Data Express 4.0

Readme

Contents

Readme

General information on Data Express is available here. This information includes hardware and software requirements, backward compatibility, known errors and restrictions and so on.

If you install a WrapPack containing updates and fixes to your installation, information on the WrapPack is included here. However, last-minute information is only in the WrapPack Readme, which is downloadable with the WrapPack from the Customer Care Web site.

To find out how to get the latest information, see the chapter *Updates and Product Support*.

System Requirements

This section provides system requirements.

Windows

This section describes the Windows system requirements for using Data Express with Data Express for z/OS and Data Express for Distributed Systems solutions.

Hardware Requirements

The following minimum configuration for Windows is required:

Component	Description
Processor	Must be at least the minimum specified for the operating system you are using.
Memory	- Data Express for z/OS: at least 512 MB is needed; 1 GB is recommended. - Data Express for Distributed Systems: at least 1 GB is needed; 1.5 GB is recommended.
Disk space	- Data Express for z/OS: at least 30 MB. - Data Express for Distributed Systems: 300 MB of disk space available to install all the modules of the Data Express suite (500 MB recommended).
Video	Display with 800 x 600 SVGA in 256 colors. Preferred screen resolution 1024 x 768 or higher.

Software Requirements

The following software is supported:

Component	Details	Description
Operating Systems	32-bit Windows	- Windows 7, 8, 10, and 11 - Windows Server 2003 and 2003 R2 - Windows Server 2008 and 2008 R2 - Windows Server 2016, 2019, and 2022
	64-bit Windows	- Windows 7, 8, 10, and 11 - Windows Server 2003 and 2003 R2

Component	Details	Description
Third-party software		• Windows Server 2008 and 2008 R2 • Windows Server 2016, 2019, and 2022
		When running on a 64-bit Windows platform, Data Express runs as a 32-bit application.
	Data Express for Distributed Systems	Borland Database Engine. This software needs to be installed after the Data Express product installation process on Windows.
	Data Express on z/OS	IBM DB2 Connect Personal Edition (or Data Server Client) needed to access Gateway DB2 Connect Enterprise Edition.
		Borland Database Engine. This software needs to be installed after the Data Express product installation process on Windows.
		Although not required, if you are using the z/OS solution we recommend that your Windows machine have a direct connection to the DB2 database through DB2 Connect.

User Authorization Requirements

For Data Express for z/OS, when a project is opened for the first time, the user ID and password for the connection to the database server where the work environment resides must be provided. The user ID provided must have read privileges on the following:

`SYSIBM.SYSTABLES`

All tables are created by Data Express during product installation.

z/OS

This section describes requirements for the System z servers running z/OS. If you are using Data Express for Distributed Systems, which means that your Knowledge Base will reside on a Windows machine, you can skip this section.

Hardware Requirements

Any mainframe system that supports the minimum software requirements listed in the Software Requirements section can be used. Data Express requires the following amount of disk space:

- 183 MB disk space available for product installation
- 3 MB of disk space per analyzed archive (50 fields)

Software Requirements

The following software is supported for z/OS:

- MVS, OS/390 2.5 or later, or z/OS 1.1 or later
- Language Environment 6.1 or later
- IBM DB2 for z/OS versions 9, 10, 11, and 12

DB2 Database Requirements

Data Express for z/OS uses a DB2 database that contains about 150 tables and views. The database must be at least DB2 V7R1 with proper DDF configuration.

The tablespace definition for one table and the DDL statements used to create the database and are shown below.

```
CREATE  TABLESPACE        ANURDCLA
        IN                &URDBASE
        USING STOGROUP  &URSGROUP
        PRIQTY                $PQTY
        SECQTY                $SQTY
        FREEPAGE          $FPAGE
        PCTFREE              $PFREE
        BUFFERPOOL      &URBPTS
        SEGSIZE 64
        COMPRESS          $COMPRESS;
CREATE  TABLE   &UROWNER..ANURDCLA
(MCRECID                  SMALLINT              NOT NULL WITH DEFAULT,
 FILRECID                   INTEGER               NOT NULL WITH DEFAULT,
 FLDRECID                   INTEGER               NOT NULL WITH DEFAULT,
 CLATYPE                   SMALLINT             NOT NULL WITH DEFAULT,
 PRG                          SMALLINT              NOT NULL WITH DEFAULT,
 CDRULECLA              INTEGER              NOT NULL WITH DEFAULT,
 CONFID                     INTEGER               NOT NULL WITH DEFAULT,
 FLAGDEL                  CHAR      (001)     NOT NULL WITH DEFAULT,
 BESTCLA                   CHAR      (001)      NOT NULL WITH DEFAULT)
 IN   &URDBASE..ANURDCLA;
```

Data Set Requirements

Data Express for z/OS uses 45 partitioned data sets (PDS) and 4 sequential data sets (SEQ). PDS and SEQ data sets are identified by the combination of a prefix and a suffix. However, the user can only choose the prefix.

The current prefixes are MFDATA.VxRx for the VR release library, MFDATA.VxRxPTF for the PTF library, and MFDATA.VxRxPER for the Personalized library. These prefixes can be modified. Suffixes (for example, BIND, CLIST, and DDL) cannot be modified.

