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Introduction

Micro Focus Mainframe Express® Enterprise Edition is the leading PC-based development environment for IBM mainframe applications, enabling rapid editing, compilation, debugging and testing of applications in a Windows environment.

Mainframe Express Enterprise Edition was introduced as a new product in version 3.0. It added the power of Micro Focus application generation and Web services capabilities to the proven mainframe application development environment to create a single integrated toolset. This enables the fast and easy extension of existing CICS and IMS transactions into new software architectures such as J2EE (for example, WebSphere Application Server) and Microsoft .NET.

The AppMaster Builder feature enables the very fast creation of whole applications (such as IMS and CICS transactions and batch systems) including generation of supporting infrastructure items such as screen maps and database copybooks. The process is automated and can be carried out with a minimum of coding using a point and click approach. The resultant application is a pure mainframe COBOL application that is easy to debug and understand, with no proprietary run-time components required for deployment into production.

If you are migrating from Micro Focus APS, additional benefits include an APS-to-AppMaster Builder migration wizard, and tight integration with the Mainframe Express development environment.

This release updates our SOA and Web services offering under a new name: SOA Express. Using SOA Express you can capture complete legacy application business processes and automatically generate reusable, industry-standard J2EE and .NET components that participate in an SOA environment for use throughout your enterprise. With SOA Express you can:

- Maximize return on existing assets - enable mainframe assets to be integrated into new applications, extending the value of your mainframe investments
- Create mainframe components - develop and generate components that provide access to complete legacy business processes which can be reused and integrated with your other enterprise applications or combined with custom and off-the-shelf components to assemble new applications
- Support standard component models, such as JavaBeans, EJBs, .NET and Web services
- Enable mainframe assets for use in B2B transactions - visually map mainframe data to vertical industry XML DTDs or schemas
- Support access to mainframe assets from wireless and consumer devices using J2ME

This release includes cumulative fixes for reported incidents as well as a series of significant new features that we believe you will find very valuable in your Windows-based IBM mainframe development environment.
1 Mainframe Compatibility
In this release there is improved mainframe compatibility in the following areas:

1.1 SQL Option for DB2

1.1.1 DB2v8 Compatibility
Full scalar select functionality has been added completing DB2v8 functionality in the SQL Option for DB2. In addition, numerous performance enhancements within the XDB engine have been implemented.

1.1.2 COBOL Stored Procedure Support
In addition to the existing capabilities of the XDB Stored Procedure Test tool, we've added new SQL wizards that enable you to easily create COBOL Store Procedures, external Table and Scalar Functions. The wizards generate both the SQL statements needed to create the stored procedure or function as well as the COBOL routines with the corresponding parameter lists that are interactively defined as you progress through the wizards.

1.1.3 Improved Mainframe Data Migration Support
SQL Migrate now allows data migration from the mainframe at the logical database level, rather than just the individual table level. In addition, views are also migrated when a particular database is specified.

The first maintenance release of Mainframe Express Enterprise Edition will introduce a version of DSNUTILB that will provide basic LOAD and UNLOAD capabilities to and from the SQL Option.

1.1.4 Hot Backup/Restore Wizard
SQL Wizard now automates your XDB hot backups for you. Through the SQL Wizard, you can now set up your backups, and also restore previous hot backups.

1.1.5 New Windows Server Application
SQL Option for DB2's blue-screen server has been replaced by a new executable. The new executable runs as a Windows application rather than a console application, so does not require a console when it is running. To maintain the look and feel, the SQL Option monitor application (XDBMONN.EXE) runs when the new server is started.

1.2 IMS
The IMS Fileshare databases project setting now supports a concatenation of multiple paths specified with the name of the Fileshare server. Previously, it allowed only a single path to accompany the Fileshare server name in this optional path area. These paths can either be fully qualified drive:\directory for an explicit path on the Fileshare computer or an environment variable which will be expanded on the server. These paths are separated using a semi-colon character ";;".
1.3  **CICS**

1.3.1  **EZASOKET Support**
Support has been added for the EZASOKET API for use within CICS systems and programs.

