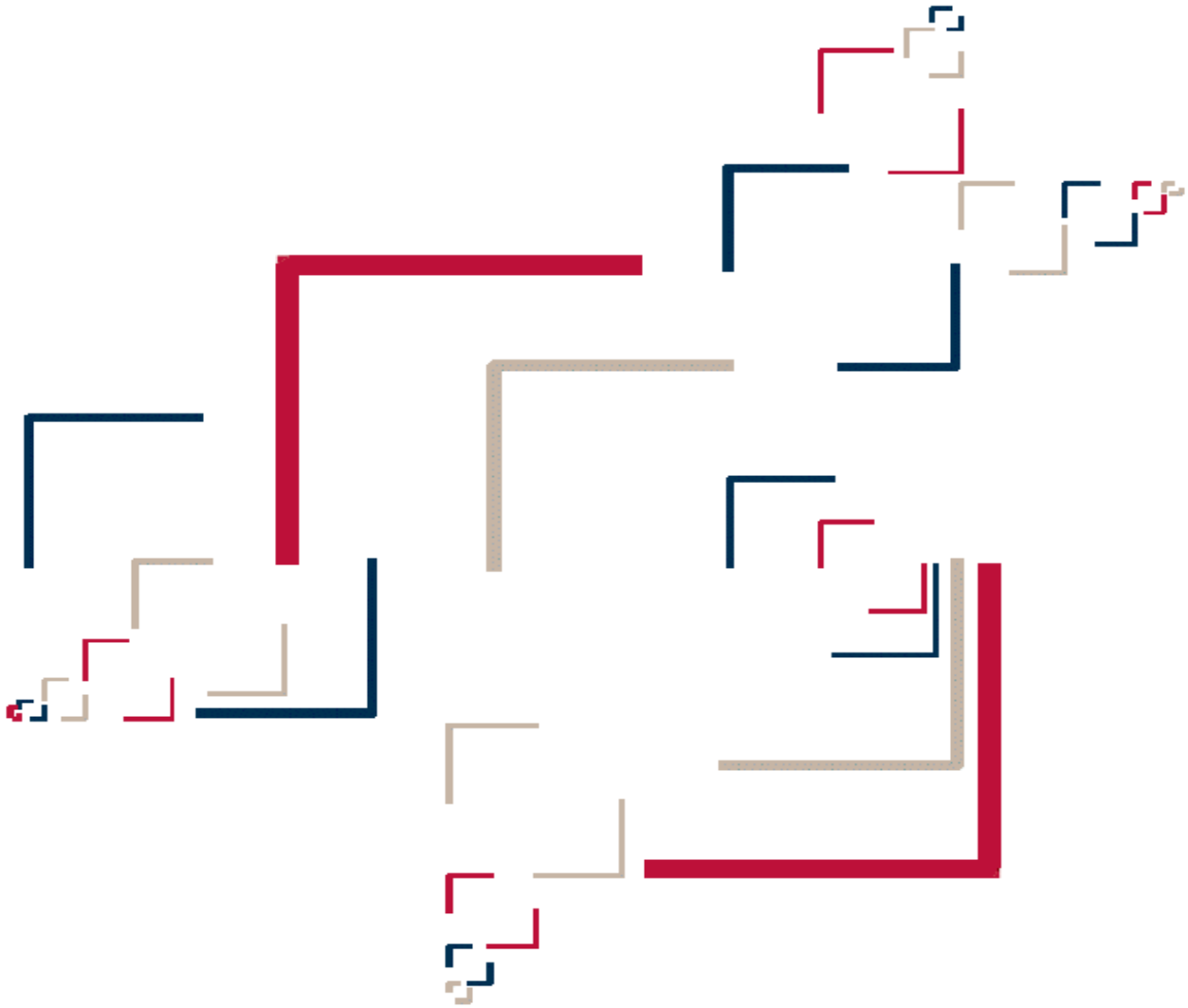

Micro Focus Data Express ™

Getting Started with z/OS Data Stores

MICRO FOCUS®

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About this Guide

This guide contains explanatory information and a series of tutorials that show you how to start using Data Express in order to analyze and manage data stores from System z servers running z/OS. The tutorials introduce the major features of Data Express in a number of short sessions, typically 10 - 30 minutes.

This guide is intended for customers who are using z/OS data stores. If you have the Data Express for z/OS solution but have also purchased the additional ODBC Extension or Oracle Extension, use the ***Getting Started with Distributed Data Stores*** guide instead.

Overview

Micro Focus Data Express is an application that consists of three client-side modules: Data Builder, Data Masking, and Data Subset Extraction.

This guide outlines the concepts and procedures used by Data Express for distributed data stores. It also shows how to start and work with Data Express in a Windows environment, creating a subset of production data for testing purposes or to masking proprietary information (or in some cases, masking a subset of the data).

Bear in mind the following points about the Data Express:

- You do not need to analyze the sources of the programs in the application in order to use Data Express.
- Data Express does not perform any operation capable of altering the analyzed data.
- To use the Data Express for z/OS solution, you must have the correct license. See the ***Installation Guide*** for more details.
- The Data Subset Extraction and the Data Masking modules manage all types of files that have been processed by the Data Builder module.
- This product is designed to read data stores containing the information to be analyzed, and then to create output data stores as specified by the user.

The tables defined during the installation phase that are updated by Data Express are described in chapters *Table List* and *Table Description* of the ***Data Model Guide***.

Data Express Components

Let's start with a brief description of the major parts of Data Express:

- **Data Builder**: The core Data Express module that enables you to take inventory of your data, and store information in the Data Express Knowledge Base, which resides on z/OS. Data Builder works with both Data Masking and Data Subset Extraction.
- **Data Masking**: The module that enables you to generate a test environment where personal and sensitive data has been made anonymous by using predefined or customized masking routines.
- **Data Subset Extraction**: The module that enables you to generate a test environment where a consistent and congruent subset of data has been extracted to allow for a manageable volume of data.
- **Workspace**: A two-dimensional working environment definition from which you can categorize and classify data stores for your test environment.
- **Data Express Knowledge Base**: A collection of tables within a database that contain all information about catalogued files, including properties and processing rules. The Knowledge Base for the Data Express for z/OS solution is a Mainframe DB/2 repository located in your z/OS environment.

Using z/OS Data Stores with Data Express

This chapter provides a high-level overview of the work-flow for the Data Express z/OS solution. For more information, see the ***Process for z/OS Guide***. Basically, the work-flow process for z/OS data stores looks like this:

- Data Inventory Phase (Data Builder, Work with Jobs)
  - Non-relational data stores
    - Load and analysis of the copybook
    - Load, analysis, and association of the data store
  - Relational data stores
    - Load DB2 or ADABAS tables
- Data Classification Phase (Data Builder, Work with Jobs)
  - Manual Association
  - Import Classification from Referential Integrity
  - Import Classification from Data Dictionary
  - Data Analysis
    - Sampling
    - Fingerprinting
- Data Masking Phase (Data Masking)
  - Method creation (not mandatory and only used in conjunction with Data Subset Extraction to create a test environment)
  - BTUNLDR - Create Data Changer Jobs (Data Builder, Work with Jobs)
- Data Subsetting Phase (Data Subset Extraction)
  - Method creation
    - BTEDDUR - Import Method From Referential Integrity job (Data Builder, Work with Jobs)
    - Create New Method Wizard (Data Subset Extraction)
    - Data Masking module
  - Test Environment Creation (Data Builder, Work with Jobs)
- Life Cycle (Data Builder)

Data Express for z/OS Tutorials

These tutorials show you how to prepare your Data Express working environment in z/OS and introduce the Data Express Windows client, which consists of three Data Express modules: Data Builder, Data Masking, and Data Subset Extraction. Follow the tutorials in this guide in order after you have completed your product installation.

The easiest way to learn about Data Express is to complete a few simple tasks. This guide takes you through configuring Data Builder, loading metadata into the Data Express Knowledge Base, using Data Masking to implement masking rules on a small amount of data, using Data Subset Extraction to create a simple subset of data, and finally using Data Subset Extraction twice more to create subsets of data using referential integrity. Please note that some of the data reduction examples also mask data, showing that Data Express can do both functions in one method invocation.

The three Data Express modules, Data Builder, Data Masking, and Data Subset Extraction, and tutorial files contain all the tools you need to perform these tasks.

This tutorial describes the process of configuring your z/OS environment so that you can use the Data Express Windows client (as demonstrated in subsequent tutorials) for data masking and data reduction.

Machine IDs and Company Codes

A Machine ID and Company code pair is essentially an identifier for your Data Express working environment or *workspace*. The Machine ID is the higher-level identifier, while the Company code must be identified by a Machine ID. You can create a new Machine ID and a new Company code for each test environment, or you can create new Company codes under a single Machine ID as needed for each test environment you want to create.

Note: A single machine ID can correspond to numerous company codes. A new company code can be created only if an existing machine ID is first selected.

Sample Data

Data Express includes the files that create the sample DB2 tables and sequential files that are used throughout the exercises in this tutorial. The database and its sample tables must be created and populated after product installation.

Note: The JCL job streams, files, and scripts needed to create your tutorial environment are located in the **tutorial** folder of your installation directory.

In this session, you load data needed for this tutorial into your mainframe environment and you use Data Builder to define your workspace. This involves editing several files, executing programs, creating a machine ID and company code pair for your workspace, and submitting jobs that will load information into your mainframe environment from external files.

You can follow the tutorials for either DB2 data stores, sequential files or both DB2 data stores and sequential files.

Sample Sessions

The sample sessions are broken out into two parts: one for DB2 data stores and one for sequential files.

Note: Sessions in this tutorial must be done in order. If you choose to complete the tutorial for both DB2 and sequential data, then do all sessions. If you choose to complete the tutorial for only DB2 or sequential data, then follow the sessions only for that data type.

DB2 Data Stores Session

In this session, you prepare your z/OS environment for DB2 data stores:

- Import JCL job streams into your mainframe environment
- Create DB2 tablespace and tables
- Start Data Builder
- Set your workspace
- Load data store information from an external interface

Importing JCL Job Streams into Your Mainframe Environment

In order to import the JCL CREATBT and CREASEQD into your mainframe environment, you must first edit an FTP script, **PUT_JCL_DB2**, to include your login credentials.

Next, you run **FTPJCLDB2.BAT**, which executes the FTP commands listed in the file **PUT_JCL_DB2.txt** to transfer the JCL job streams to an existing library in your mainframe environment.

To import the JCL job streams CREATBT and CREASEQD into your mainframe environment:

1. Edit the FTP script in the **PUT_JCL_DB2.TXT** file with the following information:

123.123.123.123	the IP address of your mainframe
YOURUSERNAME	your mainframe user name
YOURPASSWORD	your mainframe password
YOURJCLLIBRARY	the name of the library that you want to contain the JCL

   This FTP script transfers the JCL job streams CREATBT and CREASEQD onto the mainframe environment into your the specified JCL library when **FTPJCLDB2.BAT** is executed.

2. Ask the DBA to customize the following parameters in the **CREATBT.TXT** file:
   - DSN
   - DSN SYSTEM
   - PLAN
   - LIB
   - TABLESPACE
   - DATABASE NAME
   - STOGROUP
   - PRIQTY
   - SECQTY
   - FREEPAGE
   - PCTFREE
   - BUFFERPOOL
   - SEGSIZE
   - COMPRESS

The **CREATBT.TXT** file contains the JCL that is used to create the tablespace DETESTLG and the following DB2 tables:

- CUSTOMER
- ACCOUNT
- CCARD
- OPERAT

3. Change each instance of the *XXXXXX.XXXXXX* library in the **CREASEQD.TXT** file to URADAR.DEMOT. For example, DSN=XXXXXX.XXXXXX.LISTDB2 becomes: DSN=URADAR.DEMOT.LISTDB2.

   Note: The library URADAR.DEMOT is used as an example throughout this tutorial. You can use any library that suits your mainframe library naming conventions. However, it is assumed that the mainframe user ID you are using has no restrictions and can therefore access this library.

4. Execute **FTPJCLDB2.BAT** to import the JCL job streams into your mainframe environment.
5. Continue to the next section.

Creating the DB2 Tablespace and Tables

In this exercise, you submit the CREATBT JCL (to create the tablespace and tables) and the CREASEQD JCL needed to complete your environment creation.

To create the DB2 tablespace and tables:

1. Within your TSO environment, submit the JCL job streams CREATBT and CREASEQD.
2. Review results to verify that the jobs ran successfully.
3. Edit the FTP script in the **PUT_FILE_DB2.txt** file with the following information:

123.123.123.123	the IP address of your mainframe
YOURUSERNAME	your mainframe user name
YOURPASSWORD	your mainframe password
XXXXXX.XXXXXX	the name of the library created by JCL CREASEQD, for example: URADAR.DEMOT.

   This FTP script creates the files **LISTDB2** and **REFINTEG** specified by the **CREASEQD.TXT** JCL.

   Note: The library URADAR.DEMOT is used as an example throughout this tutorial. You can use any library that suits your mainframe library naming conventions. However, it is assumed that the mainframe user ID you are using has no restrictions and can therefore access this library.

4. Within your Windows environment, execute **FTPTUTORIALDB2.BAT.BAT** to import the informaiton into your mainframe environment.
5. Continue to the next section.

Starting Data Builder

Data Builder enables functionality for the Data Masking and Data Subset Extraction modules. With Data Builder, you can take an inventory of data, and classify the data as you see fit. These processes store information about the data in the Data Express Knowledge Base repository.

Note: You will use the settings shown in this section throughout each subsequent chapter of this Getting Started guide.

Start Data Builder:

1. Click **Start** > **All Programs** > **Micro Focus Data Express 4.0** > **Data Builder**.
2. Select the mainframe Knowledge Base as the required database with which to launch the connection. In this example, the database is **MVSDB2**.

   By default, the highlighted item in the list of available databases is the last database you connected to using the Data Builder module. However, for the very first connection, **MVSDB2 – OWUR40SV** is selected by default.

   Note: By selecting **MVSDB2 – OWUR40SV**, you do not need to choose the database and then the schema **OWUR40SV**.
3. Click **OK**.
4. Log in using your mainframe user name and password.

   The **[Work with Data Stores]** window provides a list of files cataloged by Data Express using different sets of search criteria, including:

   - Machine identifiers
   - Company names
   - Application identifiers
   - Data store types
   - Data stores with assigned classes (Multiple class Selection)
   - Data stores with assigned copybooks
   - Data store with sampling activated
   - Data stores with Data Changer activated
   - Data stores with Data Changer inactivated
   - Data stores set as Register Table
   - Data stores without Register Table attribute

This window comprises four tabular views: Structure, Classes, Data Changer, and Register Tables. You can select a tab to view files using a specific set of criteria as listed previously. Each tab is associated with different grouping criteria.

The list of displayed data stores can be further restricted by applying filters. Filters can be selected from the context menu displayed by right-clicking the **List of Files** grid, or by selecting the specific icons displayed on the left side of the screen.

Note: The Data Masking and the Data Subset Extraction modules are launched as separate applications.

5. Continue to the next section.

Setting Your Workspace

Data Builder lets you set your workspace as part of the Data Inventory process. You must specify your workspace to organize and sort data on the basis of a logical model.

Note: If you have already set your workspace for your sequential files environment, you do not need to perform this exercise. Both DB2 and sequential file data stores share the same workspace for this sample tutorial.

Set your workspace:

1. From Data Builder, open the **Work with Machine IDs** window (click or access it through **Environment** > **Work with Machine IDs**) to create a new Machine ID.

