



Micro Focus Enterprise Developer 7.0 for Visual Studio

Release Notes

Micro Focus
The Lawn
22-30 Old Bath Road
Newbury, Berkshire RG14 1QN
UK
<http://www.microfocus.com>

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2022-04-06

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Micro Focus Enterprise Developer 7.0 for Visual Studio Release Notes

These release notes contain information that might not appear in the Help. Read them in their entirety before you install the product.



Note:

- This document contains a number of links to external Web sites. Micro Focus cannot be responsible for the contents of the Web site or for the contents of any site to which it might link. Web sites by their nature can change very rapidly and although we try to keep our links up-to-date, we cannot guarantee that they will always work as expected.
- Check the *Product Documentation* section of the [Micro Focus Customer Support Documentation Web site](#) for any updates to the documentation which might have been uploaded.

Product Overview

Enterprise Developer enables you to develop COBOL applications within Microsoft Visual Studio. You use the Visual Studio integrated development environment (IDE) to edit, compile and debug COBOL applications. The IDE provides all the functionality to manage projects and build applications.

You can develop applications that have been migrated from the mainframe and that use mainframe technologies like CICS, JCL, and IMS. These compile to native COBOL code, as `.exe` or `.dll`. You then deploy and further debug the application under Enterprise Server.

The product is available in the following variants - Enterprise Developer for Visual Studio 2017 and Enterprise Developer for Visual Studio 2019. The execution environment for applications created with any of these product variants is Enterprise Server.

Upgrading from earlier Micro Focus products

This version of your product is dependent on a later version of the Microsoft C run-time system than earlier Micro Focus products. This means that COBOL executables (`.exe`) built with a version earlier than 4.0 might not be compatible with the current version of the run-time products. If the behavior of your application changes with the current version, we strongly recommend that you relink the main executable with the current version. This will ensure that the COBOL run-time system fully handles any run-time error conditions that might occur.

A new executable that is fully compatible with the current version can be produced without recompiling the application, as long as the original object code is available and it is relinked with the current version.

To allow your executables to benefit from the product's latest programming and performance enhancements, we recommend a full recompilation of your source code.

If you are using Visual Studio, you can configure the IDE to automatically check whether applications created with older releases must be relinked. If the application uses an older version of the C run-time system, Enterprise Developer can automatically relink the existing executable or `.dll` to the new version of the C run-time system without the need to recompile the application first. If a project needs relinking, Visual Studio displays a message in the status bar providing an option for you to choose and relink the project.

What's New

This *What's New?* document covers some of the new features and functions in the latest release of the Micro Focus Enterprise Product Suite. Updates apply to the following products:

- **Micro Focus Enterprise Developer** which provides a contemporary development suite for developing and maintaining mainframe applications, whether the target deployment is on or off the mainframe.
- **Micro Focus Enterprise Test Server** which provides a comprehensive test platform that takes advantage of low cost processing power on Windows environments, to supply scalable capacity for testing z/OS applications without consuming z/OS resources.
- **Micro Focus Enterprise Server** which provides the execution environment to deploy fit-for-purpose mainframe workload on Linux, UNIX and Windows (LUW) environments on IBM LinuxONE (IFLs), standalone servers, virtual servers, or the Cloud.
- **Micro Focus Enterprise Server for .NET** which provides the execution and modernization platform to deploy fit-for-purpose mainframe workload on a scale-out .NET infrastructure and the Azure Cloud.

This document helps you to quickly understand the new capabilities within the 7.0 release.

Enhancements are available in the following areas:

- [Micro Focus COBOL Extension for Visual Studio Code](#) on page 6
- [.NET Core Support](#)
- [Assembler Support](#)
- [CICS Support](#)
- [COBOL Language Enhancements](#)
- [Code Analysis](#)
- [Code Set Support](#)
- [Compiler Directives](#)
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- [Database Access - HCOSS Manage Connections Tool](#)
- [Database Access - MBDT Utilities](#)
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- [Micro Focus Database File Handler](#)
- [Micro Focus Unit Testing Framework](#)
- [PL/I Support](#)
- [Visual Studio Integration](#)

Micro Focus COBOL Extension for Visual Studio Code

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The new Micro Focus COBOL extension for Visual Studio Code is available on the Microsoft Visual Studio Marketplace. This provides edit, compile and debug support for Visual COBOL and Enterprise Developer users in Visual Studio Code.



Note: The new Micro Focus COBOL extension is not included with the Enterprise Developer installer.

.NET Core Support

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Support has been added for creating, building and running .NET Core projects using the `dotnet` command. This new support is in addition to the ability to work with .NET Core projects in the IDE.

This functionality is available in the following products:

- Enterprise Developer for Visual Studio

Assembler Support

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This release includes the following enhancements:

- Support for Assembler data table generation on UNIX and Linux - a new command-line executable, `MFMODGEN`, is available on these operating systems to generate an Assembler data table (`.MOD` file) from an Assembler source file.

This feature is the only Assembler functionality currently supported on UNIX systems. The rest of the Micro Focus Assembler functionality is supported for 32-bit Windows only.

CICS Support

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CICS support in development has the following new features:

- A 64-bit BMS Compiler on Windows and UNIX - the command-line utility, `MFBMSCL`, is now available in 64-bit format on Windows as part of Enterprise Developer and on UNIX as part of Micro Focus Enterprise Developer Unix Components.

CICS support in deployment has the following new features:

CICS support inside Visual Studio:

- The support for viewing CICS (PCT, PPT and FCT) resources inside Visual Studio is now a full support and no longer a Technical Preview.

COBOL Language

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The following enhancements have been made to the Micro Focus COBOL language:

- **.NET COBOL data type to hold strings of utf-8 characters** - support is now available in .NET COBOL for the PIC U data type. This was already available for native COBOL, to support its introduction by IBM in Enterprise COBOL version 6.3.

- The DYNAMIC LENGTH clause, which enables a data item to vary in length at run time, is supported. Again, this is in response to its introduction by IBM in Enterprise COBOL version 6.3.
- The following date-format-checking intrinsic functions have been added: TEST-DATE-YYYYMMDD and TEST-DAY-YYYYDDD.

Code Analysis

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This release includes the following enhancements:

- **Get Direct References** command - you can use this command to see if changing a file will affect the other files in your project as well as the files in the whole application. In Visual Studio, you can access this command from the context menu for COBOL files in Solution Explorer or from the **Analysis Server** window.
- The Data Flow Analysis is now available in both a tree and a graph view.
- The Code Analysis functionality is now available for the Procedural Multi-Output Project (.NET Framework) type.

Code Set Support

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The following enhancements have been made to the integrated code set translation support:

- Arabic support for Enterprise Server applications is available.

If you are building Arabic support into Enterprise Server applications, your terminal emulator must support the Arabic EBCDIC 420 code page.

Support is added by building your applications and configuring your enterprise server regions with the MF CODESET variable set to the supported country code (0420). Your product's in-built code set translation utility performs translations between the ASCII 1256 Arabic code page on your enterprise server region, and a terminal emulator that supports the Arabic EBCDIC 420 code page (for example, IBM's Personal Communications emulator).

There are some considerations when working with a bi-directional language such as Arabic.

Compiler Directives

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The following Compiler directives are new in this release:

- PANVALET-INCLUDES-IN-COMMENTS - This directive controls whether ++INCLUDE statements in comments are actioned or not.
- EXECSQL-FLAG - This directive defines whether syntax reporting should emulate that of the DB2 preprocessor, the DB2 coprocessor, or to allow all syntax variations of both.
- RM-FILE-ERRORS - This directive generates run-time system errors for certain file conditions, even when a FILE STATUS clause is present; this is to emulate RM/COBOL behavior.

The following Compiler directive option has been deprecated:

- ILCLR(2) - this is as a result of deprecating support for versions 3.0 and 3.5 of the .NET Framework. Applications that have this option set will produce an E level message when compiled in this release of Enterprise Developer.

Containers Support

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Support for containers in Visual Studio has the following enhancements:

- You can now add a Dockerfile to native Micro Focus Unit Testing projects in Visual Studio and run the tests in a container.
- Projects with Docker support now include an additional **Containers** property page. From it you can:
 - Specify any build, debug and run arguments for the image that will override the arguments specified in the project's dockerfile.
 - See all command-line arguments that will be applied when you build the image.
 - See the arguments that will apply when you run the container, or debug an application running in a container.
- The **Add COBOL Docker Support** dialog box now shows all available images, and supports images provided with a Patch Update release of this product suite.

The versions of the **Runtime Image** and the **Built Tools Image** must match therefore the dialog box only shows the **Built Tools Image** that match the one for the runtime. For example, if you use a Patch Update 1 Build Tools image, the dialog box only shows the relevant Patch Update 1 Runtime image.


The dialog box shows only the images that match the major release version (or a Patch Update of it) of your installed product. They must target the same platform (x64 or x86) as well. If you want to specify images from different major product versions, you need to edit the Dockerfile manually.

Database Access - HCOSS Manage Connections Tool

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This release includes:

- Enhanced usability features around connection error diagnosis and SQL Server connection/installed ODBC driver selections.


 **Attention:** This feature is in Early Adopter Program (EAP) release status. We intend to provide the finalized feature in a future release. Please contact Micro Focus Customer Care if you require further clarification.

Database Access - MBDT Utilities

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This release introduces:

- The SQLTUL utility, which is equivalent to the z/OS DB2 DSNTIAUL program.

 **Attention:** This feature is in Early Adopter Program (EAP) release status. We intend to provide the finalized feature in a future release. Please contact Micro Focus Customer Care if you require further clarification.

Database Access - OpenESQL

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This release provides the following enhancement:

- New OpenESQL TRACELEVEL=5 option - native OpenESQL applications can now trace ODBC calls to the database vendor's ODBC driver, recording the start and stop times of each call's execution. OpenESQL tracing can now provide more detail on where an SQL application is spending execution time, in the OpenESQL layer or the underlying ODBC driver layer.

Data File Tools

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This release includes the following enhancements in the Data File Editor:

- **New Data Explorer for working with data sets** - a new Data Explorer enables you to connect to either an ESCWA service or directly to an enterprise server region to access a catalog when working with data sets in the editor.
- **Multiple record selection**- you can select multiple records and, where appropriate, can perform certain actions on more than one record at once.
- **Cut, copy, and paste functionality** - traditional cut, copy, and paste functionality (including the standard Ctrl+X, Ctrl+C, and Ctrl+V shortcuts) is now available throughout the editor.
- **New filter creation** - a new process for creating filters has been introduced. A filter consists of one or more sets of conditions, and the resulting filter can include or exclude those records selected. The previous filter process is still available, but has been marked as deprecated.
- **Remote filtering** - functionality has gone into Fileshare Server which allows filtering to occur server side when opening data sets on remote enterprise server regions. The filter process results in only those filtered records being downloaded to the data file editor client.
- **Find/replace functionality** - you can search records in a data file to identify specific strings, and then if required, replace them.

Enterprise Server

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This release includes the following enhancements:

- Multiple Network Interface support - there is improved support for multiple network interfaces in some components, including better awareness of network interfaces and control over networking. This is a partial implementation and will be enhanced in future releases.
- Extended IPv6 support - support is available in Micro Focus Directory Server (MFDS) and in the Micro Focus Communications Server (MFCS) listener for multiple IPv6 addresses.

In release 6.0, you could only configure MFDS and MFCS listeners to listen on a single IPv6 address. In release 7.0, by default, MFDS and MFCS now listen on all configured IPv4 and IPv6 addresses, and can also be configured to listen on a combination of specific addresses.

- HTTP improvements:
 - Additional security measures for HTTP, such as security-related headers.
 - Chunking support for large HTTP messages makes it possible to retrieve very large files from Enterprise Server regions.
 - Enhancements to CICS Web Interface and CICS Web Services.
- Application Diagnostic Reporting for Enterprise Server - Application diagnostic reporting collects and packages a number of reports, trace, and log files into a single report file.
- Enterprise Server now supports automatic reconnection to the standby Queue manager in an Multi-Instance Queue Manager.
- The casmgr process has been optimized to improve the use of initiators when dispatching jobs across a PAC. In addition, improvements have been made to the way it manages the queue of jobs waiting to be dispatched.

- Information has been added describing the best practice and the recommended approach you should adopt when performing a Patch Update to your PAC environment.
- (This feature has been added in 7.0 Patch Update 1) New operating modes , *upgrade* and *quiesce*, have been introduced for Performance and Availability Clusters (PACs). These operating modes can be used to facilitate the installation of product updates that introduce incompatibilities between PSOR data structures. You can check for incompatibilities using the new *caspac* utility option *CheckCompat*. An upgrade mode can be set when starting the first enterprise server region in a new PAC using the new *casstart* utility *start-type* option *u*. This upgrade mode will prevent participating enterprise server regions from processing batch workloads as part of its normal operation, and any EXEC CICS START requests will be rejected. See *casstart* and *caspac* in your product Help for more information.

When enough enterprise server regions have been switched over to the new PAC, the old PAC can be set to operate in the quiesce mode. This prevents further batch workload and EXEC CICS START from being processed.

The new PAC can now be switched to running mode so that batch workload and EXEC CICS START are enabled for processing again.



Note: Before setting the new PAC mode to running, you must switch enough enterprise server regions to the new PAC to enable it to service the expected workload.

Enterprise Server Common Web Administration (ESCWA)

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This release offers the following improvements:

- MFDS User Interface functionality replacement - ESCWA now replaces the MFDS inside the IDE as the engine that provides access to and management of regions. ESCWA provides all the functionality that was previously available from MFDS. This release includes the following enhancements:
 - Delete all regions.
 - Session list.
 - Renew listening addresses.
- ESMAC User Interface functionality replacement - the following ESMAC features have been implemented in ESCWA:
 - Resource Filtering.
 - Millisecond support.
 - Control the scope for all changes to timeouts, trace flags, and memory strategy when applied to regions in a PAC.
 - Enable Application Diagnostic reporting.
 - Submission of local jobs from the JES Control page when CASRDO44_NEWSUB=OFF has been specified.
 - View and reply to pending ACCEPT FROM CONSOLE statements.
 - The messages after a JCL job has been submitted are now correctly JSON formatted. This page now works in ESCWA when MFJUXIT is enabled.
- Import, export, and copy regions - you can now use the UI to export and import regions in various formats, including use JSON. You can:
 - Copy regions between Directory Servers
 - Import and export regions in JSON, XML or in the `.dat` legacy format. The legacy format can be converted to a modern format.
- Mainframe Access (MFA) administration - ESCWA provides a modern Web UI and does not require you to use a separate terminal application. Features include:
 - Log in or off from MFA.

- Change your MFA password.
- View MFA server tasks.
- Retrieve the XDBOUT log (Web UI).
- Retrieve the JES spool files by DD Name (API).
- Set the MFA and JES tracing level.
- View the active MFA users.
- Invalidate active user sessions.
- View mainframe/MFA statistics.

The MFA API library has been exposed to enable you to test and use the requests that are provided.

- CICS resource support - the following resources are supported:
 - Resource Name List (RNL) CICS resource.
 - Thresholds CICS resource.
 - Extended Architecture Table (XAT) CICS resource.
- Scale-Out and PAC administration - you can now:
 - Monitor Redis Sentinel and Cluster instances when used for Scale-Out Repositories.
 - Specify that all changes to timeouts, trace flags, and memory strategy can be applied to one of three options:
 - Only the local region.
 - All members of a PAC except the regions where local changes have been made.
 - All members of a PAC.

You can configure this in ESCWA with the **Apply Scope** field on the ES CONTROL page. Alternatively, you can use the casutl utility with the /w option.

- Multi-Network Interface Card support - ESCWA now enables you to configure Communications Servers and Listeners to listen on multiple IPv4 and IPv6 addresses. Previously, they were limited to listen on either all IPv4 addresses, or a single IPv4 or IPv6 address. Now a combination of any of the following can be used:
 - One or more specific IPv4 addresses.
 - One or more specific IPv6 addresses.
 - All IPv4 addresses.
 - All IPv6 addresses.
- A new filter field **resFilter** has been added to the following ESCWA and ESMAC resource listing modules:
 - Every resource in By Type
 - Every resource in By Start L
 - Resource lists under Groups
 - Every active resource type except Locks

This parameter will filter the list of resources displayed by ESCWA and ESMAC. In addition, a new environment variable ES_RDO_MAX_RESOURCES has been added that enables you to specify a limit to the number of records displayed. For JSON requests, the list being truncated is indicated by the addition of the JSON property "truncated": true.

Enterprise Server for .NET

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This release includes the following enhancements:

- CICS time calculations - ABSTIME, EIBDATE, EIBTIME, FORMAT TIME, and CONVERT TIME have been improved.

- CICS condition handling has been improved.
- A new option, **console message maximum**, enables you to specify how many console messages are retained. Previously, this value was fixed at 10000.

Enterprise Server Security

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This release includes the following enhancements:

- MLDAP ESM caching - the MLDAP ESM Module now implements LDAP search-result caching. This is controlled by the existing Security Manager cache settings, so that many installations will have this activated automatically. See the product Help for details.
- Vault Hashicorp support - support is available for using a Hashicorp KV2 vault server as a local or remote vault.

IMS Support

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This release includes the following enhancements:

- An IMS Automated Operator Interface (AOI) - allows an application program to send IMS commands to, and receive responses from IMS Transaction Manager using the DL/I CMD and CGMS functions. This support includes:
 - Enterprise Developer and Enterprise Server support IMS DL/I functions CMD and GCMD across all language interfaces. These functions are used to send IMS commands and receive responses.
 - Commands can be sent from applications compiled either ASCII or EBCDIC.
 - Commands sent using AOI are limited to those supported in Enterprise Developer and Enterprise Server.
 - You can install an exit program that enables programming support for commands not directly supported by Enterprise Developer and Enterprise Server.
 - The `IMSAO.CBL` and **IMSAO.JCL** sample files, located in `%PUBLIC%\Documents\Micro Focus\Enterprise Developer\Samples\Mainframe\IMS\Classic\Examples`, are provided to demonstrate the use of AOI.
 - The `AOEXIT.CBL` program, located in the same place as the other AOI sample files, is an example of an installed exit routine for processing of AOI commands. Instructions for this interface are described in the program source.
- The IMS editor in Visual Studio now offers Renumber and Unnumber commands for PSB files.

JCL Support

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This release includes the following enhancement:

- New Spool and Catalog windows - the Spool and Catalog windows have been updated and are now based on ESCWA functionality. You can view and modify the details of a job and a catalog, create new items, all in one page of the window.

Library Routines

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The following library routines are new:

- CBL_GET_ERROR_INFO - enables error processing routines to establish the location of the error that occurred to cause the error processing routine to execute. This is available on a restricted range of platforms.

Licensing

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AutoPass licensing technology

In this release, Micro Focus brings in the power of the in-house Micro Focus AutoPass licensing technology alongside Sentinel RMS. AutoPass has the following additional benefits compared to Sentinel RMS:

- Usage logging which enables you to monitor the product usage. You need to install the AutoPass License Server in order to do this.
- Ongoing support for all platforms that this product is available for.

Features include:

- Installing this release installs both the AutoPass Daemon and the Sentinel RMS License Manager. Both of them are available in the Micro Focus License Administration tool.
- You can have both AutoPass and Sentinel RMS licenses installed on the same machine. Optionally, you can switch off the licensing technology you do not use.
- If you are an existing user of a Visual COBOL or an Enterprise Developer product, you only need an AutoPass license if you want to utilize usage logging or if you want to use your product on a platform on which Sentinel RMS is not supported.
- If you are a new user of the Micro Focus COBOL products, you will normally be issued an AutoPass license.
- Micro Focus will continue to provide Sentinel RMS in future releases of this product.
- AutoPass licenses should be installed into the existing Micro Focus License Administration tool, and not in the AutoPass License Server.

Installing licenses at the command line

On Windows, Micro Focus License Administration is now also available as a command-line utility.

For more about AutoPass and usage logging, and about Micro Focus License Administration, see *Managing Licenses* in your product Help.

Mainframe Access (MFA)

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This release includes the following enhancements:

- Improved file download and upload speeds - offers over seven times faster speeds for compressed files larger than 64K, and almost four times faster speeds for uncompressed files over 64K. This requires that you update both the Mainframe Access client and server, if you are using an older version of them.

- Endeavor transaction performance improvements - transactions with Endeavor have been improved and are now around two times faster.
- Support for MFDAS load and unload - load and unload-specific load library members are now available from the MFDAS command line. This enables you to interact remotely with Load libraries from the MFDAS command line.
- SCLM export protection - you can now configure the MFA components to respect the SCLM managed flags. In this way, you can prevent outside source control changes to your managed datasets.

The Micro Focus Database File Handler

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This release includes the following enhancements to the Micro Focus Database File Handler:

- **Oracle support:** support has been added for use with Oracle databases (version 19c and later). Support is mostly equivalent to that of the existing databases, except that ODBC connectivity is not supported; connections must be made directly with the databases, using Oracle's OCI interface.
- **The `dbfview` command line utility:** a command line utility that generates database views from your Data File Editor structure files. These views allow you to view your data once it's stored in a datastore.
- **The `mfdbscatc` command line utility:** a command line utility that helps you to relocate a disk-based catalog to a database. It can scan the current catalog, then generate a deployable response file that attempts to maintain the current structure of the catalog.
- **COBOL Run-Time System support for datastores:** Library routines and variables that typically deal with files and folders on disk are now capable of also handling the SQL URLs required to reference file and folders in a datastore.

The Micro Focus Unit Testing Framework

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The following enhancements have been made to the Micro Focus Unit Testing Framework:

- The MFUPP preprocessor has been introduced to provide a seam between your program and a unit test. This seam lets you access the internals of a program under test, allowing you to create granular unit tests from paragraphs or sections. The MFUPP preprocessor also provides the ability to mock programs or stub programs out to create a unit test.

PL/I Support

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Enhancements are available in the following areas:

PL/I debugger:

- PL/I integrated debugger support has been added to the Visual Studio IDE, which provides a much improved user experience for PL/I developers. The CodeWatch debugger has been removed.
- PL/I projects now support debug profiles, a feature of Visual Studio, where a debug profile stores a set of properties which specify how to start debugging the application. You can create and manage multiple debug profiles available on the **Debug** tab in the project's properties.
- Much larger call stacks are now supported.

PL/I compiler compatibility:

- New statements supported - DEFINE STRUCTURE, LOCATE.

- Improved compatibility for the DEFAULT RANGE statement.
- New built-in functions - AUTOMATIC, ENTRYADDR built-in function and pseudovvariable, HEXDECODE, INLIST, ISLL, ISRL, REPLACE, and TIMESTAMP.
- Support for the DIMACROSS attribute and for the PARM attribute on a declaration.

PL/I compiler functionality:

- You now receive warnings when redundant WHEN clauses appear in a SELECT statement.
- Improved compiler listings to show more attributes for parameters.
- The PL/I error messages in the product Help are now in sync with the messages shown in the product.

PL/I EXEC Preprocessor:

- Provides information about host variable references/modifications for the background parsing.
- Support for DB2 style comments in EXEC SQL Statements.

PL/I Macro Preprocessor:

- The SCAN option of the ANSWER statement is now supported.
- Improved compatibility of COMPILEDATE and COMPILETIME built-in functions.

PL/I Run-Time System:

- The behavior of PL/I ON FINISH now matches IBM's behavior.
- Improved compatibility for the JSONPUTVALUE built-in function - it now supports multi-dimensional arrays within structures.
- Improved compatibility for the XMLCHAR built-in function.
- PLIDUMP now checks the allocated memory chains for corruptions.
- PLIDUMP can now display much larger automatic variables and parameters without consuming excess memory and CPU resources.
- Support for the L format PUT EDIT directed I-O.

Visual Studio Integration

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This release includes enhancements in the following areas:

Editor:

- **Code cleanup** - Visual Studio now supports a variety of code cleanup options for COBOL which you can apply during formatting. These enable you to update any existing code, or enforce rules for new code for specific keywords or operators.
- **EditorConfig file support** - you can now create `.editorconfig` files with the code style settings in the IDE, and share the file within your organization to ensure consistency of the code.
- The **Force uppercase** command is now available for Assembler, BMS, and JCL files opened in Visual Studio.

Significant Changes in Behavior or Usage

This section describes significant changes in behavior or usage. These changes could potentially affect the behavior of existing applications or impact the way the tools are used.

The numbers that follow each issue are the Support Case Number followed by the Defect number (in parentheses).

- [Assembler Support](#)
- [Common Communications Interface](#)
- [Communications Server](#)
- [Compiler](#)
- [Data Tools](#)
- [Enterprise Server](#)
- [File Handling](#)
- [Header-to-COPY Utility](#)
- [Interface Mapping Toolkit](#)
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- [Run-time System](#)
- [SQL: Mainframe Batch Database Tools](#)
- [SQL: OpenESQL](#)

Assembler Support

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- Define Constant character items are now filled with EBCDIC spaces when you specify a null character string to match the IBM HLASM behaviour. For example:

```
ALAB 40C' ' or ALAB CL40' '
```

DC C" instructions are now IBM HLASM compatible. This should not affect any customer but some may notice cobol like DEFAULTBYTE(X'40') values in their DC C... data items now. Such a change should be innocuous for existing customer programs.

3237050 (12504)

Common Communications Interface

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- The default TLS Security Level has been increased from 0 to 1. This change will not affect you if you have specified your own security options. If you rely upon the default TLS security options you might find that some old clients that are restricted to the use of weak ciphers will no longer be able to connect. See *Security Levels* and *Specifying a Server Protocol and Cipher Suite Preference* in your product Help for more information on the change to Security Level 1.

(8453)

Communications Server

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- The functionality of GIVE and TAKESOCKET have been modified to make them more similar to the documented IBM behavior:
 - If a caller issues a GIVESOCKET specifying a subtask, then only a caller will be allowed to take the socket if they specify the same subtask.
 - A caller can supply an empty (spaces) subtask on the client parameter to indicate that anyone can take the socket. In order to achieve this, a dummy client is inserted during a GIVESOCKET call if the subtask name does not match an existing client entry.

00422057 (59129)

Compiler

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- Programs with file records greater than the documented limit of 62KB will now generate an error that they previously did not (COBCH0649) - although being an E level message, the program can still be executed and will work if it did so previously.

