



# Micro Focus Visual COBOL 8.0 for ISVs

Release Notes

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# Micro Focus Visual COBOL 8.0 for ISVs 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 documentation updates.

## Product Overview

The Micro Focus Visual COBOL for ISVs package comprises the following products which you can download from your Electronic Product Delivery Note:

- Visual COBOL for Visual Studio - delivers the richest development experience for COBOL programming available on Windows using Microsoft's Visual Studio 2017, 2019, or 2022. Visual COBOL supports the development and deployment of both managed .NET and native COBOL applications.
- Visual COBOL for Eclipse - provides an Eclipse-based integrated COBOL development environment for Windows or Linux. Provides COBOL JVM support and enhanced compatibility with ACUCOBOL. Can be used standalone for developing local applications or in conjunction with the Development Hub to develop remote projects in Linux and UNIX.
- Visual COBOL Development Hub - provides a rich desktop development environment based on the Eclipse IDE with high-performance server-based tools for managing builds, source code access and debugger engine. The Development Hub also provides a central administration site, simplifying the development tool distribution and maintenance process.

## Upgrading from earlier Micro Focus products

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

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

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

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

If you are using Eclipse, Visual COBOL can automatically relink existing projects created with Visual COBOL earlier than 4.0 that have executable link artefacts. Eclipse displays a warning in the **Problems**

view that the project requires relinking. It then offers a Quick Fix action for you to execute that will link your project with the most recent version of the Run-Time System.

# What's New

Enhancements are available in the following areas:

- [Micro Focus COBOL Extension for Visual Studio Code](#)
- [.NET 6 Support](#)
- [COBOL Language Enhancements](#)
- [Code Analysis](#)
- [Compiler Directives](#)
- [Data File Tools](#)
- [Debugging](#)
- [Eclipse Integration](#)
- [Enterprise Server](#)
- [Enterprise Server Common Web Administration](#)
- [Enterprise Server Security](#)
- [Micro Focus Database File Handler](#)
- [Micro Focus Unit Testing Framework](#)
- [Open ESQL](#)
- [Visual Studio Integration](#)

## Micro Focus COBOL Extension for Visual Studio Code

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The Micro Focus COBOL extension for Visual Studio Code provides the following enhancements:

- The use of the Micro Focus COBOL extension with Visual COBOL 8.0 installed on the same machine enables COBOL Language Server support. This offers a rich COBOL editor experience inside Visual Studio Code including IntelliSense, Peek Definition, and Rename.



**Note:** The Micro Focus COBOL extension is available from the Microsoft Visual Studio Marketplace - [click here](#).

## .NET 6 Support

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This release provides the following enhancement:

- You can create, build and run COBOL projects targeting .NET 6 in Visual Studio 2022. In all other supported environments, you can use the .NET 6 SDK or Visual Studio code to build .NET 6 COBOL projects.

Support for .NET Core 3.1 has been discontinued.

## COBOL Language

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

- Further support for IBM Enterprise COBOL 6.3:
  - JSON PARSE and JSON GENERATE statements - for JSON GENERATE, anonymous objects can be generated using the OMITTED key word; the SUPPRESS phrase has been enhanced; the CONVERTING phrase is supported. For JSON PARSE, anonymous objects can be parsed using the OMITTED key word; the CONVERTING phrase is supported.
  - Intrinsic functions - the following list of functions is now supported: COMBINED-DATETIME, FORMATTED-CURRENT-DATE, FORMATTED-DATE, FORMATTED-DATETIME, FORMATTED-TIME, INTEGER-OF-FORMATTED-DATE, SECONDS-PAST-MIDNIGHT, SECONDS-FROM-FORMATTED-DATE, TEST-FORMATTED-DATETIME, and UUID4.
  - The AMODE Compiler directive has been enhanced to allow COBOL programs full access to the 64-bit address space (AMODE"64"). This emulates the LP"64" option in Enterprise COBOL.
  - The DYNAMIC LENGTH clause, introduced in the last product release, is now supported in .NET COBOL and JVM COBOL (as well native COBOL).
- JVM COBOL.NET COBOL enhancements:
  - When no explicit type is declared for a variable, but the value is a non-integer numeric (for example `declare var1 = 1.23`), it is assumed to be of type float-long.
  - The NAME OF expression has been introduced. It returns the unqualified name of the type or member specified.

