related data. For example, you can use IBM File Export for z/OS to delete rows from target DB2 tables based on keys extracted from a DB2, IMS, VSAM, or sequential source.

- Protect sensitive data by reproducible "scrambling" on a field-by-field basis

IBM File Export Interfaces

As a user, you will interface to IBM File Export by means of TSO/ISPF or by creating and running batch JCL jobs. Use the TSO/ISPF panels for "fill-in-the-blanks" specification of sources and targets, and the automatic generation of IBM File Export for z/OS processing instructions (control syntax). Alternatively, you can quickly learn IBM File Export's control syntax to write IBM File Export for z/OS JCL streams from scratch. IBM File Export's control syntax is documented in the chapter entitled "Creating JCL Using Control Statements" in the *IBM File Export for z/OS: Reference Manual*.

Sources, targets, and associated ddnames

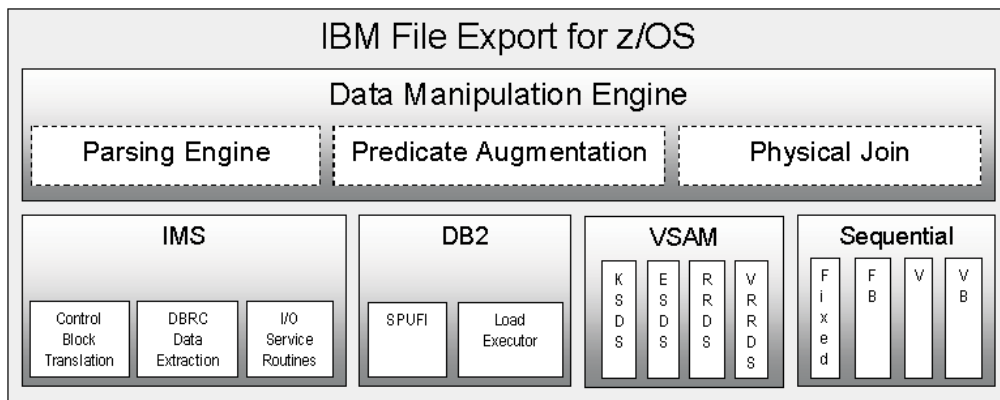
IBM File Export supports DB2, IMS (both full-function and Fast Path), VSAM, and sequential sources and targets. Well-recognized ddnames are used to identify the primary source, primary target, and data manipulation instructions to IBM File Export for z/OS.

- ABXIN identifies the primary source
- ABXOUT is the primary target
- ABXCTL is used to specify data gathering and manipulation instructions

For information about the ddnames that are used by IBM File Export for z/OS, see the appropriate appendix in the *IBM File Export for z/OS: Reference Manual*.

Data manipulation

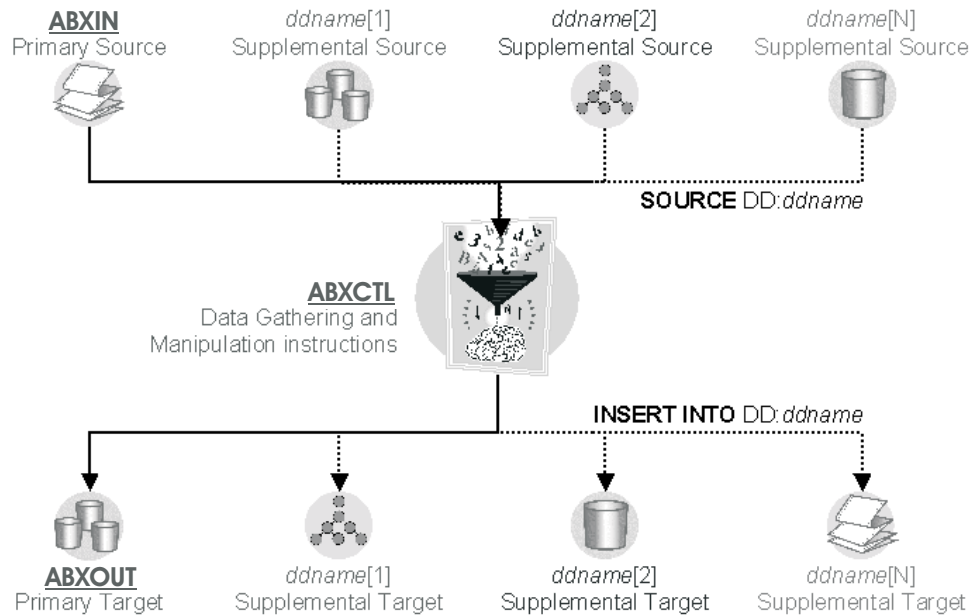
The heart of IBM File Export is the Data Manipulation Engine. Regardless of source or target file format, instructions provided to IBM File Export are processed by the Data Manipulation Engine which handles all aspects of data gathering, manipulation and generation.



For the purpose of extracting data from sources that are not relational, IBM File Export for z/OS has drawn on the syntax of the SQL (Structured Query Language) definitions of SELECT and INSERT. IBM File Export for z/OS reads data from a source or several sources, processes instructions which look very familiar to anyone acquainted with SQL, and then writes output to the requested target or targets.

This provides the following benefits to Application Developers and Development Test personnel:

- Ease of Use - IBM File Export for z/OS instructions are similar to SQL
- Enhanced Productivity - No need to learn the underlying I/O routines or spend time writing one time, "throw away" code
- Export Data On Demand - Generate IBM File Export for z/OS batch streams to automatically extract production data and load it into a test environment



The File Export repository

IBM File Export provides a repository which you can use to store information about applications and data structures that are used by more than one export. You can store data such as file layouts, record layouts, DB2 tables, and so forth. The use of the repository is optional. However, its use improves your productivity by permitting you to store information once for use by multiple applications.

Defining relationships in IBM File Export

Records can be related to each other. For example, an employee's personnel record probably contains an employee number (EMPNUM). This same employee number also exists in the payroll record, perhaps by the name EMPNO. Thus the employee's personnel record and payroll record have a relationship based on the field *employee number*. This relationship is a two-way path: `personnel.empnum = payroll.empno`. Likewise, `payroll.empno=personnel.empnum`. It is also possible that the files or tables that contain these records have been defined as having a parent-child relationship.

Relationships are specified in IBM File Export for z/OS by one of several methods:

- *Parent-child relationships* in DB2 processing .
- *Application-defined relationships* (ADRs) in DB2, VSAM, and sequential processing. Application-defined relationships are relationships that you, the user, define, rather than relationships defined by the DB2 catalog.

Application-defined relationships provide a powerful tool that permits you to create a subset of data in a *driving* table or file. You can then use this driving file to ensure that later records are extracted from a 'secondary' file only if they relate back to (match) records in the driving file.

Using the RELATIONSHIP control syntax statement, you specify an application-defined relationship by creating definitions. In these definitions, you specify a source name for data in the file, as well as the position, length, and data type of the data. A file can have as many sources for matching as desired, but each source element must have a unique name. A list of keys used for matching can be produced by previous runs of IBM File Export for z/OS using the THEN INSERT INTO dd:ddname values (captured-key) statement, or content in existing files can be used. IBM File Export's control statement syntax is documented in the chapter entitled "Creating JCL Using Control Statements" in the *IBM File Export for z/OS: Reference Manual*. A further example of application-defined relationships can be found in the same manual in the Appendix documenting the IBM File Export Installation Verification Program (IVP) for DB2.

During VSAM and sequential processing, the application-defined relationship matches content that is found in this secondary file. In DB2 processing, both application-defined relationship matching and parent-child matching can be used.

IBM File Export information

The IBM File Export library comprises the following manuals:

- *IBM File Export for z/OS: User's Guide*. This manual assists you in getting started with the product by providing a high-level overview of the IBM File Export user interface and examples of IBM File Export's use. It also provides directions for obtaining, installing, and using example code stored in the IBM File Export sample library, SABXSAMP, to further assist you with understanding the product's functions.
- *IBM File Export for z/OS: Reference Manual*. This manual documents the panels that comprise the user interface, describing the panel's fields and the valid entries you supply to define your export requests. It also documents the control statement syntax provided with ABXUTIL, the program by which you can define control statements to create JCL directly without using the product's ISPF user interface.

This manual also contains the information required to install IBM File Export for z/OS

- *IBM File Export for z/OS: Messages and Codes*. This manual documents the messages produced by the product.

In addition, a Help panel is provided for each ISPF product panel. These Help panels provide high-level help for the fields on the panels.

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This part contains provides a high-level overview of the IBM File Export ISPF user interface. It explains the tasks required to export DB2, IMS, VSAM, and sequential source data into target files using ISPF. Detailed information to support these tasks is found in the *IBM File Export for z/OS: Reference Manual*. Use that manual to

understand the fields on each panel and the valid entries for each field. In addition, each panel's online Help describes each field on each ISPF panel and the valid entries for each field.

Note: The panels and panel descriptions provided in this book are representative of the panels in the product, but may differ slightly. In cases where there are differences, you should consider the panels shipped with the product as being the most current.

Chapter 2. Getting Started with IBM File Export

This chapter contains information about getting started using IBM File Export for z/OS.

IBM File Export provides interfaces via TSO/ISPF as well as batch JCL. Use the TSO/ISPF panels for "fill-in-the-blanks" identification of sources and targets, and the automatic generation of IBM File Export processing instructions. This manual will concentrate on using the ISPF panels to create IBM File Export jobs. If you would like to create JCL directly using IBM File Export's ABXUTIL facility, you will find those details in the *IBM File Export for z/OS: Reference Manual*.

Starting the product

If your system programmer has added IBM File Export to an ISPF menu, specify the appropriate menu option on the ISPF Option line and press **Enter** to display the IBM File Export Main Menu. Otherwise, start IBM File Export by running the ABX CLIST.

Exporting data using IBM File Export for z/OS

To export data using IBM File Export for z/OS, follow this progression:

1. Define one or more sources where the data that you want to export is located. You can define a primary source, a secondary source and relationships between the sources.
2. Optionally, specify any data transformations that are to be applied to your source data as it is exported.
3. Define one or more targets where the data that you export will be located.
4. Generate the data.
5. Load the data at the target location.

Begin your session with the IBM File Export Main Menu.

What sources and targets can I use?

The table that follows identifies the combinations of sources and targets that are valid when using IBM File Export.

Table 1. Valid Sources and Targets

Valid Sources	Valid Targets								
	DB2	SEQ.	VSAM	IMS	DEDB	DLI	DBB	BMP	FEUn-load
DB2	X								
Sequential		X	X						
VSAM		X	X						
IMS				X	X	X	X	X	

Table 1. Valid Sources and Targets

Valid Sources	Valid Targets								
	DB2	SEQ.	VSAM	IMS	DEDB	DLI	DBB	BMP	FEUn- load
DEDB				X	X	X	X	X	
DLI				X	X	X			X
DBB				X	X		X		X
BMP				X	X			X	X
FEUnload									

Notes:

1. You can specify multiple sources as input only when using FEUNLOAD as output.
2. FEUNLOAD is never supported as a source input.

The IBM File Export for z/OS Main Menu

The IBM File Export Main Menu (ABX\$MAIN) permits you to select Repository Management or Session Management. Select Repository Management to perform repository administration, that includes adding, deleting, or modifying repository entries. Select Session Management to begin or continue a IBM File Export session.

```

ABX$MAIN      ----- IBM File Export for z/OS ----- 2004/09/23 10:19:40
Option  ===>

1  Repository Management
2  Session Management

S  Settings
A  About
X  Exit
    
```

Figure 1. IBM File Export Main Menu (ABX\$MAIN) panel

From the Main Menu, you can also select the option to define product global settings, you can display information about the product, or you can choose to exit the product.

Administering the repository

Selecting Repository Management from the IBM File Export Main Menu displays the Repository Management (ABX\$RMNG) panel. From this panel, you can create a repository, or delete or open an existing repository.

```

ABX$RMNG      ----- Repository Management ----- 2004/09/17 10:02:50
Option ==>> 1

1 Create Repository
2 Delete Repository
3 Open Repository

```

Figure 2. IBM File Export Repository Management (ABX\$RMNG) panel

Creating and using IBM File Export sessions

Selecting Session Management from the IBM File Export Main Menu opens the Session Management (ABX\$SMNG) panel. From this panel, you can choose the type of session you want to create, open an existing session, or view a list of existing sessions from which you can select the session to work with.

```

ABX$SMNG V1R1 ----- Session Management ----- 2004/11/18 15:54:01
Option ==>>

Session Name      User
-----
New Session
1 DB2
2 IMS
3 Data Set

Restore Session
4 Open Session
5 Session List

```

Figure 3. IBM File Export Session Management (ABX\$SMNG) panel

Specifying global settings

Use the Settings (ABX\$GOPT) panel to specify project global settings. Global settings are parameters that apply to all IBM File Export sessions. Some of these global settings can be overridden using entries you can specify using a product panel or a specification you make when creating JCL directly using ABXUTIL.

```

ABX$GOPT V1R1 ----- Settings ----- 2004/11/18 15:57:40
Option ==>

More: +

Fill Character BLANK          Decimal          DECIMAL
Sysout Class   *             Wild Card Char PERCENT
Work Unit      SYSDA         Work Volume
Fixed Block                    Quiet            Y (Yes / No)
High Level Qual                    Field            (Yes / No)
User Exit      (Yes / No)    User Exit Prgm

Audit         (Yes / No / Force) SMF Record

Repository HLQ
JCL Library
Session Library
Work DSN      ABX.EDITWORK

Job Statement Information:
==> //JOB CARD JOB MDSTIT,CLASS=A,NOTIFY=&SYSUID
==> /*
==> /*
==> /*

Enter D command to setup DB2 options now, or PF3 to exit

```

Figure 4. IBM File Export Global Options (ABX\$GOPT) panel

The global fields are:

- The fill character that you want to use for padding
- The character to be used as the decimal character
- The Sysout output class that you want to use for JCL
- The character that you want to use as a wildcard

Note: In DB2 mode, wild card processing is native SQL and DB2 uses only the percent sign (%), which cannot be overridden.

- The name of the work unit that you want to use
- The name of the volume that you want to use for product work data sets
- If you want to force a fixed length record, the length for records. This is ignored for IMS processing.
- Whether or not to suppress printing runtime messages normally emitted by PRINT requests on SELECT and INSERT statements or that fail the UNIQUE directive

- The name of the PDS member that will contain the JCL generated by IBM File Export for z/OS. You must define a JCL library in order to save the JCL you will generate using IBM File Export for z/OS.
- The high level qualifier that you want to use to prefix IBM File Export for z/OS output data sets
- Whether or not a message will be produced for each field, specifying its attributes. The messages are produced when the fields from the source DBD are automatically defined in the input DBD when the DBDLIB definition is run.
- Whether or not you will perform auditing by writing audit records to SMF.
- The high level qualifier you will use to identify your repository
- The name of the library to be used by IBM File Export for z/OS to store the JCL created by the product
- The name of the library that is to contain the information related to a specific session of IBM File Export for z/OS. If you do not specify a session library, the session you are defining will not be saved.
- The name of the work data set to be used by IBM File Export for z/OS for DB2 Exports. If this field is left blank, USERID.ABX.EDITWORK will be used by default. This data set is always prefaced with your TSO userID.
- The job statement information to be used by IBM File Export for z/OS

For detailed information about using ABXUTIL to override fields on the Settings panel, refer to the *IBM File Export for z/OS: Reference Manual*, in the chapter entitled "Creating JCL Using Control Statements."

Chapter 3. Working with the IBM File Export Repository

IBM File Export's repository permits you to store information about applications and data structures that are used by more than one export. You can store data such as file layouts, record layouts, DB2 tables, and so forth. The use of the repository is optional. However, its use improves your productivity by permitting you to store information once for use by multiple applications.

The Repository Management panel

Selecting **1** on the IBM File Export Main Menu opens the Repository Management panel. From the Repository Management panel, you can create a new repository, delete an existing repository, or work with an existing repository.

Creating a new repository

To create a new repository:

- Select **Create Repository** from the Repository Management panel to open the **Create Repository** panel.
- Specify the following information for your new repository
 - A high level qualifier to be used when creating this repository
 - A version number to be assigned to this repository
 - A name for this repository
 - Whether this repository will be your default repository
- When you have completed your work, press **Enter** to return to the Repository Management panel.

Deleting an existing repository

To delete an existing repository:

- Select **Delete Repository** on the Repository Management panel to open the **Delete Repository** panel.
- If you have an existing repository, its name will be displayed in the **Repository HLQ** field. If a high-level qualifier is not already specified in this field, type the high level qualifier to be used to identify the repository to be deleted. If a high-level qualifier is specified, but you want to work with another repository, you can overwrite the value in this field.
- Specify whether or not you want to delete the named repository, or continue without deleting a repository.
- Press **Enter** when your work on this panel is complete. IBM File Export returns you to the Repository Management panel.

Opening an existing repository

To open an existing repository:

- Select **Open Repository** on the Repository Management (ABX\$RMNG) panel. The **Repository Selection (ABX\$ZRNM)** panel opens. The high level qualifier of

your default repository will be displayed in the Repository HLQ field. If a high-level qualifier is not already specified in this field, type the high level qualifier to be used to specify the repository to be opened. You may change the value in this field by overtyping it.

- You can now move through the repository panels. You can create, delete, or edit existing repository structures using the panels provided
- On any panel that provides the Refresh option, typing **R** on the Option line refreshes the panel to display its current status. Objects you have added will be displayed and objects you have deleted will no longer appear.