3227892 (12447)

- Two of the available Ant parameters for compiling COBOL programs have been renamed as follows (functionality remains the same):
 - forceCompile becomes mf.forceCompile
 - threadCount becomes mf.buildThreadCount

3230709 (12665)

Data Tools

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- The editor now automatically selects the first record in comparison when first loaded. The Editor will automatically select first record in comparison when first loaded

3212848 (11362)

- Data File Tools now provides the Data Explorer, which is a catalog view that can connect to either ESMAC or ESCWA. When connecting to ESCWA, it enables you to open multiple data sets.

(70242)

- The scrolling speed for formatted records has been increased.

00366018 (11378)

Enterprise Server

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- The structure returned by EXEC CICS ADDRESS ACEE now conforms to the IBM IHAACEE definition.

3241109 (11667)

- There are more security checks performed in addition to the verification against `casout` under the OPERCMDS class. Depending on what options are used, checks are also performed to ensure that the user has access to a particular job - such as for restarting, modifying, or viewing datasets. The corresponding rules are under the JESSPOOL class. When trying to retrieve a dataset, additional checks are made for the particular dataset being accessed. This is also under the JESSPOOL class.

3234588 (11576)

- Previously, there was no security check performed when an ESMAC user tries to access the console, traces, or dumps. This is no longer the case. If you use LDAP-based security you can now add the new DIAGS resource under OPERCMDS class and provide access to ESMAC users accordingly.

3231918 (12556)

- When locks are being stored in a database (for example, when running in a PAC), a CICS ENQ will, by default, be stored in the region database. ENQs are directed to the cross-region database if they match an ENQMODEL that has an ENQSCOPE value that is not equal to spaces. This enables ENQs to be shared outside of the region (or PAC). There is a performance overhead to storing ENQs in the database. If an application uses ENQs and does not need them to be shared outside of the region, then you can specify the new attribute in the ENQMODEL resource to direct matching ENQs to shared memory, this can improve performance. For example, this might be used for an application running in a PAC that issues multiple STARTs to each ENQ on the same resource. In this case, the STARTed transactions will all run in the same region and it would be safe to store those ENQs in shared memory provided that the resource being ENQed on is unique to these STARTed transactions. Note: An EXEC CICS START that uses the TERMID option might not run in the same region as the STARTing program. When running in a PAC, the transaction will be transferred to whichever region the terminal is connected to. In this case, it would NOT be safe for ENQs taken by the STARTed transaction to be stored in shared memory. You can now specify the _SHAREDMEM option in the ENQMODEL resource to enable matching ENQs to be stored in shared memory when running in an environment where locks are normally stored in a database, such as a PAC: _SHAREDMEM(YES | NO) The default value is NO. Specifying an ENQMODEL with _SHAREDMEM(YES), will store matching CICS ENQs in shared memory. Caution: This option should only be used if the ENQed resource will not be accessed by any other region.

00367119 (13432)

- An abend in the service provider CICS application was not being propagated back to the soap client when CICS WEB SERVICES were used. This has been fixed.

00365431 (13583)

- The "Requested Licenses" field has been removed from the ESCWA General Properties page as it is not used.

(3956)

- If CASRDO44_NEWSUB=OFF has been specified in the region's Configuration Information field of the General Properties page or as an environment variable, then the JES control page will submit only local jobs, rather than remote jobs. Behaviour Change: When CASRDO44_NEWSUB=OFF is specified in the region environment, the JES control page will allow for submission of local jobs, rather than remote jobs.

(9431)

- Added the option to delete the associated package when the service has an associated package and that service is the only one with that associated package.

00370971 (22264)

- When a new region is created in ESCWA, the Web listener's conversation type is now correctly set to "Web" instead of "SOAP and J2EE (legacy)".

3244594 (21270)

- The Group can now be specified when starting or stopping a region using ESCWA.

00371543 (12436)

- For Enterprise Developer 6.0 and later, the installer on Windows has automatically started the Enterprise Server Common Web Administration (ESCWA) service as part of the installation process. When using the Japanese system locale on the Windows operating system, the ESCWA service does not start automatically. During the installation process you might be required to press Retry to complete a successful product install. Even after a successful product install, ESCWA does not start until you have installed a valid license.

00368527 (12747)

- Added StepCC to the Spool DD Display page in ESCWA.

3236954 (13587)

- The Initial Tran field on the region ES Control page has changed from a list to a text box field.

3232139 (11506)

- In ESCWA, the Security Manager properties could be set too long, causing a crash. This has now been fixed.

(61192)

- This fixes an issue with the change to the behavior introduced with the passtoken changes in previous patch updates. An issue might occur in a stacked environment with OS ESM and MLDAP_ESM. Job dispatch would issue a deny when `casub` was used.

3229601 (11524)

- An issue when using a secured MFDS, with an LDAP ESM as first in the stack, and a PAM ESM as second in the stack, and with federation enabled, has been resolved. Previously, if the security was reinitialized through any means (such as clicking the apply button, or reordering the ESMs and changing them back), the MLDAP ESM would not be able to correctly determine that the PAM ESM user `user1` in `group1` matched the LDAP resource rule which described `group1` within the resource rule. This should have worked because the group information is shared when federation is enabled. With this fix, the resource rule in LDAP correctly identifies that the `group1` rule applies to the PAM ESM user `user1`, on both initialization and reinitialization. Behaviour Change: When SAFMGR was reinitialized, PAM ESM was pointing to the old shared groups table, so MLDAP ESM and PAM ESM ended up pointing to different shared groups tables. It should have been the same table as federation was enabled. PAM ESM groups table is now cleared on initialization, so that the ESMs will now point to the same groups table.

3221760 (11697)

- EZA Socket transactions failed under load. To fix this a new version of the CSKL transaction has been supplied with the product (EZACIC02.cbl).

00422057 (51114)

- ESMAC now includes cross-site request forgery protection. A 403 Forbidden page is now returned whenever a user attempts to bypass the protection. If you want to access more than one region in ESMAC at the same time, it can no longer be done in the same browser session. You can access the regions in separate private browsing sessions.

3216052 (13208)

- A new resource class, DCBINFO, enables you to control who can access the DCB information for cataloged datasets in ESMAC for a LDAP secured region. DCBINFO must be created for existing users to be able to access the DCB information in ESMAC.

3231918 (13300)

- The call format of the first parameter of CEEGTJS has been corrected to be "call by reference" rather than "call by value".

3231324 (12494)

- MQ commands did not work because Windows installations of MQ are client, not server. This has been corrected.

(46022)

- MFDS now correctly uses the specified region user in the ESCWA Directory Server Scripts page or Directory Server user in the ESCWA Directory Server Configuration page. Otherwise, it defaults to the current user.

(8727)

- If MFDS is set to "Restricted Access" and the MFDS "Anonymous access" option is off (the default), then valid authorized credentials will be required to access information stored in the Directory Server either via the legacy UI, ESCWA, or utilities such as `mdump`.

(62100)

- When MFDS is TLS enabled and a client connects on the non-TLS port, it will now send a HTTP 302 Found response to the client to redirect it from the non-TLS port to the TLS-enabled port. This is seamless to the Web browser.

(46024)

File Handling

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- The key definitions of newly-created database-hosted files and existing files deployed to a database will now be honored. Previously, all alternate keys were being created by MFDBFH as "with duplicates" irrespective of how they were specified in the key definition area of the FCD. This affected files both created directly by COBOL programs, and those deployed into datastores from disk. One of the side effects of this problem was that if a catalog and associated `SPL*.dat` files were extracted from a datastore, and a CAS JCL region configured to use them, JES failed to initialize during region start-up due to a file status 3/9 occurring on the `SPLJOB.dat` file. The `dbfhdeploy` utility has been enhanced to allow the keys of existing files to be listed, and to be changed from "with duplicates" to "without duplicates" if required. It is strongly recommended that if you are using a database-hosted catalog and associated spool files for an Enterprise Server JES region, that you update the `SPLJOB.dat` file's alternate keys by running the following commands:

```
dbfhdeploy keys 1:dup=n sql://MYSERVER/MYFILES/SPLJOB.dat?folder=/MyFolder
dbfhdeploy keys 2:dup=n sql://MYSERVER/MYFILES/SPLJOB.dat?folder=/MyFolder
dbfhdeploy keys 3:dup=n sql://MYSERVER/MYFILES/SPLJOB.dat?folder=/MyFolder
dbfhdeploy keys 4:dup=n sql://MYSERVER/MYFILES/SPLJOB.dat?folder=/MyFolder
dbfhdeploy keys 5:dup=n sql://MYSERVER/MYFILES/SPLJOB.dat?folder=/MyFolder
dbfhdeploy keys 6:dup=n sql://MYSERVER/MYFILES/SPLJOB.dat?folder=/MyFolder
```

See *The dbfhdeploy Command Line Utility* in the documentation for more details and examples.

00372425 (69057)

- Within MFDBFH, enhancements have been made to optimized I/O to further improve performance. Enterprise Developer 6.0 and Enterprise Developer 7.0 only: The `dbfhconfig` utility has been enhanced with the addition of the `-optiokeyreads` and `-optioseqreads` command-line options. These options are used to override the default number of records read ahead by MFDBFH when optimized I/O is enabled.

00726932 (83019)

- MFJSORT now supports RESTART in SEQNUM processing. The format `RESTART=(p,m)` is supported.

00368449 (13606)

- The SFF (Signed Free Form numeric) input field is now supported in the TRAILER3 operand.

3217597 (12477)

- A File Handler limit on the maximum record size (62KB) has resulted in the documented limits for data-driven unit tests to be revised. See *Restrictions in the Micro Focus Unit Testing Framework*.

(25064)

Header-to-COPY Utility

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- When `h2cpy` is used to convert C header files to COBOL copy files, function prototypes with `const *`, which produce BY REFERENCE parameters in the ENTRY statement for the COBOL call prototype, will now include the `CONSTANT` reserved word. In this context, it means the variable is read-only in the callee, just like in C.

(10214)

Interface Mapping Toolkit

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- Headers are no longer mapped in the output of WS2LS.
3235120 (12606)
- Top-down CWS generation from WSDL now properly marks hexBinary fields in the generated WSBIND.
3236069 (11690)
- WS2LS now assigns usage COMP-3 to items mapped from decimal and integer types in the WSDL. Behaviour Change: WS2LS will now assign usage COMP-3 to items mapped from decimal and integer types in the WSDL. This will affect the generated copybooks and WSBIND. Previously-generated files will still work, and users should be using the WSBIND and copybooks from a single execution of WS2LS in their environment anyway, since changing one results in (or reflects) changes to the other.
3235120 (13494)
- In copybooks generated by WS2LS, several data types now have mappings that are closer to those generated by IBM's DFHWS2LS. Behaviour Change: In copybooks generated by ws2ls, several data types will now have mappings closer to those generated by IBM's DFHWS2LS.
00365433 (11693)

JCL Support

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- The IDCAMS DEFINE ALIAS command has been added to enable you to create an ALIAS, or, for a PO member, the TSO RENAME ALIAS command. When referencing an ALIAS, the related dataset is resolved. You can also use SYMBOLICRELATE datasets, and the symbol is resolved at run time using system symbols defined in SYS1.PARMLIB(IEASYM00).
00368450 (13425)
- The IDCAMS DELETE command has been enhanced to now accept % and * wildcards with the use of the "MASK" keyword. Because support for multiple wildcards has been enhanced, IDCAMS commands that previously reported a JCLAM0163S error and set CC to 12 may now be accepted and processed.
00375690 00367509 00368440 (12180)
- The support for wildcards when using the IDCAMS LISTCAT command has been improved: both * and % are accepted within the data set name, and multiple wildcards may be used; for example:

```
LISTCAT LEVEL(MFI01.MFI%%%.D*.DAT)
```


00366749 (11515)
- When a job contains duplicate step names, you can now specify which step to start.
(69229)
- You can now restart a JCL job by specifying a value for MF_UCC11.
(71227)
- A new topic, *Advanced Restart Functionality*, has been added to the JCL documentation to document the use of the `casout /jrestart` option, which enables you to restart a job with additional parameters. The #t parameter identifies the step on which to end a restarted job. See your product documentation for details.
(70223)
- A new topic, *Advanced Restart Functionality*, has been added to the JCL documentation to document the use of the `casout /jrestart` option, which enables you to restart a job with additional parameters. The #k parameter enables you to specify whether or not ABEND and COND codes from a previous run are used or not. In addition, the #k parameter enables you to specify the COND code to use for a specific step. See your product documentation for details.
(70224)
- By default, a non-zero return code from a commit at the end of a unit of work for DSNAL or IKJEFT** will now be reported and set a step abend code of S482. You can control this behavior by using the MF_JES_ABEND_CAF_COMMIT environment variable; see JCL-specific Environment Variables in the

documentation for more details. Behaviour Change: A non-zero return code from the commit issued at the end of a unit of work, i.e. when the program run as part of the step returns control to the JES system, will now generate a message in the syspsprt and cause the step to abend with the cond code S482. This behaviour is configurable using the environment variable MF_JES_ABEND_CAF_COMMIT. A value of 'NO' will provide the current behaviour, i.e. we ignore the return code. A numeric value (up to 3 digits) would cause that value to be used as the return code from running the program.

3239642 (11750)

- If a MGMTCLAS is defined for a dataset, it will be included in the MGMTCLAS field of the MFJCTLBP control block. Behaviour Change: The mfjctlbp dataset control block will now include the MGMTCLAS if it is defined in the catalog record for the dataset

3231081 (13361)

- A problem that set the wrong parameter override value for a step in a procedure because of the alphanumeric ordering of the step names was not consistent has been corrected.

3235581 (12478)

- When changing a GDG roll disposition to EMPTY, the number of rolled-in data sets was incorrect. Now, if a NONVSAM data set is defined in IDCAMS that is a GDG version, it will be included in the GDG set.

3238565 (12731)

- A problem that caused the incorrect resolution of output statements in steps with duplicate names has been corrected. An output statement class of "*" is now replaced by the msgclass of the job.

(30104)

- The value of the ALTER NEWNAME will now be checked to ensure it conforms to naming convention before trying to update the catalog. An error message, JCLAM0105S(12) - Invalid entry name syntax or length, will be issued if the check fails. Behaviour Change: As per readme

3236388 (12641)

- When running in a PAC or with the MFDBFH database locking for multiple regions, active jobs are not flushed at region start-up. Behaviour Change: As per ReadMe

3227362 (12487)

- It is now possible to include a set of default ON conditions in the VSE configuration file and these will be added to all VSE jobs.

3230967 (11486)

- User labels (DLBL & TLBL) are now removed when a new one is assigned following the running of a program.

3213728 (12340)

- The system symbols file, SYS1.PARMLIB(IEASYM00), can use the EBCDIC encoding. Support for EBCDIC programs calling the system symbol entry point, IEFSJSYM, has been added.

3226132 (11503)

Mainframe Access

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- Users will now be able to specify a volume when cataloguing a data set.

(41007)

Micro Focus Batch Scheduler Integration

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- The %%LIBSYM/%%MEMSYM Control-M function variable value is now delimited by the first ending space. For values that request one or more embedded spaces, use the %%BLANKnn Control-M function.

00422148 (51104)

PL/I Support

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- DEFINE STRUCTURE statements are now supported.
00368478 (12186)
- Previously, if STRINGRANGE had been enabled by the -prefix stringrange compiler option, and a user program did not contain an ON STRINGSIZE statement, there was no message printed out indicating that STRINGRANGE had been triggered. The message now appears in this scenario.
00696776 (73031)
- A performance bottleneck present in Enterprise Developer 5.0 and 6.0 has been resolved to provide faster record I/O.
00669680 (71440)
- Previously, if a job was cancelled while in an active state, PL/I would, as part of RTS cleanup, attempt to RELEASE all fetched routines. This resulted in a problem because some of the fetchables had the potential to be active on the callstack and be in a non-cancellable state. This no longer occurs.
00368471 (27328)
- Previously, if using PLISAXA() and XML Element's content contained a character greater than x"7F" (ASCII), the CONTENT_CHARACTERS event would be driven twice - once for the characters that preceded the x"7F", and once for the remainder. This no longer occurs and the CONTENT_CHARACTERS event is driven for the entire XML Element's contents.
00381945 (30084)
- Previously, when using PLISAXA, the document length as driven to the Start of Document event was incorrect if the XML document contained characters that exceeded hex 7F. This has now been fixed.
00381945 (61228)
- The diagnostic MPLIE0056 has been changed from a "Severe" level diagnostic to an "Error" level diagnostic. This provides you with the ability to tailor behavior to your environments. If you wish compiles to fail in this scenario, you can use the compiler message exit to bump severity back to "S" level. If you do not wish to have an "Error" level diagnostic in this scenario, you can use the compiler message exit to reduce severity to "W".
Behaviour Change: The diagnostic MPLIE0056, which tells the customer they have SQLCA declared in an internal procedure, has been changed from a "Severe" level diagnostic to an "Error" level diagnostic. If the customer desires the old behavior they can bump this diagnostic to an "S" level diagnostic using the compiler message exit, or if they intend to have the potential confusion from having multiple SQLCA's declared they can bump the severity down to a "Warning" level using the same compiler message exit.
3239052 (12538)

REXX Support

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- EXECIO * DISKW was stopping on the first line containing no characters, writing out no further records. Now after encountering an empty record, a line with only a linefeed is written and processing continues with the remaining records.
00366667 (27187)

Run-time System

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- When defining the file name for CBL_CREATE_STACKDUMP, %f now expands to basename of the program correctly when used cross-process.
(60049)

- When CTF trace level is set to info (for post-offset values only) or debug (for pre-offset, offset and post-offset values) and component rts#process is set to true, the API will now dump the captured metrics to the output CTF file.

(27040)

SQL: Mainframe Batch Database Tools

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- An equivalent of the mainframe DB2 utility DNSTIAUL, SQLTUL, is now available in the MBDT utility suite.

2148818 (10857)

SQL: OpenESQL

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- An issue with compiling native programs that use SQL TYPE IS XML AS CLOB has been resolved.

3240037 (12679)

Known Issues

Refer to the *Known Issues and Restrictions* topic in the *Product Information* section of your product Help.

In addition, note the following:

- The Server Core form of Windows Server 2019 is not supported.
- The Enterprise Developer 7.0 for VS2017 or VS2019 installer crashes when you run it on machines where Visual Studio 2022 is or has been installed before.

The following Knowledge Base article on the Micro Focus Support Portal provides a patch and instructions for fixing your system - [click here](#).

To patch your system before you can successfully run the Enterprise Developer installer:

1. Open an Administrative Command Prompt
2. Backup or create a copy of the `Microsoft.VisualStudio.Setup.Configuration.Native.dll` file (v. 3.1.n) in the `C:\ProgramData\Microsoft\VisualStudio\Setup\x86\` folder.
3. Unzip and copy the 2.7.n version of the `Microsoft.VisualStudio.Setup.Configuration.Native.dll` file supplied with the Knowledge Base article.
4. Register the 2.7.n version of the .dll - execute the following at the command prompt:

```
regsvr32
C:\ProgramData\Microsoft\VisualStudio\Setup
\x86\Microsoft.VisualStudio.Setup.Configuration.Native.dll
```

The 7.0 installer should then run successfully.

- In Enterprise Developer 4.0 and 5.0 in an extremely small and limited set of cases, an issue could occur with running .NET executables and .dll files, or JVM .class files, created with an earlier version of the product. This issue only occurred if:
 1. The application performs an IS NUMERIC condition test on a variable declared with USAGE NATIONAL.
 2. The application has been created with Enterprise Developer 3.0 or earlier, then executed in Enterprise Developer 4.0 or 5.0.

In these rare cases, the IS NUMERIC test could provide the wrong answer.

In order to resolve this issue, in Enterprise Developer 6.0 and later, the .NET COBOL and JVM COBOL run-times reject any program using IS NUMERIC on a NATIONAL item which was compiled with a version 5.0 or earlier of the product. You receive a "missing method" exception. To resolve the issue, you need to recompile any programs that use this construct in Enterprise Developer 6.0.

Programs that do not use NATIONAL data, or those that have been recompiled in Enterprise Developer 6.0 or later are not affected.

- Copying and pasting the contents of a license file into the **License file** field of Micro Focus License Administration results in the error "The path is not of a legal form. Please contact Micro Focus SupportLine".

Resolved Issues

The numbers that follow each issue are the Support Incident Numbers followed by the Defect number (in parentheses).

- [Assembler Support](#)
- [CGI Support](#)
- [CICS BMS Compiler](#)
- [Code Analysis](#)
- [Common Communications Interface](#)
- [Compiler](#)
- [Data Tools](#)
- [Data Tools \(Classic\)](#)
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- [SQL: Mainframe Batch Database Tools](#)
- [SQL: OpenESQL](#)
- [SQL Option for DB2](#)
- [Visual Studio IDE](#)
- [XML Support](#)

Assembler Support

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- A problem where an 0C1 error could be generated following a rebuild of a subprogram has been fixed. The MFASM linker will now skip an unnamed CSECT (\$\$CSECT) and mark a named CSECT occurring second in the load module as the module's main entry point. This will only be done in the absence of any direction from a linker input file (.LIN) or label on an END statement in the module.

3232164 (13563)

- The CEETERM macro had two reversed lines causing the wrong RETURN-CODE value to always be returned. The lines are now in proper order.

3232164 (11751)

- The MFASM linker module, MF370LNK.DLL, has been changed to allow for up to 500,000 relocatable items in one .390 or .MOD file. The old limit was 50,000 items.

3227781 (12405)

CGI Support

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- The query string for CGI Applications using REQUEST_METHOD=GET no longer has a limit of 4096 bytes.

3227061 (10285)

CICS BMS Compiler

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- The mfbmsc1 command-line utility is now available in Enterprise Developer for Unix and Eclipse.

00377337 (30004)

Code Analysis

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- A problem that caused the exclusion of the SQLCA copybook has been fixed.

3219870 (11398)

- This release supports nested COBOL programs in a single source module.

00366795 (12647)

- Verification errors for a specific structure-based slice have been fixed.

3236246 (13377)

Common Communications Interface

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- A problem that caused the ccierr.log to contain multiple "connect_endpoint(), called in NET_CONNECT, return code 2" messages has been fixed.

(77040)

- When running an application that uses CCI in an aggressively multi-threaded environment, RTS 114 errors could be generated.

00370924 (13510)

- Because of a previous optimization that was made it might result in getting stuck on a blocking receive. This has been fixed.

00457870 (57287)

- An integer overflow in CCI time handling has been fixed.

(9632)

- When running an application that uses CCI in an aggressively multi-threaded environment, RTS 114 errors could be generated.

00370924 (12575)

- A rare crash in the Micro Focus Communications Server under heavy load has been resolved.

3238018 (11727)

Compiler

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- A large amount of REPLACE text no longer causes unexpected syntax errors.
00483050 (66002)
- The precision of intermediate results, and hence the result of arithmetic expressions, has been modified when ARITH(COMPAT) is specified to emulate the equivalent IBM option.
00373696 (12616)
- CALL <data name>, where data name is defined as an ANY LENGTH item, now works as expected.
00365007 (13541)
- A missing period on a File Description entry now compiles with only a warning message under OSVS emulation.
3227505 (11445)
- A JSON GENERATE statement on a structure containing variable length groups now compiles and executes as expected.
00429712 (57257)
- A new Compiler directive, PANVALET-IGNORE-COMMENT, has been added to control whether the PANVALET option expands ++INCLUDE statements which are commented out.
3233957 (12517)
- When specifying a subscript, it is possible to use 'index-name +/- data-name' when under an MF dialect.
00371309 (13582)
- EXEC INCLUDE syntax with a period following the include name (and before the END-EXEC) is now supported for better compatibility with the Oracle Pro*COBOL precompiler.
00370456 (12738)
- Very long source lines now debug as expected.
00481396 (65050)
- Syntax specifying the LENGTH OF a Reference Modified item is now rejected under an IBM dialect. This is to emulate the equivalent mainframe behavior.
00373977 (13404)
- A new directive RM-FILE-ERRORS is provided to control emulation of RM/COBOL file errors. See the documentation for full details.
00368536 (12711)
- READ and WRITE statements under DIALECT"RM" now only process the exception clause appropriate for the format of that statement.
00368537 (12729)
- DISPLAY literal AT now works with the DISPLAY-AT directive.
3201040 (12639)
- A bug has been fixed so EA now indicates if a nested program is "COMMON".
00366795 (70003)
- Compiling with the SOURCEASM directive now produces an .idy file as expected.
3231077 (12489)
- There is no longer an issue in printing the value of the EXITPROGRAM directive when SETTING is on.
00369139 (12490)
- FUNCTION DISPLAY-OF(nat-var, 1208), which is a national data item to UTF-8, no longer truncates the UTF-8 results.
(8864)

- Programs which contain numeric edited data items now compile successfully when both Compiler directives DIALECT(OSVS) and INIT-BY-TYPE are specified together.
00366269 (13289)
- Compiling a program containing nested date intrinsic functions with the compiler option INTDATE(LILIAN) now produces valid object code as expected.
3227569 (12457)
- The CONSTANT qualifier can now be applied to data items > PIC 9(18).
(8678)
- A DISPLAY of sub-screen-section items that are under a group LINE identifier clause now position correctly.
00368541 (13573)
- A new Compiler directive, DPC-IN-DATA, enables you to control whether the DECIMAL-POINT IS COMMA clause (if specified) is applied to the output from the XML GENERATE and JSON GENERATE statements.
3225204 (12393)
- The record area of a print file is no longer cleared after a WRITE statement for a program compiled with a mainframe dialect.
00383677 (47029)
- The NOBOUND directive specified after the SSRANGE option is now correctly respected. Also, when both NOBOUND and SSRANGE are specified, the behaviors of the intermediate and generated code are now consistent.
3226804 (12430)
- ISO2002 behavior for PROCEDURE DIVISION/CALL RETURNING is now under ISO2002(2) to allow compatibility with Server Express/Net Express. The previous behavior can be selected with ISO2002(1).
00363117 (12604)
- The startup time of the run-time system has been reduced, which has resulted in improved compilation performance for some programs.
00384452 (50019)
- The \$REGION syntax can now be used in comments if the DIRECTIVES-IN-COMMENTS directive is specified.
3232251 (12464)
- The SCREEN SECTION clause FROM ZERO no longer produces an internal error.
00380019 (31075)
- A DISPLAY of a hexadecimal literal in a program compiled with the CHARSET"EBCDIC" directive now produces expected results.
00416522 (52011)
- Index names within a COBOL program no longer cause validation issues when compiling for use with EA.
00370455 (28197)
- The Compiler directive option ILCLR(2) has been deprecated. Applications that have this set will produce an E level message when compiled in this release of Enterprise Developer or Visual COBOL.
(10381)
- An invalid program no longer results if a .NET class contains an ASYNC method, and that class also defines a COBOL file (using SELECT syntax).
00379383 (31065)
- In a static class, a spurious error was produced for the record following an FD.
3233665 (12706)

- An assignment requiring an implicit conversion could cause bad generation of the rvgen/treegen output, or cause the compiler to crash.
00373024 (13380)
- When debugging generated code, if the first statement following PROCEDURE DIVISION or an ENTRY statement is a GO TO statement, stepping into that program could fail and the debugger would zoom. This has now been fixed.
00455393 (69101)
- For native generated code, a bug when referencing a field in a linkage section parameter when PROTECT-LINKAGE has been specified has been fixed.
00479164 (71154)
- For Intel x86 32-bit generated code only, a bug in generating code with OPT"4" set, which caused the Compiler to hang, has been fixed.
00619916 (71454)
- A run-time system error (COBRT114), which occurred at generate time when a call literal contained an unmatched quote symbol (that is, ""), has been fixed.
3242461 (13524)
- Support is now available for the Control-M function %\$\$WEEKDAY. Control-M week day variables now correctly respect the start week day specified in mfbsi.cfg (StartOfWeek=Sunday|Monday).
(10495)
- In Control-M emulation, a problem that prevented the \$WCALC function from accepting a variable for the calendar name has been fixed.
00487802 (69090)
- The Control-M XML Calendar has been updated to enable the defining of 366 days, even for years other than leap years.
00488291 (71104)
- The Control-M SUBSTR function now correctly handles the Start and Length variables defined using environment variables.
3226645 (11688)
- In a non PAC environment, MFBSI now validates that the .sem files created in \$MFBSI_DIR use STRIPSPACE=ON.
3224140 (11417)
- An abend 0C4 sometimes occurred when mfbsijcl was cancelled from a scheduler. This has been resolved by returning an abend S222 instead.
00366666 (12724)
- The mfbsi.cfg file now supports a new parameter, STDNUM, which is set to ON by default. If STDNUM=OFF, all JCL records in columns 73-80 are ignored even if there are JCL statements or any in-stream data records in these columns. The previous MFBSI logic based on the contents of the first record of JCL and whether it contains any data in columns 73-80 is maintained. This parameter is mainly useful when your JCL members contain a mix of STD NUM ON and OFF. for existing customers
3230289 (12654)

Data Tools

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- A 'large file' alert is no longer displayed when opening files > 128 MB and the 'Use temporary file for editing' option is not selected.
(69199)
- The Column indicator in the status bar now shows the correct value when selecting a field in the right-hand pane (structured view).

