



Data Express 4.0

Life Cycle Guide

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2019-02-08

Contents

Life Cycle Guide	4
Considerations	4
Life Cycle Introduction	4
Life Cycle Phases	5
Sequential Steps	6
Concepts and Terms	6
Working with Life Cycle	7
Definition of Environment	7
Execute Life Cycle Phase 1	9
Modification of Guide Files	9
Work with Life Cycle Jobs	13
Introduction	13
Life Cycle Job Creation	13
Clear Life Cycle History Job Creation	14
Available Operations	15

Life Cycle Guide

Provides step-by-step instructions to help you handle modifications within the layout of the files already processed by Data Express.

The use of Data Express requires a minimum experience of the mainframe platform z/OS.

We recommend you carefully read the following users guides, which supplement this guide:

Guide	Description
<i>Installation Guide</i>	Explains installation procedures.
<i>Data Model Guide</i>	Describes the structure of the tables that comprise the Data Express Knowledge Base.
<i>User Guide (z/OS)</i>	Explains Data Express functions accessible from the z/OS system.
<i>Front End Guide</i>	Shows how to perform basic functions from the graphical front-end.
<i>Data Masking Guide</i>	Explains the Data Masking module.
<i>Data Subset Extraction Guide</i>	Explains how to create a new environment, starting from an existing environment and on the basis of selection criteria specified by the user.

Considerations

Bear in mind the following points about Data Express:

- To use this product, you must have the correct licence. See the *Installation Guide* for more details.
- 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.

Life Cycle Introduction

Life Cycle is a tool within Data Express that keeps track of each modification applied to the file structure of your application, and prevents loss of information when these structural changes occur.



Note:

- The Life Cycle is taken to mean exclusively the entering, into the database, of new data stores or modifications of the layout of existing data stores and not of modifications of the content that leave the file layout unaltered.
- The algorithm used for the recognition of file modifications is based on the modifications of the sources (copybook COBOL and PL/I, SYSPUNCH, and DCLGEN) associated with the files. Direct-access DB2 files are the exception. The recognition of their modifications is based on the information contained in the DB2 system tables.
- The Life Cycle feature of Data Express for z/OS also manages changes in the structure of distributed databases. To enable this feature, you use Distributed Loader to generate the `IMPSRC` file used as starting point for life cycle. For details see the *Full Life Cycle Support* topic in *Getting Started with Distributed Data Stores*.

Known Restriction For DB2 tables with non-direct access, Life Cycle requires SYSPUNCH and DCLGEN to be partitioned data set (PDS) members, even though the cataloging phase supports SYSPUNCH and DCLGEN as sequential files. If you want to use Life Cycle and you have cataloged SYSPUNCH in a sequential file, you will need to delete it from the knowledge base and re-catalog it as a PDS member.

Life Cycle Phases

In order to detect all the changes, the z/OS solution provides specific jobs that must be scheduled and executed. These operations are grouped into three phases:

1. Changed Data Stores Identification (reading the IMPSRC file)
2. Changed Data Elements Identification
3. Apply Identified Changes



Note: For all phases, data stores are processed at the moment the phase is launched.

Phase 1: Changed Data Stores Identification

Phase 1 of the Life Cycle, *Changed Data Stores Identification*, involves the following events:

- Flat file population. Use the Toolkit to populate the IMPSRC, which contains a list of data stores and corresponding I/O areas that have been modified.



Note: For more information, see *Load IMPSRC for Life Cycle* in your *Toolkit (z/OS)* guide.

- File changes are identified. All copybooks included in the specified PDS or DB2 owner tables are scanned and compared with the structures already defined in the Data Express Knowledge Base.
- A sequential guide file is created. This file is a list of information about the matches between the data stores included in the Data Express Knowledge Base and the copybooks, or of the modified DB2 tables.

The guide file information is accessible in the **Work with Changed Data Stores** area.



Note: The guide file is followed by the IMPSRC file, which is created from the job **Load Sequential for Life Cycle** to recognize the modified sources. This Life Cycle feature of the toolkit can be omitted if the list is produced by your development management tool.

Before proceeding to the next phase, the list in the **Work with Changed Data Stores** area should be examined in order to confirm it and to possibly integrate additional information.

