# MICRO FOCUS

# Micro Focus
# Enterprise Server 7.0

Release Notes

# Contents

# Micro Focus Enterprise Server 7.0 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 Server provides the execution environment for applications created with any IDE variant of Enterprise Developer.

**Upgrading from earlier Micro Focus products**

> **Note:** This applies to Windows platforms only.

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.

# 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 5
- *Assembler Support*
- *CICS Support*
- *Code Set Support*
- *Database Access - HCOSS Manage Connections Tool*
- *Database Access - MBDT Utilities*
- *Data File Tools*
- *Enterprise Server*
- *Enterprise Server Common Web Administration*
- *Enterprise Server Security*
- *IMS Support*
- *Licensing Technologies*
- *Mainframe Access*
- *Micro Focus Database File Handler*
- *PL/I Support*

## 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.

## 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.

# 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 MFCODESET 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.

# 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.

# 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)

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 Security

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

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/opt/ microfocus/EnterpriseDeveloper/demo/ims/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.

# Licensing

**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.
- Endevor transaction performance improvements - transactions with Endevor 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 `dbfhview` 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 `mfdbcatc` 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.

# PL/I Support

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Enhancements are available in the following areas:

**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.

# 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*
- *Data Tools*
- *Enterprise Server*
- *JCL Support*
- *Licensing requirements*
- *Mainframe Access*
- *Micro Focus Batch Scheduler Integration*
- *PL/I Support*
- *REXX Support*
- *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)

- On Unix/Linux environments assembler data tables (.MOD files) can now be generated entirely from the command line with the new MFMODGEN utility:

```
mfmodgen    filename.MLC
```

This assembles and links *filename*.MLC to *filename*.MOD suitable for use in EXEC CICS LOAD COBOL statements.

00367288 30004 00377337 (11608)

## 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

- 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)

## Data Tools

- 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

- 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 `cassub` 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)
- We now take note of VALUE clauses for fields and properties defined in a JVM attribute (annotation), and output the default value to the class file. When using an attribute, any field that does NOT have a default value must now be specified explicitly.

  (30021)
- 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 ccorrected.

  (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)

**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 to 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 systsprt 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)

### Licensing requirements

*Back to the list*

- The following platforms - Solaris, Red Hat on IBM Z System, SUSE on IBM Z System, and Ubuntu - are now licensed using a new licensing model called AutoPass. These platforms and licenses are not available from the Software Licenses and Download portal (*sld.microfocus.com*) if you are using the existing SafeNet license technology. To obtain AutoPass licenses for the aforementioned platforms, contact your account manager to discuss your actual requirements, and also raise a support incident to track the request.

### Mainframe Access

*Back to the list*

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

  (41007)

### Micro Focus Batch Scheduler Integration

*Back to the list*

- 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

*Back to the list*

- 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

*Back to the list*

- 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

*Back to the list*

- 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

*Back to the list*

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

2148818 (10857)

**SQL: OpenESQL**

*Back to the list*

• 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.

- The Server Core form of Windows Server 2019 is not supported.

- Oracle does not support deployed .NET Core 3.x client applications on SUSE Enterprise Linux accessing Oracle databases.

- 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*
- *Common Communications Interface*
- *Data Tools*
- *Data Tools (Classic)*
- *Dockerfiles*
- *Enterprise Server*
- *HCO for SQL Server*
- *IMS Support*
- *JCL Support*
- *Mainframe Access*
- *Micro Focus Server Administrator (GUI)*
- *PL/I Support*
- *Run-time System*
- *Setup Issues (UNIX)*
- *Setup Issues (Windows)*
- *SQL: COBSQL*
- *SQL: Mainframe Batch Database Tools*
- *SQL: OpenESQL*
- *XML Support*

## Assembler Support

*Back to the list*

- 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 occuring 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

*Back to the list*

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

  3227061 (10285)

**CICS BMS Compiler**

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

  00377337 (30004)

**Common Communications Interface**

- 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)
- Enterprise Server for UNIX and COBOL Server for UNIX now include the same Run-Time System and CCI C header files that are available in Enterprise Developer Unix Components and in Visual COBOL Development Hub.

  3230929 (13552)
- 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)

**Data Tools**

- 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)

*Back to the list*

- 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)

### Dockerfiles

*Back to the list*

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

  (8146)
- On Ubuntu, in order for debugging to work within a Docker version 18.04 Container, you must update the kernel of the Docker host from version 5.0.0-27 to 5.0.0-31.

  (9295)

### Enterprise Server

*Back to the list*

- 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)
- Using the AMODE option to request a reload of a data table using the CPMT transaction sometimes resulted in a FUNC abend. This has been fixed.