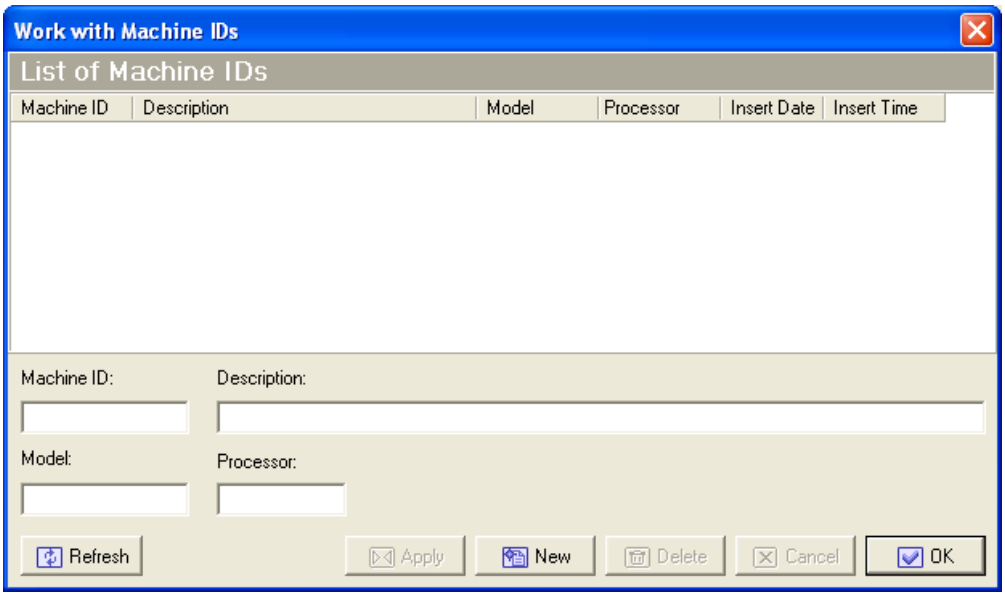


Figure: Data Builder – Work with Machine IDs

2. Click **New**.
3. Specify your name as the name of the machine ID in the **Machine ID** box. For this tutorial, type: **DATAEXPRES**.
4. Type a description of your machine ID in the **Description** box. For this tutorial, type: **DEMO ENVIRONMENT**.
5. Specify additional information if appropriate. For this tutorial, the additional fields have been left blank. Click **Apply**.
6. Click **OK** to save your specification and to close the window.
7. From Data Builder, open the **Work with Companies** window (click or access it through **Environment** > **Work with Companies**) to create a new company code:
8. Click **New**.
9. Select the **DATAEXPRES** Machine ID you just created.
10. Specify **DEMO** as the name of your company code in the **Company Code** box.
11. In the **Company Description** box, type: **DX GETTING STARTED GUIDE**.
12. By default, the Life Cycle is activated. Leave this box selected.
13. By default, the **Is a Backup Company** checkbox is not selected. Leave this box unselected.

    During the definition of a company, the backup company associated with it can also be defined.

    A Backup Company is useful when all the information concerning the files that undergo the Life Cycle procedure needs to be preserved.

    Note: Only one version for each file is stored in the backup company.
14. Click **Apply**. The company you just created appears in the **List of Companies**.
15. Click **OK** to save your specification and to close the window.
16. Continue to the next section.

Loading Data Store Information into Your Mainframe Environment

Perform this procedure to map and load the definitions from your data store into the Knowledge Base. The information from your data store will be mapped to your workspace.

Load data store information into the Knowledge Base:

1. In your mainframe environment, execute the following from an ISPF command line:

   `TSO EXEC 'xxxxxxxx.xxxxxxxx.CLIST(MFDATA)'`

   where *xxxxxxxx.xxxxxxxx* is a part of the PDS library name where member MFDATA is located. In both cases, this command allocates PDS libraries to ISPF and launches the **Main Menu** in an ISPF environment as shown:

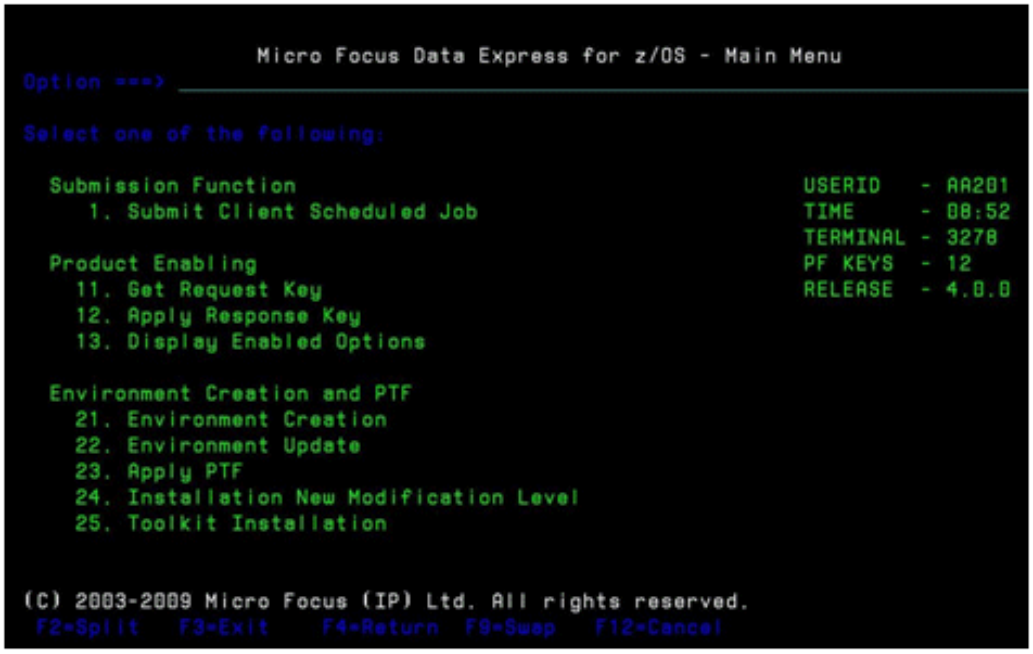


Figure: Data Express for z/OS - Main Menu Panel

2. Enter the following command: `TSO CUINFIL`

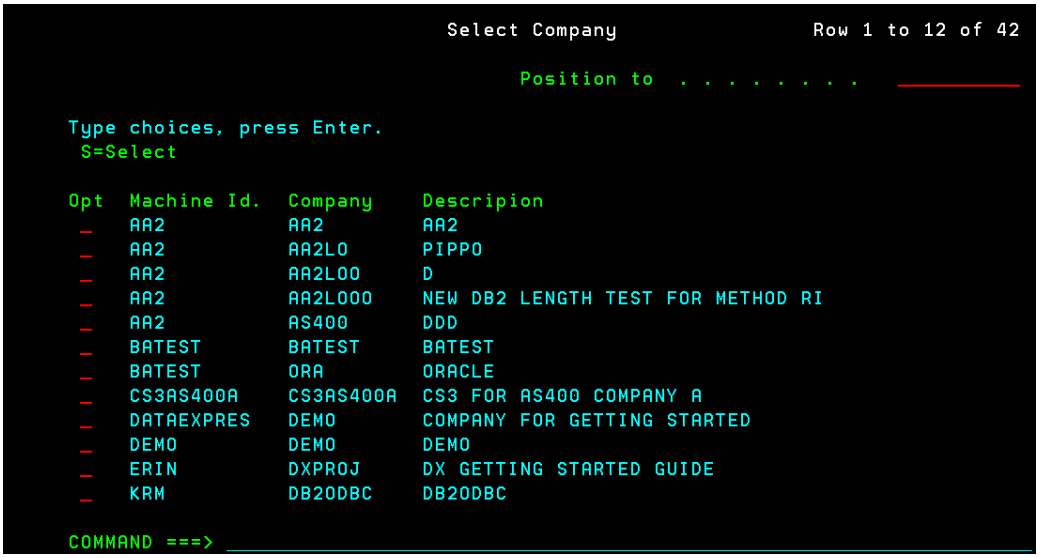


Figure: Select Company Panel

3. Select the Machine ID and Company you created.

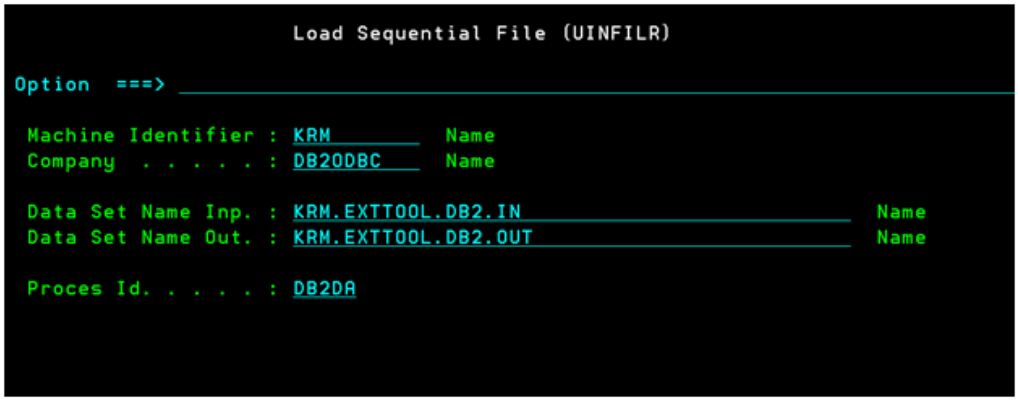


Figure: Load Sequential File (UINFILR)

4. Specify the following parameters:
   - **Data Set Name Inp** – the name of the input data set that contains the table and owner names. For this demo, use URADAR.DEMOT.LISTDB2.
   - **Data Set Name Out** –the name of the output data set that contains the table names, column names, and column descriptions. For this demo, use URADAR.DEMOT.LISTODB2.

     Note: The names for input and output datasets must be different.
   - **Process Id** – the process identifier associated with the elaborated file. For example, for a DB2 data store with direct access, use **DB2DA**.
5. Open the [**Work with Jobs]** window (click or access it through **Environment** > **Work with Jobs**) to schedule a new job:
6. Click **New**.
7. In **List of Jobs**, select the job **BURLFIL** (Load Data Store Information From External Interface).
8. Select the **DATAEXPRES** Machine ID you just created.
9. Specify **DEMO** as the name of your company code in the **Company name** box.
10. Click **Apply**.
11. In the **Sequential data store** box, enter: `URADAR.DEMOT.LISTODB2`
12. Click **OK**.

    The job appears in the **List of Scheduled Jobs**. The pause symbol ( ) indicates that the job is awaiting execution. Once the job has completed successfully, the job is listed with a green check mark ( ).
13. In your TSO environment, submit the BURLFIL job by using the **Submit Client Scheduled Job** panel.

    Note: The **Submit Client Scheduled Job** panel is accessible by selecting option **Submit Client Scheduled Job** from the **Data Express for z/OS - Main Menu** panel. For more information, see the Appendix *Submission Function* in the ***Process Guide for z/OS***.
14. In the **Work with Jobs** area, click the refresh button ( ) to verify that the jobs completed successfully.
15. Close the **Work with Jobs** window.
16. In the **[Work with Data Stores]** window, expand the **Machine ID** node, and select **DATAEXPRES**, to view data stores associated with the DATAEXPRES machine ID:

17. If you're planning to go straight on to the next session, you can keep Data Builder open. Otherwise, either click **File** > **Exit** or click the button, and then click **Yes**.
18. Continue to the next section if you want to complete the sequential files session. Otherwise, go to the chapter *Data Masking*.

Sequential Files Session

In this session, you prepare your z/OS environment for sequential files:

- Import JCL CREASEQS into your mainframe environment
- Import the copybook and sequential file information into your mainframe environment
- Start Data Builder
- Set your workspace
- Load copybook information from an external interface
- Load data store information from an external interface

Importing the JCL CREASEQS into Your Mainframe Environment

In order to import the JCL CREASEQS into your mainframe environment, you must first edit an FTP script, a JCL, list of copybook files, and a list of sequential files. The FTP script, **PUT_JCL_SEQ**, must be modified to include your login credentials so that you can transfer the JCL CREASEQS to an existing library in your mainframe environment. Then, the CREASEQS JCL must be modified to list the name of the library that will contain it.

After editing the provided files, you run **FTPJCLSEQ.BAT**, which executes the FTP commands listed in the file **PUT_JCL_SEQ.txt**.

Import the JCL CREASEQS into your mainframe environment:

1. Edit the FTP script in the **PUT_JCL_SEQ.TXT** file with the following information:

123.123.123.123	the IP address of your mainframe
YOURUSERNAME	your mainframe user name
YOURPASSWORD	your mainframe password
YOURJCLLIBRARY	the name of the library that you want to contain the JCL

   This FTP script transfers the JCL CREASEQS onto the mainframe environment into your the specified JCL library when **FTPJCLSEQ.BAT** is executed.

2. Change each instance of the *XXXXXX.XXXXXX* library name in the **CREASEQS.TXT** file to URADAR.DEMOT.

   Note: The library URADAR.DEMOT is used as an example during instructional steps throughout this tutorial. You can use any library that suits your mainframe library naming conventions. However, it is assumed that the mainframe user ID you are using has no restrictions and can therefore access this library.

   The **CREASEQS.TXT** file contains the JCL that is used to create the PDS library COPYBOOK and the libraries for the following sequential files:

   - CUSTOMER
   - PHCONTRA
   - PHNUMBER
   - PHONBILL

- EXTSEQ
- EXTCPY

Note: The library name URADAR.DEMOT used in this JCL must also be inserted into the FTP job within the **PUT_FILE_SEQ.TXT** file.

3. Execute **FTPJCLSEQ.BAT** to import the JCL into your mainframe environment.
4. Continue to the next section.

Importing the Sequential File and Copybook Information into Your Mainframe Environment

In this exercise, you submit the CREASEQS JCL to create the library URADAR.DEMOT in order to complete your environment creation. Then, you import sequential file and copybook into your mainframe environment.

Import the copybook and sequential file information into your mainframe environment:

1. Edit the FTP script in the **PUT_FILE_SEQ.txt** file with the following information:

123.123.123.123	the IP address of your mainframe
YOURUSERNAME	your mainframe user name
YOURPASSWORD	your mainframe password
XXXXXX.XXXXXX	the name of the library created by JCL CREASEQS, for example: URADAR.DEMOT.

   This FTP script inserts the COPY and RECORD lines of the sequential files into the libraries created by the **CREASEQS.TXT** JCL.
2. Within your TSO environment, submit the CREASEQS JCL.
3. Review results to verify that the job ran successfully.
4. Within your Windows environment, execute **FTPTUTORIALSEQ.BAT** to import the information into your mainframe environment.

   The information from the following sequential files is loaded into the output dataset you specified:

Sequential File	Related Data Element File	Related Copybook File	Data Elements
CUSTOMER	CUSTOMER_REC	CUSTOMER_COPY	COD-CUS (customer code) NAME (customer name) SURNAME (customer surname) DATE-OF-BIRTH (customer birth date) PLACE-OF-BIRTH (customer place of birth)
PHCONTRA	PHCONTRA_REC	PHCONTRA_COPY	COD-CUS (customer code) OPERAT-NUM (operator number) CONTR-NUM (contract number) DATE-SIGN (date contract

			signed)
PHNUMBER	PHNUMBER_REC	PHNUMBER_COPY	OPERAT-NUM (operator number) CONTR-NUM (contract number) PHON-TYPE (phone type: S=smart phone, M=mobile) PHON-NUM (phone number)
PHONBILL	PHONBILL_REC	PHONBILL_COPY	PHON-TYPE (phone type: S=smart phone, M=mobile) PHON-NUMBER (phone number) TOT-CALL (total number of incoming and outgoing calls) PERIOD (billing cycle)

5. Continue to the next section.

Starting Data Builder

Data Builder enables functionality for the Data Masking and Data Subset Extraction modules. With Data Builder, you can take an inventory of data, and classify the data as you see fit. These processes store information about the data in the Data Express Knowledge Base repository.

Note: You will use the settings shown in this section throughout each subsequent chapter of this Getting Started guide.

Start Data Builder:

1. Click **Start** > **All Programs** > **Micro Focus Data Express 4.0** > **Data Builder**.
2. Select the mainframe Knowledge Base as the required database with which to launch the connection. In this example, the database is **MVSDB2**.

   By default, the highlighted item in the list of available databases is the last database you connected to using the Data Builder module. However, for the very first connection, **MVSDB2 – OWUR40SV** is selected by default.

   Note: By selecting **MVSDB2 – OWUR40SV**, you do not need to choose the database and then the schema **OWUR40SV**.
3. Click **OK**.
4. Log in using your mainframe user name and password.

   The **[Work with Data Stores]** window provides a list of files cataloged by Data Express using different sets of search criteria, including:

   - Machine identifiers
   - Company names
   - Application identifiers
   - Data store types
   - Data stores with assigned classes (Multiple class Selection)
   - Data stores with assigned copybooks
   - Data store with sampling activated

- Data stores with Data Changer activated
- Data stores with Data Changer inactivated
- Data stores set as Register Table
- Data stores without Register Table attribute

This window comprises four tabular views: Structure, Classes, Data Changer, and Register Tables. You can select a tab to view files using a specific set of criteria as listed previously. Each tab is associated with different grouping criteria.

The list of displayed data stores can be further restricted by applying filters. Filters can be selected from the context menu displayed by right-clicking the **List of Files** grid, or by selecting the specific icons displayed on the left side of the screen.

Note: The Data Masking and the Data Subset Extraction modules are launched as separate applications.

5. Continue to the next section.

Setting Your Workspace

Data Builder lets you set your workspace as part of the Data Inventory process. You must specify your workspace to organize and sort data on the basis of a logical model.

Note: If you have already set your workspace for your DB2 environment, you do not need to perform this exercise. Both DB2 and sequential file data stores share the same workspace for this sample tutorial.