Create a storage structure

If you selected Open Repository, IBM File Export displays the Storage List (ABX\$ZSTL) panel. If you have already created storage structures, these structures are listed on this panel. Using this panel, you can

- Add or delete a structure
- Edit an existing structure
- Refresh the storage list
- Open an entry in the list
- View and work with record layouts in your repository

Add or edit a storage structure

If you want to add a storage structure to the list:

- Type **A** to open the Create Storage (ABX\$ZSTR) panel.
- Assign an arbitrary name to the storage structure.
- Select the type of storage you are creating
 - DB2 storage
 - IMS storage when the databases reside in a DBDLIB
 - IMS storage when the databases reside in an ACBLIB
 - Sequential storage
 - VSAM storage

Create or edit DB2 storage

To create new DB2 storage or to edit an existing DB2 storage structure:

- Start from the Create Storage or Storage List panel. IBM File Export opens the Edit DB2 Storage (ABX\$ZSE1) panel. The repository high level qualifier and the storage name you specified for this storage structure are displayed at the top of the Edit DB2 Storage panel.
- Provide the following information:
 - The name of the DB2 subsystem
 - The name of the DB2 plan
 - The name of the DB2 LOADLIB
 - The names of any additional LOADLIBs to be used
- Fill out or edit the fields on this panel. When you have finished your work, press **Enter** to return to the Storage List panel.

Create or edit IMS storage

To create new IMS storage or to edit an existing IMS storage structure:

- Start from the Create Storage or Storage List panel. IBM File Export opens the appropriate Edit IMS Storage panel. The repository high level qualifier and the storage name you specified for this storage structure are displayed at the top of the Edit IMS Storage panel.
- If you selected Create IMS Storage using Databases from a DBDLIB, IBM File Export opens the Edit IMS Storage (ABX\$ZSE2) panel. Provide the following information:
 - The fully-qualified name of the IMS DBD LOADLIB
 - The name of the member that will contain this storage definition
- If you selected Create IMS Storage using Databases from a ACBLIB, IBM File Export opens the Edit IMS Storage (ABX\$ZSE5) panel. Provide the following information:
 - Whether you want to use ACBLIB or MODSTAT
 - If you chose ACBLIB, the name of the IMS ACBLIB. This field is mandatory unless you choose to specify the MODSTAT, IMSACBA, and IMSACBB fields. In that case, leave this ACBLIB field blank.
 - If you chose MODSTAT, specify the name of the IMS MODSTAT data set. You must also specify names for IMSACBA and IMSACBB.
- Fill out or edit the fields on the panel you are presented with. When you have finished your work, press **PF3** to return to the Storage List panel.

Create or edit sequential or VSAM storage

To create new sequential or VSAM storage or to edit existing sequential or VSAM storage structure:

- Start from the Create Storage or Storage List panel. IBM File Export opens the Edit VSAM or Sequential Storage (ABX\$ZSE3) panel. The repository high level qualifier and the storage name you specified for this storage structure are displayed at the top of the panel.
- IBM File Export opens the Edit VSAM or Sequential Storage (ABX\$ZSE3) panel.
- Specify the fully qualified name of the VSAM or sequential data set.
- Fill out or edit the fields on this panel. When you have finished your work, press **Enter** to return to the Storage List panel.

Working with a DB2 storage structure

The following section describes how you may work with DB2 when using the repository.

Open a DB2 Storage Structure

Open a storage structure in order to add to or edit the components of that structure.

- Starting from the Storage List (ABX\$ZSTL) panel, type **O** on the Cmd line of a structure whose type is DB2. IBM File Export opens the Table List (ABX\$ZTLS) panel. The repository's high level qualifier and the name for this storage that you chose on the Create Storage panel are displayed at the top of this panel.
- Use the Table List panel to add tables to the table list, delete tables from the list, or open a table to work with its substructures.

- To add a table, type **A** on the panel's Option line. A pop-up opens on which you can specify the name of the table and the table owner of the table you want to add to the list. If you don't know the name of the table you want, you can enter a partially-qualified table name containing an asterisk. IBM File Export displays the Tables Selection (ABX\$ZTBS) list, from which you can select the table you want to add.
- To delete a table from the list, type **D** on the line next to its name and press **Enter**.
- To open any table on the Table List (ABX\$ZTLS) panel, type **O** on the Cmd line of that table. IBM File Export opens the Record Layouts (ABX\$ZTRL) panel. For information about populating DB2 storage using IBM File Export's record layout panels, see "Working with record layouts" on page 19.

Working with an IMS storage structure

The following section describes how you may work with IMS when using the repository.

Open an IMS Storage Structure

Open a storage structure in order to add to or edit the components of that structure.

- Starting from the Storage List (ABX\$ZSTL) panel, type **O** on the Cmd line of a structure whose type is IMS. IBM File Export opens the Segment List (ABX\$ZSLS) panel. The repository's high level qualifier and the name for this storage that you chose on the Create Storage panel are displayed at the top of this panel.
- Use the Segment List panel to add segments to the segment list, delete segments from the list, or open a segment to work with its substructures.
- To add a segment, type **A** on the Option line of the Segment List (ABX\$ZSLS) panel. IBM File Export displays the Segments Selection (ABX\$ZSGS) list, from which you can select the segment you want to add.
- To delete a table from the list, type **D** on the line next to its name and press **Enter**.
- To open any segment on the Segment List panel, type **O** on the Cmd line of that segment. IBM File Export opens the Record Layouts (ABX\$ZFRL) panel. For information about populating IMS storage using IBM File Export's record layout panels, see "Working with record layouts" on page 19.

Working with VSAM or Sequential records

The following section describes how you may work with VSAM or sequential files when using the repository.

Open a VSAM or sequential storage structure

To open a VSAM or sequential storage structure:

- Type **O** on a Cmd line of the Storage List panel for storage whose type is VSAM or sequential.
- IBM File Export opens the Record Layouts (ABX\$ZFRL) panel. See "Working with record layouts" on page 19.

Working with record layouts

This section describes how you will work with the Record Layouts panels to further define your repository structures. To see a list of all of the record layouts you have defined for this repository, type **L** on the Options line of the Storage List (ABX\$ZSTL) panel. The Record Layouts (ABX\$ZRDL) panel opens. The repository's high-level qualifier is displayed at the top of the panel.

Use the Record Layouts panel to add, delete, or edit existing records, to open any entry on the list to work with its subrecords, or to go to the Parser Configuration panel to configure your parser. On this panel:

- If you selected a record to edit, the Edit Record (ABX\$ZSE4) panel opens for the record you have selected. On the Edit Record panel, you can rename the record you selected by typing its name on the Record Name line. If a name appears on the line, you can change it by overtyping it. When you have completed work on the Edit Record panel, press **Enter** to continue.
- If you selected a record to open, the appropriate record layout panel opens. See the sections that follow that describe the sequence of events for DB2, IMS, sequential, or VSAM records.
- If you chose to add a record, the Create Record (ABX\$ZREC) panel opens. On this panel, you can name the new record. When you have completed your work, press **PF3** to continue.
- If you chose to configure your parser, the Parser Configuration (ABX\$ZPRS) panel opens. See "Using the parser" on page 26.

Working with DB2 record layouts

You can access DB2 record layouts in one of the following ways:

- Follow these steps from the Options line of the Storage List (ABX\$ZSTL) panel:
 1. Type **L** on the Options line of the Storage List (ABX\$ZSTL) panel. The Record Layouts (ABX\$ZRDL) panel opens.
 2. Type an **O** next to a DB2 record.
 3. If this record is a default record, the fields that comprise it cannot be changed. IBM File Export takes you directly to the Column List panel. The repository high level qualifier, the name for this storage structure that you chose on the Create Storage panel, and the DB2 table and record type to which this record belongs appear at the top of this panel. Each column's name, type (such as INT or VARCHAR), and length appear at the bottom of the panel.
 4. If this is not a default record, you can add or delete fields, or edit existing fields. In that case, IBM File Export opens the Field List (ABX\$ZFDL) panel.
 5. The Field List panel displays a list of fields that comprise the record. Each field is classified as SIMPLE or GROUP. From the Field List panel, you can choose to add simple or group fields to the list, edit simple or group fields already on the list, or delete fields from the list. The following information can be provided for simple fields:
 - The name of the parent record to which this field belongs.
 - The name of the field you want to edit
 - The position of the field in the record and the field's length and type (for example, CHAR or INT)
 - The number of times a variable length repeating group occurs and the object of the Occurs. If the number of times a repeating group can occur in the record depends on this object of the Occurs, that dependency

should be specified here. For information about Occurs Depending On, see the *IBM File Export: Reference Manual*.

- The precision and scale of numeric data and whether or not the numeric data is signed or unsigned
- Whether data in the field is to be scrambled
- A group length and maximum length
- Fields containing a position algorithm, field algorithm, or both. Because the length of a group item containing variable length data is not a constant, an algorithm is required to express the position of a field, and in some cases, the length of the field or group item.
- A field that permits you to add or delete position and field algorithms to those specified on this panel.

The following information can be provided for group fields:

- The name of the parent record to which this field belongs
 - The name of the field to which this subrecord belongs
 - The name of the subrecord
 - The position of the field in the subrecord and the field's length
 - The field's type which may be REDEFINE or SUBREC. REDEFINE indicates that you are defining more than one linked record. SUBREC specifies that you are defining a single record.
 - The number of times a variable length repeating group occurs and the object of the Occurs. If the number of times a repeating group can occur in the record depends on this object of the Occurs, that dependency should be specified here. For information about Occurs Depending On, see the *IBM File Export: Reference Manual*.
 - Whether data in the field is to be scrambled
 - A group length and maximum length
 - Fields containing a position algorithm, field algorithm, or both. Because the length of a group item containing variable length data is not a constant, an algorithm is required to express the position of a field, and in some cases, the length of the field or group item.
 - A field that permits you to add or delete position and field algorithms to those specified on this panel.
- Follow these steps from a Cmd line of the Storage List (ABX\$ZSTL) panel:
 1. Type an **O** on the Cmd line of a DB2 Storage Structure. The Table List panel opens.
 2. Type an **O** on the Cmd line next to a table name on the Table List (ABX\$ZTLS) panel. The Record Layouts (ABX\$ZTRL) panel specific to DB2 opens. The repository's high level qualifier and the name of the parent storage structure that you chose on the Create Storage panel are displayed at the top of this panel. This panel also displays the name of the DB2 table to which this record belongs. If you are defining a new record, you can specify its name in the appropriate field.
 3. The Record Layouts panel displays the names of any DB2 records that have already been defined. To work with a record, type an **O** on the Cmd line next to a record. If this record is a default record, the fields that comprise it cannot be changed. IBM File Export takes you directly to the Column List panel. If this is not a default record, you can add or delete fields, or edit existing fields. In that case, IBM File Export opens the Field List (ABX\$ZFDL) panel as described earlier in this section.

- When you have completed your work, pressing **PF3** multiple times will take you back through the panels you have used. You may continue to work with other DB2 storage structures or continue to press **PF3** to exit the repository.

Working with IMS record layouts

You can access IMS record layouts in these ways:

- Follow these steps from the Options line of the Storage List (ABX\$ZSTL) panel:
 1. Type **L** on the Options line of the Storage List (ABX\$ZSTL) panel. The Record Layouts (ABX\$ZRDL) panel opens.
 2. Type an **O** next to an IMS record.
 3. If this record is a default record, the fields that comprise it cannot be changed. IBM File Export takes you directly to the Field List panel. The repository high level qualifier, the name for this storage structure that you chose on the Create Storage panel, and the IMS segment and record to which this field belongs appear at the top of the panel. Each already-defined field's name, starting position of the field within the record, the field's size, and type (for example, CHAR or INT) are displayed in the lower portion of the panel.
 4. If this is not a default record, you can add or delete fields, or edit existing fields. In that case, IBM File Export opens the Field List (ABX\$ZFDL) panel.
 5. The Field List panel displays a list of fields that comprise the record. Each field is classified as SIMPLE or GROUP. From the Field List panel, you can choose to add simple or group fields to the list, edit simple or group fields already on the list, or delete fields from the list. The following information can be provided for simple fields:
 - The name of the parent record to which this field belongs.
 - The name of the field you want to edit
 - The position of the field in the record and the field's length and type (for example, CHAR or INT)
 - The number of times a variable length repeating group occurs and the object of the Occurs. If the number of times a repeating group can occur in the record depends on this object of the Occurs, that dependency should be specified here. For information about Occurs Depending On, see the *IBM File Export: Reference Manual*.
 - The precision and scale of numeric data and whether or not the numeric data is signed or unsigned
 - Whether data in the field is to be scrambled
 - A group length and maximum length
 - Fields containing a position algorithm, field algorithm, or both. Because the length of a group item containing variable length data is not a constant, an algorithm is required to express the position of a field, and in some cases, the length of the field or group item.
 - A field that permits you to add or delete position and field algorithms to those specified on this panel.

The following information can be provided for group fields:

 - The name of the parent record to which this field belongs
 - The name of the field to which this subrecord belongs
 - The name of the subrecord
 - The position of the field in the subrecord and the field's length

- The field's type which may be REDEFINE or SUBREC. REDEFINE indicates that you are defining more than one linked record. SUBREC specifies that you are defining a single record.
 - The number of times a variable length repeating group occurs and the object of the Occurs. If the number of times a repeating group can occur in the record depends on this object of the Occurs, that dependency should be specified here. For information about Occurs Depending On, see the *IBM File Export: Reference Manual*.
 - Whether data in the field is to be scrambled
 - A group length and maximum length
 - Fields containing a position algorithm, field algorithm, or both. Because the length of a group item containing variable length data is not a constant, an algorithm is required to express the position of a field, and in some cases, the length of the field or group item.
 - A field that permits you to add or delete position and field algorithms to those specified on this panel.
- Follow these steps from a Cmd line of the Storage List (ABX\$ZSTL) panel:
 1. Type an **O** on the Cmd line of an IMS Storage Structure. The Segment List panel opens. (The Segment List panel is described earlier in this chapter.)
 2. Type an **O** on the Cmd line next to a segment name on the Segment List (ABX\$ZSLS) panel. The Record Layouts (ABX\$ZFRL) panel specific to IMS opens. The repository's high level qualifier and the name of the parent storage structure that you chose on the Create Storage panel are displayed at the top of this panel. The panel also displays the name of the IMS file to which this record belongs. If you are defining a new record, you can specify its name in the appropriate field.
 3. The Record Layouts panel displays the names of any IMS records that have already been defined. You can perform the following functions from the Record Layouts panel:
 - Type **U** on the Cmd line next to a record to unlink (remove) that record from the list of records comprising the segment.
 - Type **M** on the Cmd line next to a record to add or delete selection criteria for that record or define relationships for the record. On the panel that displays, select either option **1**, Selection Criteria, or Option **2**, Manage Relationships.

If you chose option **1**, the Selection Criteria (ABX\$ZSCR) panel opens. On this panel you can add or delete selection criteria for the record. A selection criterion typically is entered as a WHERE clause. Note that, when specifying a value to be matched in the WHERE clause, that value is case-sensitive. For information about option **2**, Manage Relationships, see "Managing record relationships" on page 25.
 - Type **O** on the Cmd line next to a record to open that record's list of fields. If this record is a default record, the fields that comprise it cannot be changed. IBM File Export takes you directly to the Field List panel. The Field List (ABX\$ZFDD) panel opens. If this is not a default record, you can add or delete fields, or edit existing fields. In that case, IBM File Export opens the Field List (ABX\$ZFDL) panel.
 - Type **N** on the Option line to add a record. The Create Record panel (ABX\$ZREC) opens.
 - Type **L** on the Option line to link additional records to the segment. The Record Layouts Selection (ABX\$ZRDS) panel opens. Choose the record you want to link by typing **S** on the Cmd line next to its name.

- When you have completed your work, pressing **PF3** multiple times will take you back to the Storage List panel. You may continue to work with other IMS storage structures or press **PF3** to exit the repository.

Working with VSAM and sequential record layouts

You can access sequential or VSAM record layouts in these ways.

- Follow these steps from the Options line of the Storage List (ABX\$ZSTL) panel:
 1. Type **L** on the Options line of the Storage List (ABX\$ZSTL) panel. The Record Layouts (ABX\$ZRDL) panel opens.
 2. Type an **O** next to an IMS record.
 3. If this record is a default record, the fields that comprise it cannot be changed. IBM File Export takes you directly to the Field List panel. The repository high level qualifier, the name for this storage structure that you chose on the Create Storage panel, and the VSAM or sequential file to which this record belongs appear at the top of the panel. Each already-defined field's name, starting position of the field within the record, the field's size, and type (for example, CHAR or INT) are displayed at the bottom of the panel.
 4. If this is not a default record, you can add or delete fields, or edit existing fields. In that case, IBM File Export opens the Field List (ABX\$ZFDL) panel.
 5. The Field List panel displays a list of fields that comprise the record. Each field is classified as SIMPLE or GROUP. From the Field List panel, you can choose to add simple or group fields to the list, edit simple or group fields already on the list, or delete fields from the list. The following information can be provided for simple fields:
 - The name of the parent record to which this field belongs.
 - The name of the field you want to edit
 - The position of the field in the record and the field's length and type (for example, CHAR or INT)
 - The number of times a variable length repeating group occurs and the object of the Occurs. If the number of times a repeating group can occur in the record depends on this object of the Occurs, that dependency should be specified here. For information about Occurs Depending On, see the *IBM File Export: Reference Manual*.
 - The precision and scale of numeric data and whether or not the numeric data is signed or unsigned
 - Whether data in the field is to be scrambled
 - A group length and maximum length
 - Fields containing a position algorithm, field algorithm, or both. Because the length of a group item containing variable length data is not a constant, an algorithm is required to express the position of a field, and in some cases, the length of the field or group item.
 - A field that permits you to add or delete position and field algorithms to those specified on this panel.
 The following information can be provided for group fields:
 - The name of the parent record to which this field belongs
 - The name of the field to which this subrecord belongs
 - The name of the subrecord
 - The position of the field in the subrecord and the field's length

- The field's type which may be REDEFINE or SUBREC. REDEFINE indicates that you are defining more than one linked record. SUBREC specifies that you are defining a single record.
 - The number of times a variable length repeating group occurs and the object of the Occurs. If the number of times a repeating group can occur in the record depends on this object of the Occurs, that dependency should be specified here. For information about Occurs Depending On, see the *IBM File Export: Reference Manual*.
 - Whether data in the field is to be scrambled
 - A group length and maximum length
 - Fields containing a position algorithm, field algorithm, or both. Because the length of a group item containing variable length data is not a constant, an algorithm is required to express the position of a field, and in some cases, the length of the field or group item.
 - A field that permits you to add or delete position and field algorithms to those specified on this panel.
- Follow these steps from a Cmd line of the Storage List (ABX\$ZSTL) panel:
 1. Type an **O** on the Cmd line of a VSAM or sequential Storage Structure. The Record Layouts (ABX\$ZFRL) panel specific to a VSAM or sequential file opens. The repository's high level qualifier and the name of the parent storage structure that you chose on the Create Storage panel are displayed at the top of this panel. The panel also displays the name of the file to which this record belongs. If you are defining a new record, you can specify its name in the appropriate field.
 2. The Record Layouts panel displays the names of any records that have already been defined. You can perform the following functions from the Record Layouts panel:
 - Type an **E** on the Cmd line next to a record to edit that record. The Edit Record (ABX\$ZSE4) panel opens. When you have completed your work, press **Enter** to return to the Record Layouts panel.
 - Type **U** on the Cmd line next to a record to unlink (remove) that record from the list of records.
 - Type **M** on the Cmd line next to a record to add or delete selection criteria for that record or define relationships for the record. On the panel that displays, select either option **1**, Selection Criteria, or Option **2**, Manage Relationships.