## Code Analysis

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The Application Analysis Server enables you to access either Micro Focus Enterprise Analyzer or COBOL Analyzer from the IDE. This release includes the following enhancements to this feature:

- A generate code search report and a single code search reports are available.
- An improved Get Direct References report.

Enhancements to the Analysis Services include:

- An enhanced Program Flow Graph
- Support for displaying the Data Flow analysis as a Graph.
- A new Eclipse preference page, **Application Wide Knowledge in Window > Preferences > Micro Focus > COBOL > Code Analysis**. This enables you to adjust certain timeout settings for certain long-running queries executed against a remote Enterprise Analyzer or COBOL Analyzer server.

Enhancements in the Rule-Based analysis include:

- The **Micro Focus Code Analysis** project's properties page in Visual Studio, and the **Micro Focus Code Analysis Manager** dialog box now support subfolders in the rulesets.
- The **Rules** preference page in **Window > Preferences > Micro Focus > COBOL > Code Analysis** now supports nested rules.

## Compiler Directives

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The following Compiler directive is new in this release:

- DISPLAY-PICU - defines the way PIC U data items are displayed: either as ANSI or UTF-8.

The following Compiler directive has been enhanced in this release:

- AMODE - a new parameter "64" stores pointers in 64-bit format - see *COBOL Language Enhancements* for more details.

# Data File Tools

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The following enhancement has been made to the Data File Tools:

- The Data File Editor now supports opening and editing KSDS VSAM files stored in an MFDBFH datastore.

# Debugging Applications

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This release includes the following enhancements:

- **Locals** window support for native COBOL in Visual Studio - during debugging, the **Locals** window now displays the names of the variables available on the current statement.
- In Eclipse, the Enterprise Server debug configurations can now configure the **Program breakpoint on main entry point only** option, which if selected, only breaks execution when the Procedure Division entry point is called.

# Eclipse

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Enhancements are available in the following areas:

## Product:

- This release supports Eclipse 4.20 (2021-06), which is shipped and installed with Visual COBOL. Versions of Eclipse prior to this one are not supported.

## Projects:

- Apache Maven support - native COBOL and native COBOL Unit Testing projects can be incorporated into your Maven-based lifecycles. They now accept a `pom.xml` file, which can be configured to run the Maven AntRun plugin, which allows Ant-based projects to work with Maven.
- Automatic directives determination - it is now possible to specify if this should run and if you will be prompted to perform it from **Perform automatic directives determination** preference, available from **Window > Preferences > Micro Focus > COBOL > Directives Determination**.
- **Code Clean Up** - you can configure code clean up preferences, which you can apply to your code to ensure consistency throughout your COBOL code (for example consistent use of the PIC or PICTURE keyword). These preferences are stored in profiles, which allows them to be shared among development teams.
- Multi-file compilation - right-click a selection of files, and click **Compile** when **Automatic Build** is disabled. This utilizes the **Maximum compilations/links to execute concurrently** option (available from **Window > Preferences > Micro Focus > Builder > Project**) for native COBOL projects.
- Order of the Copybook Paths list - it is now possible to control the initial position of the new directory in the list. Use the **Insert to the beginning of copybook paths list** or **Append to the end of copybook paths list** options to determine the position. These options are available from **Window > Preferences > Micro Focus > Builder > Project**.

## COBOL Editor:

- COBOL code mining - code minings are additional content shown in the COBOL editor to give extra context to certain code elements. Use the **Window > Preferences > Micro Focus > COBOL > Editor**



> **Code Minings** page to enable an indicator showing the number of times that a section or a paragraph is called in your native or procedural JVM COBOL code. Select the link shown to show a list of references in the Search view, where you can use the matches shown to jump to the actual call within your code.

- `end-` delimiter tooltips - within the COBOL editor, if you hover over the `end-` delimiter of a statement such as an IF or an EVALUATE statement, a tooltip showing the opening clause of the statement is displayed. You can enable/disable this behavior from the **Block matching** section in the COBOL editor preferences.