Set your workspace:

1. From Data Builder, open the **Work with Machine IDs** window (click or access it through **Environment** > **Work with Machine IDs**) to create a new Machine ID.
2. Click **New**.
3. Specify your name as the name of the machine ID in the **Machine ID** box. For this tutorial, type: **DATAEXPRES**.
4. Type a description of your machine ID in the **Description** box. For this tutorial, type: **DEMO ENVIRONMENT**.
5. Specify additional information if appropriate. For this tutorial, the additional fields have been left blank. Click **Apply**.
6. Click **OK** to save your specification and to close the window.
7. From Data Builder, open the **Work with Companies** window (click or access it through **Environment** > **Work with Companies**) to create a new company code:
8. Click **New**.
9. Select the **DATAEXPRES** Machine ID you just created.
10. Specify **DEMO** as the name of your company code in the **Company Code** box.
11. In the **Company Description** box, type: **DX GETTING STARTED GUIDE**.
12. By default, the Life Cycle is activated. Leave this box selected.
13. By default, the **Is a Backup Company** checkbox is not selected. Leave this box unselected.

    During the definition of a company, the backup company associated with it can also be defined.

A Backup Company is useful when all the information concerning the files that undergo the Life Cycle procedure needs to be preserved.

Note: Only one version for each file is stored in the backup company.

14. Click **Apply**. The company you just created appears in the **List of Companies**.
15. Click **OK** to save your specification and to close the window.
16. Continue to the next section.

Loading Copybook Information into Your Mainframe Environment

Perform this procedure to map and load copybook information for your data store into the Knowledge Base. The information from the copybook will be mapped to your workspace.

Load copybook information into the Knowledge Base:

1. From Data Builder, open the **Work with Jobs** window (click or access it through **Environment** > **Work with Jobs**) to schedule a new job:
2. Click **New**.
3. In the **List of Jobs**, select the job **BURLCPY** (Load Copybook Information From External Interface).
4. Select the **DATAEXPRES** Machine ID you just created.
5. Specify **DEMO** as the name of your company code in the **Company name** box.

Click **Apply**.

6. In the **Sequential data store** box, enter: `URADAR.DEMOT.EXTCPY`
7. Click **OK**.

   The job appears in the **List of Scheduled Jobs**. The pause symbol ( ) indicates that the job is awaiting execution.
8. Continue to the next section.

Loading Data Store Information into Your Mainframe Environment

Perform this procedure to map and load the definitions from your data store into the Knowledge Base. The information from your data store will be mapped to your workspace.

Load data store information into the Knowledge Base:

1. From the **Work with Jobs** window, click **New**.
2. In **List of Jobs**, select the job **BURLFIL** (Load Data Store Information From External Interface).
3. Select the **DATAEXPRES** Machine ID you just created.
4. Specify **DEMO** as the name of your company code in the **Company name** box.
5. Click **Apply**.
6. In the **Sequential data store** box, enter: `URADAR.DEMOT.EXTSEQ`
7. Click **OK**.

   The job appears in the **List of Scheduled Jobs**. The pause symbol ( ) indicates that the job is awaiting execution. Once the job has been submitted on the mainframe and has completed successfully, the job is listed with a green check mark ( ).

8. In your TSO environment, submit the BURLFIL and BURLCPY jobs by using the **Submit Client Scheduled Job** panel.

   Note: The **Submit Client Scheduled Job** panel is accessible by selecting option **Submit Client Scheduled Job** from the **Data Express for z/OS - Main Menu** panel. For more information, see the Appendix *Submission Function* in the ***Process Guide for z/OS***.

9. In the Work with Jobs area, click the refresh button ( ) to verify that jobs completed successfully.
10. Close the **Work with Jobs** window.
11. In the **[Work with Data Stores]** window, expand the **Machine ID** node, and select **DATAEXPRES**, to view data stores associated with the DATAEXPRES machine ID:
12. If you're planning to go straight on to the next session, you can keep Data Builder open. Otherwise, either click **File** > **Exit** or click the button, and then click **Yes**.

Data Masking

The Data Masking module is used to manage the privacy of data contained in databases of applications that are either developed internally or purchased by external suppliers. The aim is to protect sensitive data such as name, surname, or company name according to privacy laws and regulations.

This tutorial explains the Data Masking configuration procedure and describes the steps required to migrate the files in your application.

Note: Sessions in this tutorial should be done in order.

This tutorial walks you through the data classification and the data masking phases.

Begin this session only after you have set your workspace and loaded data store information into the Knowledge Base in tutorial *Using Data Express* and *Data Inventory*. You must already be logged in to Data Builder to begin.

The sample sessions are broken out into two parts: one for DB2 data stores and one for sequential files.

Note: Sessions in this tutorial must be done in order. If you choose to complete the tutorial for both DB2 and sequential data, then do all sessions. If you choose to complete the tutorial for only DB2 or sequential data, then follow the sessions only for that data type.

DB2 Data Stores Session

In this session, you:

- Associate supplied masking classes to data elements
- Start the Data Masking module
- Enable masking on the DB2 table CUSTOMER for NAME and SURNAME classes
- Submit a JCL to mask customer first and last names
- Create a masking class
- Associate a masking class to data elements
- Enable masking on the DB2 table for the CODCUS class
- Submit a JCL to mask customer IDs

Associating Supplied Masking Classes to Data Elements

In this exercise you will be manually associating classes supplied with your Data Express installation with columns NAME and SURNAME in the table CUSTOMER:

1. In the **[Work with Data Stores]** window, ensure that the **Machine ID** node is expanded, and that **DATAEXPRES** is selected:
2. In the **List of Data** Stores, select the row for the **DELGT.CUSTOMER** data store.
3. Right-click and then select **Work with Data Elements of the Selected Data Store**:

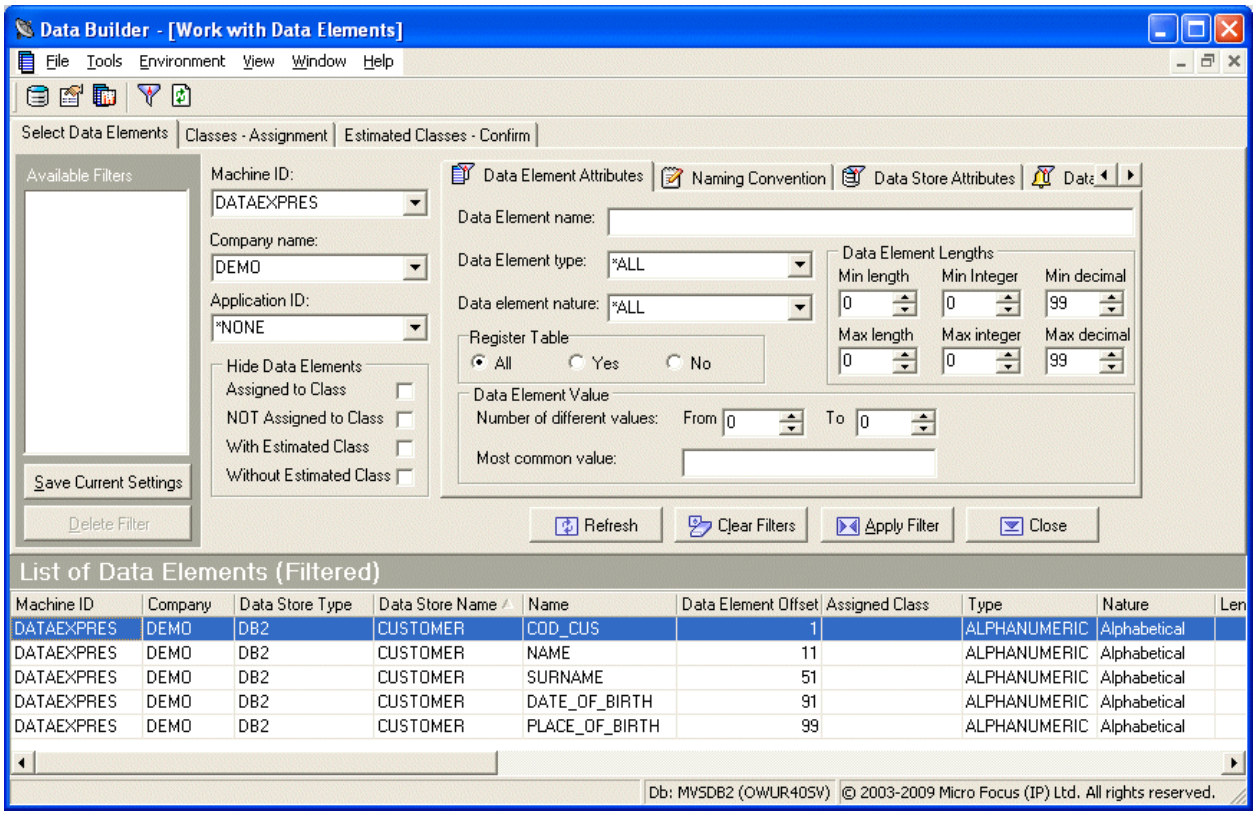


Figure: Work with Data Elements – Select Data Elements Tab

Note:

- If a message appears indicating that the default confirmation options have not been set, click **Yes** to set them; click **Apply**, and then **OK** in the **Options** window.
- You can also access the **Work with Data Elements** window by clicking or by accessing it through **Environment > Work with Data Elements**. However, if you choose to access the **Work with Data Elements** window directly, you may want to specify information in the fields above the **List of Data Elements** and then click **Apply Filter**.

4. Click the **Classes - Assignment** tab.

   Note: This screen shows a filtered list based on **Machine ID** and **Company Name**.
5. In the **All Classes** pane, expand the **Privacy** Super Class, and then select the class **NAME**.
6. In the **List of Data Elements**, select the row for **CUSTOMER.NAME**. (That is, select the row for the data store **CUSTOMER** and the name **NAME**.)

   Note: If you are viewing all data stores, you could click the **Data Store** column to s sort data elements by data store.

7. Click the **Assign Class** button to assign the NAME class to CUSTOMER.NAME.

   NAME now appears in the **Assigned Class** column for CUSTOMER.NAME:

8. In the **List of Data Elements**, select the row for **CUSTOMER.SURNAME**. (That is, select the row for the data store **CUSTOMER** and the name **SURNAME**.)
9. Click the **Assign Class** button to assign the SURNAME class to CUSTOMER.SURNAME.

   SURNAME now appears in the **Assigned Class** column for CUSTOMER.SURNAME:

10. Click the **Close** button to close the **Work with Data Elements** window.
11. Leave Data Builder running, and continue to the next section.

Starting the Data Masking Module

To start Data Masking:

1. Click **Start** > **All Programs** > **Micro Focus Data Express 4.0** > **Data Masking**:
2. Click **OK**.
3. Select the mainframe Knowledge Base as the required database with which to launch the connection. In this example, the database is **MVSDB2**.

   By default, the highlighted item in the list of available databases is the last database you connected to using Data Masking. This becomes apparent after you click **Available databases**.

4. Click **OK**.
5. Log in using your mainframe user name and password.
6. Click **OK**.
7. Select the schema **OWUR40SV**, and click **OK**:

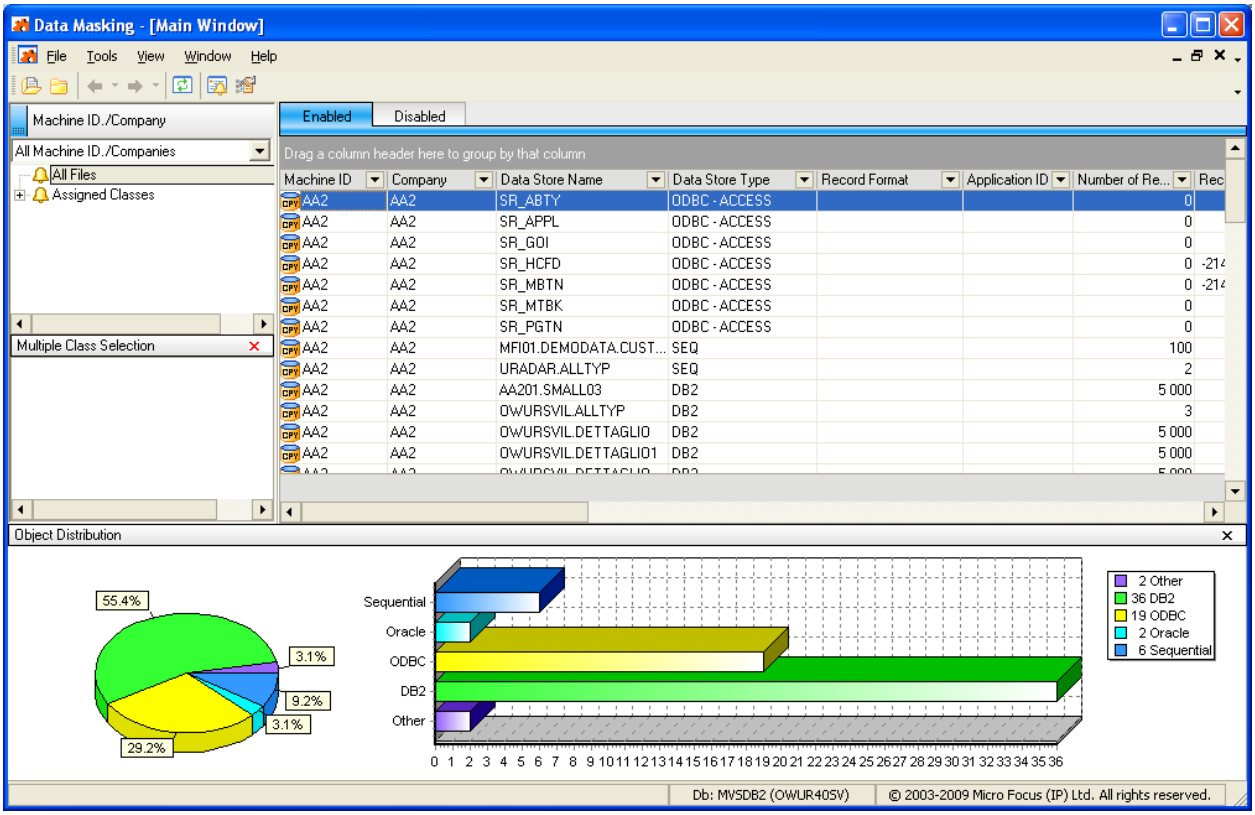


Figure: Data Masking - Main Window

The **Main Window** comprises four main areas: **Machine ID./Company grid**, **All Machine ID./Companies**, **Multiple Class Selection**, and **Object Distribution**.

The area containing the grid and the tabs **Enabled** and **Disabled** is referred to as the **Machine ID./Company** area or the **Grid** area. The grid lists files related to the selected class and to the selected machine ID and company. The names of the forms, their meaning and the included information are outlined below.

The **Enabled** tab shows a list of all active files (enabling a file means that it is visible in the export functionality in order to be prepared for masking), and all files, which have one or more specific classes related to their data elements.

The **Object Distribution** area displays a pie chart and bar chart representation of the file types for the classes selected in the **Machine ID./Companies** or **Multiple Class Section** area. The pie chart shows the percentage distribution of file types, while the bar chart shows the numerical distribution of file types. For both charts, both enabled and disabled files are included. Click the minimize button (_) to minimize the **Object Distribution** area.

8. Continue to the next section.

Enabling Masking on the DB2 Table CUSTOMER

Data Masking lets you to enable masking for individual data stores or all data stores, and to enable masking at the data-element level or class level.

- You can mask at the class level or at the data-element level. In this tutorial, we will be masking at the class level.

In this exercise you will activate masking for the data store CUSTOMER at the class (NAME and SURNAME) level.

Note: To mask at the data-element level, double-click the desired data store from the **Main Window**, right-click the desired data element, and then click **Data Changer Data Element Properties**. Click **Change**, click **Yes** to activate the Changer option, and finally click **Apply** to activate your setting.