If you chose option **1**, the Selection Criteria (ABX\$ZSCR) panel opens. On this panel you can add or delete selection criteria for the record. A selection criterion typically is entered as a WHERE clause. Note that, when specifying a value to be matched in the WHERE clause, that value is case-sensitive. For information about option **2**, Manage Relationships, see "Managing record relationships" on page 25.
 - Type **O** on the Cmd line next to a record to open that record's list of fields. If this record is a default record, the fields that comprise it cannot be changed. IBM File Export takes you directly to the Field List panel. The Field List (ABX\$ZFDD) panel opens. If this is not a default record, you can add or delete fields, or edit existing fields. In that case, IBM File Export opens the Field List (ABX\$ZFDL) panel.
 - Type **N** on the Option line to add a record. The Create Record panel (ABX\$ZREC) opens.

- Type **L** on the Option line to link additional records to the segment. The Record Layouts Selection (ABX\$ZRDS) panel opens. Choose the record you want to link by typing **S** on the Cmd line next to its name.
- When you have completed your work, pressing **PF3** multiple times will take you back through the panels you have used. You may continue to work with other sequential or VSAM storage structures or continue to press **PF3** to exit the repository.

Managing record relationships

Selecting Option 2 on the Manage Record Layouts (ABX\$ZMRL) panel permits you to define relationships between records.

1. When you select Option 2, the Record Relations panel opens.
2. If you choose to edit an existing relationship, add a parent record for the current record, or add a child record for the current record, the Edit Relation (ABX\$ZERL) panel opens.
3. Progress through the panels to define or select parent and child records by selecting Option 1 on this panel. Note that you must complete the panels related to Option 1 before you will be permitted to select Option 2. As you move through the selection process, you will be asked to select:
 - a storage structure,
 - a file,
 - and a record layoutfor the record (either child or parent) that you are defining.
4. Once you have defined the repository layouts for both the parent and child records, you may select Option 2 from the Edit Relation (ABX\$ZERL) panel.
5. Selecting Option 2 displays the Relation Field List (ABX\$FRE) panel.

This panel displays a list of previously-defined parent-child relationships. On this panel, you can choose to edit an existing parent-child relationship, delete an existing relationship, or create a new relationship. If you choose to edit an existing relationship or create a new relationship, the Edit Relation Fields (ABX\$ZREE) panel opens to permit you to do so.
6. When you have completed your relationship definition activities, you can press **PF3** multiple times to exit the repository.

Specifying DB2 table and RI definitions

There are several ways to define RI relationships using IBM File Export.

The most basic way involves using the IBM File Export-provided panels that support DB2. Relationships can be defined using application-defined referential integrity (RI), sometimes called user-defined RI. You can establish the relationship between DB2 tables while setting options in a DB2 session created through the panels. To do so, you must know the relationship between the DB2 tables from which data is being extracted because IBM File Export does not read the catalog to obtain RI information. The work flow is as follows:

- Start the File Export user interface and create a DB2 session.
- Specify the DB2 source and target information, such as subsystem IDs, plan names and the DB2 load library to use.

- Specify the tables you want to load data into and the tables you want to extract data from using Option 3, Query Specification and Manipulation, on the DB2 Menu.
- Create a query name for the parent table first, and specify the target DB2 parent object and the source DB2 parent object. Also, select the columns from which you want to extract data.
- Finally, create another query for the child table and specify the target DB2 child object and the source DB2 child object for the second query. The table contained in this query should be the child table. Then, specify the columns from which you want to export data.
- To create the parent-child relationship between the parent table and the child table, specify the columns in the parent table and the child table that creates the relationship.
- Provide the parameters for the intermediate dataset that will temporarily contain the extracted DB2 data before it is loaded into the target table. IBM File Export will create the data set if it does not exist.
- Generate the JCL to extract the data

To review the DB2 panels that support the scenario described above, see "Exporting DB2 Data" in the IBM File Export for z/OS: *Reference Manual*.

The IBM File Export repository simplifies the process of defining referential integrity. You can use IBM File Export to query the DB2 catalog to establish relationship definitions when defining data within a Repository. You do not have to know the relationship between the DB2 tables from which you are extracting data. IBM File Export reads the DB2 catalog to obtain RI information when the object is defined in the repository. You can then use the information read in from the DB2 catalog when defining a DB2 session. The work flow is as follows:

- Start the IBM File Export user interface and create a repository.
- Create a DB2 Storage Type in the repository. Import tables from the DB2 catalog using the Import DB2 Definitions (ABX\$DBRI) panel. On that panel, provide an explicit table name and table owner or supply a pattern for the table name and table owner.
- IBM File Export will read the DB2 catalog to find tables matching the wildcard pattern, and will also find and retrieve any tables to those matching the wildcard pattern. Note that if you use a wild card, all tables satisfying the pattern will be retrieved, regardless of their relationship to each other. If you want a specific table that is related to another, to ensure that it is retrieved, specify its fully qualified name and table owner.
- Once IBM File Export has queried the catalog to find all tables matching the wildcard pattern you have specified, the Table List (ABX\$ZTLS) panel is redisplayed with the related tables. You can now open the record layouts for the panels that have been displayed and continue to work in the repository as before. Tables may be deleted from or added to the list of tables in the DB2 storage type.
- Each DB2 table may be browsed for any corresponding related tables so the user can create a DB2 session (as described above) and manually define the relationships.

Using the parser

You may use either COBOL or PL/I to parse the contents of your repository. The parser translates record layouts from the source input and creates them in the repository. To do so, you must first configure the parser as follows:

- From the Record Layouts (ABX\$ZRDL) panel, type **P** on the Option line to invoke the Parser Configuration panel.
- Provide the following information by filling in the fields on the panel:
 - The name that will be assigned to the object that is being parsed
 - The name of the data set that contains the source module that is being parsed. You may browse for the data set name by typing a high level qualifier and an asterisk.
 - The name of the member that contains the source module that is being parsed
 - Whether you want to use PL/I or COBOL as the language for your parser
 - Any additional compiler options
 - Whether to include additional partitioned data sets or copy books or to delete objects from the INCLUDE list

When you have completed your work on the Parser Configuration panel, press **Enter**. The COBOL or PL/I source that was specified is displayed in a temporary data set. You can edit the source in that data set without affecting the base source input. When you press **PF3** from this temporary data set, IBM File Export runs the parser and the record layout that was specified in the top-level record name field on the Parser Configuration panel is translated from the source input and created in the repository.

Chapter 4. Exporting DB2 Data

This chapter explains the use of IBM File Export for z/OS to export DB2 data. Note that the panels illustrated in this book are representative of the panels in the product and may differ slightly from the product panels.

Summary

Specify DB2 product options

“Specify DB2 product options”

Select a DB2 session

“Select a DB2 session”

Define the source and target DB2 subsystems, including the DB2 LOADLIBs and plan names for the user interface and batch utility

“Specify the subsystems and LOADLIBs for your source and target” on page 30

Specify external relationships

“Define Relationships” on page 30

Define queries and specify manipulation of query data

“Specify and manipulate query data” on page 31

Generate JCL

“Generate JCL” on page 35

Specify DB2 product options

The DB2 Options (ABX\$DOPT) panel is available from the Settings panel. Set the defaults for using IBM File Export for z/OS with DB2 databases by filling in the fields on the panel. These panel fields are:

- Job card information for the job that will be used for the MVS SORT facility that is used by DB2
- Job card information for the job that will be used for the DB2 LOAD Utility.

Select a DB2 session

From the IBM File Export Session Management (ABX\$SMNG) panel, select option **1, DB2**, to provide specifications for a DB2 session. You must specify a session name for the session you are creating. The DB2 Menu (ABX\$DB2W) opens, displaying the name of your current session and a list of tasks you can perform.

Note: If you want to work with an existing DB2 session, specifying **4** on the Option line of the IBM File Export Session Management Menu displays a list of previously-defined sessions from which you can choose the one to work with.

From the DB2 Menu, you can perform the following tasks:

- Identify the source and target DB2 subsystems you will use.
- Create external relationships
- Define query information and how queries are constructed and manipulated
- Generate the JCL to be used to generate the target output

Specify the subsystems and LOADLIBs for your source and target

From the DB2 Menu, select Option 1 to display the DB2 Source and Target (ABX\$DBST) panel. Use the panel to specify the DB2 subsystem and LOADLIB where the source resides and where you want the target to reside. The name of your current session is displayed at the top of the panel. On this panel, you can specify.

- The DB2 subsystem and LOADLIB where the source data resides and the subsystem and LOADLIB where you want the target output to reside. You can create a target that is a DB2 table or a flat file. If you want to create a target that is a DB2 table, specify the DB2 subsystem and load libraries where the target table or tables that you want to create will reside.
- The plan names for the user interface, batch utility, and LOAD Executor

When you have completed your entries, press **Enter** to return to the DB2 Menu.

Define Relationships

To define external relationships, on the DB2 Menu panel, select option 2 to display the Relationship Specification (ABX\$RELS) panel. Before defining external relationships, you may want to review the information about application-defined relationships in “Defining relationships in IBM File Export” on page 5. This panel lists any previously-defined filters or content specifications. From this panel, you can add or delete a filter or a content specification or edit an existing filter or content specification. Choosing to add a new filter or edit an existing filter results in displaying the Filter panel. Choosing to add a new content specification or edit an existing content specification results in displaying the Content panel.

On the Filter (ABX\$RELF) panel, you can specify the following information:

- The name you are assigning to this filter
- The name of the data set that is the source for the filter. You can browse for the name if you so choose, by entering a partial qualifier to display the Data Set List (ABX\$DSLS) panel.
- The position, length, and data type of the source data.

On the Content (ABX\$RELC) panel, you can specify the following information:

- The name you are assigning to this content specification
- The name of the data set that is the source for the content specification. You can browse for the name if you so choose, by entering a partial qualifier to display the Data Set List (ABX\$DSLS) panel.
- The position, length, and data type of the source data. Note that these fields are repeated once when specifying the content key and again when specifying the content specification.

Pressing **PF3** on either the Filter or the Content panel returns you to the Relationship Specification panel. Pressing **PF3** on that panel returns you to the DB2 Menu panel.

About content relationships

Use the Content Specification panel to specify information about the content data set. To add content, you select data from a data set and match that data to the data from a specific column in the source in order to populate your target. Use the key to identify the key column. Preferably, that column is unique, as, for example, Account Number. Use the Data to identify actual data that is to be selected from the source to be written to the target.

To summarize, use a content specification to include data from an external source. Use the Key to specify what data IBM File Export is to compare to the source file, and the Data to specify what data IBM File Export is to include in the target output when the key is found.

For example, assume that your source file contains addresses using two-character State abbreviations. But you would rather have addresses with the State name spelled out in the target data. To accomplish this, you would define a Content Relationship in File Export to use an external file that contains the abbreviated State name in columns 1 and 2, and the spelled out State name in columns 3 through 28. In this example, the Key Column in the external file would be the abbreviated State name (since the same data exists in the source file) in columns 1 and 2, and the Data Column that you want to include in the target data would be the data contained in columns 3 through 28. So that when File Export finds 'TX' in the source file as the abbreviated State name, for example, the Key from the external file is matched, and File Export uses the spelled-out State name from the external file to populate the target data file.

Specify and manipulate query data

From the DB2 Menu, select Option 3 to display and manipulate query information using the Queries (ABX\$DBQL) panel. The Queries panel displays a list of previously defined queries. For each query on the list, IBM File Export displays:

- The name under which the query is stored
- The table against which the named query is to be run.

From this panel, you can add or delete queries or edit an existing query. Choosing to add a new query or edit an existing query results in displaying the Edit Query (ABX\$DBQE) panel. On the Edit Query panel you can select the next task you want to perform. These tasks are grouped to permit you to specify information about:

- The tables, columns, and selection criteria that comprise the SELECT statement that selects data from the source
- Additional processing that will occur against the intermediate result set
- The target table that will be created and the DD statements that define the intermediate data set

At any time, you can press **PF3** to return to the Queries panel.

Specify target table information

If you specified 1 on the Option line of the Edit Query panel, IBM File Export displays the Target Specification panel. The Session Name and Query Name are provided for you on that panel. Use this panel to provide information about the target table or file and the data to be written to it. You can create a target that is a DB2 table or a flat file.

To create a target table, specify the table owner and the table name in the appropriate fields.

Describe the output data using the next three fields.

- Limit the number of rows written to the output table by typing a value here. The default is 0.
- If you want to include an additional number of rows in your output table after the limit is reached, specify a value 'nn' here. After the limit is reached, then every 'nn'th row will also be written to the output table. The default is 0.
- You can specify that you want to skip some number of selected rows before writing rows to the output table. The default is 0.

Specify the LOAD Executor option you want:

- Specify RESUME on LOAD
Select this option to specify whether records are to be loaded into an empty or non-empty table space. Specifying RESUME continues loading into a non-empty table space.
- Specify REPLACE on LOAD
Replace indicates whether the table space and its indexes need to be reset to empty before records are loaded.
- Specify REUSE on LOAD
REUSE is used with REPLACE and specifies that LOAD should logically reset and reuse DB2-managed data sets without deleting and redefining them.

When you have completed work on this panel, press **PF3** to return to the Edit Query panel.

Edit source tables

If you specified **1** on the Option line of the Edit Query panel, IBM File Export displays the Source Tables (ABX\$DBTL) panel. The Session Name and Query Name are provided for you on that panel. This table displays a list of previously defined source tables. You can add tables to the list, edit information for a table already in the list, or delete tables from the list. For each table, IBM File Export lists:

- The name of the table owner
- The name of the source table.

If you are adding a table or editing information for a previously defined table, a pop-up panel opens requesting the new or revised table name and/or table owner.

When you have completed work on this panel, press **PF3** to return to the Edit Query panel.

Edit source columns

If you specified **2** on the Option line of the Edit Query panel, IBM File Export displays the Query Columns (ABX\$DBCL) panel. The Session Name and Query Name are provided for you on that panel. The query name is the name of the query for which you are defining the columns from the source table(s). The panel provides a list of previously defined columns belonging to the source table(s).

Use this panel to add or edit information about the columns comprising the source input tables accessed by this query, or to delete a column from the list. For each column, the panel displays

- The name of the table
- The name of the column
- The column's data type, which may be INT, CHAR, FLOAT, HEX, SHORT, DOUBLE, or PACKED

If you are adding a column, a pop-up panel, Column Specification, opens. On this panel, you can specify the table owner, table name, column name and column type for the new column to be added. When you press **Enter**, the pop-up closes and the information you provided is displayed on the Query Columns panel.

You can select the column to be added from a list of columns. To do so, type **L** on the Option line of the Query Columns panel displays the Column List (ABX\$DBCS)

panel. On this panel, you will find a list of columns belonging to the source table. Select from that list the table/column combination you want to add to your query.

Press **Enter** to return to the Query Columns panel. Press **PF3** on that panel to return to the Edit Query panel.

Edit selection criteria

If you specified **3** on the Option line of the Edit Query panel, IBM File Export displays the Selection Criteria (ABX\$CLST) panel. The Session Name and name of the table for which you are providing selection criteria are displayed at the top of that panel. The panel displays a list of any previously defined selection criteria. Use this panel to add selection criteria used to select source input or to delete a selection criterion from the list.

If you want to add a new criterion, selecting Option A displays a blank line on which you can type the value to be assigned as a selection criterion, for example, `LITERAL=X'0100'`.

Modify target columns

If you specified **4** on the Option line of the Edit Query panel, IBM File Export displays the Target Columns (ABX\$DBTC) panel. The Session Name and Query Name are provided for you on that panel. Any previously defined column information appears in the list. Use this panel to add or edit information about the target output you will create.

On this panel, information displayed for a given target column includes:

- The name by which the column will appear in the target output. This is not necessarily the same as the name of the column in the source input.
- Whether or not the contents of the column will be scrambled when the information is written to the output. When a column is scrambled, the contents will retain the same format as in the source, but the contents will be randomized. This is useful when the source contains sensitive data. The algorithm used for scrambling produces reproducible output. This means that the output of a scrambled value will be the same each time that value is scrambled.
- Whether this column will appear in the output or will be omitted from the output.
- Whether the column will contain data from an external source (that is, will have an external relationship)
- Whether or not this column is a new column for the target output

You can add or edit the target column information, or delete a column from the list. If you choose to add or edit the information about a target column, the Edit Target Column (ABX\$DTC1) panel opens. The name of the session you are working with, the name of the query for which you are defining target output, and the name of the source column appear at the top of the panel. This panel permits you to specify or edit the following information:

- The name by which the column will appear in the target output. This is not necessarily the same as the name of the column in the source input.
Note: This field only appears on this panel if you have specified an Alter Name on the Table Columns (ABX\$DBTC) panel.
- Whether this column will appear in the output or will be omitted from the output.
- Whether or not the contents of the column will be scrambled when the information is written to the output.

- If this column will contain data from an external source (that is, will have an external relationship), the name under which this content will be stored.
- The name of the column, taken from the results set, that will be used as a key field
- Whether or not this is a nullable column--that is, whether it can contain null values.