Data Express for z/OS uses the following 45 partitioned data sets:

```
MFDATA.V2R0.BIND
MFDATA.V2R0.CBL
MFDATA.V2R0.CLIST
MFDATA.V2R0.COPY
MFDATA.V2R0.DBRMLIB
MFDATA.V2R0.DDL
MFDATA.V2R0.DDLALTER
MFDATA.V2R0.FTOUTPUT
MFDATA.V2R0.JCL
MFDATA.V2R0.LOAD
MFDATA.V2R0.OBJ
MFDATA.V2R0.PACKAGE
MFDATA.V2R0.PANEL
MFDATA.V2R0.SKEL
MFDATA.V2R0.SYSPUNCH
MFDATA.V2R0PTF.BIND
MFDATA.V2R0PTF.CBL
MFDATA.V2R0PTF.CLIST
MFDATA.V2R0PTF.COPY
MFDATA.V2R0PTF.DBRMLIB
MFDATA.V2R0PTF.DDL
MFDATA.V2R0PTF.DDLALTER
MFDATA.V2R0PTF.FTOUTPUT
MFDATA.V2R0PTF.JCL
MFDATA.V2R0PTF.LOAD
MFDATA.V2R0PTF.OBJ
MFDATA.V2R0PTF.PACKAGE
```

```
MFDATA.V2R0PTF.PANEL
MFDATA.V2R0PTF.SKEL
MFDATA.V2R0PTF.SYSPUNCH
MFDATA.V2R0PER.BIND
MFDATA.V2R0PER.CBL
MFDATA.V2R0PER.CLIST
MFDATA.V2R0PER.COPY
MFDATA.V2R0PER.DBRMLIB
MFDATA.V2R0PER.DDL
MFDATA.V2R0PER.DDLALTER
MFDATA.V2R0PER.FTOUTPUT
MFDATA.V2R0PER.JCL
MFDATA.V2R0PER.LOAD
MFDATA.V2R0PER.OBJ
MFDATA.V2R0PER.PACKAGE
MFDATA.V2R0PER.PANEL
MFDATA.V2R0PER.SKEL
MFDATA.V2R0PER.SYSPUNCH
```

Data Express uses the following four sequential data sets:

```
MFDATA.V2R0.IMPSRC
MFDATA.KBPARAM
MFDATA.V2R0.ALLDDL
MFDATA.V2R0.ALLBNDPK
```

The installer can modify the names of the first and second qualifier of a data set (for example: `MFDATA.V2R0`, `MFDATA.V2R0PTF`, and `MFDATA.V2R0PER`) according to your requirements.

Note: The total space occupied by all data sets does not exceed 50 MB.

User Credential Requirements

Data Express for z/OS users must be suitably configured both at the TSO and DB2 level. For a proper configuration, the following authorizations are required:

- RACF authorizations (create, update, and delete) to the product PDS and sequential files (for example, JCL, CLIST, and SKEL).
- Authorizations to the creation of the product DB2 database (storage group and database).
- Authorizations to the creation of the DB2 tablespaces, views, and indexes.
- Authorizations to the execution of package and plan binds.

Site-specific Requirements

Most activities in Data Express for z/OS consist of batch jobs executed through JCLs, which are normally created by specific submission functions by updating predefined skeletons (parameters, environment, and database specifications).

Note: If necessary, you can create permanent copies of the updated JCLs and adjust them to your organizational requirements.

The following actions may be performed in order to customize the product to meet organizational standards:

- Modify job names (function supported during product installation).
- Customize the skeletons.
- Start work with proprietary or third-party products for scheduling or controlling jobs.
- Make adjustments as required to provide interfaces with scheduling products

```
CREATE STOGROUP &URSGROUP VOLUMES (xxxxxxxx) VCAT xxx;
CREATE DATABASE &URDBASE STOGROUP &URSGROUP;
```
- Modify names such as the DB2 storage group group (STOGROUP), database, and owner (function supported during product installation)

- Modify names of tablespaces, tables, views, and indexes (function not supported during product installation) *Define ALIAS or SYNONYM*
- During the installation phase at your site, the installer will need to know your standards for:
    - Jobs names, accounting, etc.
    - Names of each DB2 subsystem, name of the DB2 load library, name and plan of DSNTIAD, name and plan of DSNTIAUL.
    - Name of the volume on which to allocate your partitioned data sets.

Extension Technology

This section describes requirements needed for the Extension Technology: ODBC Extension or Oracle Extension.

Hardware Requirements

Component	Description
Processor	Must be at least the minimum specified for the operating system you are using.
Disk space	- Optional ODBC Extension: less than 5 MB per platform, precise details provided during install. - Optional Oracle Extension: less than 5 MB per platform, precise details provided during install.