Enable masking:

1. In Data Masking, click the **ALL Machine ID./Companies** list:
2. Expand the **All Machine ID./Companies** node:
3. Double-click the **DATAEXPRES** machine ID.
4. Select the row for the data store **DELGT.CUSTOMER**.
5. Right-click and select **Enable**:

   The data store disappears from the list.
6. Verify **CUSTOMER** is set as the **Input Unload data store name** and specify **URADAR.DEMOT.MASK.*new_library_name*** as the **Output Unload data store name**. For example: **URADAR.DEMOT.MASK.DB2CUST**.
7. Click **OK**.
8. Click the **Enabled** tab:

   Note: You can also choose to enable all data stores that have assigned classes with masking routines by choosing **Tools > Enable All Data Stores**.
9. Select the data store **DELGT.CUSTOMER**, right-click, and then click **Open Selected Data Store**:

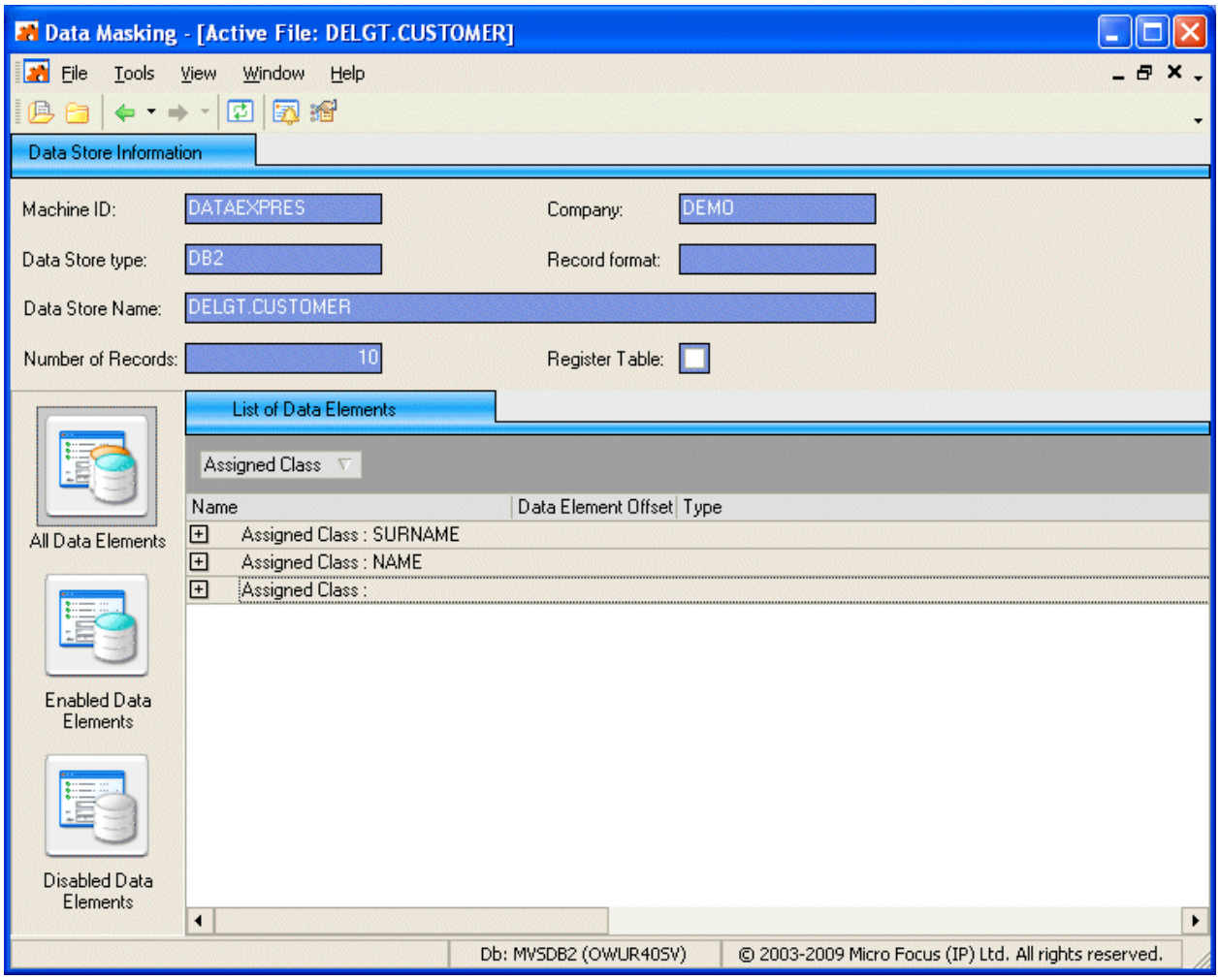


Figure: Data Store Information – Assigned Classes SURNAME and NAME

10. Expand the row for the **SURNAME** node.
11. Click the **SURNAME** class, right-click, and then click **Enable**.
12. Expand the row for the **NAME** node.
13. Click the **NAME** class, right-click, and then click **Enable**.
14. Continue to the next section.

Submitting a JCL to Mask Customer First and Last Names

Use the **Work with Jobs** tool in Data Builder to submit the JCL that does the actual masking on the **CUSTOMER** table. Then, submit the job in the mainframe environment and verify your results.

1. In Data Builder, open the **Work with Jobs** window (click or access it through **Environment** > **Work with Jobs**) to schedule a new job.
2. Click **New**.
3. In the **List of Jobs**, select the job **BDCCHGR** (Data Store Data Changer).
4. Select the **DATAEXPRES** Machine ID and the **DEMO** company name.
5. In the **Data store type** list, click **DB2**.
6. Click **Apply**.

The job appears in the **List of Scheduled Jobs**. The pause symbol ( ) indicates that the job is awaiting execution. Once the job has completed successfully, the job is listed with a green check mark ( ).

7. In your TSO environment, submit the BDCCHGR job by using the **Submit Client Scheduled Job** panel.
8. In the **Work with Jobs** area, click the refresh button ( ) to verify that the jobs completed successfully.
9. Click **OK** or the button to close the **Work with Jobs** window.
9. In your mainframe environment, notice that the values in the **NAME** and **SURNAME** columns for your input and output datasets are different.
10. Continue to the next section.

Creating a Class

You can create new classes to be used for masking purposes, or you can use a predefined class. In this exercise you will create a masking class named CODCUS, which will enable us to mask the data element COD_CUS in the CUSTOMER table:

1. In Data Builder, open the **Work with Classes** window (click or access it through **Environment** > **Work with Classes**):

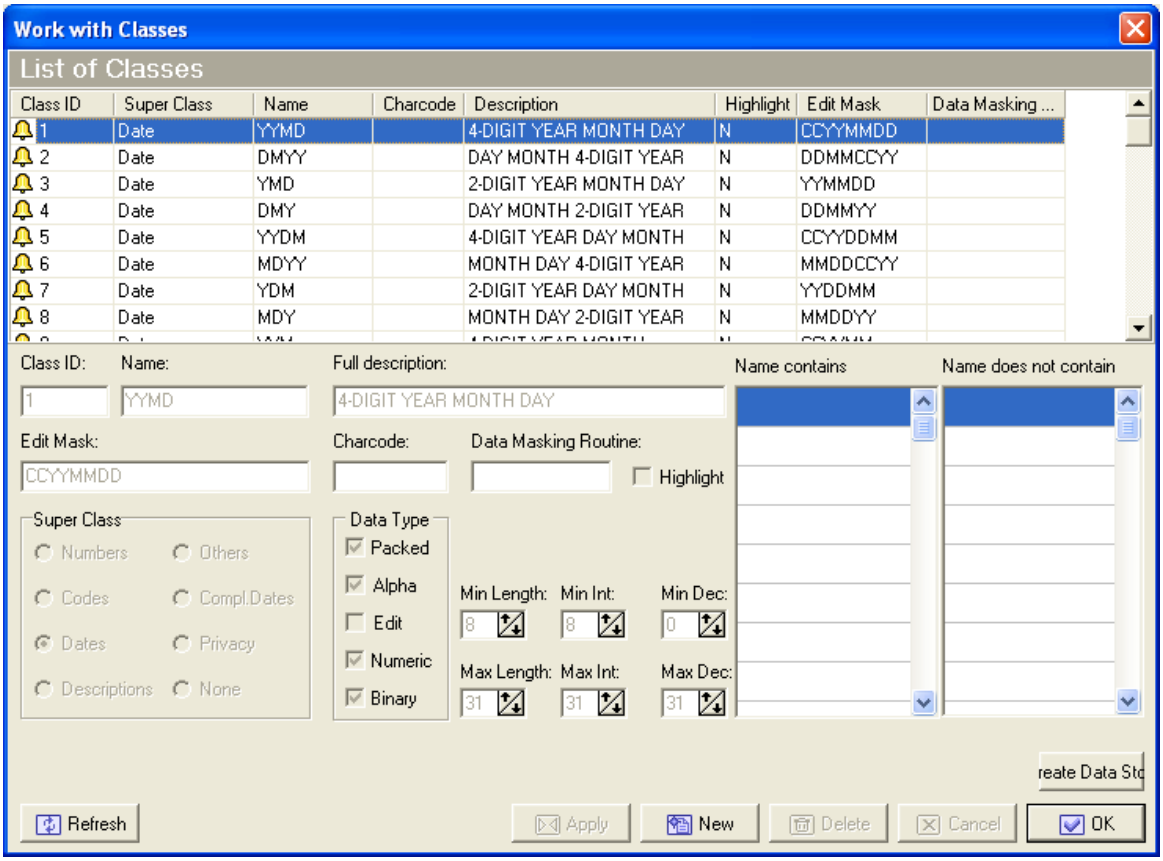


Figure: Work with Classes

2. Click **New**.
3. In the **Name** field, specify **CODCUS** as the name of the class you want to create.

4. In the **Full description** field, specify **COD_CUS MASK EXAMPLE** as the description of the class.

   Note: The description will be visible as a label when you assign the class to data elements within data stores.

5. Specify **UDCPIVC** in the **Data Masking Routine** box.

   Note:

   - This masking routine is provided during product installation. This is just an example routine for the purpose of creating a class. The masking logic for the routine is not in consideration for this demonstration.
   - You can mask at the class level or at the data-element level. In this tutorial, we will be masking at the class level.

6. Select the Super Class **Generated**.
7. Select the data type **Alpha**.
8. Leave the remainder of the fields at their default values. Click **Apply**.

   The class CODCUS is now listed in the **List of Classes** and is given the first free class ID.

9. Click **OK**.
10. Continue to the next section.

Associating a Class to Data Elements

In this exercise you will be manually associating the CODCUS class you just created with columns in the table CUSTOMER:

1. In the **[Work with Data Stores]** window, expand the **Machine ID** node, select **DATAEXPRES**, and then select the row for the **DELGT.CUSTOMER** data store in the **List of Data** Stores.
2. Right-click and then select **Work with Data Elements of the Selected Data Store**:
3. Click the **Classes - Assignment** tab.
4. In the **All Classes** pane, expand the **Generated** Super Class, and then select the class **COD_CUS MASK EXAMPLE**.
5. In the **List of Data Elements**, select the row for **CUSTOMER.COD_CUS**. (That is, select the row for the data store **CUSTOMER** and the name **COD_CUS**.)

   Note: If you are viewing all data stores, you could click the **Data Store** column to s sort data elements by data store.

6. Click the **Assign Class** button to assign the CODCUS class to CUSTOMER.COD_CUS.

   COD_CUS MASK EXAMPLE now appears in the **Assigned Class** column for CUSTOMER.COD_CUS:

7. Click the **Close** button to close the **Work with Data Elements** window.
8. Continue to the next section.

Enabling Masking on the DB2 Table CUSTOMER for the CODCUS Class

In this exercise you will activate masking for the data store CUSTOMER at the class (CODCUS) level.

1. In Data Masking, click the **ALL Machine ID./Companies** list.

2. Expand the **All Machine ID./Companies** node.
3. Double-click the **DATAEXPRES** machine ID.
4. On the **Enabled** tab, select the row for the data store **DELGT.CUSTOMER**.
5. Right-click and select **Data Changer Properties**.
6. Click **Change**.
7. Verify **CUSTOMER** is set as the **Input Unload data store name** and specify **URADAR.DEMOT.MASK.*new_library_name*** as the **Output Unload data store name**. For example: **URADAR.DEMOT.MASK.DB2CUST2**.

   Note: Be sure that you change the output data store name in this exercise or you will overwrite the data from the previous masking exercise.
8. Click **OK**.
9. From the **Enabled** tab, select the data store **DELGT.CUSTOMER**, right-click and then click **Open Selected Data Store**:
10. Expand the row for the node **COD_CUS MASK EXAMPLE** if it is not already expanded:
11. Click the **COD_CUS** class, right-click, and then click **Enable**.
12. Continue to the next section.

Submitting a JCL to Mask Customer IDs

Perform this procedure to map and load the definitions from your data store into the

1. In Data Builder, open the **Work with Jobs** window (click or access it through **Environment** > **Work with Jobs**) to schedule a new job.
2. Click **New**.
3. In the **List of Jobs**, select the job **BDCCHGR** (Data Store Data Changer).
4. Select the **DATAEXPRES** Machine ID and the **DEMO** company name.
5. In the **Data store type** list, click **DB2**.
6. Click **Apply**.

   The job appears in the **List of Scheduled Jobs**. The pause symbol ( ) indicates that the job is awaiting execution. Once the job has completed successfully, the job is listed with a green check mark ( ).
7. In your TSO environment, submit the BDCCHGR job by using the **Submit Client Scheduled Job** panel.
8. In the **Work with Jobs** area, click the refresh button ( ) to verify that the jobs completed successfully.
9. Click **OK** or the button to close the **Work with Jobs** window.
10. In your mainframe environment, notice that the values in the **COD_CUS** column for your input and output datasets are different.
11. If you are planning to go straight on to the next tutorial to complete masking on sequential data, you can keep Data Builder open. Otherwise, either click **File** > **Exit** or click the button, and then click **Yes**.

Sequential Files Session

In this session, you:

- Associate supplied classes to data elements
- Start the Data Masking module
- Enable masking on the sequential file CUSTOMER for NAME and SURNAME classes
- Submit a JCL to mask customer first and last names

Note: The sequential files session does not cover creating a masking class like the DB2 session does.

Associating Supplied Classes to Data Elements

In this exercise you will be manually associating classes supplied with your Data Express installation with columns NAME and SURNAME in the table CUSTOMER:

1. In the **[Work with Data Stores]** window, ensure that the **Machine ID** node is expanded, and that **DATAEXPRES** is selected:
2. In the **List of Data** Stores, select the row for the **URADAR.DEMOT.CUSTOMER** data store.
3. Right-click and then select **Work with Data Elements of the Selected Data Store**:

   Note:

   - If a message appears indicating that the default confirmation options have not been set, click **Yes** to set them; click **Apply**, and then **OK** in the **Options** window.

   - You can also access the **Work with Data Elements** window by clicking or by accessing it through **Environment > Work with Data Elements**. However, if you choose to access the **Work with Data Elements** window directly, you may want to specify information in the fields above the **List of Data Elements** and then click **Apply Filter**.
4. Click the **Classes - Assignment** tab.
5. In the **All Classes** pane, expand the **Privacy** Super Class, and then select the class **NAME**.
6. In the **List of Data Elements**, select the row for **CUSTOMER.NAME**. (That is, select the row for the data store **CUSTOMER** and the name **NAME**.)

   Note: If you are viewing all data stores, you could click the **Data Store** column to s sort data elements by data store.
7. Click the **Assign Class** button to assign the NAME class to CUSTOMER.NAME.

   NAME now appears in the **Assigned Class** column for CUSTOMER.NAME:
8. In the **List of Data Elements**, select the row for **CUSTOMER.SURNAME**. (That is, select the row for the data store **CUSTOMER** and the name **SURNAME**.)
9. Click the **Assign Class** button to assign the SURNAME class to CUSTOMER.SURNAME.

   SURNAME now appears in the **Assigned Class** column for CUSTOMER.SURNAME:
10. Click the **Close** button to close the **Work with Data Elements** window.
11. Leave Data Builder running, and continue to the next section.

Starting the Data Masking Module

To start Data Masking:

1. Click **Start** > **All Programs** > **Micro Focus Data Express 4.0** > **Data Masking**:
2. Click **OK**.
3. Select the mainframe Knowledge Base as the required database with which to launch the connection. In this example, the database is **MVSDB2**.

   By default, the highlighted item in the list of available databases is the last database you connected to using Data Masking. This becomes apparent after you click **Available databases**.
4. Click **OK**.
5. Log in using your mainframe user name and password.
6. Click **OK**.
7. Select the schema **OWUR40SV**, and click **OK**:

   The **Main Window** comprises four main areas: **Machine ID./Company grid**, **All Machine ID./Companies**, **Multiple Class Selection**, and **Object Distribution**.

   The area containing the grid and the tabs **Enabled** and **Disabled** is referred to as the **Machine ID./Company** area or the **Grid** area. The grid lists files related to the selected class and to the selected machine ID and company. The names of the forms, their meaning and the included information are outlined below.

   The **Enabled** tab shows a list of all active files (enabling a file means that it is visible in the export functionality in order to be prepared for masking), and all files, which have one or more specific classes related to their data elements.

   The **Object Distribution** area displays a pie chart and bar chart representation of the file types for the classes selected in the **Machine ID./Companies** or **Multiple Class Section** area. The pie chart shows the percentage distribution of file types, while the bar chart shows the numerical distribution of file types. For both charts, both enabled and disabled files are included. Click the minimize button (_) to minimize the **Object Distribution** area.
8. Continue to the next section.