  00726248 (77027)
- 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 Enterprise Server utility program casclsec did not work correctly on non-Windows platforms. This has been fixed.

  00365438 00375691 (12562)
- 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)

- 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 where 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)
- Ensure that for protected starts the recoverable flag is set on the TST entry that is cached on the TCA TST chain.

  00367517 (53093)
- 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)

- On UNIX platforms, under certain circumstances the request to start a process was incorrectly reported as having failed. This has been fixed.

00696684 (82001)

- 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)

- On AIX, when using EZASOCKET GETHOSTBYNAME with a bad IP address it was returning RC=0 instead of RC=-01. This has been fixed.

  (30080)

- 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 binary repository exports (non-XML exports) in Visual COBOL and Enterprise Developer 6.0 could contain listener data that was not cross compatible if imported on certain UNIX platforms that did not create the exports.

(61176)

- 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 MFCODESET 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 MFCODESET_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)

- Changing the status of a listener through ESCWA no longer times out on UNIX.

(71113)

- 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 Ezasokets 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 form 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

*Back to the list*

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

  3238495 (11712)

## HCO for SQL Server

*Back to the list*

- 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

*Back to the list*

- 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 MPRunder 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)
- Historcal 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)

**JCL Support**

- The directory structure required to create a member of a temporary PO will now be created.

  3239698 (13551)
- 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 enque 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 that 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)

**Run-time System**

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- 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 IBM HWTJxxxx APIs for processing JSON messages are now available on UNIX.

  3238012 (12540)
- 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)

- Reading from STDIN, via the CBL_READ_FILE API, has been enhanced when stdin is being redirected from a pipeline on UNIX. Previously, a 9/18 status would be returned if a large record was requested but only some of the data had been written in the pipeline. Now, multiple OS device reads will be used, if required. The subsequent OS device reads will block if there is no data available yet.

  00371948 (11519)

- 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)

- During compilation, libjvm.so is now correctly located when using AdoptOpenJDK.

  (52067)

- .NET COBOL and JVM COBOL programs compiled with REENTRANT"2" now produce instance methods, whereas previously, compilation of these programs produced static methods. If your non-COBOL code relies on these methods being static, you will have to refactor your code to handle this; or for .NET COBOL only, recompile the code with the ILSTATIC directive.

  (26049)

**Setup Issues (UNIX)**

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- If MFDS is started and attempts to use a zero sized XML options file, instead of terminating with an error it will write out the default options and continue to operate.

  (53015)

**Setup Issues (Windows)**

- 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 validatation 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**

- 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: Mainframe Batch Database Tools**

- 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, andASCII 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 OPTIMZE 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)

**XML Support**

- 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 or Deprecated Functionality

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

- The SafeNet Sentinel licensing system has been deprecated and will be not available in this product starting with the next major release after release 9.0. The SafeNet Sentinel licenses will not be supported after release 9.0 and you need to use AutoPass licenses if you use these releases.

  You can replace your SafeNet Sentinel licenses with AutoPass licenses starting with release 8.0. Contact Micro Focus Customer Care for further information.

- 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.

# Installation

## Before Installing

### Downloading the Product

- Use the download links in the *Software Downloads* section of the *Micro Focus Software Licenses and Downloads* Web site.

### On Windows

#### System Requirements

**Hardware Requirements**

The disk space requirements are approximately:

| Enterprise Server |
|---|
| 1 GB |

> **Note:** This includes the space needed to cache information locally so that you can modify the installation without the original source media.

**Operating Systems Supported**

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

- 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.

> **Note:**
> - This product can be installed on earlier versions of Windows but it has not been tested on them.

**Software Requirements**

> **Note:**
> - The setup file will check your machine for whether the prerequisite software is installed and will install any missing prerequisites and the product components.
> - This product includes OpenSSL version 1.1.1k-mf6 (modified).

Before installing this product, you must have the following software installed on your computer:

- The Microsoft .NET Framework - the setup file installs the .NET Framework 4.5.2 . You might need to install the following version of the .NET framework manually, if it is targeted by your applications:
  - Microsoft .NET Framework 2 - if your applications use the ILCLR(2) Compiler Directive or if they target the .NET Framework versions 2, 3 or 3.5. You might need to download these installers depending on the .NET Framework you are targeting.

To download the Microsoft .NET Framework 2 *click here*.

Microsoft .NET Framework 2 or later is also required for the Micro Focus License Manager if you install this on a separate machine as a license server.

- Microsoft's Web Platform Installer 2.0 if your application targets ASP.NET 4. This installs and sets up ASP.NET. To download the installer *click here*.

- A Web browser is required for Enterprise Server Administration in Enterprise Server.