00491656 (70177)

- An issue which could cause the Data File Editor to hang the region has been fixed.

00426198 (58053)

- The Data File Editor now provides navigation to the last page when showing fixed-block, variable-block, and indexed files, and also for filtered results. If Go To <record-number> is also larger than the number of records available, the last page of records is displayed, instead of a "no record found" error returned. For sequential fixed-block files, the available number of records is also shown.

(88030)

- The ruler will now stay at the top of the displayed record list, even when you scroll down the page.

00485504 (71308)

- The performance of the Data File Tools catalog has been enhanced when using a database-hosted catalog file, and when specifying a data set name filter with a leading wildcard character.

00377995 (31059)

Data Tools (Classic)

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- The Data File Editor now support temporary changes to sequential, line-sequential, and relative data files. Users can choose to save those changes to the data file, or revert the changes, leaving the data file in its original state. See 'Editing Data Files' in the documentation for more details.

3239290 (12680)

Debugging

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- Watchpoint values now update correctly when they change when using the x64 configuration.

3235325 (13441)

Dockerfiles

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- The HEALTHCHECK in the Dockerfile for the CICS container demonstration on Windows sometimes failed to run.

(8146)

Documentation

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- The Comments section of the ListWidth directive documentation now clarifies behavior that only happens under SOURCEFORMAT"FIXED".

00382245 (30116)

- The documentation has been updated to reference the ACUCOMMENT directive correctly (previously referenced with a hyphen - ACU-COMMENT).

(58226)

- The documented IDE equivalents for the run-time tunables have been updated to reflect the current IDE options.

(7279)

- The Configuring Your Application... tutorial, for converting RM/COBOL applications in the IDE, has been updated, as some RM/COBOL-specific configuration files are no longer shipped with the product.

00365052 (7877)

- The syntax rules have been updated in the documentation in regards to the order in which the OCCURS and VALUE clauses can be specified for a data item; see syntax rule #2 of the 'Data Description Entry Skeleton' topic.

(8710)

- The documentation has been updated to correctly state that up to 1024 conditional expressions are possible within the INCLUDE and OMIT program control statements of a SORT operation.

3232114 (12450)

- A definition for the environment variable MFRU_NOINHERIT has been added to the documentation (Windows-based only).

3145619 (13073)

- The documentation has been updated with details of how to use CSSID translation tables in deployed applications; see *Codeset Translation* for more information.

(8567)

- The documentation for the JCLCM0196S JCL error message has been updated to include the definitions for the following reason codes: 09, 082, 083, and 086.

(9716)

- The product Help has been modified to indicate that you can only use analyzer programs if they have been compiled with ASCII or EBCDIC specified as the character set. See "Analyzer Programs" in your product Help for more information.

3231967 (12460)

- The documentation has clarified the values acceptable for the SORTCOMPRESS environment variable: to enable SORTCOMPRESS, specify any positive integer.

3228239 (13280)

- The documentation has been updated to include a known restriction where the cobcall function does not locate statically-linked COBOL programs on Windows platforms.

(8304)

- The documentation for the dbfhdeploy command has been updated to list all possible file types that can be added using this command.

(9566)

- The documentation has now clarified the use of the MF CODESET values AUTO and DEFAULT, particularly for Japanese Windows, and UNIX platforms.

3229004 (13290)

- Within the documentation, the settings lists for the mainframe DIALECT directives now correctly state HOSTNUMMOVE and HOSTNUMCOMPARE (and not HOSTNUMMOVE"2" and HOSTNUMCOMPARE"2").

(9297)

- The Message Files section of the National Locale Support documentation has been corrected to use the .msg extension for user-created message files.

(8387)

- A recommendation has been added to the documentation for the tunables DATEWARP_DYNAMIC and TIMEWARP_DYNAMIC. It is recommended that these are not used in an Enterprise Server environment.

3235487 (13455)

- Details for the %%RANGE and %%RESOLVE commands have been added to the documentation for MFBSI.

00367255 (13295)

- The WebSphere 9.0 CICS Resource Adapter Configuration topic has been updated to reflect the correct version number for the CICS .rar file.
3225638 (11578)
- If the ILSMARTLINKAGE directive is used, and a linkage record contains a data item that cannot be uniquely qualified, then no property is generated for that item and a warning (COBCH1969) is produced.
00371909 (11629)
- The documentation for CBL_SPLIT_FILENAME has been updated to ensure that the syntax diagram and the definitions are consistent.
(10599)
- The documentation has been corrected to state that the SORT environment variable for determining where the run-time system stores paging files is called TMPDIR (not TEMPDIR).
(9534)
- The documentation has been updated to correctly state the name of the tracing file that records MFBSI event manager events: `castrc.textfile.log`
(8659)
- The MFFTP Control Variables topic has been updated to include a note for MFFTP_PROCESS_TRAILS_ONGET={TRUE | FALSE} that provides some additional explanation for the FALSE setting.
3232421 (11653)
- The documentation for the CBL_ALLOC_* and CBL_FREE_* library routines now state the limitation of using those routines in sub-programs that have the AMODE directive in effect.
(10712)
- Two new JCL messages have been added to the product: - JCLCM0232I Scanned input DSN <dataset>: an informational message detailing the dataset that was scanned. - JCLCM0233I Parsed input DSN <dataset>: an informational message detailing the dataset that was parsed.
(9581)
- You can now configure and optimize database connections using options in your MFDBFH configuration file (`mfdbfh.cfg`). See *Optimizing Database Connections* in your product Help for more information.
00367278 (12752)
- The directive lists automatically set for certain language-related directives have been updated to remove obsolete directives.
3223241 (12411)
- The PC_PRINTER_LOAD_BMP documentation has been updated with the list of supported formats that may be used with this routine.
3111670 (8680)
- The Unit Testing Framework documentation now updated to advise against manually editing test fixture files. Instruction on how they are to be managed is given in the topic 'Test Fixture Files'.
(10585)
- A new environment variable, ES_IMS_CANCEL_MODE, has been introduced to control the caching of IMS binaries. See 'IMS-specific Environment Variables' in the help for more information.
3246379 (26057)
- The 'Using Breakpoints and Watchpoints' topic has been updated to include more detailed information on breakpoints.
(8289)
- Information on the MFJCTLBP API has been added to the product Help. MFJCTLBP API enables the retrieval of information related to the JCL control block or the DD control block parameters. See "MFJCTLBP" in your product Help for more information.

3238482 (11587)

- See "Additional Software Requirements for PACs" in your product Help for more information on software support and compatibility for Performance and Availability Clusters (PACs).

00367289 (13588)

- One of the parameters in the example given in 'Create Microsoft SQL Server Databases Using Script Files' has been corrected. It now reads `-password:<pass>`, and not `-password=<pass>`

(71177)

- The documentation now states that the iFileshare functionality has been deprecated. It also recommends the alternative solution for anyone that was relying on iFileshare.

00367322 (22266)

Enterprise Server

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- A CICS Web Service provider application sending HEX binary data could cause memory corruption in the SEP.

3237303 (13430)

- HTTP 403 restrictions no longer erroneously prevent access to ESCWA and ESMAC after interacting with the MONITOR > Monitor page in ESCWA and ESMAC.

(57283)

- CSKL can now detect the AMODE and CODESET of the EZASOKET security exit and then convert the parameters before and after calling the security exit.

3228264 (13281)

- A CTG failure targeting a secured region (legacy/casesm) has been fixed.

00362995 (27065)

- Configuring a region to have 47 Service Execution Processes resulted in the console daemon failing to start on DBCS platforms. This has been fixed.

00371935 (13365)

- An EJB-wrapped COBOL service involving multiple invocations would not always commit database changes until the dispose event was driven. This resulted in updates not being accessible while the service was in-flight. This has been fixed.

00367387 (13507)

- An issue with the FAULTCODESTR parameter on the SOAPFAULT CREATE API has now been resolved.

3232615 (11548)

- When a client application used IBM's CICS Transaction Gateway External Presentation Interface to invoke a transaction which executed an EXEC CICS START against the active facility, the support transaction CRSR could be left in a receive state which would block a service execution process. If this happened multiple times, the system would become unresponsive. This has been fixed.

00367517 (13608)

- When a task ended abnormally before an outstanding EZASOKET SELECT request completed, a run-time error sometimes occurred. This has been fixed.

3226329 (11526)

- An improvement to socket timeout detection from listener CSKL has been introduced to prevent an EBADF error.

3237573 (11787)

- Enterprise Server now starts the requested number of admin SEPs after PLT/PI is completed.

3224132 (11562)

- The output from `caslock` is no longer truncated at 64k.
00368510 00477856 (11573)
- A message is now displayed in the `console.log` file when Enterprise Server fails to create a process when starting a region.
3222161 (11434)
- If the execution of `casout -e{ "IMS Command" }` resulted in a large volume of data, it was possible for the CASSI process which serviced the request to go into a loop.
3241427 (12715)
- Fixed parameter processing when the `-x` option is specified with `casstop`. Information about the `-x` option has been added to the command line help for `casstop` and `casstart`. See `casstop` and `casstart` in your product Help for more information.
(26323)
- HTTP Headers processing now supports HTTP Headers that do not have any spaces between ':' and the value.
3232451 (12434)
- An issue with a 3270 printer hanging has been fixed.
00371937 (13490)
- `ECONNABORTED` on `EZASOKET` accept no longer abends with `CSKL`.
00365540 (11554)
- `casout` now supports a new option, `"-@"`, which enables you to retrieve the list of jobs waiting for input from the console.
3223866 (13359)
- If an Assembler data table which used `RLD` was reloaded using `CPMT NEW`, subsequent use by an `AMODE` program would result in an `RTS 205 Invalid mainframe pointer error`. If a table of this type and usage is to be renewed using `CPMT`, the optional parameter `AMODE` must be specified. When using the `castran` utility for the same purpose, you must specify the `-b` option.
3228790 (12522)
- Connecting a printer session matching a `TCT` with `termtype TN3270` no longer causes `casmgr` to enter a loop.
00371933 (12638)
- A truncation of custom messages occurring in `HSF` has been fixed.
00382022 (39011)
- The correct `commarea` is now passed when using an analyzer or a decoder that changes the content.
3232626 (11559)
- On `WEB RECEIVE` and `WEB SEND`, if you omit all of the code page conversion options (`SERVERCONV`, `CLNTCODEPAGE`, `CHARACTERSET`, `HOSTCODEPAGE`), no code page conversion will take place.
3232480 (11632)
- When a `CWI` analyzer program was not returning a converter or a server program, an `"EIBRESP 27 pgm not found"` message was returned. Enterprise Server now correctly returns the static response received from the analyzer.
00367285 (28199)
- An issue that caused `CWI/CWS` transactions to hang intermittently and subsequently cause the region to hang has been resolved.
3239256 (12660)

- An issue where characters were being carried over from a CWS output field into subsequent fields in a table has been resolved. This was occurring when the first field was full and contained German characters.
3237218 (13528)
- The `dfhcbtct.cpy` copybook is now provided with the product.
(25040)
- `casmgr` has been optimized to improve the use of initiators when dispatching jobs across the PAC. Improvement has also been made in the way it manages the queue of jobs waiting to be dispatched.
00367265 (32076)
- An issue in `casgate` when the application is CICS Web interface-related could cause an RTS 114.
00370924 (13568)
- MFDBFH database disconnection recovery processing has been improved for when a PostgreSQL server is stopped and then restarted while an Enterprise Server region is running.
3242098 (13576)
- A change to an internal synchronization procedure resulted an increase in the time taken for a DELAY to respond to a CANCEL from 20ms to 100ms. This has been fixed.
3236122 (12619)
- EXEC CICS READNEXT FILE now returns the correct RIDFLD when XRBA is used.
00367116 (26069)
- The CSKL listener now supports a comma or a space as a separator for the transaction from the client-data.
3228322 (12640)
- An issue which caused a memory leak when a long running transaction is using EXEC CICS starts has been resolved.
3243418 00384297 (11711)
- An issue with multiple header processing programs in the pipeline has been fixed.
3225239 (11464)
- In a multi-region configuration, when one terminal routed a transaction to a different region for execution, but was disconnected before the transaction completed, this sometimes caused subsequent rerouted transactions to hang. This has been fixed.
3227734 (12443)
- If a soft kill for an IMS transaction fails, a hard kill is then issued.
3228094 (12437)
- HSF records had a response time of 0 when the application executed EXEC SQL statements and there were no trace flags switched on. This has been fixed.
00367263 00383874 (23073)
- Attempting to connect to an address with no listening server no longer gives an unexpected GkCWI: OPEN: unable to open connection: (8) and instead times out.
(51088)
- If `ES_ESM_XUSER=NO`, Enterprise Server still performs a check for the surrogate user to be defined in the system but does not check for the surrogate authority.
3231824 (13335)
- In a region with MFDBFH enabled, Run-Time System errors were not sent to the console.log.
3229195 (12404)
- A problem that prevented the User ID or Group ID from being displayed in the CICS "Signon complete..." message has been fixed.

3185569 (11456)

- An issue could result in an IOERR occurring on a REWRITE of an RRDS or ESDS file if that file was stored in a datastore.

3236142 (11706)

- When running in a clustered Enterprise Server configuration, if a significant number of locks (approximately more than 600) were required for a job to execute, the batch initiator processing the request would trap while trying to acquire them. This has been fixed.

00373527 (12653)

- The `casout` utility will no longer take a "deny write" lock when reading spool records.

00373846 (26241)

- In the case of the SEP monitor thread performing a soft kill, CAS will now defer freeing shared memory blocks (ICE and ACPE) associated with task DCA until end-of-task processing in the main thread.

(29002)

- A problem with CICS Web Services for JSON whereby an array not being present in the request meant that the request data was not written to the DFHWS-DATA container has been fixed.

3229395 (11604)

- CICS Web Services will now accept the string values of "true" and "false" as aliases for the boolean values true and false in JSON requests (as per the mainframe).

3223474 (13521)

- A trap could occur if the regions in a PAC were not all using EZASOKET.

3232556 (11744)

- A new option has been added to the `casout` utility. An IMS MPR can be stopped and replaced with the same class using the command: `casout /-{process-id}`.

3241426 (12681)

- During a terminal disconnect, MFCS will no longer get trapped in a loop under a shared memory lock.

3242752 (13592)

- If a database-hosted file was first opened using an alternate index FCT, then a subsequent record modification using the primary FCT would fail with status code 9/100 (6.0) or 37 (5.0).

(10338)

- An issue with the SOAPFAULT CREATE API and the FAULCODESTR option has been resolved. An issue with data being stored in DFHHEADER containers has also been resolved. New line characters are now stripped out to ensure the data is in the same format as on the mainframe.

00365431 (12655)

- Enterprise Server now enables automatic reconnection to the standby Queue manager in an Multi-Instance Queue Manager. See "Reconnecting to an MQ Server in a Multi-instance Queue Manager" in your product Help for more information.

00367275 (13387)

- An issue where the Syncpoint option of MQ PUT and GET APIs was set to "NO_SYNCPOINT" has been fixed.

3241185 (11747)

- When using MQBACK in JCL the messages were not rolled back if the user had not specified mqpmo-syncpoint when the message was stored using MQPUT or MQPUT1. This has now been fixed.

00725720 (69586)

- Threshold values for CPU, MEMORY, and ELAPSED TIME can now be monitored for CICS transactions and JCL. This can be configured in either ESMAC or ESCWA using the THRESHOLD resource.

3238155 (12524)

- Intermittent I/O errors (typically reported with a 9/13 file status) occurred during file creation when using DB2 datastores.

(9767)

- For a PAC, you can now specify that all changes to timeouts, trace flags, and memory strategy will be applied to one of three options:
 - Only the local region.
 - All members of a PAC except the regions where local changes have been made.
 - All members of a PAC.

You can configure this in ESCWA with the Apply Scope field on the ES CONTROL page. Alternatively, you can use the casutl utility with the /w option. See casutl in your product Help for more information.

00367291 (28046)

- An RTS 114 no longer occurs in CASSTORE during concurrent SET-FILE / RELEASE PROGRAM statements.

3240785 (12742)

- A trace that was unconditionally written is now under the CWS trace flag control.

3230887 (11721)

- It is now possible to enable persistent connections with the server for CICS Web services and CICS Web interfaces. The socketclose attribute on URIMAP definition must be set.

3222280 (12407)

- An issue with the CICS Web service provider has been resolved where the absence of charset in the content-type http header was causing an abend response to be sent to the client.

00365437 (11749)

- An RTS 114 could occur when the Analyzer was compiled with the AMODE Compiler directive,

3231834 (12467)

- In a PAC, discarding an ENQMODEL may not have resulted in the resource being removed from all regions. This has been fixed.

(58336)

- When an ASCII client (such as the CICS Transaction Gateway EPI) connected using a terminal definition which was configured with programmed symbol support, uninitialized BMS map fields were being returned encoded in EBCDIC.

00367518 (13586)

- The "3270 SNA Simulate End Bracket" field found in the SIT table was not being exported and imported correctly. This is now fixed.

00371938 (12574)

- An issue existed with importing and/or exporting a (long) SIT fileshare username and password with casrdtup or casrdtex. Lower-case characters are no longer converted to upper case, and the fileshare username and password are now correctly displayed in both ESMAC and ESCWA.

00371939 (23050)

- A new filter field "resFilter" has been added to the following ESMAC resource listing modules:
 - Every resource in by Type
 - Every resource in by Start L
 - Resource lists under groups
 - Every active resource type except Locks

This parameter will filter the list of resources returned and displayed by ESCWA and/or ESMAC. This will avoid excessive response buffers being sent over the network which might degrade browser performance. In addition, a new environment variable ES_RDO_MAX_RESOURCES has been added.

This enables you to specify a limit to the number of records ESCWA and/or ESMAC will attempt to display. For JSON requests the list being truncated will be indicated by the addition of the JSON property "truncated": true.

00367293 (13581)

- An issue which could cause deadlocks when using the SPOOLOPEN API has been resolved.

3239394 (11788)

- The stack size of `cassi.exe` has been increased from the default 1Mb to 2Mb.

3232744 (13324)

- CICS-MQ Bridge functionality is now available as a Technical Preview. It supports CICS target DPL applications that interact either with a COMMAREA or CONTAINER interface.

00363634 (11447)

- Matching transactions with Threshold resources meant that Threshold properties could be applied to the wrong transaction. This has been fixed.

00446454 (57042)

- ENQs are now cleaned up in the event of a SEP termination.

(51133)

- A deadlock scenario when writing to recoverable TSQs has been fixed.

(10161)

- An issue with READQ TS (returning QIDERR) after an EXEC CICS START in a PAC has now been resolved.

3237618 (13451)

- An issue where a user with UPDATE privileges to a CICS resource could not access the page in ESMAC. Previously, if the user had READ privileges only, they were allowed to access the page in ESMAC. This has been fixed.

(58200)

- A trace that was not controlled is now emitted when the trace API flag is enabled.

3231371 (11628)

- Default users were not added to HSF. This has now been fixed.

00376906 (31028)

- A LENGERR can no longer be returned when the SET option is used on READQ TS as on the mainframe (this condition only applies to the INTO option).

3232135 (11736)

- Enabling ESLOGGING for the Oracle Switch resulted in an error. This has been fixed.

(46056)

- XA switch now handles CAS xa-flow correctly to resolve in-doubt transaction issues on connection loss.

00368472 (48018)

- XA switch now handles CAS xa-flow correctly to resolve in-doubt transaction issues on connection loss.

00368472 (48018)

- The XA Switch module now tries to reuse an existing connection in order to prevent multiple connections being opened for the same XA resource within the same process.

3239642 (13477)

- The DB2 XA switch module now works with DB2 applications that are compiled with the NOPRE directive option.

3237650 (11691)

- The `ES_XA_%xaname%_OPTIONS` environment variable can attempt to reconnect up to a maximum of 9999 times.

00455239 (59135)

- A new exit for ESXACUSTOMORA has been added to the Oracle switch module. The build scripts have also been updated with some new options to enable this logic.

00367295 (20268)

- The call to retrieve XA information version 3 (entry point mF_ES_get_XA_info) provides the following additional information: - For IMS: Transaction ID, NETNAME and Task number. - For JES: Job Number, Job Name and Step Name. - For CICS: Transaction ID, Terminal ID and NETNAME.

00367252 (12705)

- The XA Switch module now handles the Duplicated Connection error correctly.

3211450 (11427)

- JCL jobs no longer fail as a result of previous jobs experiencing a failed connection.

3230480 (12454)

- The Vault module is no longer unloaded after the first transaction.

3243323 (12584)

- The SQL cursor is now kept opened when CICS SYNCPOINT is executed if the cursor type is WITH-HOLD or the SQL compiler directive option CLOSE_ON_COMMIT=NO is specified.

00364548 (11684)

- The DB2 XA Switch module now sets the Package Path correctly.

00362931 (12718)

- The Micro Focus Directory Server security configuration custom text could not be set or modified from the Enterprise Server Common Web Administration (ESCWA) HTML GUI interface or API.

(9646)

- ESCWA can now set region listener endpoint values that contain a valid hostname as well as an IP address value.

(10258)

- When creating a new Communications Server for a region the "autostart" value was incorrectly set. This has been fixed.

(71033)

- MFDS now supports the HTTP Strict-Transport-Security (HSTS) response header in responses from its TLS-secured endpoint.

00368444 (11617)

- Changing the configuration of a running region no longer causes the region to change to 'Not Responding' status.

00620712 (70308)

- You can now establish new MFDS sessions even if the maximum number of concurrent sessions is reached. A minimum number of UI administration sessions will always be retained.

3240043 (13428)

- An issues with the MFDS service not starting if the MFCESD licensing daemon was not started has been resolved.

3228431 (12644)

- The Micro Focus Directory Server HTML GUI now includes an additional XSS protection.

3243314 (13537)

- Previously, a low-privileged user (without read permissions to a region) could manipulate URLs to get read access to that region's Server properties, listeners, services, packages and handlers. This information leakage has now been fixed, and in these case the user will now see a 403.