Phase 2: Changed Data Elements Identification

Phase 2 of the Life Cycle, *Changed Data Elements Identification*, involves the following events:

- Field changes are identified. All copybooks included in the specified PDS or DB2 owner tables are scanned and compared with the structures already defined in the Data Express Knowledge Base.
- A second guide file is created on the basis of the guide file generated during the previous phase. This file is a list of information about the matches between the data elements belonging to the file included in the Data Express Knowledge Base and the data elements of the copybooks or of the modified DB2 tables.
- The guide file information is accessible in the **Work with Changed Fields** area.



Note: The recognition of the modified sources can be omitted if the list is produced by your development management tool.

Before proceeding to the next phase, this list in the **Work with Changed Fields** area should be examined in order to confirm it and to possibly integrate additional information.

Phase 3: Apply Identified Changes

Phase 3 of the Life Cycle, *Apply Identified Changes*, involves the following events:

- Identified changes are applied.
- File information, which is already contained in the Data Express Knowledge Base, is saved in an appropriate format. This includes sampling rules, associations of classes with fields, associations of the Data Changer with routines, test environment creation methods, and definitions of combined fields.
- If required, a backup of the old data is made.
- The modified data stores are analyzed again, and the previously saved information is applied to them, taking the new layouts into account.

Sequential Steps

The Life Cycle comprises several steps that are to be performed in the following order:

1. Definition of environment:
 - **Work with Companies** - determine whether to enable the backup of a company and, if necessary, create a backup company.
2. Definition of the Life Cycle phases:
 - Execute Phase 1 (*Changed Data Stores Identification*) - identify the PDS or schema (DB2 owner) on which the Life Cycle is to be launched. This phase consists of feeding in a guide file that contains a list of files and corresponding I/O areas that have been modified.
 - Execute Phase 2 (*Changed Data Elements Identification*) - create, on the basis of the guide file generated during the previous phase, a second guide file that contains matches between old and new fields.
 - Execute Phase 3 (*Apply Identified Changes*) - save, in an appropriate format, the information on files already contained in the Data Express Knowledge Base (for example, sampling rules, associations of classes with data elements, associations of masking routines, test environment creation methods, and definition of combined data elements), analyzes the modified data stores again and applies the previously saved information to them taking the new layouts into account.
3. Modification of the guide files produced during the *Changed Data Stores Identification* and *Changed Data Elements Identification* phases in the following areas:
 - **Work with Changed Data Stores**
 - **Work with Changed Fields**
4. Effective launch of phases:
 - Start **Life Cycle Job**

Concepts and Terms

This section describes concepts and terms specific to the Life Cycle.

Backup Company

A backup company is useful when all the information about the files that follow the Life Cycle procedure needs to be preserved.

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

When the Life Cycle procedure is started on the files of a company associated with a backup company, the new file layouts will be visible within the company itself, whereas the information concerning the file with the layout considered to be obsolete may be retrieved from the backup company.



Note: Only one version for each file is stored in the backup company. Thus, if the Life Cycle causes a file to be modified twice, the backup company will only include the version before last and the version prior to that will no longer be stored.

Log Files

All the operations submitted from the client side are stored in log files that incorporate additional information including the submission date and time and whether or not the job was successful.

You can maintain log file information by using a specific function available on the client to delete entries (possibly starting from a given day).

Working with Life Cycle

Describes the Life Cycle.

Definition of Environment

This section describes the first step of the Life Cycle: Definition of Environment.

Work with Companies

To access the **Work with Companies** area, click  (**Work with Companies**) from the **Life Cycle Phases** window. An example of the **Work with Companies** window is shown below:

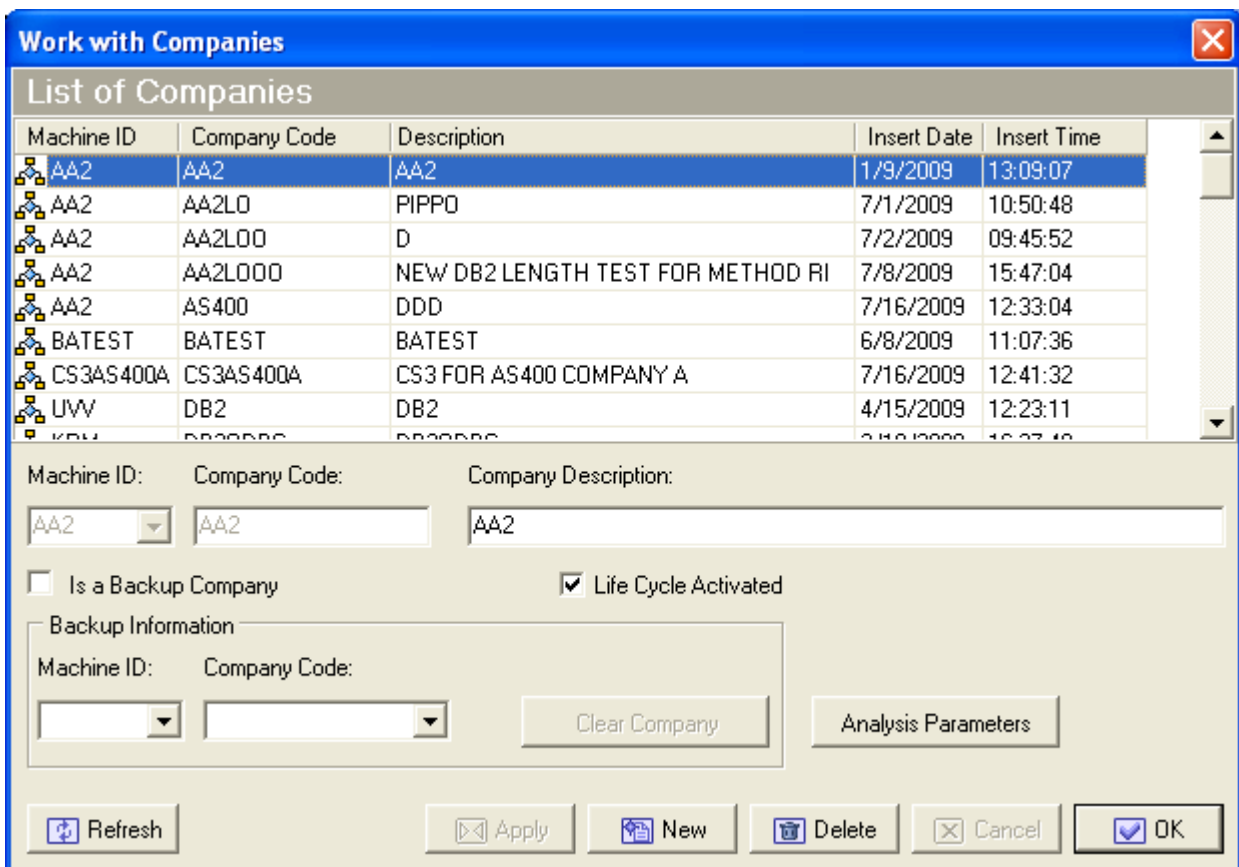



Figure 1: Work with Companies Window

New Company Creation

A new company can be created or an existing company can be modified or canceled from the **Work with Companies** window.

In addition, a company can be associated with information concerning the Life Cycle.

To create a backup company, just select the appropriate flag.

 **Warning:** A backup company cannot be associated with more than one company.

While creating a standard company, you can decide whether to:

- Enable the Life Cycle for all the files belonging to the company without creating any backup company. In this case, the flag related to the enabling of the Life Cycle must be selected and the fields related to the identification of a backup company must be left empty. This is the default behavior.
- Inhibit the Life Cycle for all the files belonging to the company. In this case, no flag must be enabled.
- Enable the Life Cycle for all the files belonging to the company, creating a backup company within which all the information about the layouts which existed before the Life Cycle is preserved. In this case, you need to select the flag related to the enabling of the Life Cycle and then a company from those proposed.

Available Operations

The buttons at the bottom of the **Work with Companies** window are:

- **Apply** - Confirms the changes made to the company. Before changes are applied, a series of checks on non-key fields are performed; if the checks fail, the update is blocked.