  To use your Web browser offline, you need the dial-up networking feature of Windows installed. Otherwise you might have TCP/IP errors such as being unable find "localhost" or the numeric equivalent (127.0.0.1).

- To use Enterprise Server Administration, scripting or JavaScript support must be enabled in your browser. This is on by default in Internet Explorer in most Windows operating systems. Also, active content must be allowed and not blocked. To enable both these in Internet Explorer:

  1. Click **Tools** > **Internet Options**.
  2. On the **Security** tab, click **Custom Level**. In the **Scripting** section, under **Active Scripting**, click **Enable**.
  3. On the **Advanced** tab, scroll down the list to the **Security** section, and ensure the item **Allow active content to run in files on My Computer** is checked.

- Enterprise Server Help requires the Java Runtime Environment on some Windows systems to enable the Search facility to work.

**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.

## Installation Restrictions and Requirements

Before starting the installation, you should consider the following:

- 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.

- Before installing this product, make sure that any existing Micro Focus Directory Server (MFDS) or CCITCP2 Windows service (on Windows) or a process (on UNIX) from an existing product is stopped and uninstalled. On Windows, do this as follows:

1. Stop the MFDS and CCITCP2, using either the Windows Service Management Console GUI (`services.msc`) or from a command line prompt by typing:

   ```
   net stop mf_ccitcp2
   ```

   Only one instance of the MFDS or CCITCP2 service can run on a Windows machine.
2. Uninstall the MFDS or CCITCP2 service.

   For MFDS, from a command line prompt enter: `mfds -u`

   For CCITCP2: `ccitcp2 -u`

To run an earlier version of MFDS as a service after you have installed a later version:

1. Stop and uninstall the MFDS service, as described above.
2. Reinstall the earlier version, as follows:

   a. Open an Enterprise Server command prompt.
   b. Install the service. Enter the following command: `mfds -i`
   c. Start the service. Enter the following command: `net start mf_ccitcp2`

   > **Note:** The two versions use different paths for environment and registry values, so the list of configured enterprise servers might be different depending on which version has been started, since, by default, different MFDS data repositories are used.

MFDS 5.1 and later are able to import or use Enterprise Server configuration data generated by earlier versions of MFDS, but 5.0 or earlier versions of MFDS might not be able to read data generated by later versions.

It is possible to run MFDS from a command prompt ("mfds") rather than as a service, but by default the "mfcobol" port is used (86) and this can only be used by one process at a time

## Product Co-Existence

> **Note:** The following applies to Windows only.

- Enterprise Developer and Enterprise Server (or Enterprise Test Server) cannot coexist on the same machine.
- Enterprise Server and Enterprise Test Server cannot coexist on the same machine.

# On UNIX

## System Requirements

### Hardware Requirements

The disk space requirements 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 | 505 MB | 2.02 GB | 1.01 GB | 41 MB |
| HP IA | Micro Focus | 912 MB | 3.65 GB | 1.83 GB | 79 MB |

| Platform | Installer type | Setup file size | Disk space required for the installation | Disk space required for running the product | Licensing technology |
| --- | --- | --- | --- | --- | --- |
| System Z running Red Hat Linux | Micro Focus | 396 MB | 1.59 MB | 792 MB | 39 MB |
| x86-64 running Red Hat Linux | Micro Focus | 606 MB | 2.42 GB | 1.22 GB | 50 MB |
| SPARC running Solaris | Micro Focus | 501 MB | 2.05 GB | 1.01 GB | 42 MB |
| x86-64 running Solaris | Micro Focus | 423 MB | 1.70 GB | 846 MB | 33 MB |
| System Z running SUSE SLES | Micro Focus | 269 MB | 1.08 GB | 538 MB | 39 MB |
| x64 running SUSE SLES | Micro Focus | 400 MB | 1.60 GB | 800 MB | 50 MB |
| x64 running Ubuntu | Micro Focus | 405 MB | 1.63 GB | 810 MB | 50 MB |
| x86-64 running CentOS | Micro Focus | 606 MB | 2.43 GB | 1.22 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**

🖉 **Note:** This product includes OpenSSL version 1.1.1k-mf6 (modified).

The setup file requires that the following software and libraries are installed before you start the installation, and that certain environment variables are set.

- *Software required by the setup file*
- *Libraries required by the setup file*
- *Required environment variables*
- *Requirements for running the product*
- *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.

  On Red Hat 8.1, pax is no longer installed by default. You must install the spax version found in the OS ISO. Use the `yum install spax` command.

- If SELinux is installed and you plan to use anything other than core COBOL functionality, or plan to use Enterprise Server within an environment with ASLR enabled, the "SELINUX" configuration must be disabled. To do this, set `SELINUX=disabled` in `/etc/selinux/config`.