00368584 (11392)

- The PAC/SOR values of a region copied from another region with the help of the Micro Focus Directory Server UI could be incorrect.
00370915 (13478)
- Region import will no longer fail if the mfServerNonDefaultSecurityConfiguration node is missing.
00696539 (69402)
- Exporting the MFDS Journal when using a 64bit MFDS process could cause a crash. This has now been fixed.
(9735)
- MFDS no longer errors when eight Security Managers are configured to be stacked for use by the MFDS process. Eight stacked Security Managers is the maximum permitted.
3232694 (12528)
- When a malformed request was sent to MFDS it could become unresponsive. This has been fixed.
00445311 (58026)
- Fixed a regression causing incorrect files to be output from an MFDS Web UI export.
(86058)
- The text for the Cold Start option of the IMS TM General configuration page (page id i300) in MFDS has been fixed to always say "Everything (queue)". Previously, it could show "Queue only" in some circumstances.
(9853)
- When using MFDS via a web browser or connecting to it via mldap (with MDUMP for instance) it was possible that MFDS would not respond immediately. This has now been fixed.
(57189)
- If a user or user group has a "Read" allow but no "Update" allow ACE for the "Enterprise Server Administration" class "Options" resource, then they will be able to view but not update the MFDS options values. Previously only the "Update" rule allowed a user to view MFDS options.
3217327 (12380)
- MFDS now sends the "Secure" cookie attribute if MFDS has been configured to use TLS.
3228919 (11606)
- If the MFDS process has been restarted or you have clicked its "Renew" option, client applications such as Server Explorer inside the IDE and ESCWA will now automatically reestablish a connection.
(10516)
- When using startup and shutdown scripts in MFDS, when run for a second time it would result in a permission error when writing the script out to a file. This has now been fixed by keeping a backup of the existing script and by writing the new one out again.
00377287 (30073)
- The "Web Services and J2EE" listener of the IVP ESDEMO and ESDEMO64 regions now use the current "mfcs-mp" connector rather than the legacy "soap" connector.
(61291)
- A potential double free caused by a race condition involving the exit handler has been fixed.
3242625 (11709)
- MFDS became unresponsive when performing multiple simultaneous service deployments. This has been fixed.
00739041 (87099)
- When you perform an XML export or import of regions with multiple communication processes, the communication process autostart option value is now correctly preserved.
3236278 (11644)

- If the calling program was compiled AMODE, the pointer returned by EXEC CICS ADDRESS ACEE(...) would be NULL. This has been fixed.
00458309 (59118)
- When using the region name option (/f) with `casclsec`, the option was not passed to the utilities invoked. This has now been fixed.
00696227 (73045)
- When applying a DEQ to an ENQ that is held in shared memory, return the ENQMODEL stored in the enqe record during check-enqmodel-match rather than attempting to re-match the ENQMODEL. During installation of a defined ENQMODEL, Enterprise Server will check if there is an active DB lock which would have matched the ENQMODEL, if there is then the installation is rejected.
(46051)
- When using an analyzer with CICS Web Interface the `wbra-user-data-ptr` was not set to the address of the received body. This has been fixed.
00480360 (62192)
- If during a CICS write TD on an extra partition CASTSC process died, the SEP will just hang and never receive a response. Now on reply with IO/ERROR to the SEP when CASTSC recovers.
00466831 (57211)
- CWI applications that issued EXEC CICS SYNCPOINT commands had incorrect values in the response time field of the HSF record. The value was the duration between the start of the transaction and the first use SYNCPOINT. This has now been fixed, so that the response time value is for the entire duration of the transaction.
00458587 00471775 (58300)
- You can now search for an individual PDS member by name or pattern, up to and including 8 characters, by using the Filter field.
00485550 (69042)
- A number of fixes have been made to do with the THRESHOLD resource including:
 - In a PAC, discarding a THRESHOLD would only result in it being removed from a single region. This has been corrected so that the THRESHOLD is removed from every region in the PAC.
 - Thresholds were not being applied to CICS transactions and JES jobs on a best match basis. Now the most accurate match will be applied. For example, for a transaction called "FRED", a THRESHOLD called "FRE*" would be applied over a THRESHOLD called "FR*".
 - After discarding a THRESHOLD, existing CICS transactions that were referencing that THRESHOLD would continue to reference it. The transaction is now updated to reference the next best matching THRESHOLD, if there is one.
 (57104)
- MFFTP creates an end-of-line (eol) file when the file transferred from Enterprise Server is a Variable Block (VB) file. A new environment variable (MFFTP_DISABLE_EOL=Y) enables the VB file to be transferred from the Enterprise Server environment as it is. The default value is 'N'.
00477620 (57488)
- When using =CIC for default CICS thresholds to be applied, the default values were applied to SDP2 incorrectly. This has been fixed.
00730137 (83003)
- An issue with a SEP been killed and stuck in termination has been fixed.
00675262 (69370)
- When the External Security Facility in Enterprise Server has the auditing option enabled, with the syslog auditing option, some processes could accumulate multiple connections to the syslog server.
00374548 (12564)
- In an Enterprise Server instance processing a heavy IMS workload with external security enabled, lock timeouts could cause undefined behavior. This has now been fixed.

3237867 (13457)

- Enterprise Server can optionally cache the results of user signon (ESF Verify) requests in order to improve the performance of signon operations. Caching these requests from any mainframe-emulation environments now works properly when enabled in the security configuration.

3232724 (11516)

- In some cases, portions of the configuration text of an Enterprise Server External Security Facility configuration were not processed correctly. This has been fixed.

(58016)

- The Enterprise Server ESF Admin LISTUSER command has a new optional parameter which disables locking the group list while computing a user's group membership. See the documentation for LISTUSER in your product Help for more information.

3235237 (11586)

- Enterprise Server ESF Update requests no longer report an error if a Security Manager does not recognize a user or group being updated.

00383391 (32087)

- When Enterprise Server Externals security is used with both PAM and LDAP external security managers, and all-groups, federation, and PAM groups are enabled, the PAM groups are correctly added to the user's group membership when the PAM ESM is not the first ESM in the list.

3221760 (11538)

- When Enterprise Server External Security is configured with both a PAM security manager (pam_esm) and an LDAP security manager (mldap_esm), and all-groups mode and group federation are enabled, and the PAM security manager is configured for PAM group processing, the various ESF Update operations (update user, update group, update all) will now correctly update the user group membership information from both security managers.

(8088)

- The Enterprise Server External Security Facility's Update feature could sometimes cause a SEP to abend with a COBOL RTS 114 error. This has been fixed.

00384962 (47011)

- The Update All button was not refreshing the group permissions for a name mapped user in an LDAP ESM. This has been fixed.

00364056 (11765)

- Arabic support for Enterprise Server applications is available as part of the in-built code set support. If you are building Arabic support into Enterprise Server applications, your terminal emulator must support the Arabic EBCDIC 420 code page. Support is added by building your applications and configuring your enterprise server regions with the MFICODESET variable set to the supported country code (0420). Your product's in-built code set translation utility performs translations between the ASCII 1256 Arabic code page on your enterprise server region, and a terminal emulator that supports the Arabic EBCDIC 420 code page (for example, IBM's Personal Communications emulator).

00374780 (11480)

- If a deployed application does not require a full Enterprise Server product to be available, but also relies on the inbuilt DBCS translation support, those applications must be deployed with the appropriate code set mapping files, and then you must use the MFICODESET_DBCSDIR environment variable to locate those files at run time. See 'Codeset Translation' in the product documentation for more details.

(10286)

- Access to the ESMAC pages are now verified and validated server side when applicable. A disabled button client side could be re-enabled and used to access an unauthorized page. This has been fixed.

00368464 (12713)

- Enterprise Server will now issue a physical cancel to ESMAC modules even if CAS_SRV_CANCEL is set to a non-default value.

3245515 (27055)

- ESMAC will no longer attempt to interpret the passtoken. It will now pass it to the System Authorization Facility (SAF) for validation.
00367223 (11546)
- Redundant comments in the source code have been removed.
3239529 (12691)
- Cookie validation has been improved to prevent any unauthorized tampering with the casCookie.
00368456 (11740)
- In ESMAC, the messages after a job has been submitted are now in proper JSON format. This page now works in ESCWA when MFJUXIT is enabled.
3225866 (12399)
- An issue with displaying PDS with dynamic extensions having less than 3 characters has now been fixed.
00367512 (12366)
- An issue with the security rule for accessing JCL datasets in ESMAC has been resolved.
3232961 (12578)
- There is a performance improvement in the spool search. When the jobname filter is used, sorting based on jobname contributes to a better performance.
3228008 (12391)
- The step name field in the Threshold resource was being cleared even when that field was enabled (resource type = JES). This has been fixed.
(57552)
- Creating an Active MQ Listener failed. This is now fixed.
(69437)
- When persistent connections are being used, lost connections to the server were not being handled, and reusing the same session returned incorrect responses to the application. This has now been fixed to verify the connection before reusing it; if lost, a new connection is established on the EXEC CICS WEB OPEN.
3222280 (12448)
- Enterprise Server External Security passtokens and the DCAS (Digital Certificate Authentication Service) feature now work properly when using a security configuration with two or more Security Managers of different types.
3231876 (11549)
- The Enterprise Server DCAS feature has been enhanced to work with IBM HATS.
00431373 (57050)
- Handling sessions for the Micro Focus Binary Protocol has been enhanced in the Micro Focus Communications Server. This resolves a number of long-standing issues where sessions could be leaked or misused by misbehaving clients. It affects J2EE services hosted by Enterprise Server and possibly some other uses of the MFBINP protocol.
00367384 (12716)
- Language specific decimal separators are now dealt with by the MFCS and by extension ESCWA components when outputting JSON.
00502140 (69256)
- Enterprise Server's `esfupdate` utility now supports updating servers where the Communications Process control listener is configured for TLS (SSL).
3236811 (11615)
- When using Ezasockets in an aggressively multi-threaded environment, an RTS 114 message could cause a crash.

00370924 (11681)

- In Enterprise Server, performance and capacity have been improved when retrieving large files, such as server log files and spool output, over the Internet.

00370973 (12381)

- An issue in the CICS Web Interface and CICS Web Services processing which could cause hung sessions and ultimately a hung communications process has been resolved.

3229566 (12659)

- Tracing options have been added to the EZ Sockets (EZASOKET and EZCICAL) feature in the Micro Focus Communications Server component of Enterprise Server. See 'Configuring Communications Processes' in the documentation.

3237573 (13540)

- The following headers on the responses for the multiprotocol listener (often named "Web Services and J2EE") have been added:- X-Frame-Options- X-XSS-Protection- X-Content-Type-Options- Content-Security-Policy This includes ESMAC responses.Header values:"X-Frame-Options": "SAMEORIGIN""X-XSS-Protection": "1; mode=block""X-Content-Type-Options": "nosniff"Content-Security-Policy": "default-src http: https;; img-src 'self'; script-src 'unsafe-inline' 'self'; style-src 'unsafe-inline' 'self'; worker-src 'none'; object-src 'none'"

00367046 (13389)

- MfsecretsAPI no longer masks exit codes from COBOL applications.

(10521)

- Support for the Hashicorp vault is now available in the Secrets API.

00370908 (11321)

- The migrate command of Mfsecretsadmin now works when two separate configurations files are specified.

00365440 (11662)

- An incorrect error message was displayed when disabling an ENQ Model CICS resource. This is now fixed.

(57350)

- In ESCWA, the JES spool and catalog pages were not displaying text inside angled brackets "<>". This has been fixed.

3230888 (13354)

- When ESMAC CSRF handling was active, and the first request to ESMAC was a POST request, the request failed because it had no CSRF token. To correct this, the ESCWA server now obtains a CSRF token by making a GET /native/v1/regions/{host}/{port}/{region}/esproperties request before the POST.

(10570)

- A notification was incorrectly displayed when opening or closing a DCT. This has now been fixed.

00364218 (12601)

- The number of items than can be displayed in the ESCWA tree has been increased to 512.

(8765)

- An issue resulting in sporadic 403 errors when viewing the Spool in ESCWA has been resolved.

(8700)

- An issue where it was not possible to set the Codeset on Catalog Entry DCBs in ESCWA has been resolved.

(9706)

- Added a DOWNLOAD option to the ESCWA Journal page. See *Journal* in your product Help for more information.

(57228)

- The STOP POLLING button has been added to the ESCWA Control page. This enables you to stop polling for the region's status while starting and stopping a region.



Note: Clicking STOP POLLING will not stop the region from starting or stopping.

(6983)

- The unit on IMS TM Keypoint Frequency was incorrectly labeled as seconds. To correct this, the label has been changed to events.

(52166)

- An issue with regions created in ESCWA not showing in the Web Service - Deployment Server list in Eclipse has been resolved.

3234600 (13345)

- Unable to delete multiple JES initiators or printers without refreshing the page. This has been fixed.

(10669)

- The ESCWA security page did not clearly identify that it was only for configuring ESCWA's security and did not affect Directory Servers. The page now has the new title "ESCWA Security Facility Configuration" as well as a new information alert to make this clear to users.

(9711)

- In ESCWA on the SEPs page when IMS is enabled and configured for MPR, the IMS MPR Processes table now displays the 'Name' column by default.

(69480)

- ESCWA server now correctly constructs the change password request to MFA using themfNewPassword attribute of the /mfa/v1/{host}/{port}/logon API when it is provided.

(59055)

- A problem translating names displayed on table filters to match their corresponding columns has been fixed.

(53076)

- Sorting the JES Spool no longer results in the sorting reverting.

00484605 (69083)

- ESCWA now creates the `commonwebadmin.json` file if it has been deleted rather than refusing to start. You can use this to reset ESCWA back to a default state.

00367573 (13511)

- In ESCWA, you can now disable the logon screen animation. To do this, at the top right of the menu bar click the user icon and then switch off Animate Logon.

00366659 (11795)

- ESMAC sent response and latency percent information to ESCWA which did not total 100%. In this case, ESCWA was displaying the wrong information in its HSF detail charts. This has now been fixed.

00372430 (27158)

- The API documentation for ESCWA ESM requests has been updated.

(26197)

- On the "JES Spool Job job-number" page, when you click DISPLAY to view job step information, the input validation has been added to the Start and For fields to ensure that their maximum values are no greater than 99999999 and 99999 respectively. This matches the maximum values for the equivalent fields in ESMAC.

00446353 (57264)

- ESCWA lost connection information for Directory Servers when the ESCWA session timed out. This has been fixed.

(7891)

- Underlying issue causing the SSL authorize page to appear when navigating between listeners has been fixed; the SSL authorize page now only appears when you click Authorize.
(8638)
- When using the ESCWA or MFDS Web APIs, a new session cookie is now attached to a failed API response.
(9661)
- ESCWA now handles regions that are started correctly but it cannot contact if it has its listeners set to connect on loopback only.
(51008)
- ESCWA now validates ports for /config APIs.
(8730)
- MFCC will now correctly parse IPv6 addresses when connecting.
(8498)
- Fixed segfault on the exit of the ESCWA shutdown command line option.
(69484)
- Virtual scrolling has been implemented for the JES Spool table in ESCWA. This is to improve performance and responsiveness for tables that contain many rows.
00366649 (11724)
- Sorting the JES spool by descending order now works correctly when loading more results while scrolling down the list.
(69292)
- The new ESCWA copy region functionality enables you to copy or discard the port as required.
2795268 (11098)
- On the ESCWA JES Output Queue page, you can now cancel jobs that have an OUTPUT TYPE of Active or Dispatch, otherwise they can be deleted.
(10532)
- Missing documentation for the Spool Job API (/native/v1/regions/{host}/{port}/{region}/jobview/{job}) has been added.
(10569)
- The TranClass field for PCT objects in ESCWA is now disabled when the region is not TranClass-enabled.
(61235)
- The following fixes are included in this release:
 - Default values for a new FCT are now consistent with ESMAC
 - Read Access, Add Access, Browse Access, Delete Access, Update Access, Backward Recovery, and EBCDIC Collating Sequence are all selected by default
 - Path Extension is set to DAT
 - LRECL Min, LRECL Max, Key Position, and Key Length are set to 1
 (57497)
- The following fixes have been applied:
 - Default values for a new PCT are now consistent with ESMAC
 - Translate to Upper Case is now selected by default
 - Input Timeout, Runaway Timeout, Deadlock Timeout, and the Transaction Threshold System Default are now deselected by default
 - TranClass is now set to DFHTCL00
 (61231)

- ESCWA will now generate an error and prevent changes being made to a Communications Process if the region would no longer have a Communications Process set to auto start.
(62177)
- The "In Service" checkbox on a new Sys62 CICS resource is now checked, in line with the behavior in ESMAC.
(62187)
- The Host field was incorrectly displayed for the TCP/IP Service CICS resource. Default values for Open, Transaction, URM, Port, and Socket Close fields have been fixed. In addition, the Status field on the active page now displays the correct value.
(57537)
- Control characters present in the `console.log` resulted in invalid JSON. The ESCWA server now replaces these control characters with spaces.
(61254)
- The size of tables in ESCWA are now adjusted based on the number and height of the rows.
(10385)
- Updating JES Catalog DCB entries via ESCWA no longer modifies the created time of the DCB.
(10654)
- ESCWA now displays a warning if creating an MSS enabled region in an environment without an MTO license. It will not create the CICS and JES services if the region is not MSS enabled.
00487304 (71110)
- MFDS Logoff method has been implemented in the ESCWA API and Web UI.
(51041)
- Widgets on the ESCWA dashboard now display the name of the directory server as well as the region. This enables you to differentiate where regions have the same name.
3225866 (13408)
- The Enterprise Server MLDAP ESM module no longer leaks sockets when there are transient connection or bind failures with the LDAP server.
00378150 (30089)

Enterprise Server Auditing

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- When using MFAuditAPI with the SYSLOG emitter in an aggressively multi-threaded environment, an RTS 114 error message could be generated.
3238495 (11712)

File Handling

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- MFDBFH now correctly handles schema names that are specified more than once when updating the CURRENT PACKAGE PATH. Previously, this was treated as an error causing the associated database operation to fail.
00374750 (24079)
- The `dbfhconfig` utility now preserves any attributes specified for configuration file elements that cannot be changed using a command-line option.
(46058)
- Improvements have been made to MFDBFH to reconnect where possible when database connections are lost.

3225946 (12378)

- The `dbfadmin` command-line tool has been enhanced to allow PostgreSQL databases to be created on a remote server, or a server using the non-default port 5432. A remote PostgreSQL server can now be specified using the `-host` option, and an alternative port number can be specified using the `-port` option. Previously the only way to use `dbfadmin` to create remote PostgreSQL databases was by setting the `PGHOST` and/or `PGPORT` environment variables prior to use. Alternatively, the PostgreSQL `psql` command could have been used to directly execute the generated SQL script.

(71250)

- Configuration options have been introduced to restrict the lifetime of database connections. These options are primarily for use with PostgreSQL to enable integration with connection poolers such as `pgbouncer` and `pgpool-II`.

00367281 (24080)

- Newly-created ESDS files now support the full 32-bit ESDS key space. Existing ESDS files will remain limited to 31 bits/half the space.

00367110 (12692)

- The Enterprise Server transaction performance has been improved.

3232506 (12506)

- An I/O error occurred during a file open operation when a Db2 SQL application was sharing the user database with an MFDBFH datastore and had issued a "SET CURRENT PACKAGE PATH" command. MFDBFH now automatically appends any schemas it needs to the current package path when required.

3214792 (12453)

- For PostgreSQL datastores, where optimised I/O was enabled, read operations for sequential files were returning zero-length data for the second and subsequent batch of records that were read-ahead (typically after the first 50 records for normal optimised I/O, and 1000 records for file downloads). This was causing problems when defining new VSAM clusters with IDCAMS. This is now fixed.

00370919 (28059)

- An RTS 114 error sometimes occurred if the CAS spool view was repeatedly refreshed while switching between Active, Completed, etc.

(8805)

- A 9/21 error (file is directory) is now returned if an attempt is made to open a filename which has been specified as a folder URL.

(9444)

- When returning a record read from a line-sequential file, MFDBFH did not pad the record with spaces. This was incompatible with the EXTFH behavior for a disk file.

(10361)

- MFDBFH did not reconnect to PostgreSQL databases after losing connections.

(10205)

- An ESDS STARTBR specifying `prev` (or `prev equals`) with a RID of `X"FFFFFFFF"` was not correctly starting the browse from the last record in the dataset.

00367110 (12555)

- Attempting to dynamically allocate a fixed-length file with a record length of 0 using the MFJCTLBP API (SVC 99) no longer causes an ODBC error when using SQL Server.

00366185 (11762)

- MFDBFH enhancements have been made to improve performance when components need to check for the existence of database-hosted files.

00468750 00488011 (61239)

- MFDBFH no longer causes excessive `CBL_THREAD_SLEEP` API entry/exit events being output to CTF trace files when RTS tracing is enabled.

3226855 (13319)

- Intermittent deadlocks could occur when SQL Server resource locking was being used in an Enterprise Server PAC

(9814)

- MFDBFH has been enhanced to improve the recovery from a lost database connection, and other transient errors, when creating a file.

(69520)

- MFDBFH now supports Oracle databases (version 19c and later).

00367287 (13426)

- MFDBFH no longer uses the default stack size associated with the main thread of the process when creating its worker threads. This helps avoid receiving any RTS 114/115 errors at run-time due to memory exhaustion if the user has specified a very large stack size to be associated with the main thread.

00373754 (12548)

- Performance enhancements have been made for MFDBFH's handling of COBOL READ statements. Part of these changes now installs an additional database index for each alternate key associated with a file when the key is created. For files that have been created prior to this change, the "dbfhdeploy upgrade" command has been enhanced to install all missing indexes for a given file.

00488011 (70352)

- The performance of the ESMAC Catalog View has been enhanced when using a database hosted catalog file and when specifying a dataset name filter with a leading wildcard character.

3242217 (11705)

- Performance improvements have been made to JES spool housekeeping when the spool files are hosted in a database.

(60015)

- Performance improvements to JES spool housekeeping have been made for spool files hosted in a database.

00367284 (30050)

- Performance improvements have been made to JES spool housekeeping when the spool files are hosted in a database.

00367284 (25071)

- Database file handling is now denied, and an error message output, if the application is not using the multi-threaded COBOL Run-Time System.

3234454 (12626)

- An error message is now output when attempting to use `dbfhadmin` to generate a script file to a non-existent folder, or to one without write permissions. Previously the operation either silently failed, or resulted in a run-time system error 115.

(62236)

- The "`dbfhadmin -region -list`" command failed to list regions which were not associated with a database of the same name. This problem could occur when a single physical database was used to host regions and datastores. The problem is now fixed.

(30001)

- When an Enterprise Server instance has been configured to use database-hosted resource locks, the ESMAC Locks view no longer remains in a busy state if the connection to the region and/or cross-region database has been lost.

(51129)

- MFDBFH is automatically upgrading existing datastores to resolve some existing restrictions on the maximum number of files that can be supported, and to prepare for future enhancements. Datastores periodically need to be upgraded and should not impact the user in any way. However, in previous

versions of MFDBFH, if an upgrade did fail, it would do so silently and could only be detected by trace files and/or unexpected application behavior. If an upgrade does fail, it is normally due to the client connection having insufficient database privileges to perform the operation. This change now also reports an upgrade failure to the user and give the user the opportunity to manually perform the upgrade using the new "dbfadmin -upgrade -datastore *datastore-url*" command. This command generates an SQL command script, which should then be executed by a database user with sysadmin privileges.



Note: For Enterprise Server scale-out systems using PostgreSQL datastores, you may want to consider temporarily shutting down the system, applying the patch update on each of the scale-out machines, and then restarting the system. This will avoid potential batch job failures that could occur on active scale-out machines that had not had the patch update applied due to them still using cached older versions of procedures that have been replaced by the upgrade.

(58126)

- When using Microsoft SQL Server, WRITE operations no longer fail with a 3/0 status (I/O error) for files using AUTOMATIC|MANUAL SINGLE record locking when a record lock is not held.

(58041)

- A temporary file that was being used by the rebuild utility had its file size restricted, which caused the recovery of large files to fail; this has now been fixed.

00375739 (30033)

- A performance issue has been addressed that was affecting parallel compilation.

3230709 (12666)

- A stability issue has been resolved that was being caused by using SHARE-OUTDD in a batch setting.

00369363 (13336)

- Specifying a collating sequence for a VSAM file no longer causes a file error to occur.

00371932 (13458)

- A new Fileshare Server option is available to control the regularity in which the disk file checks are carried out when the Flush on Commit (/fc) option is in effect. By default, the check occurs on every flash, but by setting /fds <value> you can limit the number of times the check will be performed. Permissible values are 1-65536. Any values < 1 is treated as 1, and any value > 65536 is treated as 65536.

00370974 (13238)

- FSMGR was not logging out all clients when instructed to.

3237032 (12656)

- Any temporary file created through Fileshare by Data File Tools will be deleted if Data File Tools crashes or is disconnected.

(69512)

- Using a literal string C'xx' within UTFIL OUTREC together with the SORT-EBCDIC option no longer results in incorrect output data.

3172697 (13232)

- A SORT issue, where data could be shifted by 4 characters, has been resolved.

3236136 (12630)

- An issue has been resolved that required the LRECL to be submitted for the SORTOUT entry in ICETOOL and MFJSORT. This is no longer the case.

3236709 (11793)

- The NOCC operator is now supported within the ICETOOL DISPLAY statement.

3238243 (11700)

- The RC8 operator is now supported in ICETOOL.

3238270 (12728)

- Header processing for multiple OUTFIL files has been corrected when the input file is empty.
00422273 (51118)
- The ICETOOL utility now supports signed free-form (SFF) values.
3232522 (11523)
- An issue has been resolved in ICETOOL where the DCB values were not being inherited when a temporary data set was being used.
3238537 (11735)
- For SORT operations, the HEADER/TRAILER processing when the input file is empty has been corrected.
00367266 (26302)
- An issue has been resolved when a SORTIN file contains an LRECL of 0 - this now results in an error being generated.
00371930 (12446)
- Sign processing no longer occurs on a record whilst it is calculating the maximum record size. Previously, it could, leading to an error.
00478968 (69030)
- Converted field length was not being reflected in the record length when using SORT.
3230263 (12423)
- When using the ICETOOL emulation, SPLICE WITHEACH processing ignores the extra overlay records if they do not have matching WITH fields.
00367283 (28052)
- An issue has been resolved that was causing CONDITIONS used by OMIT and INCLUDE statements to not match when they should.
3228624 (11605)
- An issue has been resolved where using SORTOUT and OUTFIL could cause the length of the records returned to SORTOUT to be incorrect.
00374078 (11591)
- An issue where ICETOOL could abend when using empty files has been resolved.
3230200 (13401)
- The SORTINxx entries no longer need to be sequential.
3236172 (11552)
- An error that was occurring when using "inrec field (x:" has now been fixed.
00366652 (13442)
- An issue that was caused by CONVERT fields not being initialized has been fixed.
00620654 (69353)
- An issue with parsing some ICETOOL syntax has been resolved.
3236709 (11694)
- Unsigned free-form (UFF) values are now supported in the SORT and ICETOOL utilities.
3236959 (11708)

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- A COBOL data item defined as FILLER was erroneously identified as a valid host variable name. This has been fixed.
00368027 (23002)

- A problem with HCOSS DDL generation that prevented a non-unique clustered index to be created for a table has been fixed.
00365023 (13204)
- An issue where setting the “Log Error Rows” option in HCOSS could result in an “0xC0048021” error when transferring a table and/or exporting the SSIS package using SQL Server 2016 and 2017 has been resolved.
3233151 (12483)
- An issue where using the SQL compiler directive DIALECT=MAINFRAME in HCOSS could result in incorrect timestamp durations has been resolved.
3234252 (13383)
- A performance issue in multi-row inserts caused by CHARSET(EBCDIC) has been resolved.
3241585 (24045)

IMS Support

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- The /DISPLAY LTERM ALL command no longer causes a signal-11 failure in certain scenarios under heavy load.
3241395 (13508)
- Issuing the /START TRAN command for a transaction for which a large number of messages are waiting no longer causes other work in the system to be suspended for an extended time while the /START TRAN is executing.
00403418 (52001)
- A problem that sporadically caused an RTS 114 error when an MQ-triggered transaction issued a ROLS command has been fixed.
3235256 (13513)
- Automatic reconnection of MPRs upon restart of the TM control process (CASTMC) after an abnormal termination has been reinstated after being erroneously removed.
3238497 (13534)
- A problem that caused a server hang upon shutdown of an MPR under certain conditions has been fixed.
3238516 (11782)
- An RTS-200 (ID: bb3c) error no longer occurs in certain scenarios under heavy load.
3242739 (13569)
- A problem that caused an RTS-200 (ID: bbb8) error in certain scenarios during region start-up has been corrected.
3242407 (12722)
- A problem that caused an application's initial input message to be discarded when the call ended without issuing a GU call has been fixed.
00403418 (52041)
- A race condition in the disconnect cleanup routines for IMS Connect clients that resulted in intermittent RTS 200 null ENQ errors is now detected and handled correctly.
(9775)
- A problem that caused IMS TM dispatch to lose efficiency when configuring a large number of MPRs or by having many MPRs configured with multiple classes has been fixed.
3234528 (13370)
- Historical Statistics Facility (HSF) records for IMS TM transactions other than the first one processed by a Message Processing Program (MPP) now contain the proper user ID.