Press **PF3** when you have completed work on this panel to return to the Table Columns panel. Press **PF3** again to return to the Edit Query menu.

Edit query relationships

If you specified **5** on the Option line of the Edit Query panel, IBM File Export displays the Edit Relation (ABX\$RRED) panel. This panel permits you to create or edit a relationship that will exist between the statement named in the Statement Name field and the statement you will name in the Parent Statement Name field. Statement Name represents a table that is an intermediate output that results from the execution of a query.

On this panel, selecting option **1** displays a list of result set statements from which you can select a parent statement. Selecting option **2** displays the Edit Relation Fields panel that permits you edit or delete fields that comprise a relationship between the statements identified in the Statement Name and Parent Statement Name fields. The panel displays a list of previously defined relationships. You can choose to add a new set of relation fields to the list by entering or selecting field names on the panel.

Edit query criteria

If you specified **6** on the Option line of the Edit Query panel, IBM File Export displays the Query Criteria (ABX\$QCRT) panel. This panel displays a list of any previously defined WHEN in COLUMN clauses for the query named at the top of the panel and permits you to define additional clauses. These clauses are used to filter the intermediate result set of data extracted from DB2 by IBM File Export. For information about using the WHEN in COLUMN clause, see the discussion of the ABXUTIL TABLE declarative in the IBM File Export for z/OS: *Reference Manual*.

Specify target table information

If you specified **7** on the Option line of the Edit Query panel, IBM File Export displays the Target Specification panel. The Session Name and Query Name are provided for you on that panel. Use this panel to provide information about the target table or file and the data to be written to it. You can create a target that is a DB2 table or a flat file.

To create a target table, specify the table owner and the table name in the appropriate fields.

Describe the output data using the next three fields.

- Limit the number of rows written to the output table by typing a value here. The default is 0.
- If you want to include an additional number of rows in your output table after the limit is reached, specify a value 'nn' here. After the limit is reached, then every 'nn'th row will also be written to the output table. The default is 0.
- You can specify that you want to skip some number of selected rows before writing rows to the output table. The default is 0.

Specify the LOAD Executor option you want:

- Specify RESUME on LOAD

Select this option to specify whether records are to be loaded into an empty or non-empty table space. Specifying RESUME continues loading into a non-empty table space.

- Specify REPLACE on LOAD

Replace indicates whether the table space and its indexes need to be reset to empty before records are loaded.

- Specify REUSE on LOAD

REUSE is used with REPLACE and specifies that LOAD should logically reset and reuse DB2-managed data sets without deleting and redefining them.

When you have completed work on this panel, press **PF3** to return to the Edit Query panel.

Specify intermediate data set DD statements

If you specified **8** on the Option line of the Edit Query panel, IBM File Export displays the DD Statement Definition (ABX\$DDE1) panel. Use this panel to provide DD information for the intermediate data set. The intermediate data set holds the extracted DB2 information from the source DB2 table before it is loaded into the target. On this panel, you are asked to supply a data set name. You can type a partially qualified name with an asterisk (*) on the line to open ABX\$DSLS, which displays a list of data set names from which you can choose the one you want to work with. You can add or delete DD parameters, or you can use an existing data set definition as a template for your DD parameters.

You can also choose to use the Data Set Allocation Parameters Wizard to create your DD parameters. The wizard prompts you for information such as:

- The name of the data set device that will be used. Leave this field blank if this is an SMS-managed data set.
- The volume serial in this field. Leave this field blank if this is an SMS-managed data set or if you have specified a value for Data Set Unit.
- The space unit you want to use, cylinders or tracks
- The number of tracks or cylinders to be allocated as the primary and secondary allocations

Generate JCL

From the DB2 Menu (ABX\$DB2W) panel, select Option **4** to generate the JCL to perform the export. The JCL Generation (ABX\$DBJC) panel opens.

On this panel, if the Data Set Name and Member Name are not displayed when the panel opens, type these names to indicate where you want to store the generated JCL. If you want to browse for the data set name, enter a partially qualified name with an asterisk and press **Enter**. IBM File Export for z/OS opens panel ABX\$DSLS which displays a list of data sets from which you can choose.

If you left the member name blank, panel ABX\$MEML displays a list of members from which you can choose the member to use. After you have selected a member from this display, pressing **Enter** returns you to the JCL Generation panel.

To add more STEPLIBs to your generated JCL, type **AL** on the Option line to display panel ABX\$DSSL. On that panel, you can select additional STEPLIBs, or you can choose to select from a list of data sets. To do so, enter a partially qualified data set name with an asterisk to open the Data Set List (ABX\$DSLS) panel. Select any additional STEPLIBs from the list on this panel.

There are two ways to export your DB2 data using IBM File Export for z/OS. You can run IBM File Export, then load the data that it exported yourself, or you can run IBM File Export and then the DB2 Load Executor in sequence, which results in your data being loaded into your DB2 target table when the process is complete. If you choose to create JCL to extract data but do not wish to create JCL to run the DB2 Load Executor, type a slash (?) next to the option on the JCL Generation (ABX\$DBJC) panel that requests Generate export only. If you leave this line blank, IBM File Export will create the JCL to both extract source data and then run the DB2 Load Executor.

Once you have completed work, press **PF3** to return to the JCL Generation (ABX\$DBJC) panel. Pressing **PF3** again returns you to the DB2 Menu (ABX\$DB2W).

Chapter 5. Exporting IMS data

This chapter explains how to use IBM File Export for z/OS to export IMS data. Note that any panels illustrated in this book are representative of the panels in the product and may differ slightly from the panels shipped with the product.

IBM File Export provides for input from and output to IMS in these ways:

1. When accessing IMS using any of the supported IMS processing options, IBM File Export uses as input a sequential file produced by IBM's HD Reorganization Unload Utility (DFSURUL0) and produces a sequential output file that can be used by IBM's Reorganization Reload Utility (DFSURGL0). The product supports all database types that are supported by these utilities.
2. When accessing IMS using the DLI, DBB, or BMP processing options, you can access IMS databases directly without using unload files.
3. Using a control syntax that is similar to that of ABXUTIL, ABXFELD0 permits you to insert IMS segment data into IMS databases using the services of the DLI, DBB, or BMP processing mode. You can limit the databases that are to be processed by means of an INCLUDE and EXCLUDE mechanism. You can also read segment data from a database and write that data to a differently-named database. For more information, see "Inserting data into IMS databases using the IBM File Export UNLOAD file" in the *IBM File Export: Reference Manual*.

Fast Path Data Entry Databases (DEDDB) are also supported when IBM's Fast Path Basic Tools (FPB) is installed and available for use.

Understanding static and dynamic PSBs

Using IBM File Export to access IMS databases directly when processing DLI, DBB, or BMP regions requires the use of an IMS control block known as a PSB. A PSB (Program Specification Block) is used to define and control access to IMS databases by using one or more PCBs (Program Control Blocks) defined within the PSB. When used by an IMS DLI region, these PSBs usually reside in a partitioned data set, called a PSBLIB, in load module format. When used by IMS DBB and BMP regions, additional processing called an ACBGEN is executed and the PSB is written in a different format to a separate partitioned data set, which is known as an ACBLIB. For more information about the creation of PSBs, see the *IMS: Utilities Reference Manual*.

IBM File Export can use PSBs that have already been coded with the appropriate PCBs for the required databases. These are known as static PSBs. These static PSBs must reside in a PSBLIB when accessing IMS databases using a DLI region. For DBB regions, the PSB must reside in an ACBLIB. For BMP regions, the PSB must reside in an ACBLIB that is represented by a DD statement in the IMS control region, and, if applicable, in a DLI/SAS region. The PSB must also be defined to IMS during the IMS GEN process using the IMS APPLCTN macro. Only PSBs that have the LANG=ASSEM or LANG=COBOL optional keyword included in the PSBGEN macro statement may be used. PSBs that have this options specified as PL/I, PASCAL, JAVA, or blank should not be used.

For more information on how to define the PSB to IMS, see *IMS Installation Volume 2: System Definition and Tailoring*.

IBM File Export can optionally generate PSBs that contain all the PCBs needed to perform the task at hand. These dynamically-generated PSBs are known as dynamic PSBs. These dynamic PSBs are created at execution time and only exist for the

duration of the job step that created them. For all region types, IBM File Export creates the PSB source statements to define PCBs with a read-only processing option (PROCOPT) for any databases that are to be read, and PCBs with a PROCOPT of ALL for databases that are to be written to. IBM File Export then dynamically invokes the assembler and linkage editor to create a PSB load module in a temporary partitioned data set (PDS).

The PSB in the temporary data set is used by IMS DLI region processing to gain access to the databases. For DBB and BMP regions, the ACBGEN process is then dynamically invoked and a PSB is created in ACBLIB format. In the case of a DBB region, this PSB is created in a temporary ACBLIB data set. In the case of a BMP region, this PSB is created in a predefined ACBLIB data set.

Using static PSBs

In order to use static PSBs, the dynamic PSB option must be OFF in the IMS Options Control Block, or you must have specified DYNPSB=N in the ABXUTIL Options control statement. You must also specify the following in the ABXUTIL control statement stream or by using the IMS Options Control Block:

- Specify the PSB name that you wish to use on the PSBNAME= keyword.
- Specify the PCB number in the PSB for the input database using the ABXUTIL control statement SOURCEDBD= or the INPCB#= parameter on the IMS Options Control Block.
- Specify the PCB number for the output database using the ABXUTIL control statement TARGETDBD= or the OUTPCB#= parameter on the IMS Options Control Block.

The static PSB to be used must reside in the appropriate data set with an appropriate DD statement referencing that data set. For example, for DLI regions, the PSB must reside in a valid PSBLIB data set, which is referenced by the IMS DD statement in the JCL. For DBB and BMP regions, the IMSACB DD statement or the MODSTAT/IMSACBA/IMSACBB combination of DD statements may be used to point to an ACBLIB data set. See *IMS Installation Volume 2: System Definition and Tailoring* for details of DD statement requirements.

Detailed specifications for the ABXUTIL control statement syntax are found in the *File Export for z/OS: Reference Manual* in the section entitled "Creating JCL Using Control Statements." Information about the IMS Options Control Block can be found in that manual in the section "Configuring IBM File Export to Process IMS Databases."

Using dynamic PSBs

In order to use IBM File Export's dynamic PSB function, the dynamic PSB option must be ON in the IMS Options Control Block, or you must have specified DYNPSB=Y in the ABXUTIL Options control statement. You must also specify the following by using the IMS Options Control Block:

- The dynamic PSB name prefix (DPSBPFX=)
- The dynamic PSB name suffix (DPSBSFX=)
- The IMS PSB Macro library dataset name (DPSBMAC=)
- The IMS DBDLIB dataset (DBDLIB=)
- If the step is to execute as a BMP region, the DOPT ACBLIB dataset name (DOPT=)

Detailed specifications for the ABXUTIL control statement syntax are found in the *File Export for z/OS: Reference Manual* in the section entitled "Creating JCL Using Control

Statements." Information about the IMS Options Control Block can be found in that manual in the section "Configuring IBM File Export to Process IMS Databases."

Select the IMS source and target types

When you initiate a new IMS session from the IBM File Export Session Management panel, ABX\$SMNG (see page 11), select **IMS** to provide specifications for an IMS full-function or Fast Path session. You must specify a session name for the session you are creating. If this is a new session, the IMS Source and Target Types Specification (ABX\$IMST) panel opens. On this panel, you can specify the input and output processing types that will be used.

```
ABX$IMST      ----- IMS Source and Target Type Specification -----
Option  ==>>

Session Name  MDSTITIW

Select the Source IMS type and the Target IMS type by typing a slash '/'
next to the IMS type.

Select the Source IMS Type:           Select the Target IMS Type:

IMS                                     IMS
DEDB                                   DEDB
DLI                                    DLI
DBB                                    DBB
BMP                                    BMP
                                       FEUNLOAD
```

Figure 5. IMS Source and Target Types (ABX\$IMST) panel

Based on the source and target pair you select, you will be shown the appropriate panels on which to define the source and target types. Valid source-target combinations are found in "What sources and targets can I use?" on page 9. If you have specified an IMS or DLI source, a pop-up requests that you specify an IMS subsystem ID. Enter an ID or press **Enter** to see a list of available SSIDs. Press **PF3** to return to the IMS Source and Target Types panel. Pressing **PF3** again returns you to the IMS Menu (ABX\$IMSW).

Starting from the IMS Menu

From the IBM File Export Session Management (ABX\$SMNG) panel, select option **2, IMS**. The IMS Menu, ABX\$IMSW, opens.

Note: If you want to work with an existing session, specify 4 on the Option line of the IBM File Export Session Management panel. Specifying Option 5 displays a list of previously-defined sessions from which you can choose the one to work with.

From the IMS Menu, you can perform the following tasks:

- Identify the source and target IMS databases you will use
- Create variables and literals to be used during this session
- Create external relationships to be used during this session
- Specify the source segments to be used and how the source segments should be manipulated to produce the target segments
- Create any required DD statements
- Specify the information needed to generate the JCL to be used to generate the target output

Specify IMS session settings

Use the IMS Settings (ABX\$IOPT) panel to specify settings specific to the current session. When specified on the IMS Settings panel, some values will override values that have been specified in the IMS Options block. Because you can specify values for a very large number of settings, this manual will provide a brief overview of the settings. For expanded information about the keywords that comprise the IMS settings, see Appendix E, "IBM File Export IMS Options" in the *IBM File Export for z/OS: Reference Manual*. The session to which the settings apply is displayed at the top of the panel.

Wild Card Char

The character that you want to use as a wildcard in IBM File Export for z/OS

Decimal

The character to be used as the decimal point.

SQL Output

Whether or not to create SQL output

SQL Qualifier

The name of the qualifier to be used by SQL for unqualified objects

SSID Name

The name of the IMS subsystem

Get request PROCOPT

The IMS processing options (PROCOPTs) that should be used to read databases when using a dynamically-built PSB

Use Dynamic PSBs

Whether or not the Dynamic PSB feature should be used for this execution. For more information about the use of static and dynamic PSBs, see "Understanding static and dynamic PSBs" on page 37.

Dynamic PSB name prefix

The 1- to 6-character prefix to be used for the names of the PSBs that are generated by the Dynamic PSB feature

Dynamic PSB name suffix

The 2-character numeric suffix to be used for the names of the PSBs that are generated by the Dynamic PSB feature

DLT Duplicate Segs

Whether or not IBM File Export should automatically delete any duplicate segments that are found in an IMS database when writing to that database

Alternate DFSRRC00 name

A 1- to 8-character program name that allows you to execute an alternate IMS region controller program to DFSRRC00

PSB Macro DSN

A 1- to 44-character name of the partitioned data set that contains the IMS macros used to generate PSBs when using the Dynamic PSB feature

DBD Library DSN

A 1- to 44-character name of the partitioned data set that contains the DBDLIB members associated with the IMS subsystem

DOPT ACBLIB DSN

A 1- to 44-character name of the partitioned data set that contains the ACBLIB members that are created by IBM File Export when the Dynamic PSB feature is used while processing

Reslib1 DSN

A 1- to 44-character name of the SVC data set that contains the IMS nucleus for the IMS subsystem

Reslib2 DSN

A 1- to 44-character name of the data set that contains any IMS dynamic allocation members for the IMS subsystem

Reslib3 DSN

A 1- to 44-character name of the data set that contains any user programs or exits needed by IMS to access IMS databases

DFSVSAMP DSN

A 1- to 44-character name of the data set that contains the buffer and subpool information for databases

AGN The Application Group Name used for interregion communication security

ALTID

An alternate IMSID that a BMP region will attempt to connect to if the primary subsystem ID (IMSID) is not available for processing

BKO Whether or not dynamic backout should occur if a pseudo-abend occurs

BUF A 1- to 3-digit number that identifies the number of 1K blocks to be used in calculating the size of the OSAM buffer subpools

CPUTIME

One to four numeric digits which identify the maximum task time in minutes that a BMP region may consume

DBRC

Whether or not DBRC should be used for this execution

DIRCA

Three numeric digits that identify the number of 1K blocks of storage to be used as the interregion communications area

EXCPVR

Whether or not OSAM buffer pools should be page-fixed

FMTO

A 1-character value to identify the format of any IMS dumps

GSGNAME

A 1- to 8-character Global Services Group name that should be used if IRLM is active for this execution

IMSPLEX

Specify the 5-character name that is passed to the SCI registration exit, DSPSCIX0. Valid for DLI and DBB processing modes.

IRLM

Whether or not IRLM should be used for this execution

IRLMNAME

A 1- to 8-character name for the IRLM subsystem that should be used if IRLM is active for this execution

LOCKMAX

A 1- to 5-digit numeric value that may be used to override the LOCKMAX value that was specified in a PSBGEN

MON Whether or not the IMS monitor should be active for this execution

NBA One to four numeric digits that identify the number of IMS buffers that should be used when processing Fast Path databases should the number of buffers specified prove to be insufficient

OBA One to four numeric digits that identify the number of IMS buffers that should be used as overflow when processing Fast Path databases should the number of buffers specified prove to be insufficient

PARDLI

Whether DL/I access to the IMS databases should occur in the IMS control region or in the BMP region

SSM The suffix of a member name used to control access to external subsystems

STIMER

Whether you want to gather processor time statistics

SWAP

Whether or not the address space is swappable

Specify source database

The path through selecting your source database varies depending on the processing mode.

If your source processing option is IMS or DLI...

On the IMS Menu that follows, select Option 1, Source Database. The IMS Source Data Base Specification (ABX\$FFDB) panel opens with the name of the current session displayed at the top of the panel. On this panel, provide the following information:

- Type the name of the source IMS DBD library that contains the DBD for HIDAM/HDAM/HISAM databases. You can enter a partial qualified name together with an asterisk to display a list from which you can select a library.
- Type the name of the database containing the DBD library. If you would rather select from a list, leave this field blank. When you press **Enter**, IBM File Export displays a list of databases (ABX\$DSL) from which you can choose the one you want to use.

Press **PF3** to return to the IMS Menu.

If your source processing option is DEDB...