- **New** - Initializes fields for insertion when creating a new company.
- **Delete** - Removes the highlighted company.
- **Cancel** - Cancels any changes made to the selected company. Any actions confirmed with the **Apply** button cannot be restored with **Cancel** but must be entered and confirmed again.
- **OK** - Saves any changes that have not been applied and closes the window.

Execute Life Cycle Phase 1

Execute Life Cycle phase 1: *Changed Data Stores Identification*.


For more information about Life Cycle phases, see the chapter *Work with life cycle jobs* of the current manual and *Life Cycle* in the *Process for z/OS Guide*.

Modification of Guide Files

Describes the first step of the Life Cycle: Definition of Environment.

Work with Changed Data Stores

After launching Phase 1 *Changed Data Stores Identification*, examine the list in the **Work with Changed Data Stores** area to confirm what Data Express has found, and possibly integrate it with additional information.

To access the **Work with Changed Data Stores** window, click  (**Work with Changed Data Stores**). An example of the **Work with Changed Data Stores** window is shown below:

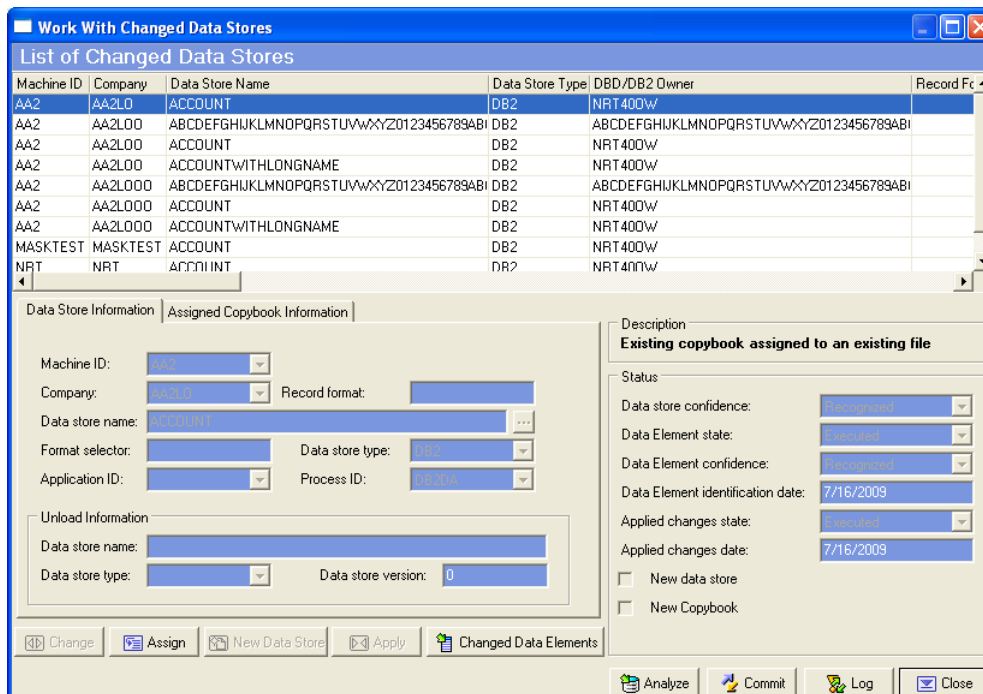


Figure 2: Work With Changed Data Stores Window

This window shows the list of the copybooks or new/modified DB2 tables.

Select any of these sources on which you want to get more detailed information and carry out operations. The information is displayed in the grid columns and, in a summarized form, in the Life Cycle Guide **Status** section. The **Data Element state** box displays a status for the phase of the Life Cycle that has been carried out on the source involved.

To delete life cycle information for the specified data store, right click an element of the list and choose **Delete**. If life cycle is not completed for the data store, the delete operation will make life cycle ignoring the changes for the deleted data store.

These fields can be modified by clicking the **Change** button: the value might change from **Executed** to **Not Executed** in case you want to re-execute the phase to which the field refers.

When a confidence field assumes a **Not recognized** value, it indicates whether Life Cycle needs additional information or user confirmation. Only when the field assumes the **Recognized** value, can the following phase be carried out.