Enabling Masking on the Sequential File CUSTOMER and NAME and SURNAME classes

Data Masking lets you to enable masking for individual data stores or all data stores, and to enable masking at the data-element level or class level.

- You can mask at the class level or at the data-element level. In this tutorial, we will be masking at the class level.

In this exercise you will activate masking for the data store CUSTOMER at the class (NAME and SURNAME) level.

Note: To mask at the data-element level, double-click the desired data store from the **Main Window**, right-click the desired data element, and then click **Data Changer Data Element Properties**. Click **Change**, click **Yes** to activate the Changer option, and finally click **Apply** to activate your setting.

Enable masking:

1. In Data Masking, click the **ALL Machine ID./Companies** list:
2. Expand the **All Machine ID./Companies** node:
3. Double-click the **DATAEXPRES** machine ID.
4. Select the row for the data store **URADAR.DEMOT.CUSTOMER**.
5. Right-click and select **Enable**.

6. Click the **Enabled** tab, and then right-click and select **Data Changer Properties**:

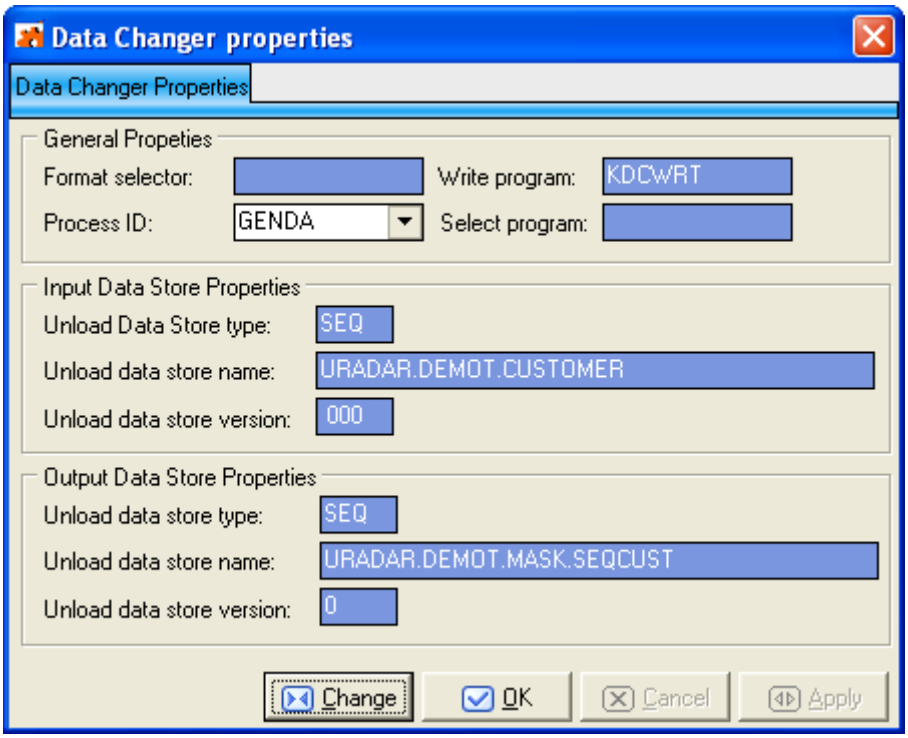


Figure: Data Changer Properties for URADAR.DEMOT.CUSTOMER

7. Verify **URADAR.DEMOT.CUSTOMER** is set as the **Input Unload data store name** and specify **URADAR.DEMOT.MASK.*new_library_name*** as the **Output Unload data store name**. For example: **URADAR.DEMOT.MASK.SEQCUST**.
8. Click **OK**.
9. Click the **Enabled** tab:
10. Select the data store **URADAR.DEMOT.CUSTOMER**, right-click, and then click **Open Selected Data Store**:
11. Expand the row for the **SURNAME** node.
12. Click the **SURNAME** class, right-click, and then click **Enable**.
13. Expand the row for the **NAME** node.
14. Click the **NAME** class, right-click, and then click **Enable**.
15. Continue to the next section.

Submitting a JCL to Mask Customer First and Last Names

Use the **Work with Jobs** tool in Data Builder to submit the JCL that does the actual masking on the **CUSTOMER** table. Then, submit the job in the mainframe environment and verify your results.

1. In Data Builder, open the **Work with Jobs** window (click or access it through **Environment** > **Work with Jobs**) to schedule a new job.
2. Click **New**.
3. In the **List of Jobs**, select the job **BDCCHGR** (Data Store Data Changer).
4. Select the **DATAEXPRES** Machine ID and the **DEMO** company name.

5. In the **Data store name** box, type: ***CUSTOMER***.
6. Click **Apply**.

   The job appears in the **List of Scheduled Jobs**. The pause icon ( ) indicates that the job is awaiting execution. Once the job has completed successfully, the job is listed with a green check mark ( ).
7. In your TSO environment, submit the BDCCHGR job by using the **Submit Client Scheduled Job** panel.
8. In the **Work with Jobs** area, click the refresh button ( ) to verify that the jobs completed successfully.
9. Click **OK** or the button to close the **Work with Jobs** window.
10. In your mainframe environment, notice that the values in the **NAME** and **SURNAME** columns for your input and output datasets are different.

Simple Data Subset Extraction

The Data Subset Extraction module is used to generate a reduced test environment. In this tutorial, you perform basic data subset extraction.

Note: Sessions in this tutorial should be done in order.

This tutorial walks you through the data classification and the data subset extraction phases. This session involves creating a simple subsetting class.

Begin this session only after you have set your workspace and loaded data store information into the Knowledge Base in tutorials *Using Data Express* and *Data Inventory*. You must already be logged in to Data Builder to begin.

The sample sessions are broken out into two parts: one for DB2 data stores and one for sequential files.

Note: Sessions in this tutorial must be done in order. If you choose to complete the tutorial for both DB2 and sequential data, then do all sessions. If you choose to complete the tutorial for only DB2 or sequential data, then follow the sessions only for that data type.

DB2 Data Stores Session

In this session, you:

- Associate a class to a data element
- Start the Data Subset Extraction module
- Create a group
- Create a simple method within that group
- Submit a JCL to subset customer names

Associating a Class to a Data Element

In this exercise, you will be manually associating the NAME predefined class supplied with your Data Express installation with the column NAME in the table CUSTOMER.

Note: Similarly, if you performed the masking tutorial for DB2 data stores, then you already have the correct class associations for your data elements; you can skip the instructions in this section. If you have not performed the masking tutorial, then you cannot skip this section.

To associate a class to data element:

1. In the **[Work with Data Stores]** window, ensure that the **Machine ID** node is expanded, and that **DATAEXPRES** is selected:
2. In the **List of Data** Stores, select the row for the **DELGT.CUSTOMER** data store.
3. Right-click and then select **Work with Data Elements of the Selected Data Store**:

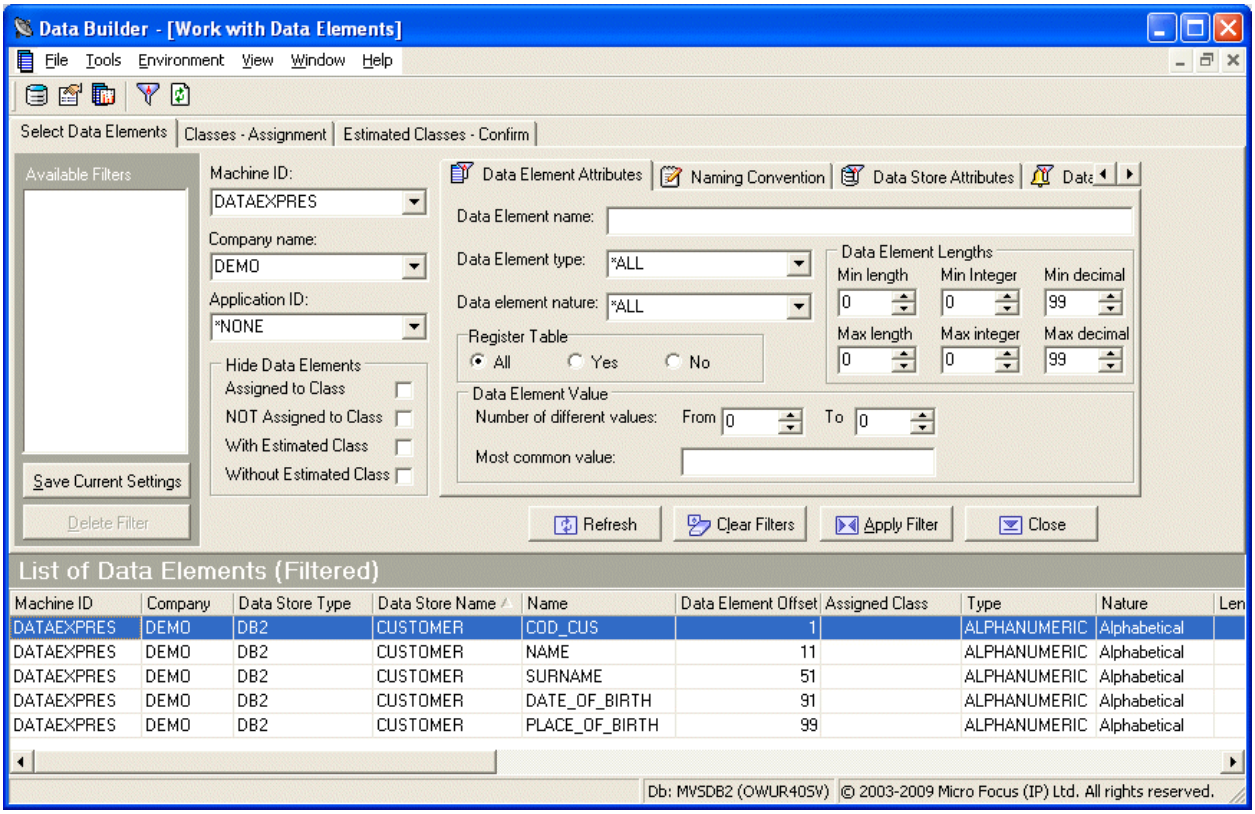


Figure: Work with Data Elements – Select Data Elements Tab

Note:

- If a message appears indicating that the default confirmation options have not been set, click **Yes** to set them; click **Apply**, and then **OK** in the **Options** window.
- You can also access the **Work with Data Elements** window by clicking or by accessing it through **Environment > Work with Data Elements**. However, if you choose to access the **Work with Data Elements** window directly, you may want to specify information in the fields above the **List of Data Elements** and then click **Apply Filter**.

4. Click the **Classes - Assignment** tab.

   Note: This screen capture shows a filtered list based on **Machine ID** and **Company Name**.
5. In the **All Classes** pane, expand the **Privacy** Super Class, and then select the class **NAME**.
6. In the **List of Data Elements**, select the row for **CUSTOMER.NAME**. (That is, select the row for the data store **CUSTOMER** and the name **NAME**.)

   Note: If you are viewing all data stores, you could click the **Data Store** column to s sort data elements by data store.

7. Click the **Assign Class** button to assign the NAME class to CUSTOMER.NAME.

NAME now appears in the **Assigned Class** column for CUSTOMER.NAME:

8. Click the **Close** button to close the **Work with Data Elements** window.
9. Leave Data Builder running, and continue to the next section.

Starting Data Subset Extraction

To start Data Subset Extraction:

1. Click **Start** > **All Programs** > **Micro Focus Data Express 4.0** > **Data Subset Extraction**.

   Note: If you are using Data Express on Windows Vista and User Access Control is enabled, you must run Data Subset Extraction as **Administrator**.

2. Select the mainframe Knowledge Base as the required database with which to launch the connection. In this example, the database is **MVSDB2**.

   By default, the highlighted item in the list of available databases is the last database you connected to using Data Masking. This becomes apparent after you click **Available databases**.

3. Click **OK**.
4. Log in using your mainframe username and password.
5. Click **OK**.
6. Select the schema **OWUR40SV**, and click **OK**:

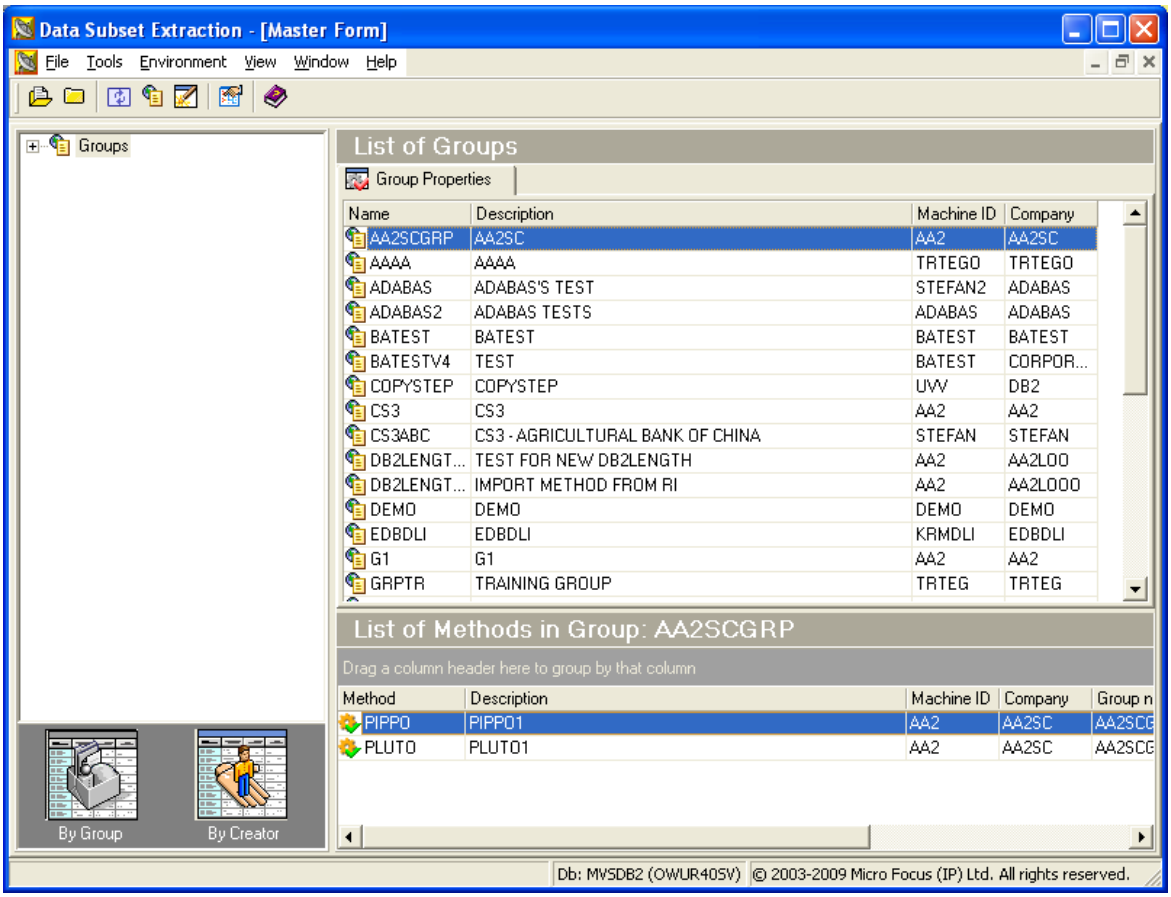


Figure: Data Subset Extraction [Master Form]

The **Data Subset Extraction** window comprises two main areas: the node pane and the grid area. The node pane contains a hierarchical structure that shows the grouping associated with each root-level node. The two root-level nodes are **Groups** and **Creators**.

7. Continue to the next section.

Creating a Group

The **Work with Groups** window lets you to define, view, modify, and delete groups.

Groups can be used to logically separate the methods created for each workspace. Each method must belong to a group.

To create a group:

1. Open the **Work with Groups** window (click or access it through **Environment > Work with Groups**).
2. Click **New**.
3. In the **Machine ID** list, click **DATAEXPRES**.
4. In the **Company** list, click **DEMO**.
5. In the **Group name** box, specify **SIMPLESUB**.
6. In the **Group description** box, type **GROUP FOR SIMPLE SUBSET EXERCISE**.
7. Click **Apply**.
8. Click **OK**.
9. Continue to the next section.

Creating a Simple Method within that Group

The New Method Wizard is used to create a new method, which is the extraction proposal containing the set of operations needed for the creation of the test environment. During method creation, all the information concerning the method is saved locally in a directory indicated by the user

Reduction can be obtained for data stores of a certain size and/or a particular type. In this case, you must be knowledgeable about the application to determine the appropriate selections. However, the Data Subset Extraction module can recognize and automatically create a first subset containing a series of files (called register table files) that are initially brought into the new test environment. Identifying register table files has the following advantages:

- You can create a method to extract only the register table file subset, which is normally valid for the creation of any test environment independently of the selection criteria applied. Once this method has been saved and confirmed, it can be run whenever necessary.
- You can create a second file subset, which filters the register file subset you created, to produce a file subset that is reduced even further.