On the IMS Menu that follows, select Option 1, **Source Database**. The IMS Source Data Base Specification (ABX\$FSPSR) panel opens with the name of the current session displayed at the top of the panel. On this panel, provide the following information:

- Type the name of the Fast Path Data Entry Data Base DBDFN library. If you would rather select from a list, you can specify a high-level qualifier in the field. When you press **Enter**, IBM File Export displays a list of data sets (ABX\$DSL)

from which you can choose the one you want to work with. To browse for a name, you must enter at least a high-level qualifier in the DBDFN Library field, together with an asterisk, or no further action is taken.

Press **PF3** to return to the IMS Menu.

If your source processing option is DBB or BMP...

On the IMS Menu that follows, select Option **1, Source Database**. The IMS Source Data Base Specification (ABX\$FPTG) panel opens with the name of the current session displayed at the top of the panel. On this panel, provide the following information:

- Specify whether you want to use ACBLIB or MODSTAT
- If you chose ACBLIB, type the name of the IMS ACBLIB data set in this field. This field is mandatory unless you choose to specify the MODSTAT, IMSACBA, and IMSACBB fields. In that case, leave this ACBLIB field blank. You can browse for this name by entering a partially qualified name together with an asterisk to display a list from which you can select the data set you want to work with.
- If you chose MODSTAT, type the name of the target IMS MODSTAT data set in this field. Leave this field blank if you fill in the ACBLIB field. If you fill in this MODSTAT field, you must also specify IMSACBA and IMSACBB fields. You can browse for these names by entering a partially qualified name together with an asterisk to display a list from which you can select the data set you want to work with.
- Type the name of the target Fast Path database. If you would rather select from a list, leave this field blank. When you press **Enter**, IBM File Export displays a list of databases (ABX\$DSL) from which you can choose the one you want to work with.

Press **PF3** to return to the IMS Menu.

Specify target database

The path through selecting your target database varies depending on the processing mode.

If your target processing option is IMS or DLI

On the IMS Menu that follows, select Option **2, Target Database**. The IMS Target Data Base Specification (ABX\$FFDB) panel opens with the name of the current session displayed at the top of the panel. On this panel, provide the following information:

- Type the name of the source IMS DBD library that contains the DBD for HIDAM/HDAM/HISAM databases. You can enter a partial qualified name together with an asterisk to display a list from which you can select a library.
- Type the name of the target database. If you would rather select from a list, leave this field blank. When you press **Enter**, IBM File Export displays a list of databases (ABX\$DSL) from which you can choose the one you want to use.

Press **PF3** to return to the IMS Menu.

If your target processing option is DEDB, DBB, or BMP

On the IMS Menu panel, select option **2, Target Database**. The IMS Target Database Specification panel, ABX\$FPTG, opens. On this panel, the name of your session is displayed in the **Session Name** field. Use this panel to define your target database.

Note: If your source processing option was DBB or BMP, the appropriate fields on this panel are display fields, with the values in them taken from the IMS Source Database Specification panel. The exception is the Database field, where you can enter a database name or browse for the name. On this panel, provide the following information:

- Specify whether you want to use ACBLIB or MODSTAT
- If you chose ACBLIB, type the name of the IMS ACBLIB data set in this field. This field is mandatory unless you choose to specify the MODSTAT, IMSACBA, and IMSACBB fields. In that case, leave this ACBLIB field blank. You can browse for this name by entering a partially qualified name together with an asterisk to display a list from which you can select the data set you want to work with.
- If you chose MODSTAT, type the name of the target IMS MODSTAT data set in this field. Leave this field blank if you fill in the ACBLIB field. If you fill in this MODSTAT field, you must also specify IMSACBA and IMSACBB fields. You can browse for these names by entering a partially qualified name together with an asterisk to display a list from which you can select the data set you want to work with.
- Type the name of the target Fast Path database. If you would rather select from a list, leave this field blank. When you press **Enter**, IBM File Export displays a list of databases (ABX\$DSLS) from which you can choose the one you want to work with.

Once you have chosen the database you want to work with from the list, press **PF3** to return to the IMS Target Database Specification panel. IBM File Export has filled in the Database field on this panel with your selection from the Database Selection List. Pressing **PF3** again returns you to the IMS Menu.

If your target processing option is FEUNLOAD...

On the IMS Menu panel, select option **2, Target Database**. The IMS Target Database Specification panel, ABX\$FETG, opens. On this panel, the name of your session is displayed in the **Session Name** field. Use this panel to provide a name for your FEUNLOAD data set.

Define variables and literals

Literals are constants and can be either implicit or named. Variables are literals that change value during the process due to being incremented as a result of system action. On the IMS Menu panel, select option **3, Variable and Literal Specification**. Panel ABX\$VLST, containing a list of any already-defined variables and literals, opens. On this panel, the name of your session is displayed in the **Session Name** field. Any variables or literals you have previously defined are displayed. For each variable or literal, the information provided includes:

- A label, which is a name you assign to the variable or literal.
- An indication of the Type, which is **L** for literal or **V** for variable.

Specify **AV** or **AL** to define a new variable or literal, respectively. The New Variable/Literal (ABX\$VARS) panel displays. On this panel, you can define a new

variable or literal or edit an existing variable or literal. On the New Variable/Literal panel, you can specify:

- A name for the source data
- The length of the source data in this field. Length is a numeric literal and is the length in bytes required in memory for the source data. The length can also be specified as '*' (an asterisk) which means the rest of the record as seen at run time. The sum of offset and length cannot exceed the record length.
- The data type, which can be one of the following:
 - INT or INTEGER
 - CHAR
 - FLOAT
 - HEX
 - SHORT
 - DOUBLE
 - PACKED
- The value to be assigned to the variable or literal, for example, X'0100'.

When you have completed work on this panel, press **PF3** to return to the Variables and Literals List. Pressing **PF3** again returns you to the IMS Menu.

Define Relationships

To define external relationships, on the IMS Menu panel, select option 4 to display the Relationship Specification (ABX\$RELS) panel. Before defining external relationships, you may want to review the information about application-defined relationships in "Defining relationships in IBM File Export" on page 5. This panel lists any previously-defined filters or content specifications. From this panel, you can add or delete a filter or a content specification, or edit an existing filter or content specification.

Choosing to add a new filter or edit an existing filter results in displaying the Filter panel. Choosing to add a new content specification or edit an existing content specification results in displaying the Content panel.

On the Filter (ABX\$RELF) panel, you can specify the following information:

- The name you are assigning to this filter
- The name of the data set that is the source of the filter. You can browse for the name if you so choose, by entering a partial qualifier to display the Data Set List (ABX\$DSLS) panel.
- The position, length, and data type (for example, HEX) of the filter

On the Content (ABX\$RELC) panel, you can specify the following information:

- The name you are assigning to this content specification
- The name of the data set that is the source for the content specification. You can browse for the name if you so choose, by entering a partial qualifier to display the Data Set List (ABX\$DSLS) panel.
- The position, length, and data type of the source data. Note that these fields are repeated once when specifying the content key and again when specifying the content specification.

Pressing **PF3** on either the Filter or the Content panel returns you to the Relationship Specification panel. Pressing **PF3** on that panel returns you to the IMS Menu panel.

About content relationships

Use the Content Specification panel to specify information about the content data set. To add content, you select data from a data set and match that data to the data from a specific column in the source in order to populate your target. Use the key to identify the key column. Preferably, that column is unique, as, for example, Account Number. Use the Data to identify actual data that is to be selected from the source to be written to the target.

To summarize, use a content specification to include data from an external source. Use the Key to specify what data IBM File Export is to compare to the source file, and the Data to specify what data IBM File Export is to include in the target output when the key is found.

For example, assume that your source file contains addresses using two-character State abbreviations. But you would rather have addresses with the State name spelled out in the target data. To accomplish this, you would define a Content Relationship in File Export to use an external file that contains the abbreviated State name in columns 1 and 2, and the spelled out State name in columns 3 through 28. In this example, the Key Column in the external file would be the abbreviated State name (since the same data exists in the source file) in columns 1 and 2, and the Data Column that you want to include in the target data would be the data contained in columns 3 through 28. So that when File Export finds 'TX' in the source file as the abbreviated State name, for example, the Key from the external file is matched, and File Export uses the spelled-out State name from the external file to populate the target data file.

Define segment specification and manipulation

To perform segment specification and manipulation, on the IMS Menu panel, select option 5, **Segment Specification and Manipulation**. The Segments (ABX\$SEGM) panel opens. The name of the current session is displayed at the top of the panel, along with the name of the source database.

In the table that appears at the bottom of the panel, IBM File Export displays the segment name and segment hierarchical level. For each segment, you can specify or modify:

- The number of records that you want to skip. You can specify that you want to skip the first 'nn' accepted records from the source when you are creating your output.
- The number of records that is the maximum number you will produce in the target output.
- An integer that specifies that after hitting the limit, 1 of the next 'n' acceptable records will be produced for the target.
- Whether this segment is the last segment in the hierarchy to be included in the target output.

On this Segments panel, you can edit a segment using the Segment Fields (ABX\$FSEL) panel, or edit the record types, for example, Debit or Credit, using the Record Type List (ABX\$SQTL) panel.

Specify or modify segment fields

Use the Segment Fields (ABX\$FSEL) panel to add a field to the segment, delete a field from the segment, and reset the current fields for the segment as well as to modify the field name, start position, size, and type, and specify whether or not the field should be scrambled. The Segment Fields (ABX\$FSEL) panel can only be used to modify

parameters for user-defined fields. When the segment displayed is from the physical DBD, that is, it is not user defined, you cannot change the value of the parameters.

The Session Name and source DBD name are displayed at the top of the panel, as well as the segment name and the minimum and maximum size for the segment. The following information is also displayed:

- The current field name
- Whether or not this is a sequence field
- The field's current start position
- The current field size
- The current data type which may be:
 - INT or INTEGER
 - CHAR
 - FLOAT
 - HEX
 - SHORT
 - DOUBLE
 - PACKED
- Whether or not the field is to be scrambled. When a field is scrambled, the contents will retain the same format as in the source, but the contents will be randomized. This is useful when the source contains sensitive data. The algorithm used for scrambling produces reproducible output. This means that the output of a scrambled value will be the same each time that value is scrambled.

On this panel, you can add or edit a field, delete a field, or reset the field's values to the default or previous value. If you chose to add a field or to edit a field currently on the pane, the Field (ABX\$NFLD) panel opens. On that panel, you can specify:

- The field name, if this is a new field
- The position of the field
 - As a numeric integer type constant like 1 or 100
 - Relative to the end of the record like 'end - 10' (ten bytes from the end of the record)
 - Using a hex constant (x'22' or h'22') which will always be interpreted as an offset (never as a 'position')
 - As a cumulative position/offset definition
- The field's length and type
- Whether or not the field is to be scrambled.
- An integer that indicates the number of times a variable length repeating group occurs and the factor that governs how many times the group repeats
- The precision and scale of numeric data and whether it is signed or unsigned
- Group length and maximum field length
- Algorithms expressing position, length, or both as required, and a method to add additional algorithms

When you have completed defining the new field on this panel, press **PF3** to return to panel ABX\$FSEL, the Segment Fields panel. Pressing **PF3** again returns you to the Segment Selection and Manipulation panel (ABX\$SEGM).

Edit record types and generate Select statement

From the Segments panel, you can edit the record types for the selected segment and generate the SELECT statement using the Record Type List (ABX\$SQTL) panel.

Use the Record Type List (ABX\$SQTL) panel to add a new type, edit the types for the file, delete an existing type, or specify fields and selection criteria for a type. You can also specify that data about the record be added from the repository. The list on this panel shows, for each record type:

- The name you have assigned to the field, for example, Debit or Credit
- Whether or not this field will be included or excluded when selecting fields for processing
- The number of records that you want to skip. You can specify that you want to skip the first 'nn' accepted records from the source when you are creating your output.
- The number of records that is the maximum number you will produce in the target output
- An integer that specifies that after hitting the limit, 1 of the next 'n' acceptable records will be produced for the target.

Adding or editing a type:

If you want to add or edit a type, IBM File Export next opens the Record Type (ABX\$SQLT) panel. On this panel:

- Type a name (such as Debit or Credit) for the record type to be added to the segment. If you are editing a type, the name will be supplied.
- Type a WHEN and/or a WHERE predicate. Information valid for the record type is described in the control statement TYPE in the chapter entitled "Creating JCL Using Control Statements" in the *IBM File Export for z/OS: Reference Manual*.

Adding a Select Statement:

The Select Statement List (ABX\$SELS) panel displays a list of SELECT statements that you can delete, add fields to, or add selection criteria to. The name of the current session is displayed for you in the Session Name field. This panel also displays the name you have specified for this Select statement and the record type name, such as Debit or Credit. On this panel, you can specify:

- Whether the record produced by the Select statement is to be written out or suppressed.
- The number of records that you want to skip. You can specify that you want to skip the first 'nn' accepted records from the source when you are creating your output.
- The number of records that is the maximum number you will produce in the target output
- An integer that specifies that after hitting the limit, 1 of the next 'n' acceptable records will be produced for the target.

You can also define fields for the Select statement and a Where clause for the statement.

Fields:

To define additional fields for a Select, IBM File Export opens the Selected Fields (ABX\$SLST) panel. The name of the current session and the record type for which you are working with fields appear at the top of the panel. The Selected Fields panel

displays those field that have been defined and permits you to add entries to or delete them from the list. The fields on ABX\$SLST are:

- The field name
- The field type, for example, Debit or Credit
- The name of the connected field. When you include content data from an external source, you must specify the key field in order to connect to that content data. This field contains the name of that key field.

If you want to add an entry to the Selected Fields panel, typing **A** on the Option line opens a list of previously defined fields (ABX\$FLST). The name of the current session and the record type for which you are working with fields appear at the top of the panel. You can select from this list the fields you want to add.

Pressing **PF3** when you are done returns you to the Selected fields (ABX\$SLST) panel. Continuing to press **PF3** returns you to the IMS Menu.

Where clause:

To define a Where clause from the Select Statement List (ABX\$SELS) panel results in opening the Selection Criteria (ABX\$CLST) panel. The Session Name and the name of the record type for which you are specifying data selection criteria are displayed at the top of the panel. On this panel, you can add a new selection criterion or delete an existing criterion. To add a criterion, first add a line to the panel using the **A** Option. Then type the value to be assigned as a selection criterion, for example, LITERAL=X'0100', in the Value column.

Pressing **PF3** when you are done returns you to the Select Statement List (ABX\$SELS). Continuing to press **PF3** returns you to the IMS Menu.

Create DD statements

To generate the DD statements required to generate the target output, on the IMS Menu panel, select option **6, Create DD Statements**. The DD Statements List (ABX\$IMSD) panel opens. On this panel, the name of your session is displayed in the **Session Name** field. A list of DD statements, created based on IMS parameters you have specified is displayed.

- Complete the fields on this panel. To edit any DD statements, type **E** on the Cmd line to display the appropriate DD Statement Definition (ABX\$DDEn) panel, as, for example ABX\$DDE1. The panel that is displayed depends on the target processing option you specified earlier and permits you to add or delete lines from the DD. You may also be given the option to use an existing definition as a template by selecting the **T** option or use the Data Set Allocation Parameters Wizard (ABX\$DDWZ) to assist in creating a correct definition.

The wizard guides you in specifying the following information:

- The name and VOLSER of the data set device that will be used
 - The space unit to be used, for example cylinders or tracks
 - The primary and secondary quantity of space units to be allocated
- If you are writing out Fast Path data, the following DD statements are represented on the DD Statements List panel. The Fast Path SORTCTLS DD requires an additional panel to be completed. On this panel, you will need to supply the following information:

FABCUR7: UR7DBDFN

The database DMB data set created by the UNLOAD process. If you edit this data set, you are taken to a DD Statement Definition panel on which you can add or delete DD statements.

FABCUR7: UR7DATA

The input data sets containing the segment data created by the UNLOAD process, FABCUR1. If you edit this data set, you are taken to a DD Statement Definition panel on which you can add or delete DD statements.

FABCUR7: UR7CTL

The control statement input stream for FABCUR7 (optional). If you edit this data set, you are taken to a DD Statement Definition panel on which you can add or delete DD statements, select a template to use to create DD statements, or use the Data Set Allocation Parameters Wizard.

FABCUR6: UR6DBDFN

The output data set containing the database DMB information that will be used by the DEDB reload program, FABCUR3. If you edit this data set, you are taken to a DD Statement Definition panel on which you can add or delete DD statements, select a template to use to create DD statements, or use the Data Set Allocation Parameters Wizard.

FABCUR6: UR6CTL

The control statement input stream for FABCUR6 (optional). If you edit this data set, you are taken to a DD Statement Definition panel on which you can add or delete DD statements.

FABCUR6: SORTCTLS

The XDnnnnnO and XSnnnnO pairs of data sets that contain the segment output and associated SORT control statements created by FABCUR6. If you edit this data set, you are taken to the Sort Control Statements panel (ABX\$DXS) on which you will supply information required for sort control.

- When you have completed your work, press **PF3** to return to the DD Statements List (ABX\$IMSD) panel. The information you provided is now filled in the appropriate fields. Pressing **PF3** again returns you to the IMS Menu.

Generate JCL

You are now ready to generate the JCL required to generate the target output. On the IMS Menu panel, select option 7, **Generate JCL**. The JCL Generation for IMS Session (ABX\$FFJC) panel opens. On this panel, the name of your session is displayed in the **Session Name** field. Provide the following information:

- On this panel, if the Data Set Name and Member Name are not displayed when the panel opens, type these names to indicate where you want to store the generated JCL. If you want to browse for the data set name, enter a partially qualified name with an asterisk and press **Enter**. IBM File Export for z/OS opens panel ABX\$DSLS which displays a list of data sets from which you can choose.
- If you left the member name blank, panel ABX\$DSLS displays a list of members from which you can choose the member to use. After you have selected a member from this display, pressing **Enter** returns you to the JCL Generation panel.
- Specify a number on the Option line to indicate that you want to define STEPLIBs, RMODLIBs, and EXITLIBs. The latter two definitions are optional.