## Enterprise Server

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This release provides enhancements in the following areas:

- EZ Sockets now supports up to 4096 sockets on Linux, up from 1024, and enhanced tracing.
  - EZ Sockets applications, including ones that use the CICS listener CSKL (EZACIC02), can have more simultaneous connections.
  - EZ Sockets tracing now has options for logging the recent history only when any error or one of a set of particular errors occurs. This makes it easier to use tracing to diagnose EZ Sockets issues.
- Enterprise Server dataset management - dataset maximum retention period with the ability to alter and create reports:
  - `ES_JES_ENFORCE_EXPIRE_DATE` - helps determine whether or not to check the expiration date when deleting a catalogued dataset, and if expired, delete the dataset. If it hasn't expired and the `PURGE` option has not been specified, the dataset is not removed. The `PURGE` keyword is required to delete non-expired datasets. `PURGE` removes the underlying physical dataset file unless it is referenced by another catalog entry. `SMS MANAGEMENTCLASS` now supports maximum `RETAIN` days. See *Using SMS MGMT Classes* and the `%SMS` example command in the same topic.
  - `ES_JES_LISTCAT_YMD` - helps determine the date format used in the `HISTORY` report generated when the `IDCAMS LISTCAT` command specifies the `ALL` option.
  - The `EXPDT` entry in a `DD` statement must be a four-digit year (YYYY); otherwise 1900 is the default, which is in-line with the mainframe processing, and prevents unexpired datasets from being erroneously removed (as was the case with the previous default of 2000). The `ALTER` command now takes the `TO` and `FOR` options to enable specification of the retention period for the entry being altered. The maximum retention period might be limited by the management class. The `IDCAMS LISTCAT` command `ALL` parameter now generates a separate `HISTORY` report that shows the creation date time and job, the last changed date time and Job, and the expiration date.
- HTTP compression - the Communications Server supports compressing large HTTP responses with gzip, and handles gzip-compressed HTTP requests. The Common Client supports gzip-compressed HTTP responses. Some large HTTP responses are compressed automatically if the client supports it. Large HTTP messages can be compressed, saving network bandwidth and improving performance.
- Task-cleanup performance - the performance of post-processing for tasks in MFCS has been improved.
- ICETOOL emulation - now supports the `COUNT+n` and `COUNT-n` syntax during trailer processing, where `n` is a numeric between 0-999. This adds to or subtracts from the `COUNT` value.
- Enterprise Server configuration - you can now change the recording directory of the dump, trace, HSF, and the `console.log` files of each region. See *Alternative Enterprise Server Output Locations* for more information.
- Compression on ECI calls via CASBNCCL Client - when using the Micro Focus External Call Interface (ECI) over TCP/IP, the request and response data flows are now compressed using RLE.

## Enterprise Server Common Web Administration (ESCWA)

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This release includes the following enhancements:

- Oracle Coherence is now available as a PAC Scale-Out repository as an alternative to Redis.
- Reduced number of Redis instances required when a PAC incompatible upgrade is performed - it is now possible to have multiple PSORs in one REDIS instance. This allows for the REDIS instances provisioned in the PAC to be reused.
- Enhanced PAC diagnostics via CTF - a new option on the ES Control page is now available to enable or disable CTF for a running region without the need to recycle the region.
- ESCWA API, version 2 - includes updated versions of some of the existing API, version 1 endpoints, with improved JSON property names, more sensible URIs. The version 2 API is a single API standard across API endpoints. It includes a number of usability enhancements, has a better readability and discoverability, and includes an improved API documentation.
- Enterprise Server Configuration Manager
  - A variety of configuration options are available in ESCWA on the **General >Advanced** page for a region.

The property grid in ESCWA shows the full list of configurable properties, categorized by group, along with help text and some additional meta-information. Properties marked as dynamic in the property grid can also be updated in a running region.
  - A number of properties that were previously set with environment variables are now available in the ESCWA UI. The environment variables are still supported for backward compatibility.
- Accessibility enhancements - the ESCWA UI includes a number of improvements in the areas of usability with screenreaders, color contrast, and text and icon sizing and alignment. This is to give it an improved compliance with the 508 and WCAG 2.1 standards.