To create a simple method:

1. Launch the **New Method Wizard** (click or access it through **Environment > Create New Method**):
2. In the **Machine ID** list, click **DATAEXPRES**.
3. In the **Company** list, click **DEMO**.

   Note: Files belonging to different workspaces cannot be included.
4. Click **Next** to go to the next screen:

   Note: If a group has not previously been defined in the **Work with Groups** area, it can be defined from this screen, by simply specifying its name and description in a specific field.

5. In the Group name box, click SIMPLESUB.Text in the **Group description** box populates automatically.
6. In the **Method** box, type **SIMPLEDB2**.
7. In the **Method description** box, type: **SIMPLE DB2 METHOD**.
8. Click **Next** to go to the next screen:
9. Select **Import all non-register table Data Stores** to include demographic files are registered in a dedicated elaboration step of the method.
10. Click to clear the **Import all register table Data Stores** box.
11. Click **Next** to go the next screen:
12. Select **NAME** to be used as the primary extraction criteria.
13. Click **Next**.

    The Data Subset Extraction module automatically extracts all the environment files containing the selected classes, entering them into a specific step. Once the method has been created, the remaining files (that is the files that are not sensitive to the selected classes) will initially be excluded from elaboration. During the Method Confirmation phase, they can be included in the method again. These files will then be integrally copied into the new environment generated by the method involved.

    The primary extraction criteria are listed in the **Selection class** field.
14. For this tutorial, specifying a selection class in the **Other Class** is not necessary because you are creating a method for only one data store; therefore you do not need another class. Note that both the DB2 and sequential data stores used throughout these tutorials both use the class NAME. Click **Finish**.
15. Click **Yes**.

    The Data Subset Extraction module automatically extracts all the environment files containing the related classes and inserts them in a further elaboration step.

    The **Create Method** window is displayed:
16. Click **Start**.
17. Click **OK**.
18. Click **Confirm**:

    During method confirmation, specified filters are applied to the classes needed to perform the extraction, and the method information is imported from a temporary file to the Knowledge Base.

    In this example, we will simply create a method based on the data stores that use the class NAME.
19. In the **Prefix** box, type: **URADAR.DEMOT.SUB.DB2CUST**
20. Click to clear the **Move excluded data stores into new step** box.
21. Click **OK**.

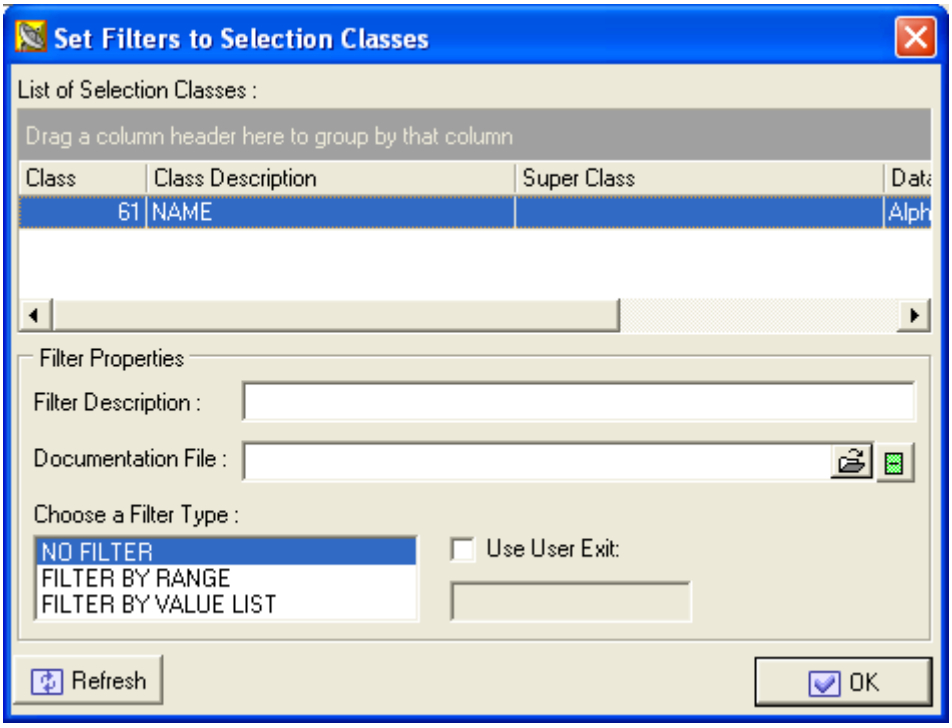


Figure: Set Filters to Selection Classes

22. In the **Choose a Filter Type** list, click **FILTER BY VALUE LIST**:
23. In one of the boxes on the lower left side, type: **Rick**.
24. Click **OK** to close the **Set Filter to Selection Classes** window:
25. In the **Unload Output Data Store Name** box, type: **URADAR.DEMOT.SUB.DB2CUST**
26. Click **OK** to confirm the method.
27. In the **Work with Method** window, click **Properties**:

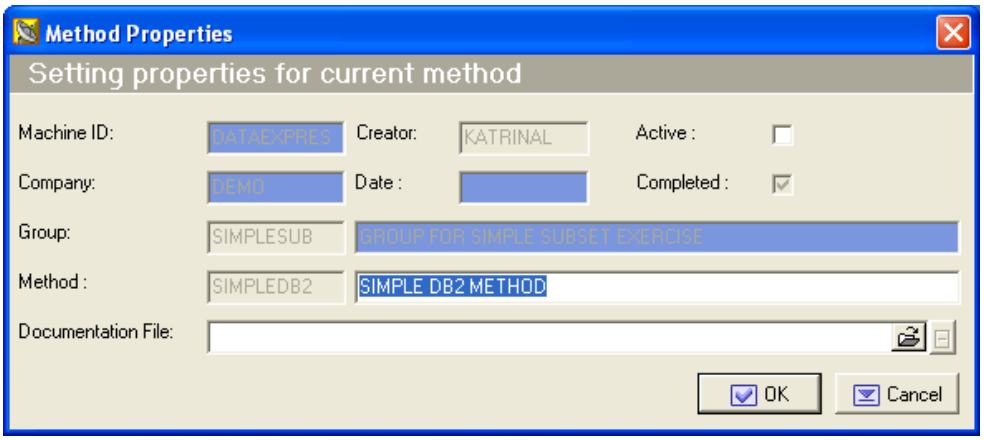


Figure: Method Properties

28. Click **Active**.
29. Click **OK** to close the **Method Properties** window.
30. Click **OK** to close the **Work with Method** window.
31. Continue to the next section.

Submitting a JCL to Subset Customer Names

Use the **Work with Jobs** tool in Data Builder to submit the JCL that does the actual subsetting on the CUSTOMER table. Then, submit the job in the mainframe environment and verify your results.

1. In Data Builder, open the **Work with Jobs** window (click or access it through **Environment** > **Work with Jobs**) to schedule a new job.
2. Click **New**.
3. In the **List of Jobs**, select the job **BTESBMR** (Test Environment Creation).
4. Select the **DATAEXPRES** Machine ID and the **DEMO** company name.
5. In the **Data store name** box, type: ***CUSTOMER***.
6. Click **Apply**.
7. In the **Group** list, click **SIMPLESUB**.
8. In the **Method** list, click **SIMPLE**.
9. Click **OK**.

   The job appears in the **List of Scheduled Jobs**. The pause symbol ( ) indicates that the job is awaiting execution. Once the job has completed successfully, the job is listed with a green check mark ( ).
10. In your TSO environment, submit the BTESBMR job by using the **Submit Client Scheduled Job** panel.
11. In the **Work with Jobs** area, click the refresh button ( ) to verify that the jobs completed successfully.
12. Click **OK** or the button to close the **Work with Jobs** window.
13. In your mainframe environment, notice that only information for the value **Rick** in the **NAME** column for your output dataset is listed.

    Note: Because the Name class is associated to a masking routine, the data was masked as well as reduced.
14. If you are planning to go straight on to the next tutorial to complete subsetting on sequential data, you can keep Data Builder open. Otherwise, either click **File** > **Exit** or click the button, and then click **Yes**,

Sequential Files Session

In this session, you:

- Associate a class to a data element
- Start the Data Subset Extraction module
- Create a group
- Create a simple method within that group
- Submit a JCL to subset customer names

Associating a Class to a Data Element

In this exercise, you will be manually associating the NAME predefined class supplied with your Data Express installation with the column NAME in the table CUSTOMER.

Note: Similarly, if you performed the masking tutorial for sequential files, then you already have the correct class associations for your data elements; you can skip the instructions in this section. If you have not performed the masking tutorial, then you cannot skip this section.

To associate a class to data element:

1. In the **[Work with Data Stores]** window, ensure that the **Machine ID** node is expanded, and that **DATAEXPRES** is selected:
2. In the **List of Data** Stores, select the row for the **URADAR.DEMOT.CUSTOMER** data store.
3. Right-click and then select **Work with Data Elements of the Selected Data Store**:

   Note:

   - If a message appears indicating that the default confirmation options have not been set, click **Yes** to set them; click **Apply**, and then **OK** in the **Options** window.
   - You can also access the **Work with Data Elements** window by clicking or by accessing it through **Environment > Work with Data Elements**. However, if you choose to access the **Work with Data Elements** window directly, you may want to specify information in the fields above the **List of Data Elements** and then click **Apply Filter**.
4. Click the **Classes - Assignment** tab.
5. In the **All Classes** pane, expand the **Privacy** Super Class, and then select the class **NAME**.
6. In the **List of Data Elements**, select the row for URADAR.DEMOT.CUSTOMER.NAME. (That is, select the row for the data store URADAR.DEMOT.CUSTOMER and the name NAME.)

   Note: If you are viewing all data stores, you could click the **Data Store** column to s sort data elements by data store.
7. Click the **Assign Class** button to assign the NAME class to URADAR.DEMOT.CUSTOMER.NAME.

   NAME now appears in the **Assigned Class** column for URADAR.DEMOT.CUSTOMER.NAME:
8. Click the **Close** button to close the **Work with Data Elements** window.
9. Leave Data Builder running, and continue to the next section.

Starting the Data Subset Extraction Module

To start Data Subset Extraction:

1. Click **Start** > **All Programs** > **Micro Focus Data Express 4.0** > **Data Subset Extraction**.

   Note: If you are using Data Express on Windows Vista and User Access Control is enabled, you must run Data Subset Extraction as **Administrator**.
2. Select the mainframe Knowledge Base as the required database with which to launch the connection. In this example, the database is **MVSDB2**.

   By default, the highlighted item in the list of available databases is the last database you connected to using Data Masking. This becomes apparent after you click **Available databases**.
3. Click **OK**.
4. Log in using your mainframe username and password.
5. Click **OK**.
6. Select the schema **OWUR40SV**, and click **OK**:

The **Data Subset Extraction** window comprises two main areas: the node pane and the grid area. The node pane contains a hierarchical structure that shows the grouping associated with each root-level node. The two root-level nodes are **Groups** and **Creators**.

7. Continue to the next section.

Creating a Group

The **Work with Groups** window lets you to define, view, modify, and delete groups.

Groups can be used to logically separate the methods created for each workspace. Each method must belong to a group.

Note: If you have created a group in order to perform simple subsetting for DB2 data stores, then you do not need to perform the instructions in this section.

To create a group:

1. Open the **Work with Groups** window (click or access it through **Environment > Work with Groups**).
2. Click **New**.
3. In the **Machine ID** list, click **DATAEXPRES**.
4. In the **Company** list, click **DEMO**.
5. In the **Group name** box, specify **SIMPLESUB**.
6. In the **Group description** box, type **GROUP FOR SIMPLE SUBSET EXERCISE**.
7. Click **Apply**.
8. Click **OK**.
9. Continue to the next section.

Creating a Simple Method within that Group

The New Method Wizard is used to create a new method, which is the extraction proposal containing the set of operations needed for the creation of the test environment. During method creation, all the information concerning the method is saved locally in a directory indicated by the user

Reduction can be obtained for data stores of a certain size and/or a particular type. In this case, you must be knowledgeable about the application to determine the appropriate selections. However, the Data Subset Extraction module can recognize and automatically create a first subset containing a series of files (called register table files) that are initially brought into the new test environment. Identifying register table files has the following advantages:

- You can create a method to extract only the register table file subset, which is normally valid for the creation of any test environment independently of the selection criteria applied. Once this method has been saved and confirmed, it can be run whenever necessary.
- You can create a second file subset, which filters the register file subset you created, to produce a file subset that is reduced even further.

To create a simple method:

1. Launch the **New Method Wizard** (click or access it through **Environment > Create New Method**):
2. In the **Machine ID** list, click **DATAEXPRES**.
3. In the **Company** list, click **DEMO**.

Note: Files belonging to different workspaces cannot be included.

4. Click **Next** to go to the next screen:

   Note: If a group has not previously been defined in the **Work with Groups** area, it can be defined from this screen, by simply specifying its name and description in a specific field.

5. In the **Group name** box, click **SIMPLESUB**.

   Text in the **Group description** box populates automatically.

6. In the **Method** box, type **SIMPLESEQ**.

7. In the **Method description** box, type: **SIMPLE SEQ METHOD**.

8. Click **Next** to go to the next screen:

9. Select **Import all non-register table Data Stores** to include demographic files are registered in a dedicated elaboration step of the method.
10. Click to clear the **Import all register table Data Stores** box.
11. Click **Next** to go the next screen:
12. Select **NAME** to be used as the primary extraction criteria.
13. Click **Next**.

    The Data Subset Extraction module automatically extracts all the environment files containing the selected classes, entering them into a specific step. Once the method has been created, the remaining files (that is the files that are not sensitive to the selected classes) will initially be excluded from elaboration. During the Method Confirmation phase, they can be included in the method again. These files will then be integrally copied into the new environment generated by the method involved.

    The primary extraction criteria are listed in the **Selection class** field.

14. For this tutorial, specifying a selection class in the **Other Class** is not necessary because you are creating a method for only one data store; therefore you do not need another class. Note that both the DB2 and sequential data stores used throughout these tutorials both use the class NAME. Click **Finish**.
15. Click **Yes**.

    The Data Subset Extraction module automatically extracts all the environment files containing the related classes and inserts them in a further elaboration step.

16. The **Create Method** window is displayed:
17. Click **Start**.
18. Click **OK**.

    Note: Because the NAME class is associated with the both the DB2 and sequential file CUSTOMER tables, both data stores URADAR.DEMOT.CUSTOMER and DELGT.CUSTOMER are listed. If you only followed previous tutorials for either DB2 or sequential files, then obviously, only the relevant data store will be listed.

19. Click **Confirm**:

During method confirmation, specified filters are applied to the classes needed to perform the extraction, and the method information is imported from a temporary file to the Knowledge Base.

In this example, we will simply create a method based on the data stores that use the class NAME.

20. In the **Prefix** box, type: **URADAR.DEMOT.SUB.SEQCUST**
21. Click to clear the **Move excluded data stores into new step** box.
22. Click **OK**.
23. In the **Choose a Filter Type** list, click **FILTER BY VALUE LIST**:
24. In one of the boxes on the lower left side, type: **Rick**.
25. Click **OK** to close the **Set Filter to Selection Classes** window:
26. In the **Unload Output Data Store Name** box, type: **URADAR.DEMOT.SUB.SEQCUST**
27. Click **OK** to confirm the method.
28. In the **Work with Method** window, click **Properties**:
29. Click **Active**.
30. Click **OK** to close the **Method Properties** window.
31. Click **OK** to close the **Work with Method** window.
32. Continue to the next section.

Submitting a JCL to Subset Customer Names

Use the **Work with Jobs** tool in Data Builder to submit the JCL that does the actual subsetting on the **CUSTOMER** table. Then, submit the job in the mainframe environment and verify your results.

1. In Data Builder, open the **Work with Jobs** window (click or access it through **Environment** > **Work with Jobs**) to schedule a new job.
2. Click **New**.
3. In the **List of Jobs**, select the job **BTESBMR** (Test Environment Creation).
4. Select the **DATAEXPRES** Machine ID and the **DEMO** company name.
5. In the **Data store name** box, type: ***CUSTOMER***.
6. Click **Apply**.
7. In the **Group** list, click **SIMPLESUB**.
8. In the **Method** list, click **SIMPLE**.
9. Click **OK**.