When you have completed work, press **PF3** to return to the JCL Generation for IMS Session (ABX\$FFJC) panel. The information you provided on the ABX\$DDen panels is now filled in the appropriate fields. Pressing **PF3** again returns you to the IMS Menu.

Chapter 6. Exporting Sequential Data or VSAM Data

This chapter explains how to use IBM File Export for z/OS to export sequential or VSAM data. The panels that are used in this process and their associated options, fields, and line commands are also explained. Note that the panels illustrated in this book are representative of the panels in the product and may differ slightly from the product panels.

Working with sequential data:

IBM File Export for z/OS can process sequential files as input and output. The supported record formats are: Fixed (F), Fixed Blocked (FB), Variable (V) and Variable Blocked (VB). The input file is designated by the ABXIN DD statement and may reside on DASD or TAPE. The output file is designated by the ABXOUT DD statement, and may also reside on DASD or TAPE.

The output record format is determined using a number of different methods. The highest precedence is the presence of a DCB= parameter coded in the JCL and attributed to the ABXOUT DD statement. This parameter may contain the RECFM and LRECL keywords to indicate what record format the output should be and the logical record length. The output data set may also be pre-allocated with the desired record format and logical record length. Lastly, if no record format or logical record length is specified, these attributes of the input file are used for the output file. In the case where no input file is supplied, as when the LOAD keyword is specified in the on the Global options panel.

You can use an input file containing fixed length records, and produce an output file containing variable length records. Conversely, you can also use an input file that contains variable length records and produce an output file containing fixed length records. The 4 byte RDW (Record Descriptor Word) will be added when building variable length records, and it will be removed, if necessary, when building fixed length records.

Note: The addition or deletion of the RDW may have adverse consequences on any data field alignment requirements.

Working with VSAM data:

IBM File Export for z/OS can process VSAM files as input and output. Key Sequenced Data Sets (KSDS), Entry Sequenced Data Sets (ESDS), Relative Record Data Sets (RRDS) and Variable Relative Record Data Sets (VRRDS) are all supported as input and output.

Summary

Select a sequential or VSAM session

“Select a sequential or VSAM session” on page 52

Specify session settings

“Select a sequential or VSAM session” on page 52

Define source and target data sets

“Specify source and target data sets” on page 53

Define variables and literals

“Define variables and literals” on page 53

Define relationships

“Define relationships” on page 54

Define field specification and manipulation

“Define field specification and manipulation” on page 55

Define type and select statement specification and manipulation

“Define type and Select statement specification and manipulation” on page 56

Generate JCL

“Generate JCL” on page 58

Select a sequential or VSAM session

From the IBM File Export Main Menu, Session Management (ABX\$SMNG) panel (see page 11), select option **3, Data Sets**, to provide specifications for a sequential data set, or a VSAM data set. You must specify a session name for the session you are creating. The Sequential and VSAM Menu, ABX\$SEQW, opens.

Note: If you want to work with an existing session, specifying **5** on the Option line of the IBM File Export Session Management Menu displays a list of previously-defined sessions from which you can choose the one to work with.

From the Sequential and VSAM menu, you can perform the following tasks:

- Specify product options specific to this session.
- Identify the source and target data sets you will use
- Create variables and literals to be used during this session
- Create external relationships to be used during this session
- Define the specifications for field statements and how they should be manipulated
- Define the specifications for type and select statements and how they should be manipulated
- Specify the information needed to generate the JCL to be used to generate the target output

Specify session settings

From the Sequential and VSAM Menu panel (ABX\$SEQW), type **0** on the Option line. The Session Settings (ABX\$FOPT) panel opens showing the name of your current session at the top of the panel. On this panel, you can provide settings that will be in effect for your VSAM or sequential session unless you override them using parameters on the various session panels. These options are:

- The value to be used as a wild card character. This value will override the value specified on the product’s global options.
- The value to be used as the decimal point. This value will override the value specified on the product’s global options.
- Whether or not you will want to product SQL output and, if so, the qualifier to be used by SQL for unqualified objects.
- A value for the SKIP parameter. Skip is defined as global in scope for Sequential and VSAM files and specifies the number of records to skip. For example, you can specify that you want to skip the first *nn* records from the source data when you are creating your output.
- A value for the LIMIT parameter. Limit is defined as global in scope for Sequential and VSAM files. You can specify that you want to limit the number of eligible records that you output to the target to the value you specify here.

- A value specifying that, after the LIMIT value is reached, write to the output every 1 in *nn* records, where *nn* is the value you specify for THEN. For example, if you specify a value of 10 for THEN, IBM File Export will write out the number of records that meets the LIMIT value, then will write out every 10th record thereafter.
- Whether to automatically load SQL or VSAM records from the repository.

To specify information about the SQL Output DD, type **S** on the Option line of the Session Settings panel. The DD Statement Definition (ABX\$DDE1) panel opens. On this panel, you can specify a data set name or you can specify a partially qualified name containing an asterisk to display a list of data sets from which you can select the one you want to use. Use this panel to define the SQL output DD. You can also specify that you want to use a template or a wizard when specifying your DD parameters.

If you elected to use a template, a pop-up window opens on which you can name the data set to be used as a template. If you requested a wizard, a panel opens that assists you in specifying the appropriate DD parameters.

To open a connection to the repository, type **C** on the Option line of the Session Settings panel.

Pressing **PF3** multiple times moves you back through the panels to the Sequential and VSAM Menu.

Specify source and target data sets

From the Sequential and VSAM Menu (ABX\$SEQW) panel, type **1** on the Option line. The Source and Target Data Set Specification (ABX\$VSDB) panel opens. The name of the current session is displayed at the top of the panel. On this panel, enter data set information for the source and the target data sets you will use. You can specify:

- The type for the source and target -- whether VSAM or sequential
- The file names for the source and target files.
- The member names for the source and target files. If the file type is sequential, you can type an asterisk in these fields to browse for the member.

From this panel, you can display the DD Statement Definition (ABX\$DDE4) panel appropriate to the source or target data set. Use this panel to add parameters to or delete them from the DD statements designating the source file and the target file. When specifying information for the target, you can elect to use a template for the DD statements you are creating. If you enter **T** on the Option line, a pop-up panel opens on which you can enter the name of the data set you want to use as a template. You can also choose to use a Wizard to define your DD statements by typing **W** on the Option line to display panel ABX\$DDWZ.

Pressing **PF3** on the DD Statement Definition panel returns you to the Source and Target Data Set Specification (ABX\$VSDB) panel. Pressing **PF3** again returns you to the Sequential and VSAM Menu.

Define variables and literals

Literals are constants and can be either implicit or named. Variables are literals that change value during the process due to being incremented as a result of system action. On the Sequential and VSAM Menu panel, select option **2, Variable and Literal Specification**. Panel ABX\$VLST, containing a list of any already-defined variables and literals, opens. On this panel, the name of your session is displayed in

the **Session Name** field. Any variables or literals you have previously defined are displayed. For each variable or literal, the information provided includes:

- A label, which is a name you assign to the variable or literal.
- An indication of the Type, which is **L** for literal or **V** for Variable.

Specify **AV** or **AL** to define a new variable or literal, respectively. The New Variable/Literal (ABX\$VARS) panel displays. On this panel, you can define a new variable or literal or edit an existing variable or literal. On the New Variable/Literal panel, you can specify:

- A name for the source data
- The length of the source data in this field. Length is a numeric literal and is the length in bytes required in memory for the source data. The length can also be specified as '*' (an asterisk) which means the rest of the record as seen at run time. The sum of offset and length cannot exceed the record length.
- The data type, which can be one of the following:
 - INT or INTEGER
 - CHAR
 - FLOAT
 - HEX
 - SHORT
 - DOUBLE
 - PACKED
- The value to be assigned to the variable or literal, for example, X'0100'.

When you have completed work on this panel, press **PF3** to return to the Variable and Literal Specification panel. Pressing **PF3** again returns you to the Sequential and VSAM Menu.

Define relationships

To define external relationships, on the Sequential and VSAM Menu panel, select option **3** to display the Relationship Specification (ABX\$RELS) panel. Before defining external relationships, you may want to review the information about application-defined relationships in "Defining relationships in IBM File Export" on page 5. This panel lists any previously-defined filters or content specifications. From this panel, you can add or delete a filter or a content specification or edit an existing filter or content specification. Choosing to add a new filter or edit an existing filter results in displaying the Filter panel. Choosing to add a new content specification or edit an existing content specification results in displaying the Content panel.

On the Filter (ABX\$RELF) panel, you can specify the following information:

- The name you are assigning to this filter
- The name of the data set that is the source of the filter. You can browse for the name if you so choose, by entering a partial qualifier to display the Data Set List (ABX\$DSL) panel.
- The position, length, and data type (for example, HEX) of the filter

On the Content (ABX\$RELC) panel, you can specify the following information:

- The name you are assigning to this content specification

- The name of the data set that is the source for the content specification. You can browse for the name if you so choose, by entering a partial qualifier to display the Data Set List (ABX\$DSL) panel.
- The position, length, and data type of the source data. Note that these fields are repeated once when specifying the content key and again when specifying the content specification.

Pressing **PF3** on either the Filter or the Content panel returns you to the Relationship Specification panel. Pressing **PF3** on that panel returns you to the Sequential and VSAM Menu panel.

About content relationships

Use the Content Specification panel to specify information about the content data set. To add content, you select data from a data set and match that data to the data from a specific column in the source in order to populate your target. Use the key to identify the key column. Preferably, that column is unique, as, for example, Account Number. Use the Data to identify actual data that is to be selected from the source to be written to the target.

To summarize, use a content specification to include data from an external source. Use the Key to specify what data IBM File Export is to compare to the source file, and the Data to specify what data IBM File Export is to include in the target output when the key is found.

For example, assume that your source file contains addresses using two-character State abbreviations. But you would rather have addresses with the State name spelled out in the target data. To accomplish this, you would define a Content Relationship in File Export to use an external file that contains the abbreviated State name in columns 1 and 2, and the spelled out State name in columns 3 through 28. In this example, the Key Column in the external file would be the abbreviated State name (since the same data exists in the source file) in columns 1 and 2, and the Data Column that you want to include in the target data would be the data contained in columns 3 through 28. So that when File Export finds 'TX' in the source file as the abbreviated State name, for example, the Key from the external file is matched, and File Export uses the spelled-out State name from the external file to populate the target data file.

Define field specification and manipulation

Selecting **4** on the Sequential and VSAM Menu permits you to define field specification and manipulation for this session. IBM File Export for z/OS opens the Fields panel, ABX\$FSEQ. On this panel, you can add or delete fields or edit an existing field.

At the top of the panel are the name of the current session, the name of the source file, and the maximum logical record length for the file as determined by IBM File Export for z/OS. The following information is displayed for the file:

- The field name
- Start position for the field
- The field's size (length in bytes)
- The field's type:
 - INT or INTEGER
 - CHAR
 - FLOAT
 - HEX

- SHORT
- DOUBLE
- PACKED
- Whether or not the field will be scrambled. When a field is scrambled, the contents will retain the same format as in the source, but the contents will be randomized. This is useful when the source contains sensitive data. The algorithm used for scrambling produces reproducible output. This means that the output of a scrambled value will be the same each time that value is scrambled.

If you chose to add a field or to edit a field currently on the pane, the Field (ABX\$NFLD) panel opens. On that panel, you can specify:

- The field name, if this is a new field
- The position of the field
 - As a numeric integer type constant like 1 or 100
 - Relative to the end of the record like 'end - 10' (ten bytes from the end of the record)
 - Using a hex constant (x'22' or h'22') which will always be interpreted as an offset (never as a 'position')
 - As a cumulative position/offset definition
- The field's length and type
- Whether or not the field is to be scrambled.
- An integer that indicates the number of times a variable length repeating group occurs and the factor that governs how many times the group repeats
- The precision and scale of numeric data and whether it is signed or unsigned
- Group length and maximum field length
- Algorithms expressing position, length, or both as required, and a method to add additional algorithms

Make any modifications to the panel, then press PF3 to return to the Fields panel. Continuing to press PF3 returns you to the VSAM and Sequential Menu.

Define type and Select statement specification and manipulation

Selecting 5 on the Sequential and VSAM menu permits you to define type and Select statement specification and manipulation for this session. IBM File Export for z/OS opens the Record Type List (ABX\$SQTL) panel. A record type is a named field as, for example, Debit or Credit.

Use panel ABX\$SQTL to add a new type, edit the types for the file, delete an existing type, or specify selection criteria for a type. If you specified on the Session Settings panel that you wanted to generate SQL output, you can also define SQL output parameters using a command on this panel. The list on this panel shows, for each record type:

- The name you have assigned to the field, for example, Debit or Credit
- Whether or not this field will be included or excluded when selecting fields for processing
- Values that will override the values you specified for Skip, Limit, and Then on the Session Settings panel

If you have chosen to add a new type, delete a type, or edit an existing type, the Record Type (ABX\$SQLT) panel opens. The name of the type for which you are adding criteria appears at the top of the panel. On this panel, you can add a new value for a type or edit an existing value. The value serves as a selection criterion for the field and may be in the form of a WHERE predicate. That is, when this criterion is met, the field is selected.

From the Record Type List (ABX\$SQLT) panel, you can also define Select statements. Specifying S on the command line next to a type in the Record Types List causes the Select Statement List (ABX\$SELS) panel to open. The name of the current session and the Record Type Name are displayed at the top of the panel. On this panel, you can:

- Add Select statements to or delete them from the list of statements
- Define fields for a specific Select statement
- Define selection criteria (in the form of a WHERE clause) for a specific select statement
- Specify SQL output parameters, if you specified on the Session Settings panel that you want to issue SQL output

Define fields

On the Record Type List panel, if you chose to define additional fields for a Select, the Selected Fields (ABX\$SLST) panel opens. This panel displays a list of those fields that have been defined and permits you to add entries to or delete them from the list. The name of the current session and the Record Type Name are displayed at the top of the panel. Information displayed on this panel includes:

- The field name
- The field's type, for example, Debit or Credit
- A field that displays the Connected Field, that is, the name of a key field that is required when you include content data from an external source.

If you have chosen to add an entry to the Selected Fields panel opens panel ABX\$FLST. On this panel, you can select a field, variable, or literal to be added to the list on the Select Statement List (ABX\$SELS) panel. Once you have made your selections on panel ABX\$FLST, pressing PF3 returns you to the Select Statement List panel.

Define selection criteria

On the Record Type List panel, if you chose to define additional selection criteria for a Select, the Selection Criteria (ABX\$CLST) panel opens. The name of the current session and the name of the record type for which you are entering selection criteria are displayed at the top of the panel. On this panel, you can add and delete selection criteria. Each time you want to add a criterion, a blank line is added to the panel. On that line, you can specify the value to be assigned as a selection criterion, for example, LITERAL=X'0100'. When you have completed your work on this panel, pressing PF3 returns you to the Select Statement List (ABX\$SELS) panel.

Generate SQL output

If you specified that you wanted to generate SQL output when defining your session settings, typing Q on a Cmd line of the Record Type List panel, ABX\$SQLT, permits you to add SQL output parameters using the SQL Output Parameters panel, ABX\$SPFI. On ABX\$SPFI, you can provide a table name, table owner, and specify the number of records to be written out.

If you are finished making changes, continue to press **PF3** until you reach the Sequential & VSAM Menu (ABX\$SEQW) panel.

Generate JCL

To generate JCL containing your exported data, on the Sequential & VSAM Menu (ABX\$SEQW) panel, select Option **6, Generate JCL**. The JCL Generation (ABX\$JCLG) panel, opens.

On this panel, if the Data Set Name and Member Name are not displayed when the panel opens, type these names to indicate where you want to store the generated JCL. If you want to browse for the data set name, enter a partially qualified name with an asterisk and press **Enter**. IBM File Export for z/OS opens panel ABX\$DSLS which displays a list of data sets from which you can choose.

If you left the member name blank, panel ABX\$MEML displays a list of members from which you can choose the member to use. After you have selected a member from this display, pressing **Enter** returns you to the JCL Generation panel.

To add more STEPLIBs to your generated JCL, type **AL** on the Option line to display panel ABX\$DSSL. On this panel, you can also add data sets to or delete them from the list of data sets provided on this panel.

Once you have completed work on panel ABX\$DSSL, press **PF3** to return to the JCL Generation (ABX\$JCLG) panel. Press **Enter** to generate your JCL. Pressing **PF3** again returns you to the Sequential and VSAM Menu (ABX\$SEQW).

Part 3. Batch and ISPF Examples

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This part provides examples of ways in which you can use the IBM File Export batch and online interfaces.

Chapter 7. Working with the IBM File Export for z/OS batch facility

IBM File Export for z/OS includes a batch facility that can be used outside of ISPF to export data. In order to use the batch facility you must provide the JCL that you want to run and the IBM File Export for z/OS control statements. For more information on IBM File Export for z/OS control statements, see the chapter of the *IBM File Export for z/OS: Reference Manual* entitled "Creating JCL using Control Statements." If you are working with non-DB2 sources and targets, you must also provide ABXIN (the source data file) and ABXOUT (the target data file). If you are working with DB2 data, you must provide a SOURCEDB2 syntax statement and ensure that a DD card for each source DB2 table that is extracted is included in the JCL stream with reference in the control syntax.

Using the IBM File Export batch facility

1. Create a JCL file. The JCL file should contain the following statements:

EXEC Statement

The EXEC statement must be in the form:

```
PGM=ABXUTIL
```

DD Statements

The DD statements that are required vary depending on the type of data that you are working with. For information on required DD statements, see the appendix entitled "DDnames used by IBM File Export for z/OS" in the *IBM File Export for z/OS: Reference Manual*.

2. Create the necessary additional files depending on your source type.
 - If you are working with non-DB2 sources and targets, create:
 - ABXIN (the source data file) that points to an existing data set
 - ABXOUT (the target data file). This must be allocated with your JCL.
 - ABXCTL (IBM File Export for z/OS control statement) this can be instream (i.e., DD *) or allocated to an existing data set.
 - If you are working with DB2 sources and targets, use IBM File Export for z/OS control syntax to create a SOURCEDB2 syntax statement and ensure that a DD card for each source DB2 table that is extracted is included in the JCL stream with reference in the control syntax. For more information on the IBM File Export for z/OS control syntax, see TYPE in the chapter entitled "Creating JCL Using Control Statements" in the *IBM File Export for z/OS: Reference Manual*.
3. Run the JCL using the batch scheduling facility of your choice.