00454669 0477804 (59086)

- An erroneously duplicate XID that caused IMS batch jobs to sporadically fail with a Resource Manager start error (-00008) has been fixed.

00389376 (48017)

- The /DISPLAY TRAN command no longer shows an incorrect QCT value for transactions invoked via MQ.

3232038 (11621)

- The output of the /DISPLAY Q TRAN command is now correctly formatted and no longer displays inaccurate message counts in certain scenarios.

00374553 (11754)

- The DFSNDMX0 exit no longer fails to be invoked in certain uncommon scenarios.

3229053 (13291)

- A transaction's reply to a terminal no longer fails to be sent when that transaction is the target of a message-switch from a transaction that issues other message-switches to transactions that do not send any terminal output.

3229053 (13417)

- Transaction queue-count (QCT) values are now correctly retained upon automatic restart of the TM control process (CASTMC) after an abnormal termination.

3238608 (12570)

- For BMP transactions, the message queue-count (QCT) value is no longer incorrectly decremented when no messages are processed.

3238608 (11611)

- A QBMP transaction no longer fails to retrieve a message when the message had previously been moved to the suspend queue.

3243085 (13519)

- The CASTMC process would occasionally hang in certain uncommon scenarios under high load. This has been fixed.

00377937 (32039)

- An MPR failure triggered a Communications Server RTS-200 (casgate-ID: 74c0) error in certain scenarios. This has been fixed.

3241881 (12646)

- IMS Connect requests no longer incorrectly receive system messages in EBCDIC under certain conditions.

3228669 (13392)

- A 'ROLB' call from a PL/I application that did not include an IO area might have caused a memory fault.

3240848 (13452)

- An RTS200 error no longer occurs when a server is configured with ES_IMS_FORCE_SIGNON=Y and a user attempts to sign on to IMS while already signed to another terminal.

3231054 (13556)

- A STOP RUN used in place of a GOBACK at the end of a BMP application could result in an SQLCODE -925 message and a rollback of the last unit of work.

3226113 (13307)

- A transaction input message sometimes erroneously processed twice when the IMS-TM control process was lost/restarted before the transaction finished processing the message. This has been corrected.

00374547 (13462)

- Two previously uncontrolled IMS Connect trace entries are now controlled by the TM trace flag. This improves TM performance when these trace entries are not needed.

00484724 (67044)

- The User ID specified on the JOB card of a JCL job executing an IMS batch or a BMP transaction is now returned to the user's application. This occurs when the transaction issues the IMS INQY call. If the User ID is not specified in the JCL, then blank spaces are returned.

3237052 (13526)

- In order to conform to mainframe behavior, the PSBGEN SERIAL Compiler directive restricts PSBs to one BMP execution at a time. A second BMP will fail with a U457 abend.

3232445 (13438)

- A problem that caused the stage1 extract parser to hang when a continuation card was followed by a comment card has been fixed.

00364603 (13497)

- An issue with parsing the stage 1 extract file has been resolved and no longer causes an abend 252. The issue was with parsing multiple transactions defined with a single CODE= parameter.

00363788 (13601)

- A problem that prevented the IMS stage-1 import facility ADDREPL directive from preserving existing transaction attributes not explicitly included in the stage-1 content has been fixed.

3240586 (12741)

- The new /REFRESH PROGRAM {name1 name2...}/ALL command can now be used to force the physical cancellation of an IMS program(s) from any MPR in which it has run (or is running, upon completion). The MPR will reload the program the next time it is scheduled, allowing a new version of the program to be installed. On Windows, when in-place replacement of a .DLL file prior to issuing the /REFRESH command is prevented due to the .DLL being locked, place the new .DLL in a staging folder. This is similar to the existing procedure for CICS as described in "Loading DLL Files" in the product documentation.

3227997 (12565)

- The MFS is now be correctly rendered for all logical pages with correct cursor positioning.

3229742 (13343)

- Non-graphic characters (x'28', x'29', and x'2A) are now suppressed prior to sending output data to screen. Previously, the non-graphic characters were interfering with output data formatting.

00366271 (12648)

- The date and time of a checkpoint call appeared truncated in the BTS trace output.

(8660)

- An IMS transaction that exceeds its timeout limit might leave the MPR in a bad state where subsequent DB calls returned unpredictable results. This could happen when the timeout ABEND occurred while the application was in a DB call.

3206852 (11421)

- MPRs and JCL running a BMP transaction failed to update the IMS system file because the file open and close functions were non-operational for these types of applications. This has been fixed.

3229260 (10307)

- An undetected deadlock was possible in busy systems that are prone to deadlock with a high number of sessions all contending for the same database record.

(8586)

- A 9/002 failure could occur during an IMS DB Control RESUME function when there were blocked sessions waiting for the RESUME to complete.

(8714)

Interface Mapping Toolkit

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- A problem that prevented JSON-REST Web services from using an application RETURN-CODE to set the response HTTP status code has been fixed.
00369975 (11324)
- A problem that prevented JSON-REST Web services from using an application RETURN-CODE to set the response HTTP status code has been fixed.
00370461 (11716)
- New service interfaces added to Enterprise Server Application projects are now in the correct format.
(10415)
- For `ws21s`, unions are now mapped with their default whitespace behavior as collapsed.
3237304 (13437)
- For `ws21s`, boolean data types in the WSDL are now defined as `BOOLEAN` in the generated `WSBIND` file.
3237798 (12511)
- Web-service clients generated from JSON schemas no longer include an extraneous root JSON field.
00366626 (12633)
- When returning the LDO array of all operations in a JSON service, any operation in the JSON response with an empty "path" attribute is now returned with a "href" value of "`</operationName>`".
(10411)
- When data containing a null character is returned to a Java string, the null character is no longer used as a delimiter and will instead be included in the Java string
00367385 (11622)
- A service created from an earlier non-versioned service definition now gives correct behavior on a POST or PUT REST operation.
00372694 (13565)
- In a program that has two or more tables that are empty, the SEP would abend after deploying and running the service in Enterprise Server. This problem has been resolved.
3229853 (11498)

Java Artifacts

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- It is now possible to send a CICS username and a password through the Micro Focus CICS IBM ECI resource adapters.
3224253 (13499)
- The JavaEE and JavaEE-CCL artifacts are installed as part of COBOL Server and Enterprise Server.
00371929 (12440)

JCL Support

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- The directory structure required to create a member of a temporary PO will now be created.
3239698 (13551)
- An environment variable that resolves to an SQL URL may now be used in the Allocation Override file.
3225377 (11432)
- An issue when trying to lock a GDG version that could not be found has been resolved.
3234014 (13480)

- A problem with the COND processing, when using a PROC and referring to a step name within the PROC that was executed in a previous step, has been corrected.
00368474 (26054)
- Performance improvements to JES spool housekeeping have been made for spool files hosted in a database.
00367284 (30050)
- A problem that prevented additional DD Cards being added as procedure overrides when exported symbols had been set in the procedure has now been corrected.
00421227 (51080)
- An issue which prevented DD overrides for procedures when a INCLUDE followed the EXEC PROC has been resolved.
3228628 (11457)
- An issue when deleting or updating datasets with a name length of 44 characters using the public catalog API MVSCATPB has been resolved.
3226763 (11455)
- A problem where a SYSOUT data set from a SSTM job could be printed a second time at job shutdown has been corrected.
3243178 (12730)
- An issue where a SYSOUT dataset might have been sent to the printer twice when a job abended has been resolved.
00368446 (11770)
- When searching for a job to dispatch, jobs that may not run because a job by that name is already running will be skipped during that search cycle, even if the running job completes while the search cycle is processing.
3228458 (11702)
- The return-code is now initialized to zero on entry to the MFJCTLBP module.
00367256 (13393)
- The new ES_JES_DELAY_MEM_ENQ environment variable enables you to delay the enqueue of a PDS member with DISP=SHR until the member file is opened.
00372418 (11767)
- An error where a symbol with an empty or 'NULL' value was not replaced correctly has been corrected.
00367220 (12468)
- An unnecessary check for membership of a dynamic PO has been removed from the catalog GUPC function.
3242000 (13615)
- An issue where MFJPTPCH did not return members of dynamic PDS correctly has been resolved.
3207555 (13303)
- A new environment variable has been added - SSTM_WC_REFRESH - which determines how often the write count for the SSTM job is updated in SYSOUT or SYSPRINT. You can set a value between 1-65535 to indicate the number of writes at which the count is updated. A value of 0 (the default) indicates that the count is only updated when the file is closed. Any other value smaller than 1 will default to 0, and any value larger than 65535 will default to 65535.
3214356 (11377)
- If possible, the position of text in in-stream data that has a symbol replacement will now be maintained.
3227073 (11692)
- The File Status is now included in error messages issued when the JES system fails to initialize correctly.

- 3230915 (11471)
 - An issue where the wrong step name was matched for an IF condition has been resolved.
- 3237242 (12683)
 - When a call is made to MFJZLOG, and joblog or syslog are already locked, the call will no longer hang: it will retry the call several times before returning either 16 (for a syslog lock), or 20 (for a joblog lock).
- 3229171 (13315)
 - When an error occurred on a job restart, the JESYSMSG record count was incorrectly set to zero. This has been corrected.
- 00366645 (11518)
 - An issue that caused a loop when more than 65535 messages were output in a job has been resolved. An option has been added so that "display upon console" messages will not be included in the splmsg list for a job, though they are still included in the JESYSMSG for the job.
- 3233869 (12610)
 - A memory leak issue in the casmgr module has been corrected.
- 00368463 (45020)
 - A problem that caused MFJCTLBP to return the DD SYSOUT DEST field values incorrectly has been fixed. If only one DEST field parameter is specified in the DD statement, the returned value for JES2 should be userid, and the returned value for JES3 should be nodename.
- 00484883 (66058)
 - A problem that caused the SVC99 utility to fail to delete a file yet still send a return code indicating success has been fixed to now return the correct code.
- 00373847 (12303)
 - When a job starts, the current date is written into the JESYSMSG job log and, for long-running jobs, the date is written into the job log, before a JCL message, whenever it changes.
- 00370009 (12102)
 - An issue where the FCD information for a custom file handler has been set up before calling an external file handler during 'close all files' has been resolved.
- (8862)
 - A problem that truncated the data set and member name when using the REXX ALLOC command has been corrected.
- 3232549 (13390)
 - An issue where the procedure override was always applied to the first procedure when the same procedure was called twice has been resolved.
- 3229162 (11463)
 - The failure to resolve a symbol in a PROC override when the DSN entry was on a continuation line of the DD entry has been resolved.
- 3230291 (12471)
 - A problem that prevented queued jobs from running when a job with a priority was blocked from running, by a job with the same name and same priority that was already running, has been corrected.
- 3223999 (12369)
 - When using MFJPTPCH with an extended Japanese code set (9123) a character was incorrectly marked as non-printable. Support when using extended Japanese code sets other than 9122 can now be enabled by setting the environment variable MFJ_PTPCH_CODESET=EXTJ.
- 00371751 (13604)
 - A spool job would go into a continuous loop when the spool job record was locked by another process. This has been corrected. Instead, the MVSSPLHK spool housekeeping makes five attempts before reporting an error.
- 00367267 (25069)

- IMS SSTM jobs will now be marked as abended if the MPR process is terminated.
00374551 (11596)
- UNC filenames and paths can now be specified for JCL spool file locations.
00367380 (12501)
- Symbols defined in a JCL job-step that are expected to last for (n) job-steps might have been removed at stage (n - 1). This has now been fixed.
00367229 (11786)
- Nested VSE Power SLI statements embedded within SYSIN are now processed.
3222685 (12481)
- MFFTP now allows the first command as 'debug' if the environment variable MFFTP_FTP_DEBUG is set to 1.
00472556 (58313)
- Performance improvements have been made to JES spool housekeeping when the spool files are hosted in a database.
(60015)
- When defining a PS VB file without a LRECL setting, the catalog will create a VB file with default settings of minimum length = 0, maximum length = 32760. These values can be overridden when a program opens the file for the first time. To avoid creation of the file, set the environment variable MFALLOC_DEF_VB_PCFILE=N.
00368455 (47024)
- The user id passed when a job is submitted is available to the JCL user exit (MFJUXIT) in the field (tag)-I-ACEE-User at the event-job-stmt-info event. You can use the user exit to change the submission of a job to a scan of the job (TYPRUN=SCAN) by setting 88 (tag)-U-submit-type-scan to true at event-job-ready.
00486646 (70057)
- When a dataset whose pc-dsn starts with environment variable is renamed, MFJAMS ALTER now does PHYSFILE permission checks on both the expanded physical location and also on the location identified using the environment variable.
00424260 (53179)
- An issue with the MFJGENER IDENT processing when the input field location is different from 1 has been corrected.
00453620 (59068)
- The search and dispatch of jobs to be run has been optimised when running with database-hosted spool control files.
00367265 (49019)
- An incorrect file status that was returned when opening a DUMMY dataset with DCB specified in the JCL has been corrected to return the correct file status of 00 as per the mainframe.
00431913 (69097)

Mainframe Access

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- The MFA server will instruct the client to convert VB binary imported files from PDS members using DFCONV.
00374537 (12727)
- The FINDMEM function will now permit more than 16 libraries to be searched.
00402212 (57347)

- Code pages 273 and 277 now work correctly.
84098 (83128)
- The MFA directory report now contains the SCLM Managed flag which is set if the PDS is SCLM managed. This will enable clients to issue a warning or error if users try to modify a member from the workstation. The SCLM Managed flag can take the values for the SCLM_WARN_LEVEL configuration parameter. See SCLM_WARN_LEVEL in your product Help for more information.
00364682 11579 69218 (70199)
- MFA will no longer truncate SYSOUT data sets to 240 lines when the "JESDD *" option is specified.
3233736 (11510)
- A problem that caused truncation of SYSOUT data sets to 240 lines when the "JESDD *" option was specified has been fixed.
3233736 (11666)
- A problem that caused JES STATUS reports to give incorrect dates for job execution times for leap years has been fixed.
3234079 (12603)
- MFA now supports PDS members that use ISPF extended statistics.
00466808 (58288)
- MFA no longer abends with an S878 error after multiple imports from data sets resident on tape volumes are requested.
3242753 (12734)
- The catalogue entries for data sets resident on more than one volume were not being processed correctly. This has now been fixed.
3227989 (9528)
- MFDAS no longer needs registry setup when run with MFA_SERVER_PARMS.
3224432 (11424)
- mfdasmx no longer does unnecessary additional log-on requests during use.
00492073 (69310)
- The MFA directory report now contains a flag which is set if the PDS is SCLM managed. This will enable clients to issue a warning if users try to modify a member from the workstation.
00364682 11579 (69218)
- The MDECONV utility now handles embedded hex values correctly.
3224126 (11665)
- Large downloads from MFA Sever are now more performant with fast connections.
00366702 (11792)
- An issue with MFDAS exports to VB sequential datasets has been resolved.
00366735 (12649)
- An error where a MFDAS KSDS file import failed with no reason specified has been resolved.
3233226 (11655)
- mfmonmx2 can be used with hash mode when timestamps are not available.
00364577 (12409)
- Catalog explorer now supports codepages beyond 037.
3230835 (13548)
- Drag and drop of GDG generation no longer fail with workstation error on the first attempt.
00486812 (71119)
- Visual Studio Mainframe Explorer now honors the Binary/Text option when downloading to the local catalog. MFDAS now supports the .* extension to import to dynamically cataloged PDSs.

00364597 (13412)

- The mfmon2 module now skips reserved windows filenames, allowing syncs containing reserved names to continue.

00407516 (57004)

- MFA has been modified to cancel or stop the TSO session rather than let the system destroy them.

00722823 (69564)

Micro Focus Server Administrator (GUI)

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- A potential MFDS abend in scenarios where a "Renew" is repeatedly issued and TLS is enabled has been resolved.

00368581 (13379)

- A Content-Security-Policy has been added to all MF Directory Server HTTP response headers. Additional restrictions on how MFDS process shutdown requests are handled.

00379021 (30103)

- Secured REDIS servers now automatically connect in secure mode.

3229330 (11499)

PL/I Support

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- A problem that caused the evaluation of elements for structures belonging to arrays to return the wrong information back to the IDEs and failed to correctly evaluate the element has been fixed.

(57331)

- A problem where character varying variables could not be edited in the expressions view when debugging has now been fixed.

(9092)

- The debugger handling of the temporary breakpoints used when stepping through PL/I procedures which are contained in an include file has been improved.

00365131 (11407)

- The debugger has been improved to better handle the animating of a PL/I program thru the end of the user program.

00365132 (11409)

- SQL-style comments are now recognized as PL/I comments.

00370006 00368490 (11437)

- PL/I JSONPUTVALUE BIF now correctly provides closing brackets for structure members and arrays.

00422336 (52088)

- The XMLCHAR built-in function now provides correct closing tags when iterating through array of structures.

00419496 (53072)

- Previously, the ALLOCATION built-in function would fail if the amount of memory requested exceeded 32767 bytes. This no longer occurs and is only subject to the limitations of the operating system upon which your program is executing.

3232973 (11501)

- Previously, the REPATTERN built-in function did date validation regardless of whether the optional WINDOW parameter was supplied. It has been determined that there is an undocumented behavior on in that no validation of the date takes place if the optional WINDOW parameter is omitted.

3233314 (12476)

- Previously, the PL/I run-time system would reroute all I/O for a file marked DD DUMMY in a JCL Jobstream to the UNIX device /dev/nul. For files opened OUTPUT SEQUENTIAL and used as DD DUMMY in a JCL Jobstream, the routines no longer attempt to OPEN/WRITE/CLOSE the file /dev/nul on UNIX and Linux and nul on Windows.

3235802 (11674)

- Previously, if a PL/I program was actively executing within an MQGET API call and the user used ESMAC or ESCWA to kill the process, then both the FINISH and ERROR ON units were triggered. The ERROR ON unit is no longer triggered when a software kill of the process via SIGTERM is performed.

00368471 (12608)

- Previously, the JSONPUTVALUE built-in function attempted to emit human readable structure element names rather than following IBM's default behavior which is JSON(CASE(UPPER)). This has now been fixed.

3233868 (13356)

- Previously, the use of the LPI_YEAR environment variable to override the year returned by the DATE built-in function was not working on Windows platforms. This has now been fixed.

00371750 (12582)

- Previously, if a file declared in JCL as DD DUMMY which contained no ENV attribute on the FILE declaration was opened, read to EOF and then closed, it would incorrectly fail on a subsequent OPEN with UNDEFINEDFILE() condition. This no longer occurs.

00368457 (13612)

- Previously, the XMLCHAR built-in function was truncating identifier names at 32 bytes.

3241023 (13453)

- Previously, if using the XMLCHAR built-in function on a data structure which contained structure elements that were individually in excess of 3200 bytes in length, an incorrect buffer length and data were passed back. This has now been fixed.

3236406 (11645)

- A new include file is now shipped with the product to allow PL/I programmers to easily call supported CEE routines. (CEEIBMAW.inc)

00368504 (22269)

- An issue related to the passing of huge structures as arguments has been fixed.

00368489 (11514)

- Open PL/I now supports the FIXEDBIN and FIXEDDEC built-ins. In addition, the FLOATBIN and FLOATDEC built-ins are also supported.



Restriction: Array arguments are not yet supported.

3140468 (13079)

- The LOCATE statement is now supported.

00368480 (11281)

- Open PL/I now supports structure/aggregate expressions when using the LEFT, RIGHT, CENTERLEFT and CENTERRIGHT built-in functions.

00368486 (11395)

- This release supports the ENTRYADDR Built-in function and pseudo-var.

00368479 (11275)

- Open PL/I now supports the FIXEDBIN and FIXEDDEC built-ins. In addition, the FLOATBIN and FLOATDEC built-ins are also supported.



Restriction: Array arguments are not yet supported.

- 3140466 (12285)
- Open PL/I now supports the AUTOMATC built-in function.
- 3239024 (11581)
- This release supports the BUILTIN attribute in the DEFAULT statement.
- 00366169 (13602)
- Open PL/I now supports the DIMACROSS attribute.
- 00366166 (13558)
- The PL/I compiler and runtime now support the HEXDECODE built-in function.
- 3239583 (13475)
- The ISLL built-in has been implemented. It accepts two arguments, and returns the first argument shifted to the left by the number of bits specified by the second argument.
- 3239588 (11725)
- Open PL/I now supports the INLIST built-in.
- 3239024 (12678)
- The Open PL/I compiler now supports the TIMESTAMP built-in function.
- 3239024 (13544)
- The Open-PLI compiler now accepts PARM as a synonym for the PARAMETER attribute.
- 00366168 (13605)
- ON FINISH is now invoked when the program terminates normally.
- 00368442 (12324)
- A compiler issue concatenating a string with a structure has been fixed.
- 00370001 (11163)
- Previously, a literal that was started within an %INCLUDE statement but not terminated by the end of the %INCLUDE would generate a Severe error diagnostic. It now generates a Warning diagnostic as long as it is properly terminated back in the main program or within another %INCLUDE. If it is not terminated by the end of the source code then a Severe diagnostic is issued.
- (8550)
- A problem that occurred when structure members using STORAGE BIF or any other restricted expression as the length of an array or string were used with DEFAULT RANGE(*) STATIC has been fixed.
- 00368501 (12600)
- Open-PLI now supports the REPLACE built-in.
- 3240588 (12559)
- SELECT on a string variable will now function correctly if there is a RETURN inside a WHEN block.
- 3230870 (12439)
- The help text for -warn compiler option has been fixed.
- 3190928 (12421)
- GET EDIT and PUT EDIT statements which use an L format item are now supported.
- 2819196 (10972)
- A possible compiler problem related to a DISPLAY statement has been resolved.
- 2846464 (11149)
- Open PL/I now emits diagnostic message MFPLI00465W or MFPLI00466W when duplicate WHEN expressions are present in the same SELECT statement.
- 00370004 (12222)

- Previously, the XMLCHAR built-in function qualified a substructure reference with the top level name of the structure. This no longer occurs.
3236406 (11557)
- Previously, a program compiled with -prefix subscriptrange incorrectly triggered a SIGSEGV. This has now been fixed.
3233954 (11753)
- The Open PL/I compiler now produces diagnostics MFPLI01280E and MFPLI01281 when SUBSTR arguments are out-of-range.
00370005 (13189)
- Blank date-to-month and month-to-year separators are now replaced with periods in MACRO COMPILETIME BiF.
00470199 (58265)
- The Open PL/I diagnostic message MFPLI01227W pertaining to passing arguments BYVALUE has been relocated from the call point to the declaration of the entry, and modified appropriately.
3220424 (13274)
- The PL/I linker's limit for objects has been increased.
00696713 (71413)
- A problem when using the OPTIONAL attribute applied to a parameter with star-extent has been resolved.
00475039 (61130)
- Macro statements ACTIVATE and DEACTIVATE are allowed in a macro procedure.
00366180 (11652)
- Support has been added in the ANSWER statement for the SCAN and RESCAN keywords, matching the IBM behavior.
00366165 (11781)
- *PROCESS PPMACRO('CASE([ASIS][UPPER]') and *PROCESS PP(MACRO('CASE([ASIS][UPPER]')) are now supported. On CASE(ASIS), the macro preprocessor will keep the characters' case as is. On CASE(UPPER), which is the default, it will only remove from the command line the -case_asis option (if present) and issue a diagnostic warning.
00368491 (13515)
- Compile's listing will contain "BEGIN"/"END" comments at the beginning and end of an included file when macro or include pre-processor is specified.
00368497 (13572)
- When using the MIN builtin function, if the values to check were all greater than zero, the result was always zero.
(8557)
- The ISRL built-in has been implemented. It accepts two arguments, and returns the logical right shift of the first argument by the number of bits specified by the second argument.
3239589 (12737)
- A new compiler option -pmod has been added. This sets the result of the MOD builtin to always return a positive value even if one of the operands is negative. Default behavior is to return the "mathematically correct" result; if y in 'x mod y' is negative, the result will be negative. For example:
By default:
4 mod 3 = 1
-4 mod 3 = 2
4 mod -3 = -2

-4 mod -3 = -1
Using -pmod:
4 mod 3 = 1
-4 mod 3 = 2
4 mod -3 = 1
-4 mod -3 = 2
(8814)

Run-time System

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- A .NET Core COBOL application deployed on Linux, which performs file handling operations, no longer prevents the correct processing of a `NullReferenceException` in the managed code.

(8770)

- In .NET environments, `ACCEPT FROM DAY-OF-WEEK` now returns the correct value on a Sunday.

00368357 (13597)

- When using the .NET Runtime, a new tunable, `command_line_arguments_unquoted`, is now available which when set to true will provide command line argument handling that is compatible with that of the 2.3.2 product and earlier releases - in that command line arguments containing quoted spaces are returned to the application.

00417766 (52004)

- You can potentially reduce print close time of a .NET deployed COBOL application that prints long documents by enabling the optimization for network printers via the `Switch.System.Drawing.Printing.OptimizePrintPreview` configuration switch.