The possible cases are outlined below:

- New copybook is not associated to file. Even the case in which the source is new but refers to an additional format/segment of an existing file falls within this category.
- Existing copybook is associated with existing file.
- Existing copybook is not associated with any file.
- New copybook is associated with new data store (for DB2 files only).



Note: If a copybook defines several file layouts and only one of these has changed, Data Express identifies all the data stores (including the non-modified data stores) as *changed data stores*. At the end of the Life Cycle, only the modified data stores will contain the modifications made.

Case 1 - New copybook is not associated with data store

If Phase 1 identifies a new copybook and Data Express cannot determine which data store the copybook should be associated with, you are asked to specify further information.

In this case, you should always specify an existing machine ID and a company name (not a backup company) for the copybook. There are three ways to make the confidence field take on the **Recognized** value:

- **Leave the copybook unassigned** - No other operation is required.
- **Set an existing data store** - A data store is specified from the list of data stores that already exist in the Knowledge Base, which is made available by clicking the **New Data Store**. The copybook is then associated with the selected data store.
- **Specify a new data store** - A new data store is specified, also entering all the information required to load it. The copybook is then associated with the new data store specified.

Case 2 - Existing copybook is associated with an existing data store

Phase 1 has detected that an existing copybook assigned to a data store has been modified. In this case, you cannot change anything about the copybook except for the data store assignments.

- **Leave the copybook assigned to the data store** - No other operation is required.
- **Set an existing data store** - A data store is specified from the list of data stores that already exist in the Data Express Knowledge Base, which is made available by clicking the **New Data Store** button. The copybook is then associated with the selected data store.
- **Specify a new data store** - A new data store is specified, also entering all the information required to load it. The copybook is then associated with the specified data store.

Case 3 - Existing copybook is not associated with any data store

Phase 1 has detected that an existing copybook has been modified but is not associated with any data store. This may indicate that the previously modified copybook had not been assigned to any data store or that the copybook has been modified to such an extent that Data Express is no longer able to reconstruct its association with the data store.

In this case, you cannot change anything about the copybook but can assign another data store or leave it unassigned.

- **Leave the copybook unassigned** - No other operation is required.
- **Set an existing data store** - A data store is specified from the list of data stores that already exist in the Knowledge Base, which is made available by clicking the **New Data Store** button. The copybook is then associated with the selected data store.
- **Specify a new data store** - A new data store is specified. (You must also enter all the information required to load it.) The copybook is then associated with the new data store specified.

Case 4 - New copybook is associated with new data store (for DB2 files only)

Phase 1 has detected a new DB2 file. In this case, you must specify an existing machine ID and a company name.

Execute Life Cycle Phase 2

Execute Life Cycle phase 2: *Changed Data Elements Identification*:

For more information about Life Cycle phases, see the chapter *Work with life cycle jobs* of the current manual and the chapter *Life Cycle* in the *Process for z/OS Guide*.

Work with Changed Data Elements

The *Changed Data Elements Identification* phase performed should be confirmed and/or modified from the **Work with Changed Fields** window. The batch job identifies matches between the old copybook data elements. The processing operation might miss something (the value assumed by the confidence field is different from **Recognized**), so you must force the confidence field value to **Recognized**.

To access the **Work with Changed Fields** window:

1. Click  (**Work with Changed Data Stores**) from the **Life Cycle Phases** window.

The **Work with Changed Fields** window is displayed:

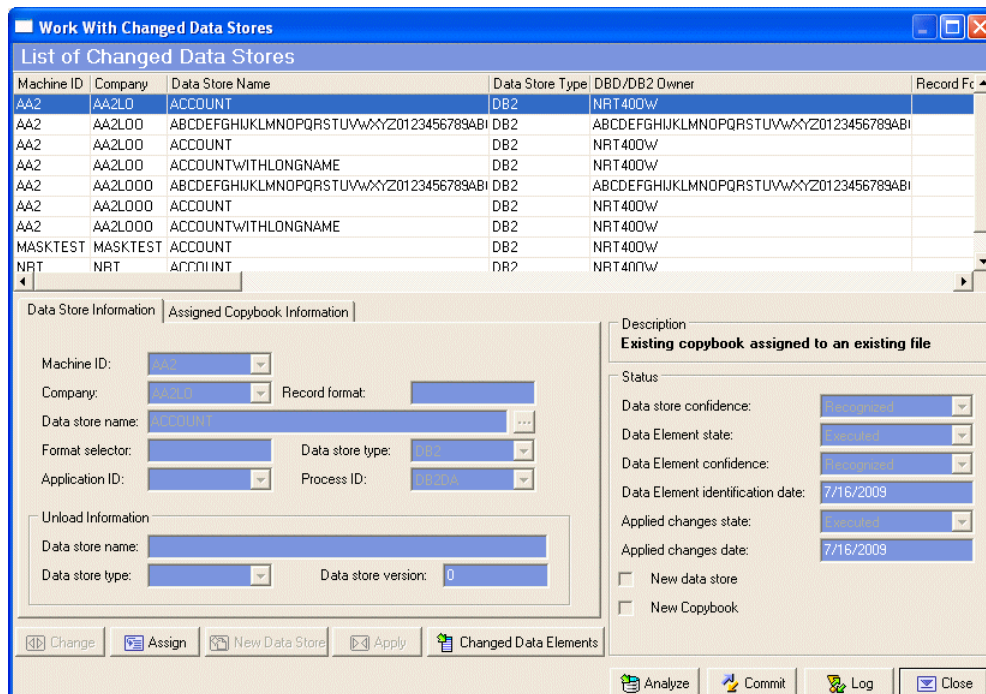


Figure 3: Work With Changed Data Stores Window

2. Select the required row from the **List of Changed Data Stores** and click the **Changed Data Elements** button. An example of the **Work with Changed Fields** window is shown below:

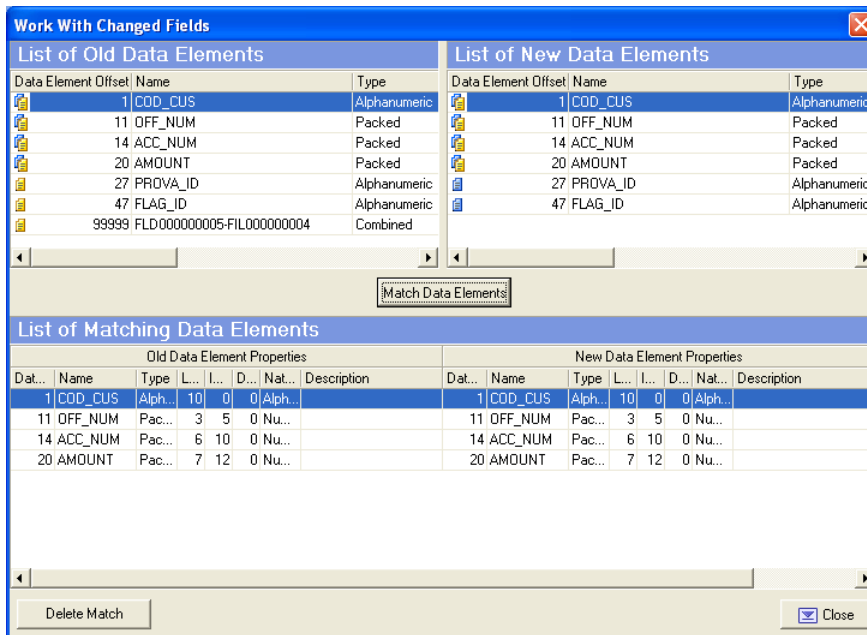




Figure 4: Work With Changed Fields Window

The two upper lists show the old and new data elements list for the selected source. Within the two lists, the different icons alongside the listed fields identify data elements that have been matched and data elements that have no matches.


The lower list shows the matches between the new and old data elements.

 **Note:** If there are no matched data elements, this list will be empty.

3. Identify new matches between data elements and define those that Data Express could not recognize.
4. If required, modify or delete the matches identified by Data Express.

 **Note:** Bear in mind that the following steps only apply to the records of the list of confirmed data elements.

5. Select the two data elements to be compared from the upper lists, and click the **Match Data Elements** button to view matches in the lower list.