Sample input and output files

The following is an example where the source is DB2. In this example, seven rows are extracted from DB2 and the first three are printed (only the first is shown below). JCL:

```

//JOBNAME JOB (ACCTNUM),ME,CLASS=A,MSGCLASS=X,MSGLEVEL=(1,1),
// NOTIFY=&SYSUID
//STEP1 EXEC PGM=ABXUTIL,REGION=4M
//STEPLIB DD DISP=SHR,DSN=ABX.V1R1.LOAD
//SYSUT8 DD UNIT=SYSDA,SPACE=(CYL,(10,1)),DISP=(NEW,DELETE),
// DSN=&&SYSUT8
//ABXPRINT DD SYSOUT=*,DCB=(LRECL=121,BLKSIZE=121,RECFM=FA) //SYSUDUMP DD
SYSOUT=*
//ABXCTL DD *
print word
OPTIONS(DB2,NOCONTROL);
SOURCEDB2(DB2DB);
TARGETDB2(DB2DB);
TABLE(Q) SOURCE(Q.STAFF) TARGET(Q.STAFF)
DD:SYSUT8 PRINT(3) ;
LIMIT (7);
/*

```

Where:

- In: OPTIONS(DB2,NOCONTROL), DB2 states that the source is DB2 and NOCONTROL states that there is no input control file provided and no output control file to be produced. These options are only available for DB2 processing and the result is that the load executor will not be used.
- DB2DB is the name of your DB2 subsystem.

The results from the above JCL are as follows:

```

ABX0004I - Start time (hhmmss) = 18:33:02
(#1) OPTIONS(DB2,DDL,NOCONTROL);
(#2) SOURCEDB2(DB2DB);
ABX1471I - The SOURCEDB2 (DB2DB) is version 610
(#3) TARGETDB2(DB2DB);
(#4) TABLE(Q) SOURCE(Q.STAFF) TARGET(Q.STAFF)
(#4) DD:SYSUT8 PRINT(3) ;
(#5) LIMIT (7);
ABX0134I - Editing had no errors
ABX1532I - Processing table Q
SQLDA for table Q :

ID (data type = 500 len = 2) follows
0000 0014
NAME (data type = 448 len = 11) follows
0000 0006D7C5 D9D5C1D3 000000
      P E R N A L
DEPT (data type = 500 len = 2) follows
0000 0014
JOB (data type = 452 len = 5) follows
0000 E2C1D3C5 E2
      S A L E S
YEARS (data type = 500 len = 2) follows
0000 0008
SALARY (data type = 484 len = 1794) follows
0000 1757125C
/*
COMM (data type = 484 len = 1794) follows
0000 0061245C
/*
Produced record for table Q (len = 38) follows
0000 40404040 40400014 0006D7C5 D9D5C1D3 40404000 0014E2C1 D3C5E200 00081757
      P E R N A L S A L E S
0020 125C0061 245C
/*
SQLDA for table Q :

```

... and then two more records are printed
... and then:

```
ABX1587I - At the limit of 7 for table Q - bypassing the remaining rows
ABX1534I - Finished processing table Q
ABX1591I - For the Table Q, there were 7 rows processed and 7 rows selected
ABX1663I - Option NOCONTROL was specified - no load executor control file will
           be created
ABX0008I - Had no run time errors
ABX0009I - End time (hhmmss) = 18:33:04
ABX0010I - CPU time used = 0.0434 seconds
ABX0236I - ABXUTIL return code = 0
```

Where *DB2DB* is the name of your DB2 subsystem.

The following is an example using non-DB2 data. This example looks into an assembler program to find references to registers nine and fourteen.

```
// JOB
//STEP1 EXEC PGM=ABXUTIL,REGION=4M,PARM='ABXCTL ABXPRINT'
//STEPLIB DD DISP=SHR,DSN=ABX.V1R1.LOAD
//ABXIN DD DISP=SHR,DSN=ABX.V1R1.ASM(ABXDBRW0)
//ABXOUT DD SYSOUT=*
//ABXPRINT DD SYSOUT=*,DCB=(LRECL=121,BLKSIZE=121,RECFM=FA)
//SYSUDUMP DD SYSOUT=*

//ABXCTL DD *
print word
OPTIONS(SEQ);
FIELD (FIELD1) = (1,80,CHAR);
SELECT * FROM SOURCE WHERE FIELD1 LIKE '%R14%' OR FIELD1 LIKE
' %R9%';
/*
```

This example results in the following ABXPRINT file:

```
ABXUTIL Version 1.0 Release 1.00
*****
* Licensed Materials - Property of IBM *
* 5697-I12 *
* (c) Copyright IBM Corp. 2003,2004 All Rights Reserved. *
* (c) Copyright Rocket Software, Inc 2003,2004 All Rights Reserved. *
* US Government Users Restricted Rights - Use, duplication or *
* disclosure restricted by GSA ADP Schedule Contract with *
* IBM Corp. *
*****
```

```

ABX0004I - Start time (hhmmss) = 14:48:10
(#1)  OPTIONS(SEQ);
(#2)  FIELD (FIELD1) = (1,80,CHAR);
(#3)  SELECT * FROM SOURCE WHERE FIELD1 LIKE '%R14%' OR FIELD1 LIKE '%R9%';
ABX0385I - This produced record will
ABX0388I - contain the source record's data
ABX0267I - The minimum source record length for executing the select list and
          predicates is 80 bytes
ABX0134I - Editing had no errors
ABX0408I - Formatting data in Sequential format
ABX0580I - Input processing started using SEQUENTIAL dataset: ABX.V1R1.ASM
ABX0581I - Output processing started using SEQUENTIAL dataset: yyy
ABX0421I - Processed 1975 data records, selected 170, inserted 0, bypassed 0
ABX0437I - Processing ended with the end of data
ABX0584I - Input processing completed from dataset: ABX.V1R1.ASM
          - Total records read: 1,975
ABX0585I - Output processing completed to dataset: xxx
          - Total records written: 170
BX0008I - Had no run time errors
BX0009I - End time (hhmmss) = 14:48:10
BX0010I - CPU time used = 0.1207 seconds
BX0236I - ABXUTIL return code = 0

```

The ABXOUT data directed to SYSOUT=* contains:

STH	R14,OUTHLEN	SET OUTPUT HDR LEN	03140000
L	R14,USSEGTYP	INCR. COUNTER	03310000
LA	R14,1(,R14)	OF RECORDS	03320000
ST	R14,USSEGTYP	"READ".	03330000
L	R14,CURSEG@	CURRENT SEGM DATA ADDR	03810000
MVCL	R0,R14	MOVE THE SEGMENT DATA	03830000
L	R14,12(,R13)		03990000
BSM	0,R14		04010000
STM	R14,R12,12(R13)		04290000
LA	R14,RGULEN	NON-PARTITIONED	04433007
LA	R14,PGULEN	PARTITIONED HDR	04436007
STH	R14,OUTHLEN	SET OUTPUT HDR	04439007
L	R9,SEGMENT@	R9 = A(ABXSGCTL BLOCK)	04460000

...and other lines

Usage examples

This section contains sample problems and their solutions illustrating how the IBM File Export for z/OS batch facility can be used.

Sample Problem #1 - file alteration to meet specifications

"I have a file containing used car sales data. The file contains year, make, model for cars on the lot and also indicates when we took delivery and who the sales representative is. The Marketing department is running a promotion and they need a file listing only year, make and model for those cars which are pre-2000 model year. Oh, and by the way, Marketing's application is limited to 10 characters for the model year."

This sample demonstrates the following capabilities:

- One Source, one Target
- Altering the size of columns
- Limiting which columns are read and written
- Specifying which rows are selected for output

Source data set:

```
Menu Utilities Compilers Help

BROWSE   PDBICE.ABX.SEQ.IN                               Line 00000001 Col 001 080
Command ==>>>                                         Scroll ==>> CSR

-----1-----2-----3-----4-----5-----6-----7-----8
CHEVROLET   IMPALA   1998 01/20/02 T.MCSHAE
HONDA      ACCORD   2002 01/10/03 C.FREDETTE
CHEVROLET   MALIBU   2000 08/02/01 D.COMTOS
INFINITI    QX4      1997 07/15/99 A.BRACKETT
FORD        EXPLORER 2002 03/18/03 D.STORM
CADILLAC    ELDORADO 1996 11/09/99 P.SHERATON
HONDA      ACCORD   1997 06/15/03 T.MCSHAE
INFINITI    J30      2002 04/01/03 T.MCSHAE
CHEVROLET   MONTE CARLO 2001 05/23/02 D.COMTOS
CADILLAC    DEVILLE  1989 09/12/92 D.COMTOS
INFINITI    G35      1998 07/18/03 D.STORM
FORD        EXPLORER 1995 11/12/00 P.SHERATON
HONDA      ACCORD   1992 07/19/01 P.SHERATON
CHEVROLET   K10      1993 11/23/00 D.STORM
HONDA      ACCORD   2001 12/12/02 C.FREDETTE
CHEVROLET   IMPALA   1997 02/25/02 T.MCSHAE
HONDA      ACCORD   2001 02/11/03 C.FREDETTE
CHEVROLET   MALIBU   2001 04/12/01 D.COMTOS
INFINITI    QX4      1998 04/05/99 A.BRACKETT
```

Source record layout:

MAKE at column 1, length 15
MODEL at column 17, length 11
YEAR at column 29, length 4
RECEIVED at column 34, length 8
SALESREP at column 43, length 12

The JCL:

```
File Edit Edit_Settings Menu Utilities Compilers Test Help

EDIT          PDBICE.ABX.JCL(SEQSEL1) - 01.49          Columns 00001 00072
Command ==>                                       Scroll ==> CSR
***** ***** Top of Data *****
000001 //PDBICEFE JOB (ACCT#),'FILE EXPORT',CLASS=A,MSGCLASS=X,MSGLEVEL=(1,1)
000002 //EXPORT EXEC PGM=ABXUTIL,REGION=4M
000003 //STEPLIB DD DISP=SHR,DSN=RSQA.ABX110.IBMTAPE.SABXLOAD
000004 //ABXIN DD DISP=SHR,DSN=PDBICE.ABX.SEQ.IN
000005 //ABXOUT DD DSN=PDBICE.ABX.SEQ.OUT,
000006 // DISP=(NEW,CATLG,DELETE),
000007 // UNIT=SYSDA,
000008 // SPACE=(CYL,(1,1)),
000009 // DCB=(RECFM=FB,LRECL=128)
000010 //SYSPRINT DD SYSOUT=*
000011 //SYSUDUMP DD SYSOUT=*
000012 //ABXCTL DD *
000013 : DEFINE THE FIELDS THAT WE ARE INTERESTED IN
000014 OPTIONS(SEQ);
000015 FIELD(MAKE ) = ( 1,10,CHAR);
000016 FIELD(MODEL) = (17,11,CHAR);
000017 FIELD(YEAR ) = (29, 4,CHAR);
000018 : SPECIFY WHAT WILL BE WRITTEN TO ABXOUT
000019 SELECT MAKE, MODEL, YEAR FROM ABXIN
000020 WHERE YEAR LT '2000';
000021 /*
***** ***** Bottom of Data *****
```

Notes based on Record Number:

- 4 - ABXIN identifies the Source data set
- 5 - ABXOUT identifies the Target
- 12 - ABXCTL contains control statements for IBM File Export
- 13 and 18 - ABXCTL records beginning with a colon ":" are treated as comments
- 14 - The OPTIONS(SEQ) statement indicates that sequential files are being used
- 15 through 17 - The FIELD statement is used to define and name file data fields in the Source data set
- 15 - Define a field entitled MAKE as a ten character field beginning in column one. Note that the MAKE field in the Source data set actually takes up 15

characters (see previous page). Since the problem statement requires that we limit the output to ten characters, only the first ten characters are assigned to this field

- 19 - The SELECT statement specifies which fields are extracted and which order they are written as well as what subset of records meets this request

The resulting Target data set:

```

Menu Utilities Compilers Help

BROWSE   PDBICE.ABX.SEQ.OUT                               Line 00000000 Col 001 080
Command ==>                                           Scroll ==> CSR
-----1-----2-----3-----4-----5-----6-----7-----8
***** Top of Data *****
CHEVROLET IMPALA      1998
INFINITI  QX4         1997
CADILLAC  ELDORADO    1996
HONDA     ACCORD        1997
CADILLAC  DEVILLE         1989
INFINITI  G35          1998
FORD      EXPLORER         1995
HONDA     ACCORD          1992
CHEVROLET K10         1993
CHEVROLET IMPALA     1997
INFINITI  QX4           1998
CADILLAC  ELDORADO       1995
HONDA     ACCORD          1996
CADILLAC  DEVILLE         1990
INFINITI  G35           1997
FORD      EXPLORER         1994
HONDA     ACCORD          1991
CHEVROLET K10        1992
***** Bottom of Data *****

```

Note: The target data set contains only those records which have a YEAR value less than '2000' and the MAKE field has been reduced to ten characters.

Summary:

This sample demonstrated the following capabilities:

- One sequential Source in, one sequential Target out
- Altering the size of a column (i.e., the MAKE field)
- Limiting which columns are read and written (SELECT MAKE, MODEL, YEAR)

- Specifying which rows are selected for output (WHERE YEAR LT '2000')

Sample Problem #2 - different record types and formats

"I have a file containing used car sales data. The file contains year, make, model for cars on the lot and also indicates when we took delivery and who the sales representative is. For reasons which elude me to this day, the file contains different record types with different formats: one type for Domestic autos, a different type for Foreign autos. In any case my job is to produce two separate files, one for Domestic and one for Foreign, both files are to have the same format."

This sample demonstrates the following capabilities:

- One Source, two Targets
- Support for multiple record types
- Rearranging the order of columns

Source data set:

```
Menu Utilities Compilers Help

BROWSE   PDBICE.ABX.SEQ.IN3                               Line 00000001 Col 001 080
Command ==>                                           Scroll ==> CSR
-----1-----2-----3-----4-----5-----6-----7-----8
ACCORD   HONDA           F 01/10/03 C.FREDETTE 2002
D CHEVROLET   K10           1993 11/23/00 D.STORM
ACCORD   HONDA           F 02/11/03 C.FREDETTE 2001
CAMRY     TOYOTA           F 01/01/03 P.SHERATON 2001
D FORD      EXPLORER       2000 05/08/03 D.STORM
J30       INFINITI        F 04/01/03 T.MCSHAE   2002
D CHEVROLET   IMPALA        1998 01/20/02 T.MCSHAE
D CADILLAC   DEVILLE       1989 09/12/92 D.COMTOS
QX4       INFINITI        F 07/15/99 A.BRACKETT 1997
D CHEVROLET   K10           1992 10/03/00 D.STORM
D FORD      EXPLORER       1994 12/02/00 P.SHERATON
D CADILLAC   ELDORADO      1995 10/09/99 P.SHERATON
ACCORD   HONDA           F 09/09/01 P.SHERATON 1991
D FORD      EXPLORER       1995 11/12/00 P.SHERATON
J30       INFINITI        F 07/11/03 T.MCSHAE   2001
D CHEVROLET   MONTE CARLO  2000 04/03/02 D.COMTOS
ACCORD   HONDA           F 12/12/02 C.FREDETTE 2001
D CADILLAC   ELDORADO      1996 11/09/99 P.SHERATON
OUTBACK   SUBARU         F 03/22/01 D.STORM   2000
ACCORD   HONDA           F 11/02/02 C.FREDETTE 2000
D CHEVROLET   MALIBU        2000 08/02/01 D.COMTOS
D CADILLAC   DEVILLE       1990 04/02/92 D.COMTOS
CAMRY     TOYOTA           F 11/21/01 P.SHERATON 2000
D CHEVROLET   MONTE CARLO  2001 05/23/02 D.COMTOS
D FORD      EXPLORER       2002 03/18/03 D.STORM
CAMRY     TOYOTA           F 06/15/03 A.BRACKETT 2002
OUTBACK   SUBARU         F 04/25/03 P.SHERATON 1999
ACCORD   HONDA           F 07/05/03 T.MCSHAE   1996
D CHEVROLET   IMPALA        1997 02/25/02 T.MCSHAE
ACCORD   HONDA           F 06/15/03 T.MCSHAE   1997
```

The records associated with Domestic autos includes a "D" in column 1. Foreign autos are indicated by an "F" in column 29. Domestic records contain, left to right, MAKE, MODEL, YEAR, DATE, SALESREP. Foreign records contain MODEL, MAKE, DATE, SALESREP, YEAR.