This means that you will be able to use Mainframe Express to maintain and test your modernized IBM mainframe-based online CICS applications with clients and new technology that uses this TCP socket-based API. This support is available for CICS programs only.

1.3.2  **CICS Transaction Gateway EXCI Support**
Support has been added for the external call interface (EXCI), which enables access to CICS Option programs from batch. A prerequisite for this feature is IBM's CICS Transaction Gateway (CTG).

1.4  **JCL Support**

1.4.1  **IDCAMS**
IDCAMS now supports LOG and many other recently-introduced keywords.

1.4.2  **VSE JCL**
Additional support has been added for VSE JCL. New keywords that have improved support are:

- IF for $RC and $MRC (not for PARAMETER),
- GOTO
- LABEL
- ON for $RC and $ABEND (not for $CANCEL)
- LIBLIST
- LIBDROP
- SLI, RESET
- UPSI,
- USER and STANDARD Label support improved

1.4.3  **JCL Printing**
Support has been added for the JCL OUTPUT statement and the /*ROUTE JES2 control statement.
1.4.4 OSCOPY
OSCOPYLAX, has been added to the REPRO(OSCOPY | VSAM) parameter. When OSCOPYLAX is specified less attribute checking is performed and OSCOPY is always done even if the attributes do not match. For both OSCOPY and OSCOPYLAX, when attributes do not match the system automatically does a LISTCAT for both input and output data sets involved.

1.4.5 JCL User Exit
The JCL user exit now supports a new event, Event-job-concluded, that indicates that the job execution has completely finished and any spool output is ready for viewing/printing. This new event enables the user exit (or processes triggered by it) to access the job's log and other spool output.

1.4.6 JCL Informational Message
The JCL engine now issues an informational message for every program executed. The message issued will be in the following format:

```
JCLCM0199I Program pgm-name is
    [COBOL ANS85 | COBOL VSC2 | COBOL OSVS | z/OS HLASM
    | non-COBOL] [ASCII | EBCDIC] [Big-Endian | Little-Endian] [AMODE31 | AMODE24 | NOAMODE]
```

1.4.7 Five-digit Job Numbers
JCL and TSO now support a five-digit job number. The system now uses a new "job number" data set (MVSJOBDS.DAT), and by default sets the job number range to be 1000-99999. The old data set MVSJOBNO.DAT can be deleted.

1.4.8 New Rules-based Data Set Allocation Facility
A new rules-based engine is available in Mainframe Express 3.1 which enables your administrators to write rules to control the location (subdirectory) where newly-allocated data sets are placed. This can be as simple as routing all SYSOUT output to a certain location or as advanced as routing based on HLQs for data set names or DCB information about the data set.

1.4.9 JOBLIB/STEPLIB Support
If a dynamic PDS is used to represent a DSN within a JOBLIB and/or STEPLIB statement then during execution we will prepend the search paths as appropriate.

1.4.10 Job Accounting Information
Accounting information is now collected and presented to the JCL User Exit. This has been done to facilitate usage-based billing and other user needs.

1.4.11 JES2 Exit #3 Functionality
JES2 exit #3 functionality is now present in the JCL User Exit. It is now possible to change things such as the jobname, userid, etc. from within a JCL User Exit.
1.5 **EZTRIEVE Support**

Micro Focus partners MigrationWare now provide technology integrated with Mainframe Express that enables you to edit, debug and execute your CA-EZTRIEVE programs in the Mainframe Express Windows environment.

See your Micro Focus representative for more information on this additional product.
2 Testing Enhancements

2.1 Stored Procedure Test Tool
The Stored Procedure Test tool (SP Test tool) has been added to the IDE in order to simplify the testing of stored procedures. The SP Test tool enables you to test various input values for a stored procedure, see the results, and optionally create test scripts without having to write COBOL code to invoke the stored procedure.

2.2 Remote Job Step Execution (RJSE)

This is a revolutionary new function within the Windows development environment. It enables a JCL job step that executes a program or utility that is not available on the Windows platform to be executed on the IBM mainframe platform. This execution on the remote platform is transparent to the JCL job on Windows. The behaviour is exactly as if the step had executed successfully in the Windows environment. All input is made available to the IBM mainframe and any output files and conditional code responses are available locally on the PC.