This optimization is described in the "PrintPreviewDialog performance" section in "PrintPreviewDialog control overview (Windows Forms)", direct link <https://docs.microsoft.com/en-us/dotnet/desktop/winforms/controls/printpreviewdialog-control-overview-windows-forms?view=netframeworkdesktop-4.8>, in the Microsoft's .NET Framework documentation (under Docs->.NET Desktop Guide->.NET Framework->Windows Forms->Controls->Controls to Use on Windows Forms->PrintPreviewDialog Control->PrintPreviewDialog Control Overview).

For example, for apps running on the .NET Framework 4.6 version or later, you can add the following switch to the `<AppContextSwitchOverrides>` element in the `<runtime>` section of your app config file:

```
<runtime>  
  <AppContextSwitchOverrides value =  
  "Switch.System.Drawing.Printing.OptimizePrintPreview=true" />  
</runtime>
```

00501669 (71260)

- In .NET COBOL and JVM COBOL, when using the Compiler directive `numproc(acos)`, a space character, `0x20`, in the sign byte of a sign included display item, was being interpreted as negative instead of as positive.

3228161 (13329)

- Printer close in a program that uses printer redirection and `pc_printer_set_font` many times no longer takes a very long time.

00445383 (59200)

- The 64-bit version of 'name.dll' is now built and delivered into the product.

00368438 (28156)

- If a recoverable run-time error occurs in an Enterprise Server container when the `core_on_error` tunable is set, then a core file is now created.

(53181)

- CBL_GET_OS_INFO now returns the correct major and minor operating system versions.

3226654 (13376)

- When using CBL_GET_PROGRAM_INFO to find the next program, with bit 4 set in flags, then PL/I programs would not be returned if that PL/I program had called a system COBOL program.

(8755)

- FUNCTION NATIONAL-OF, when used with a reference-modified identifier and the 2nd parameter is a ccsid number, now returns the correct length of data.

3243083 (9863)

- It is now possible to add an application launch configuration file to applications where the main program is not written in COBOL. To enable this, you need to calling the new coblaunchconfig() API.

3232953 (12513)

- Defaults for the memory_strategy tunable in some of the product documentation versions have been updated.

(73061)

- The profile_behavior tunable can now be configured to enable the Profiler to record time spent in called programs in CPU time or in real time.

3126255 (12491)

- The MFLEINIT entry point in a threaded run-time system invoked non-threaded LE370 routines. This has now been corrected.

3233664 (8687)

- FUNCTION DISPLAY-OF(XML-NTEXT) no longer produces a 'COBRT105 - Memory allocation error' error.

00364697 (26053)

- When the core_on_error tunable is used, a core dump is produced when a signal or error occurs. However, there was a situation where a SIGSEGV signal could be repeatedly generated, which would cause a very large core dump to be produced; this has now been resolved.

00373622 (27254)

- After using the PL/I ON-unit... GOTO syntax, the CBL_GET_PROGRAM_INFO API could return incorrect values or cause an error. This has now been resolved.

3233664 (11624)

- A run-time system error when loading 32-bit .gnt files, on an Intel x86 platform, has been fixed.

3235746 (13506)

Setup Issues (Windows)

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- The cblms tool no longer detects Windows SDK installations that do not include the required lib subfolder and so are not valid to use.

(8454)

- Spacey input paths are now handled correctly.

3236578 (11603)

- The topic "Installing Visual COBOL in an Offline Environment" in the product Help of Visual COBOL for Visual Studio and Enterprise Developer for Visual Studio available from the Micro Focus SupportLine now includes instructions about how to add CRL information into the certificate store. This is a required step for offline installations that enables the validation of the signature on the Visual Studio extensions without any errors.

00378086 (51001)

- The Software Requirements topic in the product Help for installing on UNIX machines now includes more detailed instructions about how to set up the LANG environment variable. This must be set before you start the installation.

LANG must be set to one of the following English or Japanese locales: C, default, en_GB, en_GB.UTF-8, en_US, en_US.UTF-8 ja_JP, ja_JP.SJIS, ja_JP.UTF-8, ja_JP.eucJP, ja_JP.eucjp, ja_JP.sjis, ja_JP.ujis, ja_JP.utf8, japanese

Set LANG either before running the setup file - for example: export LANG=C Alternatively, add it at the start of the command for running the setup file: LANG=C ./setup_...

00371216 (11458)

- The deployment SDK zip file names now include the Patch Update number and the build package number. For example, for Patch Update 4, the name of the deployment SDK file for Visual COBOL is now generated as: cs_60_pu04_268826_deployment_sdk.zip
- 3240181 (13554)
- Previously, there was an issue when uninstalling release 6.0 of Visual COBOL or Enterprise Developer if IBM DB/2 was also installed. This is resolved in release 7.0.
- 00368460 (11643)

SQL: COBSQL

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- Support in COBSQL for a large number of REDEFINE data items has been increased to up to 8000.
- 3244127 (13591)
- COBSQL did not correctly handle the byte conversion of FETCH statements with 10 COMP items and one Non-COMP item. It now correctly handles this scenario, as well as the same one in INSERT statements and EBCDIC conversion.
- 00365970 (22267)
- COBSQL now supports EBCDIC conversion in the case in which the operator token is right next to a host variable inside a DECLARE SELECT statement.
- 3232492 (13562)
- COBSQL now handles correctly a long list of host variables when the KEEPCOMP Compiler directive is used.
- 00365968 (13415)
- COBSQL now displays an error (in Visual Studio, Eclipse and on the command line) when the procobol command is not found.
- (10332)
- EBCDIC conversion when DECLARE TABLE statements are present is now handled correctly.
- 3236281 (12536)
- COBSQL now supports the EBCDIC conversion in the case in which the host variable used in a FETCH statement was previously initialized, and the FETCH statement returns no rows.
- 3232429 (13368)
- A problem that caused COBSQL to abend with memory errors when the KEEPCOMP variable was used along with certain array values in a "FOR :HOSTVAR ALLOCATE" statement has been corrected. COBSQL now skips unnecessary byte conversions for "FOR :HOSTVAR ALLOCATE" statements.
- 00365886 (13607)
- COBSQL has been updated to handle redefined variable declarations broken into multiple lines.
- 00430595 00506991 (59202)
- COBSQL now supports EBCDIC conversion of saved declare cursor variables with '= variable syntax'.
- 3240853 (13447)

- COBSQL has been updated to override or reset previously set directives with those specified by inline \$SET statements as needed.
00422020 (53080)
- COBSQL now supports host variables used in FOR :HOSTVAR statements when the KEEPCOMP directive is used.
00373979 (11794)
- COBSQL is no longer unnecessarily setting a "bad pointer" to check if the EBCDIC modules are present.
3242687 (12748)
- COBSQL now supports EBCDIC conversion of redefined host variables.
3241688 (12700)

SQL: DB2 ECM

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- DB2 ECM now correctly handles data item names with the character 'f' or 'F'. It also handles arrays of COMP values correctly when the FOR n ROWS clause is used.
3229912 (13341)
- When DB2(RELEASE=COMMIT) was specified and the targeted database was not DB2 z/OS, the compiler generated a warning indicating that the directive would be ignored. This has been corrected.
00371184 (11372)
- Using a group host variable with FILLER could cause a Visual Studio background parse crash of Visual Studio. Compiling from the command line would result in a subscript out-of-range error. This issue has been resolved.
00371048 (27157)
- A problem compiling a COBOL program using dialect ENTCOBOL on a program using ROWSET in a SQL statement has been fixed.
00424387 (57057)
- An issue with the HCO for DB2 LUW tooling in DDL generation where creating a table with a "FOR EACH" or "FOR BIT" clause on a column was generated incorrectly has been resolved.
00373396 (11400)
- DB2 ECM now handles COMP data items correctly when the NULL indicator array is involved and COMP data item is used in the SQL Statement as both input and output host variable.
3236080 (12661)
- The HCO for DB2 DDL tool erroneously inserted a space when an input line filled the maximum column with a non-space literal value, and continued on the following line at position 1. This has been fixed.
3205352 (8474)
- The limit on the NULL indicator array size has been extended from 255 to 1012.
00368494 (12545)
- A problem that caused a failure in the CheckSwitchUserStatus section when running a job that uses DB2 User impersonation has been fixed.
00375618 (32025)

SQL: Mainframe Batch Database Tools

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- There is no longer a problem outputting messages with a length less than 4 bytes in the SYSPRINT of DSNTEP2. The minimum length is set to 1.

00695983 (73016)

- An error sometimes occurred when submitting a SQLTP2job with a very large SYSIN. This has been corrected by enabling the buffer to be incrementally increased.

00403340 (46032)

- There is no longer an issue with exiting with code 8 if loading SYSREC is defined as NULLFILE or DUMMY using the 'Check Row Size against LRECL of SYSREC' option checked. An issue with the NULLFILE or DUMMY SYSREC processing where 'Check Row Size against LRECL of SYSREC' option being processed incorrectly has been fixed.

3230497 (11625)

- A problem loading date, time, and timestamp literals into char fields of tables in DB2 LUW using MBDT has been fixed. The data formats are now kept.

00485911 (71041)

- Previously, more than one SYSIN statements in a JCL were not being picked up by SQLTP2.

3240790 (13559)

- A problem concatenating to SYSPRINT in SQLTP2 has been fixed. The successive contents will now be appended in SYSPRINT.

00502243 (71219)

- There is no longer an issue with submitting a large volume of SQL code (such as 300,000 lines) via SQLTP2. The limit on the SQL volume has been extended to 500,000 lines.

00367282 (26062)

- A problem sometimes occurred when SQLTP2 was running in an EBCDIC enterprise server region, and ASCII character padding existed in SYSPRINT of FB format. This has been corrected.

00403637 (49001)

- There is no longer an issue with specifying a SYSPRINT if the DCB parameters are set correctly with LRECL=133. The RECFM is set to VBA by default but can be overridden to FB in the DCB of SYSPRINT.

00367261 (13522)

- There is no longer an issue with producing garbage characters in the SQLTP2 SYSPRINT, if it is cataloged as RECFM = FB.

00367261 (24083)

- The LOG NO option for SQLUTB LOAD is now supported if the user has the privileges of ALTER TABLE ACTIVATE NOT LOGGED INITIALLY WITH EMPTY TABLE.

3230163 (12507)

- There is no longer an issue with using reserved words, such as "FINAL" and "timestamp", as column names in PostgreSQL for running SQLUTB LOAD.

00364353 (28063)

SQL: OpenESQL

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- When compiling with the ILTARGET directive without specifying x86 or x64 bitness, an unknown type 'type OdbcWrapper.Class1' compiler error was returned erroneously. This has been corrected.

(52174)

- An error that occurred when a DB2 stored procedure was called from the ADO runtime has been resolved.

00425931 (58056)

- Opened cursors are now kept open after a ROLLBACK if SQL directive option CLOSE_ON_ROLLBACK=NO or BEHAVIOR=UNOPTIMIZED is specified.

3238292 (11710)

- OpenESQL application now retrieves DBCS strings correctly from PostgreSQL database.

00369140 (28051)

- An issue that caused truncation of a dynamic SQL statement and that resulted in a runtime error, even when the maximum length of an allowed statement had not been exceeded, has been corrected.

00454855 (58163)

- The OpenESQL directive option CLOSE_ON_COMMIT is now available to select from the project's properties inside Visual Studio and Eclipse.

00364548 (11631)

- The OpenESQL run-time now handles Oracle passwords correctly.

3230203 (13545)

- A problem that prevented the OpenESQL preprocessor from recognizing the SQL Server OPTIMIZE FOR syntax has been fixed.

00465904 (57173)

- OpenESQL did not handle syntax checking for PostgreSQL when using VARBINARY type variables.

3239363 (13433)

- The new PICXBINARY SQL compiler directive option, enables COBOL and PL/I programs to use PIC X(n) host variables to receive data from BINARY, VARBINARY, LONGVARBINARY columns in binary format without changing source to use SQL TYPE BINARY host variables.

3242422 (12745)

- .NET COBOL applications with dynamic SQL statements using SQLDA now work correctly via the ODBC driver.

00370895 (11701)

SQL Option for DB2

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- An issue which could sometimes present with an RTS114 error during XA connections to XDB has been resolved..

3231973 (13464)

- The Optimizer has been fixed for OR conditions that were providing too many rows on query output..

3227837 (12554)

- An issue with updated JDBC logic using UTF-16 data for String type has been resolved.

00371173 (12749)

- A problem with binding a UTF-16 host variable into a date constant within a query parse tree has been resolved.

00371175 (23046)

- An issue caused by an improper conversion to DECFLOAT when implicitly casting predicates has been resolved.

00374541 (12634)

- The behavior of XDB V10/V11 engines has been updated to implicitly cast to DECFLOAT like z/OS DB2, to not optimize any predicates using implicit casting, to return SQLCODE -420 when an implicitly cast string value is not in numeric form, and to automatically close any cursor that returns SQLCODE -420.

00374540 (13613)

- A memory leak that occurred when merging index RID queues for poorly optimized indexes has been fixed.

3164695 (11312)

- The XDB Link now supports the z/OS DB2 12 syntax for a host variable, specifying the result set limit in the FETCH FIRST clause of a query.

3229611 (13434)

- A restriction on implicit casting that occurred against SQL statements operating in V10/V11 local XDB engines on pre-V10 locations has been removed. Client was using V9 location with V10/V11 engine.

00417856 (51003)

- A problem that prevented views created in V11 and V10 from running in V9 has been fixed by correcting an invalid pointer and rebuilding code. In addition, metadata in sysviews has been fixed.

3236057 (13489)

- The query optimizer now removes redundant predicates that could cause too many rows to be selected, and could potentially cause programs to hang. For example, if >= and > predicates are used for the same values on both sides of the predicate, only the > will be kept since it is more restrictive..

3200659 (13192)

- A problem that sometimes prevented the XDB control panel applet from properly connecting to the Windows service control API has been fixed.

00374543 (13406)

- A problem caused by timestamp not incrementing microseconds correctly to compensate for Windows millisecond resolution resulted in duplicate values. This has been resolved..

00366766 (13471)

- When XDB(BEHAVIOR=COPROCESSOR) was specified, the compiler generated a COBCH0010S error on XDB applications containing EXEC SQL statements beginning in Area A. This has been fixed.

00383249 (51012)

- A null object exception that occurred when using the toString() method on a PreparedStatement object in the XDB JDBC Driver has been resolved.

00371181 (28231)

- The JDBC driver has been enhance and now allows Java binary data to be treated as EBCDIC code page data when passed to the XDB Server.

00371172 (11589)

- A required symbol is now available in the XDB SQL Client run-time system.

3228563 (12643)

- The START40N utility now always uses any newer XRR files for error message processing and does not report a missing HRR file for an error message.

00369127 (24081)

Visual Studio IDE

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- Attempting to scroll to a copybook within a program displayed in the Visual Studio preview tab no longer causes the IDE to display an error alert.

00452493 (58245)

- The debugger tool-tip no longer flickers when you use the keyboard shortcut for the "Quick Info" command while debugging.

(7804)

- When using Visual Studio 2019 16.8 or later, COBOL .NET Core projects require that you install Visual COBOL or Enterprise Developer 6.0 Patch Update 4 (or later).

(9828)

- Visual Studio now offers suggestions for both paths and executables' file names in the Executable field on the Debug page in the project's properties.
00376339 (27354)
- Under some conditions, importing a Net Express project into Visual Studio could result in a large amount of invalid information being added to the Visual Studio projects. This led to unexpected results when the projects were built. For previously-imported projects where this issue has arisen, after installing this Patch Update you need to either manually remove the erroneous information or re-import the projects.
00371252 10602 (28061)
- When stepping into an external source file during a debug session, the source code now parses correctly without errors.
00466126 (57255)
- The speed of building of very large projects has been improved.
00364436 (13539)
- An issue that resulted in a warning shown when you paste code into the virtual space in the editor has been resolved.
00364591 (11658)
- It is now possible to enforce upper case for text you add in the COBOL, Assembler, BMS, IMS, and JCL editors. You can enable upper case from Edit > Advanced > Force Uppercase menu item, or from Tools > Options > Text Editor, select the desired language, and go to the Margins and Text Casing options page. This option applies to all code inserted into the source file, whether typed, pasted or automatically inserted.
3230875 (11531)
- Some properties of RESTful web services (.svi) were not included when using the "Package services as COBOL archive (.car) files" option of Enterprise Server Application projects in Visual Studio.
(10452)
- When creating new files using any of the COBOL refactoring commands, the new files use the same file encoding as the one of the original program file.
3231350 (11495)
- An issue that was causing an intermittent exception during multi-processor compilation has been resolved.
00364604 (25072)
- Changes made to any of the values in a project's Debug property page are now saved when the project is saved or closed.
(10529)
- core_on_error and debug_on_error tunable options now show a list of valid values.
00365051 (7187)
- Properties are now generated with the getter and setter syntax.
00365050 (4880)
- The Program Flow graph now supports nested COBOL programs.
00366795 (69362)
- When using Visual Studio 2019 versions 16.6 or later, documents that were previously open when a project was closed will now be reopened automatically when reopening the project.
3236715 (11540)
- An issue related to breakpoints resulted in memory leaks. This has been resolved.
00367085 (11651)
- The Standalone Editing Debug Options dialog box will now appear each time you start debugging unless the 'Don't show this dialog again' check box is checked.

(5748)

- The Build Settings page now correctly shows the values of the -debug, -dc and -isuffix directives used when building a PL/I project.

(3977)

- An issue that was preventing core dump debugging of native Mainframe Subsystem Application projects has been resolved.

00378870 (31063)

- The TO keyword alignment formatting preference is no longer ignored.

00364587 (12533)

- When debugging, if a module is loaded that does not have valid date or time information, an ArgumentOutOfRangeException popup is no longer displayed.

(10298)

- A PL/I project which has not been changed is no longer rebuilt every time a Build is run.

00366618 (12645)

- By default, when debugging .int or.gnt code in Visual Studio, RUNW.EXE is used as trigger. However, you can now use RUN.EXE by selecting the 'Debug as a console application for INT/GNT or Library projects' option in Tools > Options > Debugging > Micro Focus COBOL.

00365053 (8239)

- The COBOL debug setting "Show load information for system programs" (see Debug > Debug Options > Micro Focus COBOL) has been renamed as "Show load and stack frame information for system programs". When unchecked, the Call Stack debug window does not show any system stack frames.

(9712)

- It is now possible to transfer PDS datasets in Visual Studio from Mainframe Explorer to the Enterprise Server Catalog.

00370818 (12624)

- Mainframe Explorer in Visual Studio no longer displays an IMS information message when downloading files from the mainframe that are not IMS files.

00364596 (12597)

- When using Drag and Drop to move files from Mainframe Explorer to Server Explorer, the transfer is executed asynchronously. This enables you to use the development environment while the transfer is in progress. The status bar shows the name of the item being transferred if a single file, or a progress bar if multiple items are being transferred.

00364609 (26075)

- An issue with Mainframe Explorer where mfd daemon would not receive the session has been resolved.

00364608 (26074)

- An issue with Mainframe Explorer where mfd daemon would not receive the session has been resolved.

00364608 (26074)

- The Mainframe Explorer in Visual Studio now displays members with no member name set.

00478965 (61184)

- You no longer receive any errors when trying to refresh the list of "my jobs" in Mainframe Explorer.

(52054)

- Listing a PDS node with many members in Mainframe Explorer no longer causes Visual Studio to become unresponsive.

00364607 (26060)

- Binary transfers from Mainframe Explorer to Catalog Explorer now respect the Mainframe Explorer translation options.

00364606 (28053)

- A problem that prevented Visual Studio Mainframe Explorer filters to be modified after creation has been fixed.
00364610 (26066)
- In Visual Studio, the IMS import from the Mainframe Explorer now queries the ESMAC environment settings of the running region. These settings are then passed to the MFA Client to enable PCIMS to process the IMS dataset correctly.
3224585 (12373)
- Recl is now displayed as a PDS member property and passed to the Data File Tools when opened as an editor.
00364598 (12542)
- The catalog explorer in Visual Studio now warns the user that PCIMS has converted the format of an IMS database.
3217979 (11593)
- Expanding a PDS node with many members in Server Explorer no longer results in Visual Studio becoming unresponsive.
00364611 (27156)
- Visual Studio catalog filters now support regular expressions.
00370817 (13531)

XML Support

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- The XMLIO run-time system now correctly handles namespace prefixes specified in the IDENTIFIED BY clause.
00371218 (11634)
- The XML PARSE run-time system can now handle large elements content.
3222846 (13461)

Other Issues Resolved in This Release

The numbers listed are the Support Incident Numbers followed by the Defect number (in parentheses).

- 00367244 (12615)

Unsupported Functionality

This section includes information about features or functionality that are not supported.

- The HOSTSIGNS Compiler directive is no longer supported. Micro Focus recommends that you use the following Compiler directives instead: SIGN-FIXUP, HOST-NUMMOVE, and HOST-NUMCOMPARE. This is a change since version 3.0 of this product.

Additional Software Requirements


To ensure full functionality for some Enterprise Developer features, you might be required to obtain and install additional third-party software.

See this information on the Product Documentation pages on Micro Focus Customer Care, in the product help for Enterprise Developer for Visual Studio 2017 ([click here](#)) or Enterprise Developer for Visual Studio 2019 ([click here](#)).

Installation

Supported Operating Systems and Third-party Software

Lists operating systems supported and tested with Micro Focus software products, and third-party software supported by major features within Micro Focus products.

 **Attention:** This provides a summary of operating systems and third-party software supported across the Micro Focus Visual COBOL / Enterprise Developer suite of products. Not all software and/or software versions listed here are supported by every product in the suite.

- [Windows Operating Systems](#) on page 79
- [Linux/UNIX Operating Systems](#) on page 79
- [IBM Mainframe Operating Systems](#) on page 81
- [Integrated Development Environments \(IDEs\)](#) on page 81
- [.NET Core](#) on page 82
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- [Relational Database Management Systems \(RDBMSs\)](#) on page 83
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Windows Operating Systems

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All supported Windows operating system versions have been tested with all listed Micro Focus product releases. Each listed Windows operating system version and its subsequent updates are supported.

Operating System	Micro Focus Product Release		
	5.0	6.0	7.0
Windows 7	X		
Windows 8.1	X	X	X
Windows 10	X	X	X
Windows Server 2008 R2 SP1	X		
Windows Server 2012 R2	X	X	X
Windows Server 2016	X	X	X
Windows Server 2019	X	X	X

Linux/UNIX Operating Systems

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Micro Focus has tested the operating system base versions with corresponding Micro Focus product releases. Any Micro Focus release that supports a given operating system base release also supports any subsequent minor releases provided by the vendor.

Micro Focus Product Release				
Operating System Base	Processor	5.0	6.0	7.0
AIX 7.1.x (where x >=4) ¹	IBM Power System ²	X	X	X
AIX 7.2 ¹	IBM Power System ²	X	X	X
CentOS 7 ¹	Intel x86-64		X	X
CentOS 8 ³	Intel x86-64		X ¹	X
HP - UX 11.31 ¹	Itanium	X	X	X
Oracle Linux - Red Hat Compatible Kernel 6 ¹	Intel x86-64	X	X	
Oracle Linux - Red Hat Compatible Kernel 7 ¹	Intel x86-64	X	X	X
Oracle Linux - Red Hat Compatible Kernel 8 ¹	Intel x86-64	X	X	X
Oracle Linux - Unbreakable Enterprise Kernel 6 ¹	Intel x86-64	X	X	
Oracle Linux - Unbreakable Enterprise Kernel 7 ¹	Intel x86-64	X	X	X
Oracle Linux - Unbreakable Enterprise Kernel 8 ¹	Intel x86-64	X	X	X
Red Hat Enterprise Linux 6	Intel x86-64 ¹	X	X	
Red Hat Enterprise Linux 6	IBM Z System ¹	X	X	
Red Hat Enterprise Linux 7	IBM Power System ^{1,2}	X		
Red Hat Enterprise Linux 7	Intel x86-64	X	X	X
Red Hat Enterprise Linux 7	IBM Z System ¹	X	X	
Red Hat Enterprise Linux 8	Intel x86-64		X	X
Red Hat Enterprise Linux 8.2 and later	IBM Z System ^{1,2}		X	X
Oracle Solaris 11 ¹	Intel x86-64	X	X	X
Oracle Solaris 11 ¹	SPARC	X	X	X

Micro Focus Product Release				
Operating System Base	Processor	5.0	6.0	7.0
SUSE Linux Enterprise Server 12	IBM Power System ¹	X		
SUSE Linux Enterprise Server 15	IBM Power System ¹	X		
SUSE Linux Enterprise Server 12	Intel x64	X	X	X
SUSE Linux Enterprise Server 15	Intel x64	X	X	X
SUSE Linux Enterprise Server 12	IBM Z System ¹	X	X	X
SUSE Linux Enterprise Server 15	IBM Z System ¹	X	X	X
SUSE Linux Enterprise Desktop 15	Intel x64			X
Ubuntu 18.04 ¹	Intel x64		X	X
Ubuntu 20.04	Intel x64			X

¹ Not supported by Eclipse.

² 64-bit-only

³ The end-of-life date for this platform is 31 December 2021. We recommend that you check CentOS 8 end-of-life notices before using this platform.

IBM Mainframe Operating Systems

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Micro Focus Product Release			
Operating System	5.0	6.0	7.0
z/OS 2.3	X	X	X
z/OS 2.4	X	X	X

Integrated Development Environments (IDEs)

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Micro Focus Product Release			
IDE	5.0	6.0	7.0
Microsoft Visual Studio 2017	X	X	X
Microsoft Visual Studio 2019	X	X	X
Eclipse v4.16 ¹			X
Eclipse v4.7	X	X	

Micro Focus Product Release			
IDE	5.0	6.0	7.0
Eclipse v4.8	X	X	
Microsoft VS Code v1.x	X	X	X
¹ Installed automatically with Eclipse-based products.			

.NET Core

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Micro Focus Product Release			
.NET Core	5.0	6.0	7.0
.NET Core 2.1	X		
.NET Core 3.1	X	X	X

Java JDK

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Micro Focus Product Release			
Java	5.0	6.0	7.0
IBM JDK 1.7	X	X	
IBM JDK 1.8	X	X	X
Oracle JDK 1.7 / 7	X	X	
Oracle JDK 1.8 / 8	X	X	X
AdoptOpenJDK 8	X	X	X
AdoptOpenJDK 11 ^{1,2}		X	X
AdoptOpenJDK 11 OpenJ9			X
¹ Installed with Micro Focus products for Windows platforms.			
² Not supported on AIX platforms. See the AdoptOpenJDK Web site for more information about OpenJ9.			