Software Requirements

Component	Description
32-bit Windows	- Windows 7, 8, 10, and 11 - Windows Server 2003 and 2003 R2 - Windows Server 2008 and 2008 R2 - Windows Server 2016, 2019, and 2022
64-bit Windows	- Windows 7, 8, 10, and 11 - Windows Server 2003 and 2003 R2 - Windows Server 2008 and 2008 R2 - Windows Server 2016, 2019, and 2022
UNIX	- IBM System p running AIX 5.3 or 6.1 - IBM System z running SuSE Linux Enterprise Server 10 SP1 - x86 running Red Hat Linux 4.0 Update 1, 5.1, 5.3, 6.1, 7.2 or 8.5 - x86 running SuSE Linux Enterprise Server 10 SP1 or 11 - SPARC running Solaris 9 or 10 **Note:** When running on 64-bit UNIX platforms, Data Express Extension works as a 32-bit application.

Run-time Knowledge Base Requirements

This section describes requirements that apply to both Windows and UNIX platforms.

Before using either the ODBC or Oracle Extension, a Run-time Knowledge Base needs to be created within your source data store(s). The Run-time Knowledge Base drives the operation and performance of the Data Express masking and subsetting processes.

The Run-time Knowledge Base consists of tables and indexes, and needs to be created using the schema name **DEKB**.

> **Note:** As different data stores have different requirements for creating schemas and associated objects, Micro Focus strongly suggests that the database administrator (DBA) for each source data store create the associated Data Express Run-time Knowledge Base.

A script, `createkb.sql` is provided within the `config` directory. This script contains canonical DDL (Data Definition Language) statements, describing the Run-time Knowledge Base tables and indexes.

Please note that `createkb.sql` is not guaranteed to execute correctly for all source data stores as-is. Each data store can have slightly different syntax when it comes to `CREATE TABLE` and `CREATE INDEX` statements. The DBA for your source data store can assess what changes are necessary to allow the successful creation of the `DEKB` schema, and will have the appropriate permissions to create and populate that schema.

If you are the DBA for a source data store, please review the Customer Care Knowledge Base article #10277 for additional details on how to create the Run-time Knowledge Base for your source data store.

User Credential Requirements

This section describes requirements that apply to both Windows and UNIX platforms.

ODBC or Oracle Extension users are required to have the appropriate access to source and target data stores, as well as to the Run-time Knowledge Base, which is located in the source data store(s).

The table below lists the pertinent objects and specific privileges required to mask and subset data:

Object	Privilege Required
Source data store(s)	`SELECT` on tables to be processed within the specified schema(s).
Run-time Knowledge Base	`INSERT`, `SELECT`, and `DELETE` on the tables within the `DEKB` schema.
Target data store(s)	`CREATE TABLE`, `INSERT`, `UPDATE`, and `DELETE` on tables to be processed within the specified schema(s).

> **Note:** As different data stores have different user credential requirements, Micro Focus strongly suggests that the DBA for the data stores listed above establish appropriate user credentials.
>
> For security reasons, it may not be permissible to allow Data Express privileges to operate in the manner described in the table above. In this case, you can use Extension Technology in *unload* mode.
>
> For more information regarding unload mode, see the chapter *Extension Technology Utilities* in the *Getting Started with Distributed Data Stores* guide.

ODBC Extension Requirements

To use the ODBC Extension with an ODBC-enabled data store, you will need:

- ODBC driver relevant to your data store
- The UNIX machine should be configured with the environment variable settings needed to provide connectivity to the ODBC data store. At minimum, this should include:
  - `ODBCINI` - this should be set to the ODBC configuration file `LD_LIBRARY_PATH` (Linux, Solaris), `SHLIB_PATH` (HP/UX), or `LIBPATH` (AIX) , for the ODBC Driver Manager.
  - Any additional environment variables as specified within the documentation of your ODBC Driver Manager and ODBC Driver software.

Data Express for Distributed Systems is regularly tested against the following data sources and ODBC drivers:

Data Source Version	ODBC Driver Name	ODBC Driver Version
COBOL Files	Micro Focus Relativity	2.2.2
Windows TXT and CSV fles	Microsoft Text Driver	6.01.7601.17632
DB2 v8	IBM DB2 ODBC Driver	01.300.257
DB2 v9	IBM DB2 ODBC Driver	01.300.257
DB2 v10	IBM DB2 ODBC Driver	01.300.257
DB2 v11	IBM DB2 ODBC Driver	01.300.257
DB2 v12	IBM DB2 ODBC Driver	01.300.257
Informix 11.70	IBM Informix ODBC Driver	3.70 TC5
Micro Focus XDB Server 6.0	Micro Focus XDB for DX4.0	8.00.06.1001
Microsoft SQL Server	SQL Server	85.1132.00
MySQL 8.0	MySQL ODBC Driver	
Oracle 11g R1	Oracle in OraDb11g_home1	01.00.06
Oracle 12 R1	Oracle 12R1	
Oracle 12 R2	Oracle 12R2	
Oracle 18c	Oracle 18c	
Oracle 19c	Oracle 19c	
PostGreSQL 9.6	Devart ODBC Driver for PostGreSQL	2.1.5
Sybase 6.0.0.4765	Sybase Adaptive Server Enterprise	05.00.1016
Teradata 15	Teradata 15 ODBC Driver	15.00.00.02

Note: Microsoft SQL Server Native Client is not supported as an ODBC driver. Instead, use Microsoft SQL Server as an ODBC driver.