This is a major new feature that will help companies perform more of their testing on the low-cost Windows environment.

This feature is in its first implementation. There are some limitations in the current implementation. If you think you would find this function valuable we would like to work with you. See your Micro Focus representative for more information. Some of the limitations of this feature are detailed in appendix A.
3 Usability Improvements

3.1 Editing

You can now place the cursor in an expanded copybook and execute a “Save As” command to save the file to a different name and/or location. This new feature, which you can map onto a keystroke, is very useful when you are working in a workgroup environment and want to create a new copy of a copybook (in a different location) for use in your unit testing.

3.2 Documentation

3.2.1 Enterprise COBOL Directives Compatibility

The documentation has been enhanced with a topic that shows the Compiler directive equivalents for the default settings of the Enterprise COBOL for z/OS Compiler options.

3.2.2 Serena ChangeMan ZMF Documentation

You can now create your own documentation for help that is displayed when you click Help on the User Options tab of the ChangeMan Options dialog box. By default, the HTML document displayed is Help\HelpTemplate.htm. You can update this file to specify the relevant details for your user options. To specify a different HTML file or location use the Build Option Help Sheet Location field of the Options dialog box.

3.3 Integrated Development Environment Enhancements

The following enhancements have been made to the IDE to make working with Mainframe Express projects easier:

- When adding a file to a workgroup, if a file with the same name exists in a different workgroup, the new file is now flagged as "Out of Date".
- A check box has been added to the Save As dialog box that enables you to add the newly-created file to the current project.
- When debugging an application when a project is not loaded, breakpoints and watch list items are now saved and restored from a debug state file (mfeddebug.dbs in the folder \mfuser\projects).
- Enhancements have been made to the Mainframe Express IDE to simplify the way in which you work with SQL Option for DB2 to run and debug stored procedures.
4  Administration and Implementation Features
We have added a series of enhancements that we believe will help administrators who are responsible for supporting large Mainframe Express installations.

4.1  Microsoft Installer (MSI) Support
This release and future releases and maintenance will be delivered using the Microsoft Installer (MSI) technology.

Where administrators and installations have selected standard desktop installation and update technology that integrates with MSI they can now use this technology to deliver the Mainframe Express product and maintenance updates.

4.2  Citrix/Terminal Services Install
Although these environments were supported in Mainframe Express Enterprise Edition 3.0, version 3.1 includes an installation configurations option that tailors the product and its components to run optimally on the Citrix and Terminal Services servers.

4.3  Microsoft Vista
Mainframe Express 3.1 is the first version of the Mainframe Express product certified by Micro Focus for installation and use with the Microsoft Vista platform.

4.4  64-bit Platform Support
Mainframe Express Enterprise Edition is now supported for use on 64-bit hardware (in 32-bit compatibility mode). This includes for use with Citrix and Terminal Services on these platforms.

4.5  Serena ChangeMan ZMF Support
Mainframe Express now provides an interface that enables you to integrate with the Serena ChangeMan ZMF source code management facility.

4.6  MFECL
The Micro Focus External Command Line Facility (MFECL) provides administrators with a series of command line API that can be used to update and manage developers projects remotely and dynamically.

4 new functions have been delivered in MFECL in this release.

- ADDFILETOLEVEL
When using the /ADDFILE, /COMPILE and /REMOVEFILE command line functions, the file you specify as the filename parameter can now be a file containing a list of files to be used as parameters to the function. The filename uses the file extension .list to denote a file containing the list of filenames. The file should contain one record for each filename.

**4.7 Consolidated Tracing Facility**

The Consolidated Tracing Facility (CTF) is a tracing infrastructure that enables you to quickly and easily produce diagnostic information detailing the operation of Micro Focus software components.

**4.8 Host Connectivity Option**

**4.8.1 Auto-Shutdown for Inactive MFA Endevor Dependant Regions**

An Endevor dependant region will now shut itself down if it has not had any transaction activity during the last hour. A new instance will automatically be started when a subsequent user request arrives. This also implies that when multiple (concurrent) dependant regions have been started, as the workload drops, then the unused dependant regions will also quiesce during the day.