Java Application Servers

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Micro Focus Product Release			
Java Application Servers	5.0	6.0	7.0
Apache Tomcat 9.0	X	X	X
IBM WebSphere 8.5.5	X	X	X
IBM WebSphere 9.0	X	X	X
IBM WebSphere Liberty 19.0.0.0 ¹	X	X	X
IBM WebSphere Liberty 20.0.0.0 ¹			X

Micro Focus Product Release			
Java Application Servers	5.0	6.0	7.0
JBoss EAP 7.1	X	X	X
JBoss EAP 7.2		X	X
JBoss EAP 7.3			X
Oracle WebLogic 12.2.1	X	X	X
<p>¹ Websphere Liberty is made available as a single stream continuous delivery software lifecycle. Micro Focus does not test all updates to Liberty but does periodically test the latest release of WebSphere Liberty against the latest available Micro Focus product release.</p> <p>Micro Focus will make reasonable efforts to resolve product issues against supported releases of Liberty and in accordance with the Micro Focus product lifecycle policy. Micro Focus might require you to update to a newer release of Liberty to remedy a Support case.</p>			

Relational Database Management Systems (RDBMSs)

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All RDBMS testing is done on both 32- and 64-bit platforms based on RDBMS client software availability.

Micro Focus Product Release			
RDBMS	5.0	6.0	7.0
Oracle 12.2, 12.2.0.1	X		
Oracle 18c (12.2.0.2)	X	X	
Oracle 19c (12.2.0.3)		X	X
Microsoft SQL Server 2012	X		
Microsoft SQL Server 2014	X	X	X
Microsoft SQL Server 2016	X	X	X
Microsoft SQL Server 2017	X	X	X
Microsoft SQL Server 2019		X	X
Microsoft Azure SQL Database			X
Microsoft Azure SQL Managed Instance			X
IBM DB2 LUW 10.5	X	X	X
IBM DB2 LUW 11.1	X	X	X
IBM DB2 LUW 11.5		X	X
IBM POWERLinux LE using DB2 LUW 10.5		X	
EDB PostgreSQL 10.x	X	X	X
EDB PostgreSQL 11.x		X	X
EDB PostgreSQL 12.x			X
GDG PostgreSQL 10.x	X	X	X
GDG PostgreSQL 11.x		X	X

Micro Focus Product Release			
RDBMS	5.0	6.0	7.0
GDG PostgreSQL 12.x			X
Amazon Aurora for PostgreSQL 2.x (10.x)			X
Amazon Aurora for PostgreSQL 3.x (11.x)			X
MySQL 5.7	X	X	X

Database Client Software

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Client	Release	Micro Focus Component(s)
.NET Core database providers	Consult the RDBMS documentation specific to your installed RDBMS to determine which version(s) of .NET Core are compatible.	OpenESQL
ADO.NET	Consult the RDBMS documentation specific to your installed RDBMS to determine which version(s) of ADO.NET are compatible.	OpenESQL HCOSS
IBM Data Server Runtime Client, which includes Database Connectors, CLI, Database Connectors, and ADO.NET	Consult the IBM documentation specific to your installed RDBMS to determine which version(s) of IBM Data Server Runtime Client are compatible.	OpenESQL DB2 DB2 for HCO
IBM Data Server Client	Consult the IBM documentation specific to your installed RDBMS to determine which version(s) of IBM Data Server Client are compatible.	OpenESQL DB2 ECM
Oracle Client and Oracle Instant Client with Pro*COBOL	Consult the Oracle documentation specific to your installed RDBMS to determine which version(s) of Oracle Client or Oracle Instant Client are compatible.	OpenESQL COBSQL
IBM Informix ESQL/COBOL ¹	7.3 or later	
Database Connectors Drivers	Consult the RDBMS documentation specific to your installed RDBMS to determine which version(s) of Database Connectors Drivers are compatible.	OpenESQL
Microsoft OLE DB Provider for DB2	Consult the SQL Server documentation specific to your installed RDBMS to determine which version(s) of Database	HCOSS

Client	Release	Micro Focus Component(s)
	Connectors Drivers are compatible.	
Microsoft OLE DB Provider for SQL Server	Consult the SQL Server documentation specific to your installed RDBMS to determine which version(s) of Database Connectors Drivers are compatible.	HCROSS
Database Connectors Drivers	ODatabase Connectors 3.0-compliant drivers	
Sybase Open Client Embedded SQL/COBOL ¹	11.1 or later	
¹ Not tested.		

Middleware

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Middleware	Micro Focus Product Release		
	5.0	6.0	7.0
IBM WebSphere MQ 9.0	X	X	X
IBM TXSeries for Multiplatforms ¹	X	X	X
Oracle Tuxedo and Tuxedo ART ²	X	X	X
¹ See the IBM Web site for a list of supported versions.			
² See the Oracle Web site for a list of supported versions.			

Before Installing

Downloading the Product

1. Log into the Software Licenses and Downloads (SLD) site at <https://sld.microfocus.com/mysoftware/download/downloadCenter>.
2. Select your account and click **Entitlements**.
3. Search for the product by using any of the available search parameters.
4. Click **Show all entitlements**.
5. Click **Get Software** in the Action column for the product you want to download or update.

In the **File Type** column, you see entries for "Software" for any GA products, and "Patch" for any patch updates.

6. Click **Download** on the relevant row.

On Windows

System Requirements

Hardware Requirements

Enterprise Developer has the following requirements in addition to the requirements of Microsoft Visual Studio. See the Visual Studio documentation for details of the Microsoft requirements.

In general, most modern machines will have the required processor and available RAM to run the Micro Focus products under Windows effectively. For planning purposes, you should consider having a minimum of 2GB of RAM.

The maximum disk space requirements are, approximately:

Enterprise Developer	Sentinel RMS License Manager
2.3Gb	75MB

- This includes the space needed to cache information locally so that you can modify the installation without the original source media.
- The disk space requirements include the versions of JRE and .NET Framework supplied with the setup file.

Operating Systems Supported

For a list of supported operating systems, see *Supported Operating Systems and Third-party Software* in your product documentation.

Note:

- A 64-bit Windows is required. You can produce both 32-bit and 64-bit applications with Enterprise Developer installed on a 64-bit operating system.
- Support for development and deployment on Windows 7 has been discontinued.
- Support for development on Windows 8 and Windows Server 2012 has been discontinued. These platforms are still supported for deployment. Windows 8.1 and Windows Server 2012 R2 are supported.

Software Requirements

The setup file will check your machine for whether the prerequisite software is installed and will install any missing prerequisites and the product components. A supported version of Microsoft's Visual Studio must be installed in advance.

- Besides the software listed below, the setup file also installs the 64-bit AdoptOpenJDK 11.0.8 (LTS) with Hotspot.
- This product includes OpenSSL version 1.1.1k-mf6 (modified).

Visual Studio IDE

You must have Microsoft's Visual Studio 2017 version 15.9.4 or a newer one or 2019 version 16.9 or a newer one installed in advance.

You need one of the advanced versions of Visual Studio listed below:

Professional, Enterprise or Community Edition (for Visual Studio 2017) - see the next section for the Visual Studio components you must install.

Professional, Enterprise or Community Edition (for Visual Studio 2019) - see the next section for the Visual Studio components you must install.

Microsoft's Visual Studio Express Edition is not supported.

Important:

- When installing Visual Studio, ensure you select the Help Viewer component for installing if you want to view the Enterprise Developer product help inside Visual Studio. When you select components to install in the Visual Studio installer, click **Individual components** and check **Help Viewer** in the **Code tools** section.

The following software is also required:

- Microsoft .NET Framework 4.7.2. This is included with Visual Studio.

Selecting the Visual Studio components to install

The Visual Studio installer enables you to customize and only install the workloads and components that are most suitable for your area of development. For example, you can select the components that are required for .NET desktop development, ASP.NET Web or C++ development.

If not already installed, the Enterprise Developer setup file will install the following components:

- .NET Framework version 4.7.2.
- Debugger
- Data services

A number of workloads and components are optional and only required by specific types of applications or tasks:

- Azure, WCF, Web, WPF or SQL CLR application development.

If you require any of these, you can select them when you start the Visual Studio installer or, enable them after completing the installation - see the next section.

Installing Visual Studio features that are not currently installed

If a feature of Visual Studio was not installed during the Visual Studio installation, the respective functionality or the project templates for it are not available. You can install a missing feature in one of the following ways:

Rerun the Visual Studio installer:

1. Start the Visual Studio installer and choose to modify an existing Visual Studio instance.
2. Select the workloads and the components that are missing (for example, **ASP.NET and web development** or **Help Viewer**).
3. Start the Visual Studio installation.

Use the **Quick Launch** control in Visual Studio:

1. Start Visual Studio.
2. Type the name of the feature in the **Quick Launch** control - for example, type `ASP.NET` or `Help Viewer`.

A drop-down list with any features matching your search string appears. If the feature is not already installed, one of the search results will be an option to install it.

Use the `Install Missing Feature(s)` command in Visual Studio:

1. Start Visual Studio.
2. Click **Help > Micro Focus Product Help > Install Missing Feature(s) > Feature Name**.

Follow the instructions in the installer to install the missing feature.

3. Alternatively, if a Micro Focus project template requires a Visual Studio feature which is not currently installed, the IDE displays an information bar with instructions to install the feature.

Other Requirements

Various actions and operations within your COBOL development environment depend on certain files that Microsoft distributes in the following packages: the Windows SDK package and the Microsoft Build Tools

package. See *Microsoft Package Dependencies* for a full list of actions and operations that require one or both of these packages.

By default, the product installation installs the latest versions of the Microsoft Windows 10 SDK, and the Microsoft Build Tools for Visual Studio 2017, to their default locations.

If you need to use any other version of these packages, or use them installed to a non-default location, use the `cb1ms` command line utility post-installation to manage this; see *Managing the Microsoft Build Tools and Windows SDK Packages* for more information.

License Manager requirements

- The Micro Focus License Administration tool requires Java to run. It supports Java 1.7 or later.
- For local servers, you do not need to install the Micro Focus License Administration tool separately, as the setup file installs a new Enterprise Developer client and a new licensing server on the same machine.
- If you have any network license servers, you must update them before you update the client machines.
- If you are upgrading from Enterprise Developer release 2.2 or earlier, uninstall the license manager before installing the product.

You can download the new version of the license server software by following these steps:

1. Log into the Software Licenses and Downloads (SLD) site at <https://sld.microfocus.com/mysoftware/download/downloadCenter>.
2. Select your account and click **Downloads**.
3. Select a product and a product version from your orders.
4. In the list of software downloads, locate the **License Manager**.
5. Click **Download** to download an archive with the installers.
6. Run the installer suitable for your Operating System to install License Manager on your machine.

Product Co-Existence

- Enterprise Developer and Enterprise Server (or Enterprise Test Server) cannot coexist on the same machine.
- Visual COBOL and Enterprise Developer cannot coexist on the same machine regardless of which IDE (Visual Studio or Eclipse) you install.

Installation Restrictions and Requirements

Before starting the installation you should consider the following:

- Visual COBOL and Enterprise Developer cannot coexist on the same machine.
- If, when you install Enterprise Developer, the machine does not have Microsoft Visual C++ 2017 Redistributable Runtime already installed, it is installed as required by Enterprise Developer. The installation of Microsoft Visual C++ Redistributable Runtime adds a number of `.dll` files, without digital signatures, into the `winsxs` directory.
- You need to be logged in with a user-ID that has write access to the registry structure under `HKEY_LOCAL_MACHINE`, `HKEY_CLASSES_ROOT`, and `HKEY_CURRENT_USER` so the installation software can set the environment appropriately. You also need to be logged on with Administrator privileges.
- Various actions and operations within your COBOL development environment depend on certain Microsoft files distributed in the following packages: the Windows SDK package and the Microsoft Build Tools package. By default, a standard product installation downloads and installs these. Refer to *Microsoft Package Dependencies* to see if these packages are required. If you do not plan to use your development tool in a way that will depend on any of these packages, you can run a non-standard installation, which will skip their download and installation, thus saving disk space and time taken for installation. Refer to *Advanced Installation Tasks* for details on the available installation options.

- If you already have Microsoft Build Tools for Visual Studio 2017 installed, you must ensure that it contains the Visual C++ build tools workload (or at least the individual components contained in that workload) before you run this installation.

On UNIX

Hardware Requirements

The disk space requirements for Micro Focus Enterprise Developer Unix Components are approximately:

Platform	Installer type	Setup file size	Disk space required for the installation	Disk space required for running the product	Licensing technology
POWER running AIX	Micro Focus	601 MB	2.40 GB	1.20GB	41 MB
HP IA	Micro Focus	1.03 GB	4.10 GB	2.05 GB	79 MB
System Z running Red Hat Linux	Micro Focus	485 MB	1.95 GB	970 MB	39 MB
x86-64 running Red Hat Linux	Micro Focus	743 MB	2.98 GB	1.49 GB	50 MB
SPARC running Solaris	Micro Focus	603 MB	2.42 GB	1.21 GB	42 MB
x86-64 running Solaris	Micro Focus	516 MB	2.07 GB	1.04 GB	33 MB
System Z running SUSE SLES	Micro Focus	348 MB	1.40 GB	696 MB	39 MB
x64 running SUSE SLES	Micro Focus	501 MB	2.01 GB	1.01 GB	50 MB
x64 running Ubuntu	Micro Focus	505 MB	2.03 GB	1.02 GB	50 MB
x86-64 running CentOS	Micro Focus	743 MB	2.98 GB	1.49 GB	50 MB

Operating Systems Supported

For a list of supported operating systems, see *Supported Operating Systems and Third-party Software* in your product documentation.

On SUSE 12 and 15, and on Ubuntu, you can only install and use the 64-bit version of this product.

Software Requirements for Micro Focus Enterprise Developer Unix Components

The following topic lists the software requirements for Micro Focus Enterprise Developer Unix Components.

- [Software required by the setup file](#)

- [Libraries required by the setup file](#)
- [Required environment variables](#)
- [License Manager requirements](#)

Software required by the setup file

- The "awk", "ed", "ps", "sed", "tar", "sed" and "which" "tar" utilities must be installed and added to the PATH.
- The pax archiving utility is required by the setup file. Pax is distributed with most UNIX/Linux systems but, if it is missing, you must install it separately. To verify pax is installed, run `pax --help` or `pax --version` at the command line.
- Xterm, the terminal emulator for the X Window System, is part of your UNIX/Linux distribution but is not installed by default. Use your UNIX/Linux installation media to install it.
- GNOME menus and buttons have been standardized across all applications so that icons are not displayed by default. To keep the icons and the look and feel of previous versions, enable the `menus_have_icons` property with the command:

```
gconftool-2 --type boolean --set /desktop/gnome/interface/menus_have_icons true
```

Libraries required by the setup file

The following table lists the required libraries for Red Hat and SUSE Linux platforms. The setup file checks that both the 32-bit and 64-bit libraries listed below are installed on both 32-bit and on 64-bit Operating Systems for this product to install and work correctly.

If installing on a 64-bit OS, the 32-bit libraries are not installed by default and must be installed before you start the installation.

Library	32-bit Library Name	64-bit Library Name	Platform						
			s390	SUSE 12 ¹	SUSE 15 ¹	Red Hat 6x	Red Hat 7	Red Hat 8	
glibc	glibc- *.i686	glibc- *.x86_64	glibc- *.s390				X	X	X
libgcc	libgcc- *.i686	libgcc- *.x86_64	libgcc- *.s390				X	X	X
libstdc++	libstdc++- *.i686	libstdc++- *.x86_64	libstdc++- *.s390				X	X	X
glibc-locale	glibc- locale- -32bit	glibc- locale-2		X	X				
glibc-devel	glibc- devel- *.i686	glibc- devel- *.x86_64	glibc- devel- *.s390				X	X	X
elfutils-libelf	elfutils- - libelf.i 386 or elfutils	elfutils- libelf.x86- 64	N/A				X	X	X

Library	32-bit Library Name	64-bit Library Name	Platform						
			s390	SUSE 12 ¹	SUSE 15 ¹	Red Hat 6x	Red Hat 7	Red Hat 8	
	- libelf.i686								
libelf-devel**	elfutils-devel.i386 or elfutils-devel.i686	elfutils-devel.x86_64	N/A			X	X		X
libelf-devel**	libelf-devel-32bit-0.137-8.19	libelf-devel-0.137-8.19	N/A	X	X		X		
libelf1**	libelf1-32bit-0.137-8.19	libelf1-37-8.19	N/A	X	X				
gcc ²	gcc*.i686	gcc*x86_64	X	X	X	X	X	X	X
cpp ²		cpp*x86_64				X	X		X
ld ²	Binutils*.i686	Binutils*x86_64	X	X	X	X	X		X

- Libraries marked with an 'X' are not included in the platform and need to be installed separately.
- ¹On SUSE 12 and 15, you can only install the 64-bit version of Enterprise Developer. The glibc-locale-32bit library is still required by the SafeNet Sentinel licensed components.
- ²On Red Hat, these libraries are required to enable COBOL and PL/I to compile.
- * Additional libraries required to use the core_on_error run-time system variable. The gdb packages (for the GNU Project Debugger) can be installed from the install media for your OS.
- ** Operating system libraries required for PL/I support on both SUSE and Red Hat.

Visit the [Red Hat Web site](#) for more information.

Required environment variables

- To execute JVM COBOL code, you need to set the environment as follows:
 - Set the JAVA_HOME environment variable. When installing the product, set this variable to a 64-bit Java installation or the installation terminates. For example, execute the following:

```
export JAVA_HOME=java_install_dir
```

where *java_install_dir* is the path to the JAVA installation directory such as `/usr/java/javan.n`

- Add `$JAVA_HOME/bin` to your system PATH variable. To do this, execute:

```
export PATH=$JAVA_HOME/bin:$PATH
```
- You need to set the LANG environment variable to pick up localized messages. If you do not set it as specified here, the installation will run but you might experience unexpected behavior from the installer.

The LANG settings are English and Japanese only so set it to one of the following locales:

```
C, default, en_GB, en_GB.UTF-8, en_US, en_US.UTF-8
```

```
ja_JP, ja_JP.SJIS, ja_JP.UTF-8, ja_JP.eucJP, ja_JP.eucjp, ja_JP.sjis, ja_JP.ujis, ja_JP.utf8, japanese
```

You can set LANG before running the setup file as follows:

```
export LANG=C
```

Alternatively, add it to the start of the setup command line:

```
LANG=C ./setupfilename
```

See *Using the LANG Environment Variable* for details.

License Manager requirements

- The Micro Focus License Administration tool requires Java to run. It supports Java 1.7 or later.
- For local servers, you do not need to install the Micro Focus License Administration tool separately, as the setup file installs a new Enterprise Developer client and a new licensing server on the same machine.
- If you have any network license servers, you must update them before you update the client machines.
- If you are upgrading from Enterprise Developer release 2.2 or earlier, uninstall the license manager before installing the product.

You can download the new version of the license server software by following these steps:

1. Log into the Software Licenses and Downloads (SLD) site at <https://sld.microfocus.com/mysoftware/download/downloadCenter>.
2. Select your account and click **Downloads**.
3. Select a product and a product version from your orders.
4. In the list of software downloads, locate the **License Manager**.
5. Click **Download** to download an archive with the installers.
6. Run the installer suitable for your Operating System to install License Manager on your machine.

Issues with the Installation on UNIX and Linux

Installing on Red Hat 8.x s390

On Red Hat 8.x s390, the RPM non-root install method is not supported due to errors given by cpio. You receive the following messages:

```
error: unpacking of archive failed on file /usr/lib/.build-id/lb/af99f26c6b4c00ca499a3199a574b73aeb3854;6092b79c: cpio: symlink failed - No such file or directory
error: Micro_Focus_cobol_server-7.0.0.0-100700.s390x: install failed
```

As a result, the installation in this scenario is incomplete.

Installing while using AFS/Kerberos authentication

If you are using AFS/Kerberos authentication to log onto your Linux system then you need to ensure you have a local user ID which SOA and Enterprise Developer components of the product can use. This user ID must be set up prior to running the installer. When running the installer you need to specify `ESadminID=[User ID]` on the command line so it is used by the installer.

License Server

You need to configure the computer hostname to ensure the license server will start properly.

To avoid performance issues, "localhost" and the computer hostname must not both be mapped to IP address 127.0.0.1. You should only map "localhost" to IP address 127.0.0.1.

The following is an example of how to specify these entries correctly in the `/etc/hosts` file:

```
127.0.0.1 localhost.localdomain localhost
IP machinelonghostname machineshorthostname
```

where *IP* is the unique IP address of the computer in `xx.xx.xx.xx` format.

Basic Installation

The instructions in this section apply when you are performing a basic installation of this product for the first time. If you are an administrator, you can perform a basic installation on a local machine before performing a more advanced installation when rolling out the product to developers within your organization.

For considerations when installing this product as an upgrade, for additional installation options or non-default installations and for installing the mainframe components, see *Advanced Installation Tasks* in your product Help.

Installing



Note:

- This version of the product is a full install.
- See *Before Installing* first for important information. Also, see *Installing as an Upgrade*, if you have an earlier version of Enterprise Developer installed on your machine.

To install this product:

1. Run the `edvs2017_70.exe` file (or `edvs2019_70.exe`) and follow the wizard instructions to install the prerequisite software and the product.

The installer installs Enterprise Developer, Enterprise Server for .NET, and Micro Focus Analysis Services Integration and offers to install Micro Focus Rumba+ Desktop. The setup file will also install any missing prerequisite software as listed in the topic *Software Requirements*.



Note: If you intend to use the Enterprise Server for .NET feature to run CICS or JCL applications in a .NET environment, the Rumba+ Desktop product is a prerequisite. We recommend that you install it at this time.



Note:

- If you are installing onto a machine that has an existing Micro Focus product that uses an older Sentinel RMS License Manager, you might be prompted to remove it and install the Micro Focus License Administration. By doing this you maintain the existing Sentinel RMS license files while adding the Micro Focus License Administration. If you are unsure about existing licenses on your computer or removing the Sentinel RMS License Manager, consult your System Administrator. If you want to proceed, remove Sentinel RMS License Manager by using **Program and Features**, and rerun the installation file.
- Depending on how you plan to use the product, there could be dependencies on the Microsoft Windows SDK and Microsoft Build Tools packages. The installer will install the latest versions of the Microsoft Windows 10 SDK, and the Microsoft Build Tools for Visual Studio 2017, to their default locations. Refer to *Microsoft Package Dependencies* to see if you will require these

packages, and if not, you can configure the installer to skip download and installation (see *Advanced Installation Tasks* for more information).

- If you choose not to install Rumba+ Desktop at this time, but decide you want it later, you must then uninstall Enterprise Developer, and then rerun the installer with the Rumba+ Desktop option checked. As an alternative, you can use a different emulator, but be aware that instructions in this documentation often assume that you are using the embedded Rumba+ Desktop emulator.
- Trial licenses cannot be used with remote desktop services. If you want to use your product in this way, please contact Micro Focus Customer Care to obtain a relevant license.
- We recommend that you install any updates for Visual Studio and the .NET Framework that are available at the [Microsoft Download](#) site.
- If you install JDK you might be prompted to install the latest update. The latest update is not required for use with Enterprise Developer but you can install it if you wish.

Installing Micro Focus Enterprise Developer Unix Components

Micro Focus offers two types of installers on UNIX and Linux - a proprietary Micro Focus installer for installing on UNIX and Linux and a standard RPM (RPM Package Manager) installer for installing on Linux. See your product Help for instructions on how to use the RPM installer.

Before starting the installation, see *Software Requirements*.

These are the steps to install this product using the Micro Focus installer:

1. Give execute permissions to the setup file:

```
chmod +x setup_entdev_7.0_platform
```

2. Run the installer from the Process User ID login:

```
./setup_entdev_7.0_platform
```

When the installer starts it will prompt you to enter the superuser password so it can perform operations that require root permissions.



Note: On Ubuntu, the prompt for superuser password is not available. On this platform you must either log in as root or use the `sudo` command to get root permissions before you run the installer.

The COBOL environment is installed by default into `/opt/microfocus/EnterpriseDeveloper`, (COBDIR).

Enterprise Server System Administrator Process

During the installation process, the installer configures the product's Enterprise Server System Administrator Process User ID. The Process User ID will be the owner of all Enterprise Server processes except the one for the Micro Focus Directory Server (MFDS). The Directory Server process (Enterprise Server Administration) runs as root as this allows it to access the system files and ports.

All Enterprise Server processes you start from Enterprise Server Administration run under the Process User ID which can affect the file access and creation.

You must supply the user ID at the command line - specify `-EsadminID=[ID]` as part of your command.

By default, the installer uses the login id of the user that runs the installer for the Process User ID. To change the user id after you complete the installation, execute `$(COBDIR)/bin/casperm.sh` and follow the onscreen instructions.

SafeNet Sentinel considerations

- The installation of this product could affect the SafeNet Sentinel licensed components running on your machine. During installation licensing is shutdown to allow files to be updated. To ensure the processes

running on your machine are not affected, you need to use the `-skipsafenet` option, which skips the installation of SafeNet:

```
./setup_entdev_7.0_platform -skipsafenet
```

- To protect the SafeNet Sentinel installation from accidental updating you can create an empty file named `SKIP_SAFENET_INSTALL` in `/var/microfocuslicensing/` as follows:

```
touch /var/microfocuslicensing/SKIP_SAFENET_INSTALL
```

While the file is present, the SafeNet installer does not make changes to the installation or shutdown the running license daemons. If licensing needs to be updated later, you can rerun the `MFLicenseServerInstall.sh` from within the `COBDIR/safenet` folder with the force command line option:

```
cd $COBDIR/safenet
./MFLicenseServerInstall.sh force
```

AutoPass Licensing considerations

- The installation of this product could affect the AutoPass licensed components running on your machine. During installation, the licensing shuts down to allow files to be updated. To ensure the processes running on your machine are not affected, you need to use the `-skipautopass` option, which skips the installation of AutoPass:

```
./setup file -skipautopass
```

- To protect the AutoPass installation from accidental updating, you can create an empty file named `SKIP_AUTOPASS_INSTALL` in `/opt/microfocus/licensing` as follows:

```
touch /opt/microfocus/licensing/SKIP_AUTOPASS_INSTALL
```

While the file is present, the AutoPass installer does not make changes to the installation or shutdown the running license daemons. If licensing needs to be updated later, you can rerun the `MFLicenseServerInstall.sh` from within the `COBDIR/safenet` folder with the force command line option:

```
cd $COBDIR/safenet
./MFLicenseServerInstall.sh force
```

Advanced Installation Tasks

This section includes instructions about how to perform a non-default installation, install this product as an upgrade, or about how to install the additional components.