Oracle Extension Requirements

To use the Oracle Extension, the machine housing the Data Express installation requires, at minimum, an Oracle client installation, including the Oracle Call Interface (OCI) support, configured to connect to the Oracle data store.

The UNIX machine should be configured with the environment variable settings needed to connect to the Oracle database, for example:

```
ORACLE_HOME
ORACLE_SID
PATH
LD_LIBRARY_PATH (Linux, Solaris) SHLIB_PATH (HP/UX) or LIBPATH (AIX)
```

Installation Notes

For complete installation instructions, see the following sections of the *Installation Guide*, as appropriate:

- *z/OS System Procedures*.
- *Distributed Systems Procedures*, *Windows Installation* or *UNIX/Linux Installation*

Note: After installing the full Data Express 4.0 product, install the latest WrapPack to bring you up to date. For instructions, see the *de40_wsXX_readme.pdf* file that comes with the WrapPack.

Windows Installation Program

If you do not install an option or a sub-option, you can add it later by using **Control Panel** > **Add or Remove Programs** and selecting Micro Focus Data Express 4.0 and clicking **Change**.

Uninstalling

To uninstall the product, you need to be logged in with the same user-ID as you used when you installed it.

To uninstall the product, you cannot simply delete its files from your hard disk. Instead, you uninstall by using **Control Panel** > **Add or Remove Programs** , on most Windows systems. You might need to ensure that **Show Updates** (at the top of the **Add or Remove Programs** dialog) is checked, so that any hot fixes or WrapPacks are listed.

When you uninstall, the only files deleted are those that the installation software installed. If your Data Express directory has not been removed, delete any unwanted files and subdirectories within it using **Windows Explorer**.

Repairing

If any product files, registry settings or shortcuts are accidentally removed at any point, you can perform a Repair on the installation to replace them. To do this, use **Control Panel** > **Add or Remove Programs** and follow the instructions on the screen.

New Features

New Features in WrapPack 30

Data Express version 4.0 WrapPack 30 includes the following new features:

- This version of Data Express is compatible with Red Hat 8.5, and supports the Windows Server 2012 R2 operating system.
- Data Subset Extraction now supports a new filter type for DB2 direct access and ODBC only, which is a free SQL query that identifies which records to extract from a source database.

New Features in WrapPack 29

Data Express version 4.0 WrapPack 29 includes the following new features:

- ODBC Extension technology has been updated to provide:
  - Code page conversion for the following code pages:

    AL32UTF8
    AL16UTF16
  - The option to specify an ORDER BY clause within the SELECT from source table
  - Support for Oracle sequencing
  - A choice for Oracle data stores between writing the target table and a flat file containing all data to be stored in the target, and using Oracle utilities to perform the load process

For details, see *Extension Technology Configuration File* in your product help.

New Features in WrapPack 28

Data Express version 4.0 WrapPack 28 includes the following new features:

- Compatible with Oracle 12 R2, Oracle 18c, and Oracle 19c

- Supports Windows 11, Windows Server 2016, and Windows Server 2019

New Features in WrapPack 27

Data Express version 4.0 WrapPack 27 includes the following new features:

This WrapPack contains no new features.

New Feature in WrapPack 26

Data Express version 4.0 WrapPack 26 includes the following new feature:

- Support of Windows TXT and CSV flat files

New Features in WrapPack 25

Data Express version 4.0 WrapPack 25 includes the following new features:

- Masking of combined data elements on MVS
- Support of MySQL database
- Support of PostGreSQL database
- Support of Relativity
- Routine for IBAN code masking

New Features in WrapPack 24

Data Express version 4.0 WrapPack 24 includes the following new features:

- Incremental update of target data sources enhanced with additional options
- Data store information copied more easily between different machines/companies and between different Data Express instances
- Automatic creation of indexes and foreign keys in target data sources
- Minor synthetic data generation improvements
- Better management of RI constraints, providing deletion and recreation
- Manage interfaces as tables in addition to standard MVS flat files
- Enhanced management of NULL filters processing
- Improved and enhanced logging provided for diverse scenarios
- Minor batch life cycle improvements
- This version of Data Express is compatible with DB2 12 for z/OS.

New Features in WrapPack 23

Data Express version 4.0 WrapPack 23 includes the following new features:

- This version of Data Express is compatible with Suse 11, and supports the Windows 10 operating system.
- Support for RRDS files has been added.
- The ODBC extension supports writing output in the form of a text file from the Oracle masking and subsetting process.
- DB2 catalog synchronization supports getting a record number from SELECT COUNT (*) rather than from the DB2 catalog.
- Flexible features such as substringing and adding prefixes and suffixes have been added to combined data elements functionality.
- For z/OS only, a new feature enables you to set a limit to the number of written records in a subsetting method.

- The WrapPack installation process in this release is easier and cleaner in comparison to previous releases.
- Format selector programs have been made more flexible by enabling them to call an API to retrieve a data store name, thus also enabling them to share same format selector for different data stores.
- XML masking under z/OS now supports the DSNTIAUL format.
- A new batch function has been added to enable distributed exports outside of the user interface.
- User roles and associated capabilities have been added.