   The job appears in the **List of Scheduled Jobs**. The pause symbol ( ) indicates that the job is awaiting execution. Once the job has completed successfully, the job is listed with a green check mark ( ).
10. In your TSO environment, submit the BTESBMR job by using the **Submit Client Scheduled Job** panel.
11. In the **Work with Jobs** area, click the refresh button ( ) to verify that the jobs completed successfully.
12. Click **OK** or the button to close the **Work with Jobs** window.

13. In your mainframe environment, notice that only information for the value **Rick** in the **NAME** column for your output dataset is listed.

    Note: Because the Name class is associated to a masking routine, the data was masked as well as reduced.

Data Subset Extraction using Referential Integrity and Combined Data Elements

In this tutorial, you import class information using referential integrity for a DB2 data store. Then you create a method **RIMETHOD** to use a *combined data element.*

A combined data element is essentially a "dummy" data element that you create for ease of use when it comes to manipulating classes. Once a combined data element is created, you can perform operations against the data element like you would for other elements.

Note: Sessions in this tutorial should be done in order.

This tutorial walks you through the data classification and the data subsetting phases. In this session, subsetting is based on referential integrity rules.

Begin this session only after you have completed the *DB2 Data Stores Session* for the tutorial *Simple Data Subset Extraction*. You must already be logged in to Data Builder to begin.

In this session, you:

- Import referential integrity classes
- Assign estimated classes
- Verify combined data element information
- Create a referential integrity method
- Edit method properties
- Submit a JCL to create the test environment

Importing Referential Integrity Classes

In this exercise you import referential integrity classes by running the BURDDUR (Import Classification From Referential Integrity) job, which creates a referential integrity class and combined data elements, and creates an estimated class assignment for those data elements.

Note: You can also use the Import Class window to import referential integrity classes. However, this mechanism is designed to be used with the New Method Wizard to create a simple method with referential integrity that supports two-level relationships between data stores.

1. In Data Builder, open the **Work with Jobs** window (click or access it through **Environment** > **Work with Jobs**).
2. Click **New**.
3. In **List of Jobs**, select the job **BURDDUR** (Import Classification From Referential Integrity).
4. Select the **DATAEXPRES** Machine ID.
5. Specify **DEMO** as the name of your company code in the **Company name** box.
6. Click **Apply**.
7. In the **Referential Integrity Interface** box, type: `URADAR.DEMOT.REFINTEG`
8. Click **OK**.

The job appears in the **List of Scheduled Jobs**. The pause symbol ( ) indicates that the job is awaiting execution. Once the job has completed successfully, the job is listed with a green check mark ( ).

9. In your TSO environment, submit the BURDDUR job by using the **Submit Client Scheduled Job** panel.
10. In the **Work with Jobs** area, click the refresh button ( ) to verify that the jobs completed successfully.
11. Close the Work with Jobs window.
12. Continue to the next section.

Assigning Estimated Classes

In this exercise, you assign estimated classes to the combined data elements created by the BURDDUR job and to the data elements that compose those combined data elements.

1. Open the **Work with Data Elements** window (click or access it through **Environment** > **Work with Data Elements**).

   Note: You can also access the **Work with Data Elements** window from the main window by selecting the file name, right-clicking to view the context menu, and then by clicking **Work with Data Elements of the Selected Data Store**.
2. From the **Select Data Elements** tab, specify **DATAEXPRES** as the **Machine ID** and **DEMO** as the **Company name**.
3. Click the **Data Store Attributes** tab.
4. In the **DB2 Owner, DL/I DBD** list, click **DELGT**.
5. Click **Apply Filter** to further narrow down the list of data elements displayed.
6. In the **List of Data Elements (Filtered)** table, view the column **Estimated Class**.

   The BURDDUR job you ran has created four combined data elements and has automatically estimated class assignments. These assignments are estimated for the newly created combined data elements and for the data elements that compose these combined data elements. (Likewise, if a data element that composes a combined data element already has an assigned class, the data element is not associated with an estimated class.)

   Note: When you performed the *Data Masking* exercise, the class CODCUS (displayed by its class description **COD_CUS MASK EXAMPLE**) was assigned to the COD_CUS data element in the CUSTOMER data store. Then, when you ran the BURDDUR job as part of this exercise, the class CODUS became an estimated class assignment for the COD_CUS data element in the ACCOUNT data store.
7. In the **List of Data Elements (Filtered)**, view the newly assigned estimated classes created for the following data stores:
   - ACCOUNT and CCARD data stores
     - **CLA0449** – created for the data element OFF_NUM
     - **CLA0450** – created for the data element ACC_NUM
     - **CLA0451** – created for the combined data element, which is comprised of both OFF_NUM and ACC_NUM data elements
   - CCARD and OPERAT data stores
     - **CLA0452** – created for the data element CARD_TYPE

- **CLA0453** – created for the data element CARD_NUM
- **CLA0454** – created for the combined data element, which is comprised of both CARD_TYPE and CARD_NUM

Note: The actual names of your estimated classes will differ as they are system-generated.

8. Click the **Estimated Classes - Confirm** tab:
9. In the **List of Data Elements (Filtered)**, select each row that has an estimated class but not an assigned class:

   Note: Not all selected rows are displayed.

10. Click **Confirm Class**.

    The **Estimated Class** names now appear in the **Assigned Class** column.

11. Close the **Work with Data Elements** window to return to the **Work with Data Stores** window.
12. Continue to the next section.

Verifying Combined Data Element Information

In this exercise, you will view and edit combined data element properties.

1. From the **Work with Data Stores** window, select a data store that you know has a combined data element. (For this exercise, you can select **DELGT. ACCOUNT**, **DELGT.CCARD**, or **DELGT.OPERAT**.)
2. Right-click your selection, and choose **Open Selected Data Store**:

   For this demonstration, the data store **DELGT.ACCOUNT** was chosen.

3. In the **List of Data Elements**, select the row for the combined data element, right-click, and then click **Work with Combined Data Element**:
4. View properties of the system-generated combined data element; change the **Combined Data Element Attributes** if desired.
5. Click **Apply** or **Close** as appropriate.
6. Close the **Work With Data Store** window.
7. Continue to the next section.

Creating a Referential Integrity Method

In this exercise you will create a referential integrity method by running the BTEDDUR (Import Method From Referential Integrity) job.

Note:

- After class assignments have been established, the BTEDDUR job is used to create a complex method with referential integrity that supports multiple-level relationships between data stores.
- You can also use the New Method Wizard to create a simple method with referential integrity, but the wizard is limited in that it only supports two-level relationships between data stores.
- The method created by the BTEDDUR is automatically activated during job execution. Therefore, you do not need to activate the method in the **Method Properties** window.

1. In Data Builder, open the **Work Jobs** window (click or access it through **Environment** > **Work with Jobs**).
2. Click **New**.
3. In **List of Jobs**, select the job **BTEDDUR** (Import Method From Referential Integrity).
4. Select the **DATAEXPRES** Machine ID.
5. Specify **DEMO** as the name of your company code in the **Company name** box.
6. Click **Apply**:
7. In the **Referential Integrity Interface** box, type: `URADAR.DEMOT.REFINTEG`
8. In the **Group** list, click **SIMPLESUB**.

   Note: You created the SIMPLESUB group during the *Simple Subset Extraction* exercise for DB2 data stores.
9. In the **Method** field, type: **RIMETHOD**

   Note: The method RIMETHOD is created when the job runs.
10. In the **Method text** box, type: **METHOD FOR RI AND COMBINED DATA ELEMENT**.
11. In the **Class** list, click **COD_CUS MASK EXAMPLE**.

    Note: You created the class COD_CUS MASK EXAMPLE during the *Data Masking* exercise.
12. Click **OK** to create the method.

Editing Method Properties

In this exercise, you will edit the properties of the referential integrity method you just created.

1. Launch Data Subset Extraction.
2. In the left pane, expand the **Group** list, expand the **SIMPLESUB** list, and then select **Methods**:
3. Select the row for the method **RIMETHOD**, right-click, and then choose **Work with selected Method**:

   The table information for all data stores has been exported because all data stores are related.

   Notice that the data stores DELGT.CUSTOMER and DELGT.ACCOUNT are elaborated in the step, and that the output class for the DELGT.ACCOUNT data store is the input class for DELGT.CCARD in the subsequent step. Likewise, the output class DELGT.CCARD is the input class for DELGT.OPERAT in the subsequent step.

   Elaborating the data stores in this way preserves referential integrity and shows that the DELGT.CUSTOMER data stores is indirectly related to the DELGT.OPERAT data store.

   The following diagram further demonstrations the data store relations:

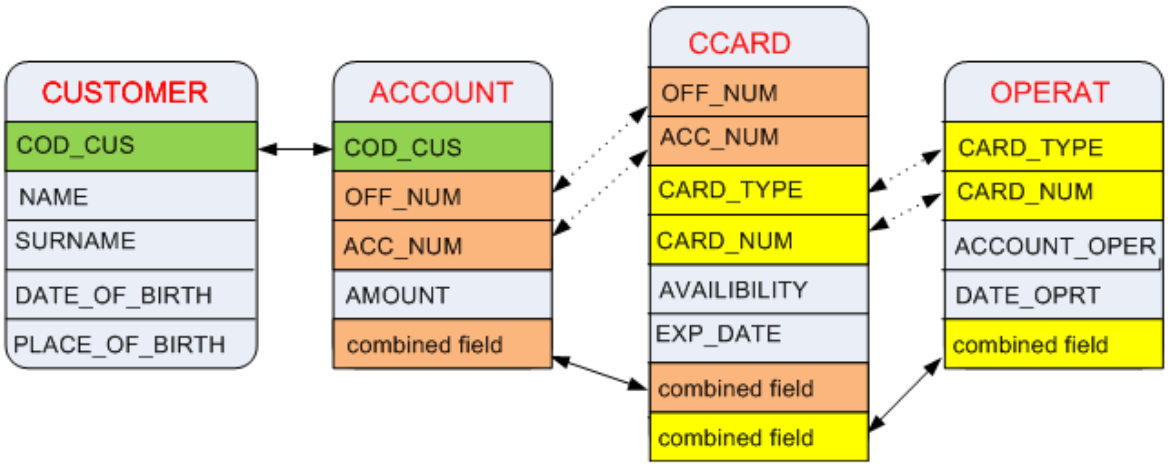


Figure: DELGT Data Store Model

Note: The dashed line represents a relationship that exists between data stores because of the combined field.

4. In the **Data Stores Elaboration** list, select a row for a DELGT.*DataStoreName* data store.
5. Right-click and select **Elaboration Properties**:
6. In the **Unload Output Data Store Properties** section, in the **Data store name** box, type:

   `URADAR.DEMOT.SUB2.`*`DataStoreName`*

   For example, type: `URADAR.DEMOT.SUB2.CUSTOMER`
7. Click **OK**.
8. Repeat steps 4-7 for each DELGT.*DataStoreName* data store.
9. In the **Data Stores Elaboration** list of the **Work with Method** window, select the row for the DELGT.CUSTOMER data store.
10. Right-click, and then select **Elaboration > Selection class / Filter properties**:
11. Choose the filter type **FILTER BY LIST VALUE**:
12. In one of the boxes in the lower-left corner, type the following CUSTOMER CODE:

    `0000000001`

    Note: You can verify the customer code in your z/OS DB2 window. However, this customer code is specified in an INSERT statement in the **CREATBT.TXT** file used to create your DB2 tables.
13. Click **OK** to close the **Set Filter to Selection Classes** window.

    Note: The filter only needs to be specified for the CUSTOMER data store because the BTEDDUR job establishes the relations between all of the other data stores.
14. Exit Data Subset Extraction. (Click **File** > **Exit** or click the button, and then click **Yes**.)
15. Continue to the next section.

Submitting a JCL to Create the Test Environment

Use the **Work with Jobs** tool in Data Builder to submit the JCL that does the actual subsetting on the CUSTOMER, ACCOUNT, CCARD, and OPERAT data stores. Then, submit the job in the mainframe environment and verify your results.

1. In Data Builder, open the **Work with Jobs** window (click or access it through **Environment > Work with Jobs**) to schedule a new job.
2. Click **New**.
3. In the **List of Jobs**, select the job **BTESBMR** (Test Environment Creation).
4. Select the **DATAEXPRES** Machine ID and the **DEMO** company name.
5. Click **Apply**.
6. In the **Group** list, click **SIMPLESUB**.
7. In the **Method** list, click **RIMETHOD**.
8. Click **OK**.

   The job appears in the **List of Scheduled Jobs**. The pause symbol ( ) indicates that the job is awaiting execution. Once the job has completed successfully, the job is listed with a green check mark ( ).
9. In your TSO environment, submit the BTESBMR job by using the **Submit Client Scheduled Job** panel.
10. In the **Work with Jobs** area, click the refresh button ( ) to verify that the jobs completed successfully.
11. Click **OK** or the button to close the **Work with Jobs** window.
12. In your mainframe environment, verify the subset extraction results by viewing the sequential files created by the BTESBMR job:
    - URADAR.DEMOT.SUB2.CUSTOMER
    - URADAR.DEMOT.SUB2.ACCOUNT
    - URADAR.DEMOT.SUB2.CCARD
    - URADAR.DEMOT.SUB2.OPERAT

    Note: Because the COD_CUS MASK EXAMPLE class is associated to a masking routine, the data was masked as well as reduced.
13. Exit Data Builder. Otherwise, either click **File > Exit** or click the button, and then click **Yes**,

Data Element Sampling

In this tutorial, you perform sampling on sequential data stores to obtain information about the distribution of data. Then you use that distribution as a way to assign classes to other data elements with similar data distributions.

Note: Sessions in this tutorial should be done in order.

This tutorial walks you through the data sampling phases.

Complete this session only after you have completed the *Configuring your z/OS Data Express Environment*, *Data Masking*, and the *Simple Data Subset Extraction* tutorials.

You must already be logged in to Data Builder to begin.

In this session, you:

- Submit a JCL to perform sampling
- Verify results

- Create a sampling class
- Associate a fingerprint to a class
- Associate a class to data elements

Submitting a JCL to Perform Sampling

Use the Work with Jobs tool in Data Builder to submit the JCL that performs the actual sampling.

1. From Data Builder, in the **List of Data Stores** in the **Work with Data Stores** window, expand the **DATA EXPRES** Machine ID and select the **DEMO** company.

   Select a data store with the Machine ID **DATA EXPRES** and the company **DEMO**, right-click, and then click **Data Store Properties**:

2. Note that the **Classification number** is **1**.

   By default all data stores are assigned a **Classification number** of **1**, which means that sampling is enabled. Classification numbers are used to restrict the data stores that get sampled and to and to provide further granularity in restricting which data stores get sampled as based on user-defined criteria. When sampling the data stores within your work environment, all enabled data stores with **Classification number** values of **1** will be sampled. To disable sampling, change the **Classification number** to **0** in the **Properties – File** window or right-click the row for the data store in the **Work with Data Stores** and click **Disable Sampling**.

   The data store remains enabled as long as the **Classification number** is not **0**. However, just because sampling is enabled does not mean that the data store is a candidate for sampling as this is controlled by the **Classification number** specified in the **Secondary Options** for the job that submits the JCL.

   If the **Classification number** set for the data store is less than or equal to the **Classification number** specified in the **Distributed Sampler**, the data store will be sampled. Likewise, if the data store **Classification number** is greater than the **Classification number** in the **Distributed Sampler**, the data store will not be sampled.

   Tip: You can assign classification numbers to your data stores based on how often you want to sample data. For example, **1** could represent daily sampling, **2** could represent **weekly** sampling, and **3** could represent monthly sampling.

3. Click **OK**.
4. Open the **Work with Jobs** window (click or access it through **Environment** > **Work with Jobs**) to schedule a new job.
5. Click **New**.
6. In the **List of Jobs**, select the job **BURSAMR** (Data Store Data Element Sampling).
7. Select the **DATAEXPRES** Machine ID and the **DEMO** company name.
8. Click **Apply**.
9. Retain all default sampling values.

   For this exercise, all data stores should be sampling candidates and all sampling options should be utilized.

   The following list describes the sampling **Options**:

   - **Compressed sampling** – Produces the data element *fingerprint*. The fingerprint graphically shows the distribution of values within a given range for the sampled data element. The fingerprints for numeric and alphanumeric data elements differ in that the

fingerprint for an alphanumeric data element shows the distribution of values based on the first character and provides additional information.

- **Standard sampling** – Displays information for each data element value including the number of times each value occurred and the percentage that value represents in the total population.
- **Min/Max calculation** – Displays the minimum and maximum values for the data element.