 **Note:** To delete a match between data elements, select it from the lower list and click the **Delete Match** button.

Data Express automatically recognizes some relationships. Therefore, if only one data element has been added to a table, leaving everything else as it was, all the data elements will appear to be matching. The new data element is displayed on the right-hand side and no matching is needed. This form is used to specify the data elements that have changed, for example, whenever a data element has been radically changed and the z/OS platform application cannot recognize it.

Data Express is designed to handle the following:

- data elements to be added (at the head, tail, or in the middle)
- data element to be split up into several data elements
- several data elements to be combined in a single data element (combined data element)
- data elements to be eliminated
- data element typology to be changed (type/length/decimals)

To identify matches between old and new data elements, Data Express mainly relies on the correspondence of:

- data element name

- position (the order number of the data elements) within the data store
- data element type and length

Execute Life Cycle Phase 3

Execute Life Cycle phase 3: Apply Identified Changes.

For more information about Life Cycle phases, see the chapter *Work with life cycle jobs* of the current manual and the chapter *Life Cycle* in the *Process for z/OS Guide*.

Work with Life Cycle Jobs

Life Cycle jobs can be scheduled from the **Work with Jobs** area.

For more information about the **Work with Jobs** area, see the *Work with Jobs* in the *Front End Guide*.


Introduction

To access the **Work with Jobs** area:

1. Start Data Builder by clicking **Start > All Programs > Micro Focus Data Express 4.0 > Data Builder**.



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

2. Click  (**Work with Jobs**) in the toolbar of the main window.

The **Work With Jobs** area is displayed as shown below:

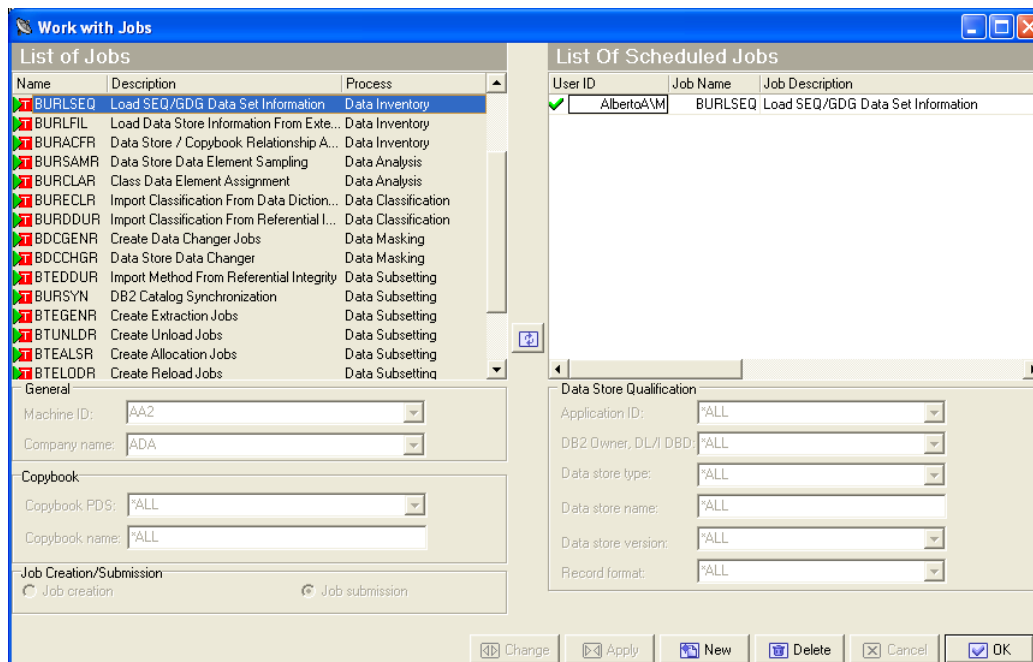


Figure 5: Work with Jobs Area

Life Cycle Job Creation

The **Life Cycle** job executes each phase of the Life Cycle sequentially. Each phase is executed until confirmation is needed.

 **Note:** Using the Life Cycle job to execute the Life Cycle phases does not take into consideration the list of scheduled phases (displayed in the **Life Cycle Phases** window) or the time limit parameter.