New Features in WrapPack 22

Data Express version 4.0 WrapPack 22 includes the following new features:

- This version of Data Express is compatible with Red Hat 7.2, and supports the Windows Server 2012 R2 operating system.
- The Define Reload Rules feature has been added to enable management of reload JCLs for z/OS DB2 tables that are managed with direct access. Once defined, you can use a reload rule to create reload jobs.
- The Work with Routines feature has been added to enable consultation and data entry (insert, edit, and delete) operations on masking and subsetting routines, allowing you to document the masking and subsetting routine used in the project.
- This version of Data Express for z/OS supports masking and subsetting of XML data stored in XML or LOB/BLOB/CLOB columns of z/OS DB2 tables.

New Features in WrapPack 21

Data Express version 4.0 WrapPack 21 includes the following new features:

- This version of Data Express is compatible with Oracle 12 and Red Hat 6.1
- Support for the generation of target data from scratch is now available for distributed data stores only
- Integration with data warehouse tools is now supported via a set of views with high-level reports about the knowledge base.
- A number of new masking routines are now supported, including routines for email, credit card numbers, and advanced names and surnames.

New Features in WrapPack 20

Data Express version 4.0 WrapPack 20 includes the following new features:

- This version of Data Express is compatible with XDBC
- Data Express for z/OS now allows incremental update of a method from referential integrity.
- Data Express for z/OS and Data Express for Distributed Systems now allow AND filters (two or more filters for the same Data Stores where the record is copied in target if all filter conditions are satisfied) in addition to the previously supported OR filters (two or more filters for the same Data Stores where the record is copied in target if at least one filter condition is satisfied).

Known Issues and Restrictions

The restrictions covered here are those that are not covered elsewhere in the documentation, or that are of a temporary nature and may be removed in a later product. Other restrictions are covered in the chapter *Supplementary Information for Data Express*:

- Data Express does not support the INTERVAL DATE data type because the 32-bit Oracle Driver does not support it.

- Data Express supports LOB field types for DB2 with some restrictions. For more information, see *Getting Started with z/OS Data Stores*, and the topic *DB2 for z/OS Environment Restrictions* in this book.
- Data Express supports XML field types for DB2 with some restrictions. For more information, see *Getting Started with z/OS Data Stores*, and the topic *DB2 for z/OS Environment Restrictions* in this book.
- Data Express supports VARBINARY fields types for DB2 with some restrictions. For more information, see the *DB2 for z/OS Environment Restrictions* topic and *Getting Started with z/OS Data Stores*.
- Data Express does not support LOB field types for ADABAS databases. Also, some Binary field types are not handled during ADABAS FDT analysis.
- 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.
- The Extension Technology does not support use of the parallel execution mode where multiple methods access the same tables within the target data store(s).
- Data Express does not support sampling on true binary data.
- Currently Data Express only shows the first 1000 distinct values and ranges, which are sorted either numerically or alphanumerically based on the data element type. When there are more than 1000 distinct data element values, the Data Element Value ends at the 1000th unique value instead of the greatest data element value.
- Data Express uses USERID and PASSWORD to connect to the databases containing lookup tables. The password is mandatory.
- On 64-bit platforms, Data Express runs as a 32-bit application; therefore, you must use 32-bit ODBC connections for Distributed Loader and Distributed Exporter even when running Data Express on a 64-bit platform.

Supplementary Information

The following sections contain supplementary information about this release.

Supported Character Encoding Systems

The following 1-byte character encoding systems are supported:

Character Encoding System	Windows CP	Mainframe CP	UNIX CS
ISO8859-1 Latin1 (Western Europe)	1252	*see table below	ISO8859-1(15)
ISO8859-2 Latin2 (Eastern Europe)	1250	IBM-870	ISO8859-2
ISO8859-5 Cyrillic	1251	IBM-1025	ISO8859-5* (iconv)
ISO8859-7 Greek	1253	IBM-875	ISO8859-7
ISO8859-9 Turkish	1254	IBM-1026	ISO8859-9
ISO8859-8 Hebrew	1255	IBM-424	ISO8859-8
ISO8859-6 Arabic	1256	IBM-420	ISO8859-6* (iconv)

The following mainframe character encoding systems are compatible with ISO8859-1:

Encoding System	Location
IBM-037(1140) -	USA, Canada, Australia, New Zealand, Netherlands, Brazil, Portugal
IBM-273(1141) -	Austria, Germany

Encoding System	Location
IBM-274 -	Belgium
IBM-275 -	Brazil
IBM-277(1142) -	Denmark, Norway
IBM-278(1143) -	Finland, Sweden
IBM-280(1144) -	Italy
IBM-281 -	Japanese English
IBM-284(1145) -	Spanish
IBM-285(1146) -	United Kingdom
IBM-297(1147) -	France
IBM-500(1047) -	Latin-1
IBM-871(1149) -	Iceland

Data Express does not support any additional character encoding systems at this time. This includes any multi or mixed byte character sets for CJK languages, Vietnamese, or any of the various forms of UNICODE, including UTF-8, UTF-16, and UCS-2.