The advanced installation tasks include:

- *Installing as an Upgrade* - included in these Release Notes
- *Command line installation options* - included in these Release Notes
- *Installing and licensing Micro Focus Rumba* - available in the product Help and on the Product Documentation pages on Micro Focus Customer Care
- *Installing the Mainframe Components* - available in the product Help and on the Product Documentation pages on Micro Focus Customer Care
- *Installing on Microsoft Terminal Server and Citrix* - available in the product Help and on the Product Documentation pages on Micro Focus Customer Care

See this information on the Product Documentation pages on Micro Focus Customer Care, in the product help for Enterprise Developer for Visual Studio 2017 ([click here](#)), and Enterprise Developer for Visual Studio 2019 ([click here](#)).

On Windows

Installing as an Upgrade

Installing this release as an upgrade will automatically uninstall any Patch Updates of the older version of the product you have installed on your machine.

- Before installing this release as an upgrade, ensure you create a back-up of your Enterprise Server configuration. To do this, on the Enterprise Server Administration home page, click **Export** and then select **Export Enterprise Server configuration and Security Manager definitions**. This creates a backup folder in the `c:\programdata\micro focus\Enterprise Developer\MFDS`. You can restore the Enterprise Server configuration after installing this release - click Import on the Enterprise Server Administration home page.
- This release can be installed as an upgrade to Enterprise Developer 6.0.

Enterprise Developer Installation Options

To install Enterprise Developer you run `edvs2017_70.exe` which contains a number of product `.msi` files (Windows Installer packages). When run, `edvs2017_70.exe` performs some initial system checks then sequentially installs the `.msi` files.



Note: The following applies to `edvs2019_70.exe` when installing the product for Visual Studio 2019.

`edvs2017_70.exe` can take a number of parameters, enabling you to specify a number of different types of installation:

- Standard Installation

Format:

```
edvs2017_70.exe
```

Summary:

Full installation including License Manager and Enterprise Developer. During installation you can specify options including the location to which the components are installed.

- Non-standard Installation

Format:

```
edvs2017_70.exe skipmstools=1
```

Summary:

Full installation, minus the Microsoft package dependencies. A standard installation downloads and installs the latest Microsoft Build Tools (for Visual Studio 2017) and Windows SDK packages. Refer to *Microsoft Package Dependencies* to see if you will depend on these packages, and if not, use the option above to skip installation of the packages, thus reducing the footprint and duration of the installation process.

- Non-interactive Installation

Format:

```
edvs2017_70.exe /passive
```

Summary:

Full installation, but the components are installed non-interactively using default options and directories.

- Silent Installation

Format:

```
start /wait edvs2017_70.exe /q
```

Summary:

Full installation, but the components are installed non-interactively with no user interface, using default options and directories.

- Modified Silent Installation

Format:

```
start /wait edvs2017_70.exe /q InstallFolder=d:\otherdirectory
```

Summary:

Full installation, but the components are installed non-interactively with no user interface, and Enterprise Developer is installed to d:\otherdirectory.

Format:

```
start /wait edvs2017_70.exe /q RumbaCheckbox=1
```

Summary:

Full installation of Enterprise Developer and of the Micro Focus Rumba+ Desktop component. All components are installed non-interactively with no user interface.

To see what parameters you can use, execute the following from the command line:

```
edvs2017_70.exe /?.
```



Note:

- Log files that are created during installation are saved in the folder specified by the TEMP environment variable. To change the location or name of the files, use the /log parameter on your setup command line and specify the path and file name, for example: filename /log d:\temp\log.txt. This creates a log file, named log.txt, in the d:\temp directory.

On UNIX

Installing as an Upgrade

This release works concurrently with the previous version of Micro Focus Enterprise Developer Unix Components, so you do not need to uninstall it.

Install the latest version in a different location and set the environment to point to it. To do this, run the Micro Focus Enterprise Developer Unix Components installer with the `-installlocation` option:

1. Execute the following command:

```
./InstallFile -installlocation="/opt/microfocus/EnterpriseDeveloper"
```



Note: You can use variables when specifying an absolute path for `-installlocation`. For example, the following examples are equivalent:

```
-installlocation="/home/myid/installdir"
```

```
-installlocation="$HOME/installdir"
```

2. Execute `cobsetenv` to set the environment and point to the new install location:

```
. <product-install-dir>/bin/cobsetenv
```



Note: `cobsetenv` is only compatible with POSIX-like shells, such as bash, ksh, or XPG4 sh. It is not compatible with C-shell or pre-XPG4 Bourne shell.

Preserving the MFDS and Enterprise Server region configuration

The following information applies when you are upgrading from release 6.0.

If you install this release to the same install location as release 6.0, the product in the current location is moved to a backup directory name.

For example, if the 6.0 product is installed in the default install location, `/opt/microfocus/EnterpriseDeveloper`, during the upgrade it is moved to `/opt/microfocus/EnterpriseDeveloper.BKP.YYYY-MM-DD.HH:MM:SS`. The new release will be installed in `/opt/microfocus/EnterpriseDeveloper`.

Note that your original installation might include some files that you changed or added to, and you need those changes preserved in the new installation.

During the upgrade, the installer moves a number of changed files to a different configuration location and symbolically links them back into the new release install location. The configuration location is one of the following:

- The default config location is `/opt/microfocus/config/`.
- For non-root installation, the default location is `$HOME/microfocus/config/`.
- To specify your own configuration location, run the setup file with the following command-line option: `-mfconfiglocation=[location]`

The setup file creates a directory in the configuration location using the sum of the value of the `$COBDIR` path. This is so that each configuration area is unique to each product installation. The configuration files and directories are then placed in this `COBDIR` hash-numbered directory. In the examples below, the install location generates a hash of 12345.

The file `/opt/microfocus/config/12345/COBDIRlocation.txt` details the `COBDIR` the configuration area is associated with.

Currently, the setup file only moves the following files and directories:

Source	Destination
secrets	<code>/opt/microfocus/config/12345/secrets/</code>
commonwebadmin.json	<code>/opt/microfocus/config/12345/escwa/ commonwebadmin.json</code>
mfdscfg.xml	<code>/opt/microfocus/config/12345/mfds/ mfdscfg.xml</code>
mfds	<code>/opt/microfocus/config/12345/mfds/ mfds/</code>


If you have changed any other files in the original installation, you need to be copy these manually from the backup directory, `/opt/microfocus/EnterpriseDeveloper.BKP.YYYY-MM-DD.HH:MM:SS`, into the install location after the upgrade installation is complete.

Micro Focus Enterprise Developer Unix Components Installation Options

Installing into a different location

To install in a different location use the `-installlocation="Location"` parameter to specify an alternative directory location. For example:

```
./setup_entdev_7.0_platform -installlocation="full path of new location"
```

 **Note:** You can use variables when specifying an absolute path for `-installlocation`. For example, the following examples are equivalent:

```
-installlocation="/home/myid/installdir"
```

```
-installlocation="$HOME/installdir"
```

You can see details about which additional parameters can be passed to the install script if you enter the `-help` option.

Configuring the Enterprise Server installation

You can use the following options to configure the Enterprise Server installation: `[-ESsysLog="Y/N"] [-ESadminID="User ID"] [-CASrtDir="location"]`, where:

- ESsysLog** Use this to enable ("Y") or disable ("N") Enterprise Server system logging. Logging is enabled by default. Log files are saved in `/var/mfcobol/logs`.
- ESadminID** Sets the Enterprise Server System Administrator Process User ID from the command line - for example, `-ESadminID="esadm"`. The default user ID is the one that runs the installer.
- CASrtDir** Specifies the location where the Enterprise Server run-time system files are placed - for example, `-CASrtDir="/home/esuser/casrt/es"`. The default location is `/var/mfcobol/es`.

Installing Silently

You can install Micro Focus products silently by using command line parameters to specify the installation directory, user information, and which features to install. You must execute the command with superuser permissions.

You can use the following command line arguments to install silently on UNIX/Linux. You need to execute the commands as root:

```
-silent -IacceptEULA
```

For example, execute:

```
setup_filename -silent -IacceptEULA
```

After Installing

- See *Changes in Behavior or Usage* in your product documentation and in the Release Notes for important information about changes in this release that might affect existing applications.
- Check the *Product Documentation* section of the [Micro Focus Customer Support Documentation Web site](#) for any updates to the documentation which might have been uploaded.

On Windows

Starting the Product

You are now ready to run Enterprise Developer:

- Windows 8.1, and Windows Server 2012 R2**
 - From your Windows desktop, click the **Visual Studio 2017** tile.
- Windows 10 and Later**
 - From your Windows desktop, click **Start > Visual Studio 2017**.

Managing the Microsoft Build Tools and Windows SDK Packages

There are a number of COBOL development features that depend on the Microsoft Build Tools and Windows SDK packages. By default, the product installer downloads and installs these packages to their default locations. The installer then sets your COBOL environment to depend on those downloaded versions.

You can use the Microsoft Build Tools and Windows SDK Packages configuration utility - `cb1ms` - to view which versions are in use, and also configure your COBOL environment if you require something other than the standard usage.

For example, some project types (for example, .NET Core) require a different version of the Microsoft Build Tools (the Visual Studio 2019 version) than the one installed (the Visual Studio 2017 version). If you have already installed the correct version for .NET Core, run `cb1ms` after product installation, to update your environment to use the correct package.

There is an option within the product installer to skip the installation of the default packages (`skipmstools=1`); however, this does skip both packages, so make sure that you do already have the package(s) that you require before setting this - see *Microsoft Package Dependencies* for details on the package(s) you may require.

The Microsoft Build Tools and Windows SDK Configuration Utility

Use the `cblms` command line utility to view and set the package versions in effect for your COBOL environment.



Important: If you are updating or clearing package versions, you must run this utility from a command prompt with administrative privileges.

Syntax:

```
cblms <option>
```

Parameters:



Note: `<option>` settings are case insensitive.

`<option>` can be one of:

-U

Updates the COBOL environment to use the latest versions of the Microsoft Build Tools and SDK packages that are located in the default folders. Any open IDE instance or command prompt must be restarted before these changes take effect.

-U<ms-pkg>

Updates the COBOL environment to use the latest version of the particular package type that is located in the default folder. Any open IDE instance or command prompt must be restarted before these changes take effect.

-U<ms-pkg>:<version>

Updates the COBOL environment to use a specific version of the particular package type that is located in the default folder. Any open IDE instance or command prompt must be restarted before these changes take effect.

-U<ms-pkg>:<path>

Updates the COBOL environment to use the latest version of the particular package type that is located in the (non-default) folder specified. Any open IDE instance or command prompt must be restarted before these changes take effect.

-U<ms-pkg>:<path>?<version>

Updates the COBOL environment to use a specific version of the particular package type that is located in the (non-default) folder specified. Any open IDE instance or command prompt must be restarted before these changes take effect.

-L

Lists all versions of the Microsoft Build Tools and SDK packages that are located in the default folders.

-L<ms-pkg>

Lists all versions of a particular package type that are located in the default folder.

-L<ms-pkg>:<path>

Lists all versions of a particular package type that are located in the (non-default) folder specified.

-Q

Displays the versions currently in use by the COBOL environment.

-Q<ms-pkg>

Displays the version of the selected package type that is currently in use by the COBOL environment.

-R

Clears all version information. (Only use this option when instructed to by Customer Care.)

-H

Displays the available command line options.

Legend:

<ms-pkg> *<ms-pkg>* can be one of **S** or **SDK** for the Microsoft SDK, or **B** or **BT** for the Microsoft Build Tools.

<path> *<path>* is the path in which to locate packages that are not installed to the default location for their package type.

<version> *<version>* is the package version with which to update when the latest version is not the one required. When specifying *version*, it must be in the form:

- *n.n.n.n* for a Windows SDK
- *n.n.n* for Build Tools
- *n* for list ID - the list ID is displayed using `cb1ms -L`.

The following example updates the COBOL environment to use version 10.0.17134.0 of the Windows 10 SDK, installed in `C:\WinSDK\10`.

```
cb1ms -USDK:C:\WinSDK\10\10.0.17134.0
```

Viewing the Product Help

Enterprise Developer is configured to display the product help available online on the Micro Focus Customer Care website: <https://www.microfocus.com/support-and-services/documentation/>.

You can view the product help in one of the following ways:

Online help (default)



Note:

- Your Visual Studio must be configured to show online help by default. Make sure **Help > Set Help Preferences** in Visual Studio points to **Launch in Browser**.
- Ensure that you have an up-to-date version of your browser.

You can access the Help in one of the following ways:

- Click **Help > Micro Focus Product Help > Product Documentation**.
- Alternatively, press **F1** inside the editor or from a UI part.

This opens the Enterprise Developer help or Microsoft's MSDN depending on which keyword in the editor or part of the UI you are querying.

Local help



Note: If you've had an earlier version of Enterprise Developer installed on your machine, you need to uninstall any older version of the documentation as follows:

1. Click **Help > Add and Remove Content** inside Visual Studio.

This starts the Microsoft Help Viewer.

2. Click the **Manage Content** tab and click **Disk**.
3. Click **Remove** next to the line for the Enterprise Developer documentation.
4. Click **Update**.

The local help is not shipped with the installer. If you prefer to view the help locally on your machine, you need to download and install it manually as described below.

1. Download the local help files:

- a. Find the download link for local help in your Electronic Product Download email or in the **Product Updates** section on the Micro Focus Customer Care website and save the files on your machine.
- b. Expand the archive on your machine. Ensure that the `.msha` and the `.cab` files are in the same folder.

2. Ensure that the Visual Studio Help Viewer is installed:

- a. Click **Help** inside Visual Studio.

If no **View Help** command is available, you need to install the Help Viewer manually. See *Installing missing components of Visual Studio* in *Software Requirements* for instructions on how to install it.

3. Install the help in the Help Viewer:

- a. Click **Help > Add and Remove Content** inside Visual Studio.

This starts the Microsoft Help Viewer.

- b. Click the **Manage Content** tab and click **Disk**.
- c. Click the browse button next to **Disk** and navigate to the folder in which you extracted the local help files.
- d. Select `helpcontentsetup.msha` and click **Open**.

This loads the Enterprise Developer documentation.

- e. Click **Add** and then **Update**.

After the installation is complete, the Enterprise Developer product Help appears in the Help Viewer.

4. Configure Visual Studio to use local help:

- a. Start Visual Studio.
- b. Ensure that the Visual Studio Help Library is pointing to local help - from the Visual Studio menu click **Help > Set Help Preferences > Launch in Help Viewer**.
- c. Click **Help > View Help**.

This opens the product help in Microsoft's Help Viewer.

For full details of the Visual Studio Help system, see the MSDN.



Note: On some Windows versions, an issue with Microsoft Help Viewer and Internet Explorer's security being turned on can cause the Help content to be displayed as raw HTML code. To resolve the issue, you need to turn off the Internet Explorer Enhanced Security Configuration (IE ESC) for both administrators and users. Check the Microsoft Windows help for more information on how to do this.

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 repair your installation:

1. From the **Control Panel**, click **Uninstall a program** under **Programs**.
2. Right-click your Micro Focus product and select **Repair**.

Uninstalling

To uninstall the product, you cannot simply delete its files from your hard disk. To uninstall the product:

1. Log in with the same user-ID as you used when you installed the product.
2. Click **Uninstall a program** under **Programs** in **Control Panel**.
3. Select the product and click **Remove** or **Uninstall** as appropriate.

During the uninstall process, only those files added during the installation (to the installation and Samples directories) are removed. If the installation installed the Microsoft Windows 10 SDK or Microsoft Build Tools packages, these are left in place, although the Micro Focus-related registry entries for these packages are removed.

If the product directory has not been removed, delete any unwanted files and subdirectories within it using Windows Explorer.



Note: The installer creates separate installations for Micro Focus Enterprise Developer, Enterprise Server for .NET, and Micro Focus License Administration. Uninstalling only Enterprise Developer does not automatically uninstall Enterprise Server for .NET, the Micro Focus License Administration or any of the prerequisite software.

Enterprise Server for .NET must be uninstalled before you remove Enterprise Developer. To completely remove the product you must uninstall the Micro Focus License Administration as well.

You can optionally remove the prerequisite software. For instructions, check the documentation of the respective software vendor.

Some registry entries are not removed by the uninstallation process and you need to manually delete them.

The following folders might not be removed:

- The *Micro Focus Product Name* folder in the Start menu - you can delete it manually.
- %systemdrive%\Users\Public\Documents\Micro Focus - includes the binaries and the log files of the samples which you have built.
- %ProgramData%\Micro Focus - includes some data files used by the Micro Focus licensing system.
- %Program Files%\Micro Focus - you can delete it manually.

To silently uninstall the product, you need the setup file and you need to execute the following at the command line:

```
start /wait install-file.exe /quiet /uninstall
```

In addition, the following registry entries are not removed. These are created the first time that an Enterprise Server that has been enabled for performance monitoring starts up:

- Micro Focus Server\Performance\Active Servers
- Micro Focus Server\Performance\PerfIniFile

On UNIX

Repairing on UNIX

If a file in the installation of the product becomes corrupt, or is missing, we recommend that you reinstall the product.

Uninstalling



Note: Before you uninstall the product, ensure that the Enterprise Server instances and the Micro Focus Directory Service (MFDS) are stopped.

To uninstall this product:

1. Execute as root the `Uninstall_EnterpriseDeveloper7.0.sh` script in the `$COBDIR/bin` directory.



Note: The installer creates separate installations for the product and for Micro Focus License Administration. Uninstalling the product does not automatically uninstall the Micro Focus License Administration or the prerequisite software. To completely remove the product you must uninstall the Micro Focus License Administration as well.

To uninstall Micro Focus License Administration:

1. Execute as root the `UnInstallMFLicenseServer.sh` script in the `/var/microfocuslicensing/bin` directory.

The script does not remove some of the files as they contain certain system settings or licenses.

You can optionally remove the prerequisite software. For instructions, check the documentation of the respective software vendor.

Licensing Information



Note:

- If you have purchased licenses for a previous release of this product, those licenses will also enable you to use this release.
- If you are unsure of what your license entitlement is or if you wish to purchase additional licenses, contact your sales representative or [Micro Focus Customer Care](#).

To start Micro Focus License Administration

To start the GUI Micro Focus License Administration

Windows 8.1, and Windows Server 2012 R2	From the Windows Start screen, click the License Administration tile.
Windows 10 and Later	From your Windows desktop, click Start > Micro Focus License Manager > License Administration .

To start the command-line Micro Focus License Administration tool

1. At a command prompt, navigate to:

```
C:\Program Files (x86)\Micro Focus\Licensing
```

2. Type `cesadmintool.bat`, and press **Enter**.

Installing licenses

You need either a license file (with a `.mflic` extension for Sentinel RMS licenses or an `.xml` extension for AutoPass licenses) or an authorization code which consists of a string of 16 alphanumeric characters (Sentinel RMS licenses only). You need to install AutoPass licenses into the existing Micro Focus License Administration tool, and not in the AutoPass License Server.

If you have a license file

To use the GUI Micro Focus License Administration

1. Start Micro Focus License Administration.
2. Click the **Install** tab.
3. Do one of the following:
 - Click **Browse** next to the **License file** field and select the license file (which has an extension of `.mflic` or `.xml`).
 - Drag and drop the license file from Windows Explorer to the **License file** field.
4. Click **Install Licenses**.

Alternatively, you can install the license file from within the IDE as follows:

1. Start Enterprise Developer.
2. Click **Help > Micro Focus Product Help > Product Licensing** to open the **Product Licensing** dialog box.

3. Ensure I have a full **Enterprise Developer Team Edition license** is checked.
4. Click **Browse** next to the **License file** field.
5. Select the license file (which has an extension of either `.mflic` or `.xml`), and then click **Open**.
6. Click **Authorize** to install the license.

You should see a dialog box with a confirmation that the licenses have been installed successfully.

To use the command-line Micro Focus License Administration tool

1. Start the command-line Micro Focus License Administration tool.
2. Select the **Manual License Installation** option by entering 4.
3. Enter the name and location of the license file.

If you have an authorization code



Note: Authorization codes are only available with Sentinel RMS licensing.

Authorizing your product when you have an Internet connection



Note:

- This topic only applies if you have an authorization code. Authorization codes are only available with Sentinel RMS licensing.
- It is not possible to install licenses remotely. You must be logged into the machine on which you are installing the licenses.

The following procedure describes how to authorize your product using a local or network license server. The license server is set up automatically when you first install the product.

To use the GUI Micro Focus License Administration

1. Start Micro Focus License Administration.
2. Click the **Install** tab.
3. Type the authorization code in the **Enter authorization code** field.
4. Click **Authorize**.

If you change the name of the machine running your license server after it has granted licenses, the licenses stop working.

To use the command-line Micro Focus License Administration tool

1. Start the command-line Micro Focus License Administration tool.
2. Select the **Online Authorization** option by entering 1 and pressing **Enter**.
3. Enter your authorization code at the **Authorization Code** prompt and then press **Enter**.

Authorizing your product when you don't have an Internet connection



Note: This topic only applies if you have an authorization code. Authorization codes are only available with Sentinel RMS licensing.

This method of authorization is required if the machine you want to license does not have an Internet connection or if normal (automatic) authorization fails.

To use the GUI Micro Focus License Administration

1. Start Micro Focus License Administration.
2. On the **Install** tab, click **Manual Authorization**.

3. Make a note of the contents of the **Machine ID** field. You will need this later.
4. Do one of the following:
 - If your machine has an Internet connection, click the Customer Care Web link in the Manual Authorization Information window.
 - If your machine does not have an Internet connection, make a note of the Web address and type it into a Web browser on a machine that has an Internet connection.

The Micro Focus Customer Care Manual product authorization Web page is displayed.

5. Type the authorization code in the **Authorization Code** field. The authorization code is a 16-character alphanumeric string supplied when you purchased your product.
6. Type the Machine ID in the **Machine ID** field.
7. Type your email address in the **Email Address** field.
8. Click **Generate**.
9. Copy the generated license string (or copy it from the email) and paste it into the box under the **License file** field on the Install page.
10. Click **Install Licenses**.

To use the command-line Micro Focus License Administration tool

In order to authorize your product from the command-line Micro Focus License Administration tool you must have the following:

- Access to a computer which is connected to the Internet.
- Your authorization code (a 16-character alphanumeric string).
- The machine ID. To get this, start the Micro Focus License Administration tool and select the **Get Machine Id** option by entering 6. Make a note of the "Old machine ID".

If you have previously received the licenses and put them in a text file, skip to step 6.

1. Open the Micro Focus license activation web page <http://supportline.microfocus.com/activation> in a browser.
2. Enter your authorization code and old machine ID and, optionally, your email address in the **Email Address** field.
3. Click **Generate**.
4. Copy the licenses strings from the web page or the email you receive into a file.
5. Put the license file onto your target machine.
6. Start the Micro Focus License Administration tool and select the **Manual License Installation** option by entering 4.
7. Enter the name and location of the license file.

To obtain more licenses

If you are unsure of what your license entitlement is or if you wish to purchase additional licenses for Enterprise Developer, contact your sales representative or Micro Focus Customer Care.

Updates and Customer Care

Our Web site provides up-to-date information of contact numbers and addresses.

Further Information and Product Support

Additional technical information or advice is available from several sources.

The product support pages contain a considerable amount of additional information, such as:

- Product Updates on [Software Licenses and Downloads](#), where you can download fixes and documentation updates.
 1. Log into the Software Licenses and Downloads (SLD) site at <https://sld.microfocus.com/mysoftware/download/downloadCenter>.
 2. Select your account and click **Entitlements**.
 3. Search for the product by using any of the available search parameters.
 4. Click **Show all entitlements**.
 5. Click **Get Software** in the Action column for the product you want to download or update.

In the **File Type** column, you see entries for "Software" for any GA products, and "Patch" for any patch updates.
 6. Click **Download** on the relevant row.
- The *Examples and Utilities* section of the Micro Focus Customer Care Web site, including demos and additional product documentation. Go to <https://supportline.microfocus.com/examplesandutilities/index.aspx>.
- The *Support Resources* section of the Micro Focus Customer Care Web site, that includes troubleshooting guides and information about how to raise an incident. Go to <https://supportline.microfocus.com/supportresources.aspx>

To connect, enter <https://www.microfocus.com/en-us/home/> in your browser to go to the Micro Focus home page, then click **Support & Services > Support**. Type or select the product you require from the product selection dropdown, and then click **Support Login**.



Note: Some information may be available only to customers who have maintenance agreements.

If you obtained this product directly from Micro Focus, contact us as described on the Micro Focus Web site, <https://www.microfocus.com/support-and-services/contact-support/>. If you obtained the product from another source, such as an authorized distributor, contact them for help first. If they are unable to help, contact us.

Also, visit:

- The Micro Focus Community Web site, where you can browse the Knowledge Base, read articles and blogs, find demonstration programs and examples, and discuss this product with other users and Micro Focus specialists. See <https://community.microfocus.com>.
- The Micro Focus YouTube channel for videos related to your product. See [Micro Focus Channel on YouTube](#).

<https://www.microfocus.com/en-us/resource-center/webinar>

Information We Need

If your purpose in contacting Micro Focus is to raise a support issue with Customer Care, you should collect some basic information before you contact us, and be ready to share it when you do.

See the *Preparing to Raise a Support Case* topic on the Product Documentation pages on Micro Focus Customer Care, in the product help for Enterprise Developer for Visual Studio 2017 ([click here](#)) or Enterprise Developer for Visual Studio 2019 ([click here](#)).

Creating Debug Files

If you encounter an error when compiling a program that requires you to contact Micro Focus Customer Care, your support representative might request that you provide additional debug files (as well as source and data files) to help us determine the cause of the problem. If so, they will advise you how to create them.

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