**4.8.2 Panvalet Member Security Exit Under MFA**

If present, a user exit will be invoked to ascertain if this user has access to this Panvalet member within this Panvalet master file. It is therefore up to the site to devise appropriate data and rules to enforce this security option. A Sample Panvalet exit is provided.

**4.8.3 "Open With" Function**

Drag and Drop has been enhanced to provide an "Open with" operation. This enables you to add third party editors/viewers to the popup menu available when you right-click on certain types of data sets.

**4.9 Performance Tuning**

**4.9.1 Memory Management**

Two new tunables, memory_free_check_size and memory_strategy, have been added to control memory management strategy. See the chapter Run-time Configuration Using Tunables in the Administrator's Guide for more information.

**4.9.2 System File Preloading**
Preloading system files enables you to reduce the time Mainframe Express spends searching for system files when debugging or executing CICS, JCL, IMS or TSO when your application search path includes folders on remote machines. For more information on preloading system files, select Start here! > Readme > Supplementary Information from the Mainframe Express help Contents then click Reducing Time Taken for System File Lookups
5   AppMaster Builder

5.1.1 Serena ChangeMan ZMF Support
You can access Serena ChangeMan ZMF files directly from the AppMaster Builder desktop. Supported ChangeMan ZMF operations include checkout, stage, lock, and unlock of source files. You can process source files individually or in bulk mode by using the AppMaster Builder Analysis Option.

5.1.2 Command line Generation Interface
A command line interface has been provided to allow you to generate applications, programs and screens outside of the AppMaster Builder IDE.
6  SOA Express – Formerly Component Generator

6.1.1 IBM Link3270 Bridge
Support for the IBM Link3270 Bridge has been added.

6.1.2 eBiz Portability
In this release you can now import existing eBiz transactions from one project to another.

6.1.3 Auto-deployment to New Server Platforms
Auto-deployment is now supported for the following additional Web Application Server technologies:
- WebSphere on z/OS, UNIX and Linux
- Oracle Application Server.
Appendix A. Remote Job Step Execution Details

The section Remote Job Step Execution (RJSE) earlier in this document outlines this new feature. This section provides additional information on the feature, including listing restrictions in the current version.

Operation:

You can define multi-step JCL, and designate any step within this job as a “remote step” through the use of a reserved JCL command under Mainframe Express Enterprise Edition:

```/*MFE: TYPEXEX=HOST

//* NOTE: "/*MFE:" IS A CONTROL STATEMENT WITH SPECIAL
//* MEANING FOR MFE BUT IS A COMMENT TO THE HOST JES'S.
//* TYPEEXEC= MAY BE ONE OF
//*    HOST - EXECUTE THIS STEP ON THE HOST
//*    SCAN - SCAN ONLY ON MFE (FOR TESTING)
//*    LOCAL - EXECUTE THIS STEP ON MFE (DEFAULT)
```

For this job step, Mainframe Express Enterprise Edition will automatically intervene to coordinate execution of this remote step including such services as:

- Authentication of userid and passwords
- Definition of any mainframe data sets designated as DISP=NEW
- Definition of transient files to act as SYSOUT within this step
- Definition of transient files to act as temporary files within this step
- Populating transient files with workstation data if necessary
- Submitting modified JCL to represent this job step on the mainframe
- Retrieving SYSOUT which may have been created by this remote step
- Retrieving mainframe files which may be referenced by subsequent job steps
- Deleting transient files which have no further references
- Deleting transient files designated as DISP=(*,DELETE)
- Recovering diagnostic dumps and standard SYSLOG information

Limitations in the first Release:

Not all JES2 or JES3 command statements will be supported.

Initial support will be for RECFM=PS files only. This includes QSAM flat files and members of a PDS, but not Generation Data Groups, VSAM files, or ISAM files.
Certain JCL statements, keywords, and attributes will not be supported initially. Most of the common DCB attributes for QSAM files will be supported. We do suggest however that catalogued files are the safest option:

```plaintext
//DDNAME   DSN=my.test.file,DISP=SHR
```

This should support a wide range of IBM utilities, third-party vendor software, and user-written programs.