Supported Data Types

ODBC Extension

The ODBC extension works with the following data types:

- SQL_SS_XML
- SQL_GUID
- SQL_BIT
- SQL_TINYINT
- SQL_BIGINT
- SQL_LONGVARBINARY
- SQL_VARBINARY
- SQL_BINARY
- SQL_LONGVARCHAR
- SQL_CHAR
- SQL_NUMERIC
- SQL_DECIMAL
- SQL_INTEGER
- SQL_SMALLINT
- SQL_FLOAT
- SQL_REAL
- SQL_DOUBLE
- SQL_DATE
- SQL_TIME
- SQL_TIMESTAMP
- SQL_VARCHAR
- SQL_TYPE_DATE
- SQL_TYPE_TIME
- SQL_TYPE_TIMESTAMP

Oracle Extension

The Oracle Extension works with the following Oracle Built-in data types:

- VARCHAR2
- NUMBER
- FLOAT
- LONG
- DATE
- TIMESTAMP
- INTERVAL YEAR TO MONTH
- INTERVAL DAY TO SECOND
- RAW
- LONG RAW
- CHAR
- CLOB
- BLOB
- BFILE

The Oracle Extension also works with the following Oracle-supplied type: XMLType.

DB2 for z/OS Environment Data Type

Data Express for z/OS works with the following DB2 data types:

- CHAR
- VARCHAR
- GRAPHIC (Processed as char)
- VARGRAPHIC (Processed as Varchar)
- TIME
- TIMESTAMP
- DATE
- SMALL INTEGER
- INTEGER
- BIGINT
- DECIMAL
- NUMERIC
- REAL FLOAT (Supported only for Loading process)
- DOUBLE FLOAT (Supported only for Loading process)
- DOUBLE PRECISION FLOAT (Supported only for Loading process)
- DECFLOAT (Supported only for Loading process)
- ROWID
- LONGVARCHAR
- LONGVARGRAPHIC
- BINARY
- VARBINARY

z/OS also works with the following Large Object data type:

- CLOB
- DBCLOB
- BLOB
- XML

COBOL & PL/I for z/OS Environment Data Type

Data Express for z/OS works with the following Cobol & PL/I data types:

- CHAR PIC X(n)
- BINARY PIC 9(n) COMP-4
- PACKED PIC S9(p-s)V9(s) COMP-3
- ZONED PIC S9(p-s)V9(s)
- EDITED Use of edit char, e.g. PIC ZZ99

ADABAS for z/OS Environment Data Type

Data Express for z/OS works with the following ADABAS data types:

- ALPHANUMERIC
- BINARY
- F LOATING POINT
- PACKED DECIMAL
- UNPACKED DECIMAL(ZONED)

Data Type Restrictions

This section lists size and format restrictions for data types.

Size Restrictions

The ODBC Extension has a size restriction of 1,048,576 bytes when processing the following data types:

- IMAGE
- TEXT
- VARBINARY
- VARBINARY(MAX)
- VARCHAR(MAX)
- XML

Format Restrictions

The ODBC Extension has a format restriction for field content that use the `DATETIME` or `SMALLDATETIME` data type for Data Subset Extraction: Data Subset Extraction rules must be specified using the format as documented by Microsoft.

ADABAS Restrictions

This section describes size restrictions for ADABAS data stores.

ADABAS Catalog Link

Data Express does not support a direct link to the ADABAS catalog . In order to mask or subset your data, you must first use the **ADABAS FDT** report to produce the output sequential file containing the structure definition of your ADABAS tables. Then, you must upload the decompressed files (that were created by the command ADACMP DECOMPRESS) that contain the content of your ADABAS tables.

For information about the ADABAS FDT report, see the chapter *Load Sequential File with ADABAS FDT report* in your *Toolkit (z/OS) guide*.

For information about the structure of the output sequential file, see the section *ADABAS - API Load Sequential File* in the chapter Sequential Files in the *Data Model Guide*.

Descriptors, Subdescriptors, and Superdescriptors

Descriptors are handled as normal fields, but subdescriptors cannot be handled. In order to mask or subset a subdescriptor, an exit routine that is associated to the field referenced by the subdescriptor is needed.

The superdescriptor clause in the FTD is not directly supported by Data Express. However, a superdescriptor can be handled if a combined data element is created in Data Builder that is composed of each field within that superdescriptor.

Target Environment Creation and Population Limitation

Sequential data sets that contain the output of the masking or subsetting process for ADABAS data stores are created by Data Express in the same way sequential data sets are created for other data store types. But, to populate your target environment, ADABAS utilities must be used as Data Express does not provide functionality that enables creation or population of your target environment.

Process Identifier Limitation

Data Express needs a specific Process Identifier in order to works properly with ADABAS data store.

We recommend using a pre-loaded Process Id ADAUN.

For information about the structure of the ADAUN Process Identifier, see the section *Process Identifier and Databases Type Relationships* in the chapter *Getting Started with Data Builder* in the *Front End Guide*.

Oracle Restrictions

Support for Oracle nested tables is not provided in this release of Data Express. If you are interested in obtaining an EAP release that supports nested tables, please contact Micro Focus Customer Care.

DB2 for z/OS Environment Restrictions

This section lists size restrictions for DB2 for z/OS Large Object data types like CLOB, DBCLOB, BLOB, XML, and for DB2 z/OS VARBINARY data types.