The JCL:

```
000001 //PDBICE12 JOB (ACCT#),'FILE EXPORT',CLASS=A,MSGCLASS=X,MSGLEVEL=(1,1)
000002 /*
000003 //EXPORT EXEC PGM=ABXUTIL,REGION=4M
000004 //STEPLIB DD DISP=SHR,DSN=RSQA.ABX110.IBMTAPE.SABXLOAD
000005 //ABXIN DD DISP=SHR,DSN=PDBICE.ABX.SEQ.IN3
000006 //ABXOUT DD DSN=PDBICE.ABX.SEQ.OUT1,DISP=(NEW,CATLG,DELETE),
000007 // UNIT=SYSDA,SPACE=(CYL,(1,1)),DCB=(RECFM=FB,LRECL=128)
000008 //ABX00001 DD DSN=PDBICE.ABX.SEQ.OUT2,DISP=(NEW,CATLG,DELETE),
000009 // UNIT=SYSDA,SPACE=(CYL,(1,1)),DCB=(RECFM=FB,LRECL=128)
000010 //SYSPRINT DD SYSOUT=*
000011 //SYSUDUMP DD SYSOUT=*
000012 //ABXCTL DD *
000013 OPTIONS(SEQ);
000014 :: RECORD TYPE FOR DOMESTIC AUTOS
000015 FIELD(DFLAG) = ( 1, 1,CHAR);
000016 FIELD(DMAKE) = ( 3,10,CHAR);
000017 FIELD(DMODEL) = (19,12,CHAR);
000018 FIELD(DYEAR) = (31, 5,CHAR);
000019 FIELD(DRCVD) = (36, 9,CHAR);
000020 FIELD(DSALES) = (45,11,CHAR);
000021 :: RECORD TYPE FOR FOREIGN AUTOS
000022 FIELD(FMODEL) = ( 1,12,CHAR);
000023 FIELD(FMAKE) = (13,10,CHAR);
000024 FIELD(FFLAG) = (29, 1,CHAR);
000025 FIELD(FRCVD) = (31, 9,CHAR);
000026 FIELD(FSALES) = (40,11,CHAR);
000027 FIELD(FYEAR) = (51, 5,CHAR);
000028 TYPE (DOMESTIC) WHEN DFLAG='D';
000029 SELECT DYEAR, DMAKE, DMODEL, DRCVD, DSALES FROM ABXIN;
000030 TYPE (FOREIGN) WHEN FFLAG='F';
000031 SELECT NOTHING FROM ABXIN;
000032 THEN INSERT INTO DD:ABX00001
000033 VALUES(FYEAR, FMAKE, FMODEL, FRCVD, FSALES);
000034 /*
```

Comments on the JCL based on line numbers:

- 5 - ddname ABXIN identifies the Source.
- 6 - ddname ABXOUT identifies the Target (we'll send Domestic autos here)
- 8 - In this example we are using ddname ABX00001 to identify a Supplemental Target (we'll send Foreign autos here). Note that a different ddname could be used here - ABXIN identifies the Primary Source, ABXOUT identifies the Primary Target - other ddnames can be used for supplement Sources and Targets.
- 14 and 21 - Non-printing comments are specified by the string ":". Non-printing comments do not appear in the batch execution sysout. Printing comments (those specified with a single colon) do appear in sysout.
- 15 through 20 - Describe field layout associated with Domestic autos. We'll use the DFLAG field to identify this record type.
- 22 through 27 - Describe the field layout associated with Foreign autos. FFLAG identifies this record type.
- 28 and 29 - Identify the DOMESTIC record type and specify what records are to be selected.
- 30 through 33 - Identify the FOREIGN record type and what actions are to be taken.
- 31 - This is key. SELECT statements are used to gather data from the Source and write it to the Primary Target (i.e., ABXOUT). Since we do not want Foreign autos written to the Domestic file we specify "SELECT NOTHING"
- 32 - We want Foreign autos written to ABX00001 so instead of using SELECT we specify THEN INSERT, indicate the ddname that we want to write to and specify which fields in which order.

Target output files:

When the job is executed two files are produced with the same format. The files are shown in ISPF Browse in split screen mode. The file containing Domestic auto records is on the top half of the screen, Foreign autos are on the bottom.

Menu Utilities Compilers Help

BROWSE PDBICE.ABX.SEQ.OUT1 Line 00000001 Col 001 080

Command ==> Scroll ==> CSR

-----1-----2-----3-----4-----5-----6-----7-----8

1993	CHEVROLET	K10	11/23/00	D.STORM
2000	FORD	EXPLORER	05/08/03	D.STORM
1998	CHEVROLET	IMPALA	01/20/02	T.MCSHAE
1989	CADILLAC	DEVILLE	09/12/92	D.COMTOS
1992	CHEVROLET	K10	10/03/00	D.STORM
1994	FORD	EXPLORER	12/02/00	P.SHERATON
1995	CADILLAC	ELDORADO	10/09/99	P.SHERATON
1995	FORD	EXPLORER	11/12/00	P.SHERATON
2000	CHEVROLET	MONTE CARLO	04/03/02	D.COMTOS
1996	CADILLAC	ELDORADO	11/09/99	P.SHERATON
2000	CHEVROLET	MALIBU	08/02/01	D.COMTOS
1990	CADILLAC	DEVILLE	04/02/92	D.COMTOS
2001	CHEVROLET	MONTE CARLO	05/23/02	D.COMTOS
2002	FORD	EXPLORER	03/18/03	D.STORM
1997	CHEVROLET	IMPALA	02/25/02	T.MCSHAE
2001	CHEVROLET	MALIBU	04/12/01	D.COMTOS

.

Menu Utilities Compilers Help

BROWSE PDBICE.ABX.SEQ.OUT2 Line 00000001 Col 001 047

Command ==> Scroll ==> CSR

2002	HONDA	ACCORD	01/10/03	C.FREDETTE
2001	HONDA	ACCORD	02/11/03	C.FREDETTE
2001	TOYOTA	CAMRY	01/01/03	P.SHERATON
2002	INFINITI	J30	04/01/03	T.MCSHAE
1997	INFINITI	QX4	07/15/99	A.BRACKETT
1991	HONDA	ACCORD	09/09/01	P.SHERATON
2001	INFINITI	J30	07/11/03	T.MCSHAE
2001	HONDA	ACCORD	12/12/02	C.FREDETTE
2000	SUBARU	OUTBACK	03/22/01	D.STORM

Summary:

This sample demonstrates the following capabilities:

- One Source, two Targets (SELECT and THEN INSERT)
- Support for multiple record types (TYPE (name) WHEN ...)
- Rearranging the order of columns

IMS batch training example

IBM File Export ships an IMS training example in the sample library, ABX.SABXSAMP, in the member named ABXLABS. This example can be used for training your staff in the use of IBM File Export's batch IMS facility. For information about obtaining, installing, and using this training example, see "Installing the training data" on page 75. Instructions for removing individual and system datasets used with this training example are found in "Removing user-specific training data sets" on page 77 and "Removing example data sets from your system" on page 77.

The example

IMS example 6, found in ABX.SABXSAMP(ABXLABS) helps you understand how to

- Read and understand the control syntax in the JCL
- Edit the control syntax in the JCL to include multiple databases with additional RESULTSET and CHILD OF statements, rather than using the ISPF interface to create these
- Create a sequential file that can then be used to populate databases

Note: Before running this IMS example, you must first execute the CLISTS 'RSDEMO.ABX.TRAINING.CLIST(ABXBUILD)' and 'RSDEMO.ABX.TRAINING.CLIST(ABXMULTI)'

Chapter 8. Using the ISPF Interface -- Some Examples

IBM File Export ships a number of examples in the sample library, ABX.SABXSAMP, in the member named ABXLABS. These examples can be used for training your staff in the use of IBM File Export. This chapter provides information about obtaining, installing, and using these training examples. All of the examples make use of IBM File Export's ISPF interface, with the exception of IMS example 6. That example is described in "IMS batch training example" on page 74.

Installing the training data

To use the training examples, you must first install the data required by those examples. Follow these steps to install the data on your system:

1. Unpack all of the data sets needed for installing the training data on your system. The JCL to do so is provided in 'ABX.SABXSAMP(ABXUNPAK)'. You need to execute the ABXUNPAK job only once for each system on which you will install the training data.
2. If your site uses SMS, you will need to edit the JCL for ABXUNPAK. In the RESTORE step, uncomment the last two lines and edit the MGMTCLAS and STORCLAS parameters so they are included in the syntax.
3. Run the ABXUNPAK job.

Job ABXUNPAK will unpack an XMIT data set that contains the sequential and IMS data required for the training exercises.

The DB2 tables Q.ORG and Q.STAFF must exist on your DB2 subsystem before you can run the DB2 examples. These objects are installed with DB2 and are used by the training examples.

4. Once the ABXUNPAK job has completed, each user who will work with the examples should execute the CLIST 'ABX.TRAINING.CLIST(ABXBUILD)'. This CLIST creates a JCLLIB data set that is qualified with the TSO user ID of the person executing the CLIST. Its format will be <userid>.ABX.JCLLIB.
On the first execution of this CLIST, you may receive an error qualifying the MDALIB and the JCLLIB. This may be ignored.
5. Once the ABXBUILD CLIST has been successfully executed and a personal CLIST data set has been created for the user, each user that will use the training examples must execute the CLIST 'ABX.TRAINING.CLIST(ABXMULTI)'.
On the first execution of this CLIST, you may receive an error qualifying the MDALIB and the JCLLIB. This may be ignored.
6. The data set ABX.TRAINING.MDALIB must be APF-authorized before you can run the training examples.
7. To start an ISPF session, you must start the IBM File Export user interface as described in "Starting the product" on page 9.

What the examples will accomplish

The table that follows identifies the examples provided and their objectives.

Table 2. Training Examples

Example	Objectives: Use this example to understand how to...
Sequential example 1	<ul style="list-style-type: none"> • Manipulate record types • Reorder sequential record fields
Sequential example 2	<ul style="list-style-type: none"> • Create a repository and connect it to the session • Manipulate record types • Reorder sequential fields • Utilize a content filter to affect output
Sequential example 3	<ul style="list-style-type: none"> • Create a repository and connect it to the session • Manipulate record types • Reformat fields • Utilize a content relationship to determine which record should be reordered
IMS example 1	<ul style="list-style-type: none"> • Clone the characteristics of the source input to produce output
IMS example 2	<ul style="list-style-type: none"> • Extract data and conditionally change fields to change the data in the target file
IMS example 3	<ul style="list-style-type: none"> • Exclude segments • Select specific data when a condition is met • Build input to a new database
IMS example 4	<ul style="list-style-type: none"> • Sample a database using LIMIT THEN control syntax • Build input into a new database
IMS example 5	<ul style="list-style-type: none"> • Set up user-defined application relationships using the RESULTSET and CHILD OF control syntax • Extract source data from multiple databases into one FEUNLOAD file that can then be used to populate other databases <p>Note: Before running this IMS example, you must first execute the CLIST 'RSDEMO.ABX.TRAINING.CLIST(ABXMULTI)'.</p>
IMS example 6	This batch example is discussed in "IMS batch training example" on page 74.
DB2 example 1	<ul style="list-style-type: none"> • Load data from one DB2 table into another using the DB2 load utility • Use a SELECT statement with a WHERE clause to limit the amount of data that will be extracted • Scramble sensitive data upon loading it into the target table
DB2 example 2	<ul style="list-style-type: none"> • Extract DB2 data into a sequential file, but not load it • Create DDL for the target table that does not exist
DB2 example 3	<ul style="list-style-type: none"> • Specify parent-child relationships in DB2 • Reformat the extracted data

Removing user-specific training data sets

After users have completed working through the examples, each user must execute the CLIST 'ABX.TRAINING.CLIST(ABXDELET)' to remove the user-specific data sets created and used when executing the training examples.

Removing example data sets from your system

When the training examples are no longer required in your installation, you can remove all of the training data sets created by running ABXUNPAK, other than 'ABX.SABXXMIT', by executing the CLIST 'ABX.SAMPLIB(ABXREMOV)'.

Part 4. Appendixes

Appendix A. Batch Coding Examples

This appendix describes some additional batch coding examples you may review. The actual example code is distributed with the product in SABXSAMP. Note that you may need to make modifications for your environment and your installed product set. This example code is meant to be illustrative only and has not been thoroughly tested under all possible operating conditions. You may also want to review the three Installation Verification Programs described in an appendix to the *IBM File Export for z/OS: Reference Manual* and the section entitled “Usage examples” on page 64 for additional batch coding examples.

Example descriptions

The coding examples provided in SABXSAMP are described in the table that follows. These members are meant to illustrate control syntax structure and are not meant to be operational examples.

Table 3. Coding examples provided in SABXSAMP

Member	Description
ABXBIND	Provides an example of a DB2 BIND and GRANT that allows you to access DB2 from IBM File Export for z/OS.
ABXIMS1	Provides an example of reading and writing IMS HDAM database unload data using IBM File Export for z/OS, illustrating no segment changes.
ABXIMS2	Provides an example of reading and writing IMS HDAM database unload data using IBM File Export for z/OS, illustrating the case where the input and output DBDs are different.
ABXIMS3	Provides an example of reading and writing IMS HDAM database unload data using IBM File Export for z/OS, illustrating the case where only the root segment is written.
ABXIMS4	Provides an example of reading and writing IMS DEDB data using IBM File Export for z/OS, illustrating no segment changes.
ABXSEQ1	Provides an example of reading and writing variable length data using IBM File Export for z/OS, illustrating no changes to the records.
ABXSEQ2	Provides an example of reading and writing fixed length data using IBM File Export for z/OS, illustrating a change to a specific field.
ABXSEQ3	Provides an example of reading and writing fixed length data using IBM File Export for z/OS, illustrating adding a new field.
ABXSEQ4	Provides an example of reading fixed length data using IBM File Export for z/OS, and writing variable length data.
ABXVSM1	Provides an example of reading and writing VSAM KSDS data using IBM File Export for z/OS, illustrating no changes to records.
ABXVSM2	Provides an example of reading and writing VSAM ESDS data using IBM File Export for z/OS, and writing only specific records.
ABXVSM3	Provides an example of reading and writing VSAM KSDS data using IBM File Export for z/OS, and writing only specific records.

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Glossary

The following cross-references are used in this glossary:

Contrast with. This refers to a term that has an opposed or substantively different meaning.

Synonym for. This indicates that the term has the same meaning as a preferred term, which is defined in its proper place in the dictionary.

Synonym with. This is a backward reference from a defined term to all other terms that have the same meaning.

See. This refers the reader to multiple-word terms that have the same last word.

See also. This refers the reader to terms that have a related, but not synonymous, meaning.

A

abend. Abnormal end of task.

abend reason code. A 4-byte hexadecimal code that uniquely identifies a problem with DB2. A complete list of DB2 abend codes and their explanations is contained in *DB2 Messages and Codes*.

abnormal end of task (abend). Termination of a task, job, or subsystem because of an error condition that recovery facilities cannot resolve during execution.

active log. The portion of the DB2 log to which log records are written as they are generated. The active log always contains the most recent log records, whereas the archive log holds those records that are older and no longer fit on the active log.

archive log. The portion of the DB2 log that contains log records that have been copied from the active log.

B

backward log recovery. The fourth and final phase of restart processing during which DB2 scans the log in a backward direction to apply UNDO log records for all aborted changes.

bind. The process by which the output from the DB2 precompiler is converted to a usable control structure (which is called a package or an application plan). During the process, access paths to the data are selected and some authorization checking is performed.

bootstrap data set (BSDS). A VSAM data set that contains name and status information for DB2 as well as RBA range specifications, for all active and archive log data sets. It also contains passwords for the DB2 directory and catalog, and lists of conditional restart and checkpoint records.

buffer pool. Main storage that is reserved to satisfy the buffering requirements for one or more table spaces or indexes.

C

catalog. In DB2, a collection of tables that contains descriptions of objects such as tables, views, and indexes.

catalog table. Any table in the DB2 catalog.

clustering index. An index that determines how rows are physically ordered in a table space.

column. The vertical component of a table. A column has a name and a particular data type (for example, CHARACTER, DECIMAL, or INTEGER).

command. A DB2 operator command or a DSN subcommand. A command is distinct from an SQL statement.

customization. The process of describing optional changes to defaults of a software program that is already installed on the system and configured so that it can be used. Contrast with Configuration.

customize. To describe the system, the devices, programs, users, and user defaults for a particular data processing system or network. Contrast with Configure.

D

DASD. Direct access storage device.

data definition name. The name of a data definition (DD) statement that corresponds to a data control block containing the same name.

DB2 catalog. Tables that are maintained by DB2 and that contain descriptions of DB2 objects, such as tables, views, and indexes.

direct access storage device. A device in which access time is independent of the location of the data.

DSN. (1) The default DB2 subsystem name. (2) The name of the TSO command processor of DB2. (3) The first three characters of the DB2 module and macro names.

I

image copy. An exact reproduction of all or part of a table space. DB2 provides utility programs to make full image copies (to copy the entire table space) or incremental image copies (to copy only those pages that have been modified since the last image copy).

index. A set of pointers in DB2 that are logically ordered by the values of a key. Indexes can provide faster access to data and can enforce uniqueness on the rows in a table.

index space. A DB2 page set that is used to store the entries of one index.

ISPF. Interactive System Productivity Facility.

J

JCL. Job control language. Synonym with job control language.

job control language. JCL. A control language that is used to identify a job to an operating system and to describe the job's requirements. Synonym with JCL.

job profile. Customized settings that describe the jobs you want to run.

L

lock. A means of controlling concurrent events or access to data. DB2 locking is performed by the IRLM (Inter-Region Lock Manager).

lock duration. The interval over which a DB2 lock is held.

lock escalation. The promotion of a lock from a row, page, or LOB lock to a table space lock because the number of page locks that are concurrently held on a given resource exceeds a present limit.

locking. The process by which the integrity of DB2 data is ensured. Locking prevents concurrent users from accessing inconsistent data.

log. A collection of records that describe the events that occur during DB2 execution and that indicate their sequence. The information thus recorded is used for recovery in the event of a failure during DB2 execution.

logical unit of work (LUW). The processing that a program performs between synchronization points.

logical unit of work identifier (LUWID). A name that uniquely identifies a thread within a network. This name consists of a fully-qualified LU network name, an LUW instance number, and an LUW sequence number.

log initialization. The first phase of restart processing during which DB2 attempts to locate the current end of the log.

log record sequence number (LRSN). A number that DB2 generates and associates with each log record. DB2 also uses the LRSN for page versioning. The LRSNs that a particular DB2 data sharing group generates form a strictly increasing sequence for each DB2 log and a strictly increasing sequence for each page across the DB2 group.

P

page. A unit of storage within a DB2 table space (4 KB, 8 KB, 16 KB, or 32 KB) or an index space (4 KB). In a table space, a page contains one or more rows of a table. In a LOB table space, a LOB value can span more than one page, but no more than one LOB value is stored on a page.

S

Source. A source is a file (either DB2 table, IMS database, VSAM file, or sequential file) from which data is extracted for the purpose of creating test data.

T

Target. A target is a file that is created using IBM File Export, and is based on the data that is extracted from the source file and your specification of the target output.

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Version 1 Release 1

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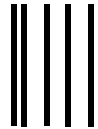
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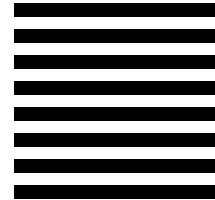
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