10. Click **Advanced**.

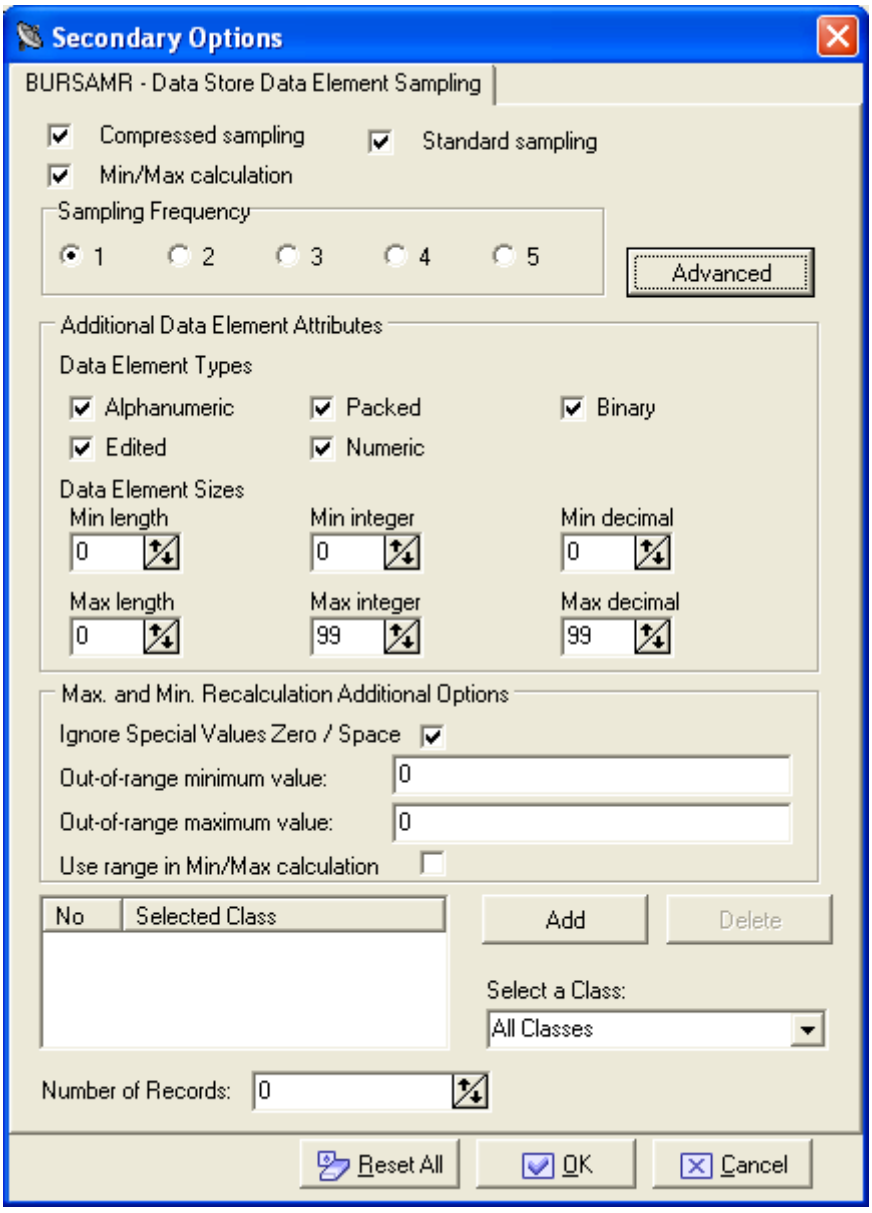


Figure: Secondary Options – BURSAMR Advanced Settings

11. Retain all default values.

    Note: The **Data Element Size** of **0** (zero) means to include all sizes in the sampling results and does not actually reflect the value of 0 when **Ignore Special Values Zero / Space** is checked. Likewise, the default **0** values in **Max. And Min. Recalculation Additional Options** mean to consider all values to be in-range and does not reflect the value of 0.

12. Click **OK**.

13. In your TSO environment, submit the BURSAMR job by using the **Submit Client Scheduled Job** panel.
14. In the **Work with Jobs** area, click the refresh button ( ) to verify that the job completed successfully.
15. Close the **Work with Jobs** window.
16. In your mainframe environment, verify the sampling results.
17. Continue to the next section.

Verifying Results

Once you have executed sampling, you can view the results.

When compressed sampling is performed, a *fingerprint* is created. The fingerprint is a unique graphical representation of the distribution of data for the sampled data element. When the results for compressed sampling are loaded, the fingerprint is created.

1. In the **List of Data Stores** in the **Work with Data Stores** window, select the row for the **URADAR.DEMOT.*TableName*** data store.
2. Click (**Show Synthetic Data Elements**) or right-click and then select **Show Synthetic Data Element Contents**.

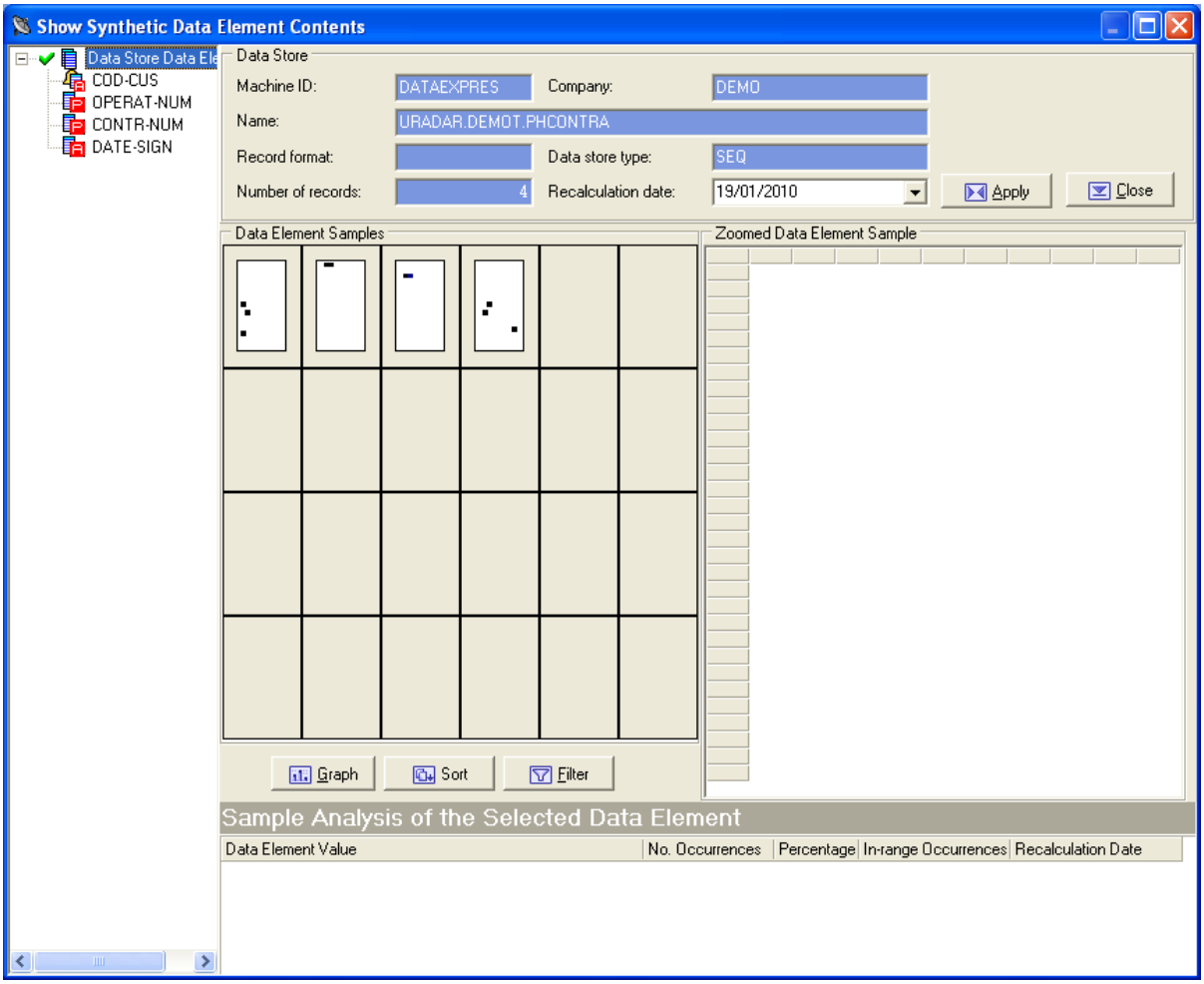


Figure: Show Synthetic Data Element Contents – URADAR.DEMOT.PHCONTRA

The **Data Store Data Elements** list in the left pane shows the data elements for the data store you selected.

3. In the **Data Store Data Elements** list, select the data element **OPERAT-NUM**.

   You can also select the image for the data element in the **Data Element Samples** grid. To ensure that you have selected the correct one, the related data element name is highlighted in the **Data Store Data Elements** list.

   Sampling results for the numeric data element **OPERAT-NUM** are displayed.

4. Review the data element fingerprint in the **Zoomed Data Element Sample**. The fingerprint is the result of performing compressed sampling.

   Notice the following:

   - The numbers on the vertical y-axes represent the ranges of values based on the decimal place, where each number represents one decimal place to the left of the decimal point. For instance, 0 represents the ones place (0-9), 1 represents the tens place (10-99), 2 represents the hundreds place (100-999), and so on.
   - The numbers on the horizontal x-axes represent a specific range based on the y-coordinate corresponding to the first digit. For instance, **1** represents the value 1 for the y-coordinate **0**, while **1** represents values 10-19 for the y-coordinate **1**.
   - The values in each cell indicate the number of times a value in the data element falls within the specified range.

   Note: The fingerprint can also be viewed as a bar graph by clicking **Graph**.

5. Review the items in the list **Sample Analysis of the Selected Data Element**. This list shows the actual data element values when standard sampling was performed.

   Known Restriction: Currently Data Express only shows the first 1500 distinct values and ranges, which are sorted either numerically or alphanumerically based on the data element type.

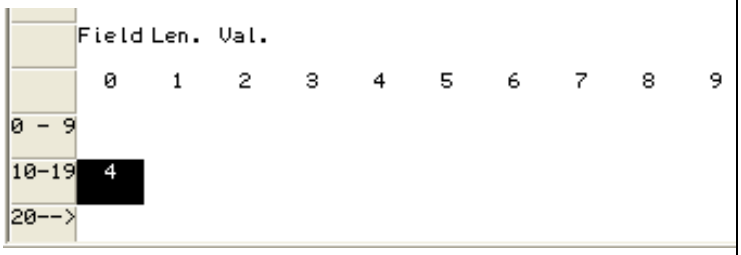
6. In the In the **Data Store Data Elements** list, select the data element **COD-CUS**.

   Sampling results for alphanumeric data element **COD-CUS** are displayed.

7. Review the data element fingerprint in the **Zoomed Data Element Sample**. The fingerprint is the result of performing compressed sampling.

   Notice that the fingerprint for an alphanumeric data element contains four distinct sections:

Section Type	Example	Description
C-haracter Distribution	Spa A B C D E F G H I J K L M N O P Q R S T U V W X Y Z * 0 1 2 3 4 5 6 7 8 9 4	A range of characters in alphabetical order is provided to show how many data elements begin with that character.
Number Distribution		A range of numbers is provided to show how many data elements begin with the indicated number. In the provided example, no data elements begin with numbers.

Type Summary		An alphanumeric data element can actually be a numeric-only data element or alphanumeric data element. The type summary provides a count of how many data elements fall into either category. In the provided example, all data elements are alphanumeric in type.
Field Length		The numbers on the vertical y-axes represent the ranges of values specified. The numbers on the horizontal x-axes represent the position of the actual number in that range. For instance, **4** in the provided example means that there are 4 values with a length equal to 10.

Note: The fingerprint can also be viewed as a bar graph by clicking **Graph**.

8. Close the **Show Synthetic Data Element Contents** window to return to **Work with Data Stores**.
9. Open the **Work with Data Elements** window (click or access it through **Environment** > **Work with Data Elements**).
10. In the **Machine ID** list, click **DATA EXPRES**.
11. In the **Company name** list, click **DEMO**.
12. Click **Apply Filter**:
13. Note the **Minimum Value** and **Maximum Value** items in the **List of Data Elements**, which are the result of performing min/max calculation sampling.
14. Leave the **Work with Data Elements** window open, and continue to the next section.

Creating a Sampling Class

You can create a new class to be used for sampling purposes, or you can use a predefined class. In this exercise you will create a sampling class named **SAMPCUS**.

1. Open the **Work with Classes** window (click or access it through **Environment** > **Work with Classes**).
2. Click **New**.
3. In the **Name** box, specify **SAMPCUS** as the name of the class you want to create.
4. In the **Full description** field, specify **SAMPLING CUSTOMER VALUES** as the description of the class.

   Note: The description will be visible as a label when you assign the class to data elements within data stores.

5. Select the Super Class **Generated**.
6. Check each data type box.
7. Leave the remainder of the fields at their default values. Click **Apply**.

   The class **SAMPCUS** is now listed in the **List of Classes**.
8. Click **OK** to return to the **Work with Data Elements** window.
9. Click **Refresh**.
10. Continue to the next section.

Associating a Fingerprint to a Class

In Data Express, you can correlate data elements if their value distributions are similar. To do this, you must first associate a fingerprint, which represents the desired distribution, to a class.

This fingerprint becomes the *prototype* that is used determine the class assignment for other data elements. If the prototype and the fingerprint for a data element are deemed similar based on a calculated confidence value, the data element is also associated with the prototype class.

1. Click the **Classes – Assignments** tab:
2. In the **All Classes** pane, expand the **Generated** Super Class, and select the class description **SAMPLING CUSTOMER VALUES**:
3. In the **List of Data Elements**, select the row for the data element **COD-CUS** in the data store **URADAR.DEMOT.PHCONTRA**.
4. Check the **Selected Data Element Attributes** check box:
5. Drag the fingerprint that now appears beneath the text **Selected Data Element Attributes**, to the first **Class Samples** cell:

   By highlighting the **SAMPCUS** class description in the **All Classes** pane and then by dragging the fingerprint for the **COD-CUS** data element to the **Class Samples** cell, the **SAMPCUS** class is then assigned to the fingerprint. This fingerprint becomes the prototype. This action also associates the **SAMPCUS** class to the **COD-CUS** data element.
6. Continue to the next section.

Associating a Class to Data Elements

In this exercise you are associating the class **SAMPCUS** (which is associated to your sampling prototype) to other data elements with sampling data distributions similar to the prototype fingerprint.

The level of similarity between distributions depends on the thresholds you set when submitting the **BURCLAR** job. If the prototype and the fingerprint for a data element are deemed similar based on a calculated confidence value, the data element is also associated with the prototype class.

1. Open the **Work with Jobs** window (click or access it through **Environment > Work with Jobs**) to schedule a new job.
2. Click **New**.
3. In the **List of Jobs**, select the job **BURCLAR** (Class Data Element Assignment).
4. Select the **DATAEXPRES** Machine ID and the **DEMO** company name.
5. Click **Apply**.

   When comparing the fingerprint for a data element to the prototype fingerprint, internal Data Express confidence values are calculated to provide measurements that illustrates the similarities

between the data distributions. The internal confidence values are used as input for the threshold formulas.

6. In the **Select a class** list, click **SAMPLING CUSTOMER VALUES**.
7. Click **Add**.

   The class description now appears in the table.
8. In the **Rules** section, uncheck **By Attribute** if it is checked.
9. Set the **ThreShold1** value to **50**.

   The value for **Threshold 1** represents a percentage where the similar areas in the two fingerprints are weighted more heavily than the dissimilar areas.
10. Let the default value of **0** for **Threshold2**.

    The value for **Threshold 2** represents a percentage where all areas (both similar and dissimilar) in the two fingerprints are given equal weight.
11. Keep the logical operator set to **AND**.
12. Click **OK**.
13. In your TSO environment, submit the BURCLAR job by using the **Submit Client Scheduled Job** panel.
14. In the **Work with Jobs** area, click refresh to verify that the job completed successfully.
15. Close the **Work with Jobs** area.
16. In your mainframe environment, verify the class assignment.
17. Return to the **Work with Data Elements** window and refresh the list of data elements.
18. Select the **Select Data Elements** tab if it is not already selected.
19. Click the **Data Store Attributes** tab.
20. Delete any text in the **Data store Name** field.
21. Click **Apply Filter**.
22. Click the **Estimated Classes - Confirm** tab.
23. In the **List of Data Elements (Filtered)**, select the row that has an estimated class but not an assigned class.
24. Click **Confirm Class**.

    The **Estimated Class** names now appear in the **Assigned Class** column.
25. Close the **Work with Data Elements** window and return to the **Work with Data Stores** window.

    A sampling class has successfully been assigned to data elements with similar distributions to the prototype.
26. Close Data Builder; either Click **File** > **Exit** or click the button, and then click **Yes**.