DB2 Large Object Data Types restrictions

Data Express does not support a direct link to all the DB2 Large Object data types for these three operations:

- Masking
- Subsetting
- Sampling

In order to mask or subset or sample your data, you must first use file reference variables method to unload each LOB or XML to a separate file. With this method, the LOB or XML values are unloaded to a different file than the normal unload file. DB2 creates or uses a different output file for each LOB or XML value to be unloaded. The output file should be on the following type:

Member of a partitioned data set (PDS) or partitioned data set extended (PDSE). See the following example JCL :

```
//LOADLOB JOB KRM,MSGCLASS=A,CLASS=1,NOTIFY=&SYSUID
//* ****************************************
//* TABLE &OWNNAME.&TABNAME
//* (PDFBLO BLOB (27994))
//* (TXTCLO CLOB (16094) )
//* (PDFBLO BLOB (16032) )
//* UNIT(SYSDA) SPACE ((20,2) MB)
//* (PDFBLO VARCHAR(54) BLOBF TSYSLOB)
//* ****************************************
//STEP1 EXEC DSNUPROC,UTPROC=,SYSTEM=&SYSTEM,LIB=DSN810.SDSNLOAD
```

```
//SYSPRINT DD SYSOUT=*
//SYSIN DD *
  TEMPLATE TSYSPUN
     DSN('URADAR.&SS..&DB..PUNCH.&TABNAME')
     DISP(MOD,CATLG,CATLG)
  TEMPLATE TSYSREC
     DSN('URADAR.&SS..&DB..SYSREC.&TABNAME')
     DISP(MOD,CATLG,CATLG)
  TEMPLATE TSYSLOB
     DSN('URADAR.&SS..&DB..PDS.&TABNAME')
     DISP(MOD,CATLG,CATLG)
     DSNTYPE(PDS)
  UNLOAD DATA FROM TABLE &OWNNAME.&TABNAME
    (A, B,C VARCHAR(44) CLOBF TSYSLOB, D)
  UNLDDN(TSYSREC) PUNCHDDN(TSYSPUN)
/*
//
```

Data Express supports a direct link to all the Large Object data types for this operation:

- Cataloguing
- Life Cycle
- Reload
- Unload

For the Data Express skeleton of Unload and/or Reload's Job, there are some modifications to apply:

- Add the "TEMPLATE" condition.
- If needed, add the field list with the specific keyword &FLDLST to be substituted.

The following example shows the Data Express Unload skeleton with the modifications applied:

```
//SYSIN     DD *
  TEMPLATE TSYSLOB
     DSN('URADAR.&DBNAME.&TSNAME.PIPPO')
     DISP(MOD,CATLG,CATLG)
     DSNTYPE(PDS)
 UNLOAD FROM TABLE
             &OWNAME.&FILNAME    HEADER NONE    LIMIT 0
&FLDLST
&DBNAME.&TSNAME
```

Process Identifier Limitation

Data Express needs a specific Process Identifier in order to works properly with DB2 Large Object data type.

Since Data Express doesn't have a pre-loaded Process Id for this kind of data, we recommend creating a new Process Identifier following these specific properties:

- Access Type: Unload File Access (UNLOAD)
- I/O Program Name: KURFIO.

For information about the Process Identifier structure, see the section *Process Identifier and Databases Type Relationships* in the chapter *Getting Started with Data Builder* in the *Front End Guide*.

DB2 VARBINARY Data Types restrictions

When Data Express accesses DB2 by direct access, it does not work directly with the execution of sub-extraction query created when applying a method's filter criteria if the filter is applied to a VARBINARY column or to a combined field containing VARBINARY column.

In general, when Data Express accesses DB2 by direct access, it creates a SELECT * statement with a WHERE clause in order to apply the appropriate filters.

For VARBINARY data type, Data Express will not generate this `WHERE` condition, but just the `SELECT *` statement.

The access to data in this case is done by a sequential access and the application of filter's criteria is done by Data Express in a transparent way, applying the filter criteria to each record and discarding this record not satisfying the filter.

For information about the Filter properties, see the chapter *Work with Method - Selection Class/Filter properties* in the *Data Subset Extraction Guide*.

AS/400 Data Stores

There are several alternatives to mask and subset AS/400 data stores.

ODBC connection to AS/400

Access via ODBC to AS/400 data via ODBC driver has the following limitations:

- DB2 connect 9 is needed in order to guarantee compatibility with AS/400 of Data Express.
- Flat files created by the CRTPF command without DDLs cannot be accessed via ODBC. This access work if there is a DDL or if the file is created via SQL.
- The target database needs commitment control and so it needs to be created and journaled before Data Express runs.
- Performance is slow because each row moves from AS/400 to windows (where the engine runs), this is mainly true for masking process (while for subsetting this is mitigated by the fact the reduction criterion can use local AS/400 indexes, differently to other two alternatives).