To create a **Life Cycle** job:

1. From the **Work with Jobs** window, click **New**.
2. In the **List of Jobs** section, select **BLCFILR - Life Cycle**.
3. Click **Apply** to submit the job. The **Secondary Options** window appears:

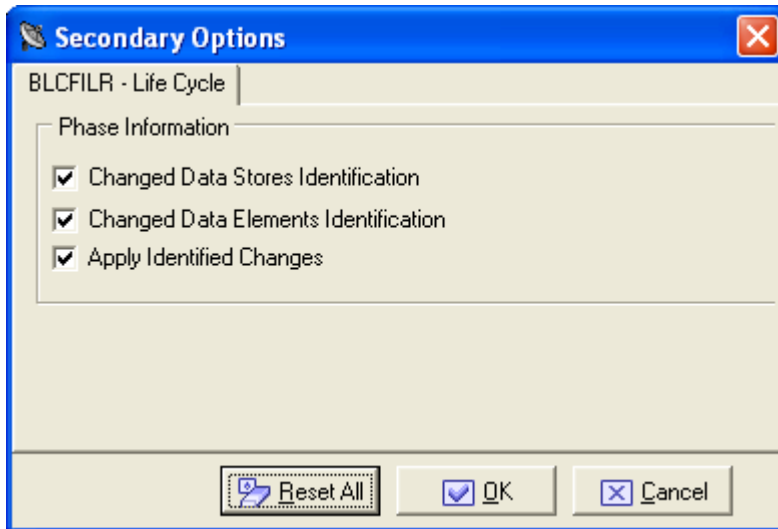


Figure 6: BLCFILR - Life Cycle Secondary Options

4. In the **Secondary Options** window, select one or more phases according to your requirements.
5. Click **OK**.

Clear Life Cycle History Job Creation

This job provides a deletion of table **ANLICLOG**. This table is the life cycle log. It is for internal use only and it is not shown in any screen of the user interface.

To create a **Clear Life Cycle History** job:

1. From the **Work with Jobs** window, click **New**.
2. In the **List of Jobs** section, select the **Clear Life Cycle History** job.
3. In the **General** section, select the appropriate **Machine Id** and **Company name**.
4. Click **Apply**.

The **Secondary Options** window appears:

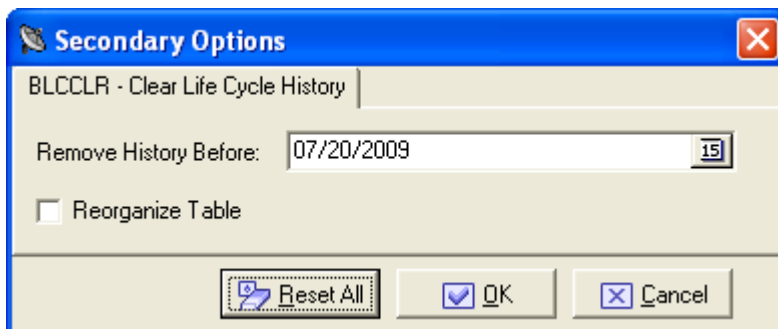


Figure 7: BLCCLR - Clear Life Cycle History Secondary Options

5. In the **Secondary Options** window, specify values for the following fields:

- **Remove History Before** - Removes all Life Cycle information before the selected date.
- **Reorganize Table** - Performs a reorganization of the table after removing the Life Cycle information.

Available Operations

The buttons in the **List of Scheduled Jobs** section of the **Work with Jobs** window and the **Secondary Options** window are:

- **Change** - Lets you modify **File Qualification** parameters for the selected job if the job is scheduled but has not yet been submitted (**Flag Status** is **0**). Changes should be saved using the **Apply** button.
- **Apply** - Saves the information for the new job, but keeps the window open.
- **New** - Initializes fields for insertion when scheduling a new job.
- **Delete** - Cancels the execution of the selected scheduled job and removes the job from the **List of Scheduled Jobs** list. If the job is currently being executed (**Flag Status** is **1**), you will be prompted to confirm the deletion.
- **Cancel** - Cancels any changes. Any confirmations made with the **Apply** button cannot be undone with the **Cancel** button but must be instead entered and confirmed again.
- **OK** - Applies all changes and closes the window.
- **Reset All** - Clears the values of all fields.