**Libraries required by the setup file**

Required libraries for Red Hat and SUSE Linux platforms - The installer 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 | Bitism | | Platform | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 32-bit | 64-bit | s390 | SUSE 12[1] | SUSE 15[1] | Red Hat 6.*x* | Red Hat 7 | Red Hat 8 | CentOS 7/8 | Ubuntu 18/20 |
| glibc[2] | X | X | X | | | X | X | X | X | |
| libgcc | X | X | X | | | X | X | X | X | |
| libstdc++ | X | X | X | | | X | X | X | X | |
| libgc1c2 | | X | | | | | | | | X |
| elfutils-libelf | X | X | | | | X | X | X | | |
| libelf-devel[3] | X | X | | | | X | X | X | | |
| libelf-devel[3] | X | X | | X | X | | | | | |
| libelf1[3] | X | X | | X | X | | | | | |

- Libraries marked with an 'X' are not included in the platform and need to be installed separately.
- [1]On SUSE 12 or 15, you can only install the 64-bit version of this product. The glibc-locale-32bit library is still required by the SafeNet Sentinel licensed components.
- [2]On 64-bit Red Hat 7, you only need to install glibc-2.17*.x86_64 and glibc-2.17*.i686.

  Visit the *Red Hat Web site* for more information.
- [3]Operating system libraries required for PL/I support on both SUSE and Red Hat.

**Required environment variables**

Before you start the installation, you need to set the environment as follows:

- 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* in the product Help for the development product for details.

### Requirements for running the product

- JavaScript or scripting support must be enabled in your browser, so that Enterprise Server Administration is usable. Also, active content must be allowed and not blocked.

### License Manager requirements

- 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/1b/
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 on Windows

✎ **Note:** If there is an earlier version of Enterprise Server installed on your machine, check *Installing as an Upgrade* first.

These are the steps to install this product:

**1.** Run the `es_70.exe` file and follow the wizard instructions to install the prerequisite software and the product.

The setup file will also install any missing prerequisite software as listed in *Software Requirements*.

✎ **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.
- 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 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 Server but you can install it if you wish.

## Installing on UNIX

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_ent_server_7.0_platform
```
**2.** Run the installer with superuser permissions:

```
./setup_ent_server_7.0_platform
```

If you don't run this as superuser, you are prompted to enter the superuser password during the install.

**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.

If you set COBDIR to an already installed product, the installer will back up the existing installation and will install this release in the location COBDIR points to. If COBDIR is not set, the installer does a fresh install.

The COBOL run-time 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 affects 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_ent_server_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 (Windows)

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

The advanced installation tasks include:

* *Installing as an Upgrade*
* *Command line installation options*

To see this information on the Product Documentation pages on Micro Focus Customer Care, *click here*.

# Advanced Installation Tasks (UNIX)

This section includes instructions about how to perform a non-default installation, install this product as an upgrade, or about how to install any 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 using an RPM installer on Linux* - available in the product Help and in the Micro Focus Infocenter

*Click here* to see this information on the Product Documentation pages on Micro Focus Customer Care.

# 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

To access the Enterprise Server help:

* On Windows 10, select **Start > All Programs > Micro Focus Enterprise Server > Documentation** from the Windows Taskbar.

* On Windows 8, right-click at the bottom of the Start screen, and click **All apps** to display all available links for this product. In the Enterprise Server section, click **Documentation**.

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

⚠ **Important:** The installer creates separate installations for Micro Focus Enterprise Server and Micro Focus License Administration. Uninstalling only Enterprise Server does not automatically uninstall the Micro Focus License Administration or any of the prerequisite software.

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.

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
```

# On UNIX

## Setting the Environment

When you have installed the product, you need to set the environment as described below.

**1.** To set up your product, execute:

```
. <product-install-dir>/bin/cobsetenv
```
**2.** To verify that your product is installed, execute:

```
cob -V
```

⚠ **Important:** These commands set the environment only for the current shell. You need to execute them for each new shell that you start.

To avoid having to run `cobsetenv` for every shell, add these commands to the shell initialization files (such as `/etc/profile`, `/etc/bashrc`).

Note that `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.

## Repairing

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_EnterpriseServer7.0.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, 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**.

Log on as root, and from a command prompt type:
```
/var/microfocuslicensing/bin/cesadmintool.sh
```

## 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**.

**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.

1. Start the Micro Focus License Administration tool and select the **Manual License Installation** option by entering 4.
2. 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**.

1. Start Micro Focus License Administration.
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.

In order to authorize your product 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.

*Click here* to see the *Preparing to Raise a Support Case* topic on the Product Documentation pages on Micro Focus Customer Care.

# 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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