The following native AS/400 column data types are supported (in parenthesis the corresponding SQL ones)

- Character (character,varchar)
- Packed decimal (decimal)
- Zoned decimal (numeric)
- Binary (integer, smallint, bigint)
- Floating point (float, real, double)
- Date
- Time
- Timestamp
- Hexadecimal
- Binary Character (binary)

The following native AS/400 column data types are not supported:

- DBCS-Only
- DBCS-Either
- DBCS-Open
- DBCS-Graphic (graphic, vargraphic, long vargraphic)

The following SQL column data types not having a correspondence with native AS/400 types are not supported:

- long varchar
- varbinary
- decfloat
- blob
- clob
- dbclob

- datalink
- rowid

Details about how Data Express deals with ODBC data stores are available in the documentation, in particular in *Getting started with distributed data stores*.

MVS flat files based approach

Engine can run on MVS. Flat files containing AS/400 data are handled as MVS sequential files. FTP is used in order to move data from AS/400 to MVS and vice versa. It is needed providing copybook mapping file layout.

Details about how Data Express deals with z-OS data stores are available in the documentation, in particular in *Getting started with z-OS data stores.*

Windows flat files based approach

Engine can run on windows. CPYTOIMPF is used in order to generate a delimited file, to be sent via FTP to a windows machine. Here it is processed via DataDirect ODBC 6.0 driver, provided by Progress. It is needed to provide a file structure in a native DataDirect format dictionary. Then masked data is sent via FTP back to AS/400, and restored with CPYFRMIMPF to target AS/400 table

Details about how Data Express deals with ODBC data stores (in this case with flat files) are available in the documentation, in particular in *Getting started with distributed data stores*.

Comparison between approaches

- MVS flat file approach is preferred if an MVS is available. It requires copybooks, normally already available in the application
- Windows flat file based approach requires more manual work than ODBC approach, and it is faster than it for masking and slower than it for subsetting (comparison of performances are strictly related to characteristics of the machines)

Reporting a Problem

Describes best practices in reporting a problem, describes the information we need from you to resolve your problem, and provides step-by-step instructions for raising a Case via the Support Portal or by directly contacting Customer Care via telephone.

Preparing to Raise a Support Case

We recommend that you follow the guidelines presented here to prepare to log a support case.

The following is good practice for gathering information about your problem so you can pass it on to Micro Focus Customer Care. This information is required for all support cases:

Micro Focus product serial number	To locate your product serial number, look in the subject line and body of either your Electronic Delivery Receipt email or Micro Focus Software Activation Information email that you received from Micro Focus when you activated or got a license key.
Computer make and model	You should be able to find this information somewhere on your physical computer.

Details about your problem	When you raise a support case, you are asked to provide the following as you log the case. Before doing so, consider the following:

- An accurate subject line that briefly and succinctly describes your problem. :

  ```
  Data Subsetting throws error WRC0483.
  ```

  rather than a more general and less useful description such as:

  ```
  Problem with Data Subsetting.
  ```
- A full description that provides:

  - Context for the problem
  - Your own observations and knowledge
  - Step-by-step instructions that your Micro Focus engineer can follow to reproduce the problem
  - For compilation problems, compiler directive options used
- The version number for the z/OS component, found on the **Main Menu** panel.
- Whether you are using the Standard or Client/Server configuration.
- The data stores you are working with, including client-side and server-side versions where appropriate.
- Details of the data store contents, for example:

  ```
  DDL, DCLGEN, or SYSPUNCH  (for SQL data stores)
  Copybooks (SEQ, VSAM, GDG, DL/I)
  FDT (ADABAS)
  DBD (DL/I)
  ```

The *Raising and Managing Support Cases* section provides detailed information on how to log a support case, and how a Micro Focus Customer Care engineer can help you to resolve your problem.

Raising and Managing Support Cases

If you cannot resolve your issue on your own, and you have an active Business Support agreement for your product, you may raise a support case with Customer Care.

⚠️ **Important:**

- Please report only one problem for each case.
- If a solution or workaround has been provided, and you encounter a further problem, open a new case with new details.

This allows us to assign the appropriate engineer to each unique issue, and allows for several engineers to progress cases simultaneously.

Reporting high-and critical-severity issues by phoning Customer Care

For high- and critical-severity issues, meaning either a production system is down or you are experiencing a major feature or function failure, call Micro Focus Customer Care at the appropriate telephone number listed on the *Contact Support page*.

Reporting new issues via the Support Portal

For low- and medium-severity issues, open the case on the Micro Focus *Support Portal page*. Detailed instructions can be found *here*.

Managing existing cases

To manage existing cases:

1. Log into the **Support Portal**.
2. Click **Cases** on the menu ribbon at the top of page, and then select the class of cases you want to view.

   💡 **Tip:** When viewing the list of support cases, you can use settings ⚙ and filters ▼ to adjust how they are displayed.
3. On the list of cases, click the **Case Number** link for the case you want to manage.

Uploading attachments

Before you can upload sample and diagnostic files, you need to get a drop box account user name and password from your Customer Care contact. To do this:

1. Have the case open in the **Support Portal**. See *Managing existing cases* above if you need instructions.
2. Hover over the name of your contact for the case, which appears under **Contact Name** at the top of the page.

   The contact information appears in a popup.
3. Contact your contact and obtain a drop-box account user name and password to use for your incident.
4. On your **Case** page, click the link under the **Exchange files** field to invoke the Micro Focus File Transfer Service, and use your drop-box account credentials to upload your files.

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