## Enterprise Server Security

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This release includes the following enhancements:

- AWS Secrets Manager - support is available for using an AWS Secrets Manager, `mfsecretsaws`, as a remote vault. See *The mfsecretsaws Vault Provider*.
- Protection for sensitive data - some sensitive data is now protected in the memory. This helps reduce the risk of exposing sensitive data such as passwords in core dumps and similar scenarios.
- An option to update short names - the ESF Update mechanism enables you to change between OS users ("long names") and ES userids ("short names") in running regions. This requires a non-default configuration setting.
- Caching improvements - ESF caching now caches more types of requests. This helps improve the Enterprise Server latency and throughput when external security is configured with caching.
- Support for Argon2 in password history - when Micro Focus passwords are used with the MLDAP ESM Module and password history is enabled, use Argon2 password verifiers in the history to avoid the potential exposure of passwords via weaker verifiers. This helps improve the security of the password-history mechanism.
- The product Help includes a new section, *Securing Enterprise Server*, which provides guidance on improving the security of Enterprise Server installations and the applications they host. This includes information on security and how to reduce security exposure.

## The Micro Focus Database File Handler

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- This release includes the introduction of the Micro Focus Database File Handler (MFDBFH). MFDBFH enables you to store your data files within one of the supported relational database management systems, which can be used by your native COBOL applications.

Data files are stored in a 'datastore'. Datastores can each be housed in their own physical database, or one database can house many datastores. Using data stores gives you the performance and resilience benefits associated with a modern RDBMS. MFDBFH does not require you make any changes to your source code in order to use it.

This feature is available as a purchasable add-on.

## Micro Focus Unit Testing Framework

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The following enhancement has been made to the Micro Focus Unit Testing Framework in the IDE:

- IDE support has been added for self-contained tests.

The following enhancement has been made to the command-line version of the Micro Focus Unit Testing Framework:

- You can now use the Micro Focus Unit Testing Framework to build and run test cases from within a .NET 6 environment. Install the NuGet package supplied with Visual COBOL to enable the mfunit extensions to the `dotnet` command line utility.

## OpenESQL

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This release includes the following enhancement:

- The new SQL Error Mapping feature enables you to customize how error information is returned in `SQLCODE`, `SQLSTATE`, `SQLERR` and `MFSQLMESSAGETEXT`. For details, see *SQL Error Mapping* in your product Help.

## Visual Studio

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- Support is now available for Visual Studio 2022.
- Syntax coloring for COBOL in the editor had been improved for identification divisions, copybooks references using `COPY... REPLACE` statements, and `EXEC` blocks.

# 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).

- [Code Analysis](#)
- [Common Communications Interface](#)
- [Compiler](#)
- [Containers](#)
- [Eclipse IDE](#)
- [Enterprise Server](#)
- [Machine Administration](#)
- [File Handling](#)
- [Micro Focus Directory Server](#)
- [Run-time System](#)
- [SQL: OpenESQL](#)

## Code Analysis

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- Rules in nested folders are now correctly processed, as well as rules with the same name.  
(207020)

## Common Communications Interface

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- For improved security, SSL/TLS connections are now restricted to TLS versions 1.2 and 1.3 by default. This is an industry best practice. If you need to use older, less-secure protocol versions with legacy clients or servers you should consult the product online help for instructions on configuring TLS protocol versions.  
PSEC:103001 (87188)

## Compiler

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- When a RELEASE or RETURN statement is executed in an input or output procedure of a sort statement, if the SORT-RETURN special register is found to contain a value of 16, then the sort should be aborted, even in a case where the RELEASE or RETURN statement is at a lower perform level than the input or output procedure itself. Previously, this was not happening for programs compiled to JVM or .NET COBOL, but this erroneous behavior is now fixed.  
01723392 (104114)
- When a variable is defined in a DECLARE statement with no explicit type, but a value that is a non-integer numeric literal, the type is assumed to be float-long (i.e. a 64 bit floating point).  
(148103)

## Containers

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- The containers image build tool now supports custom Java run-times which helps to keep the size of Java-based applications smaller.  
(182004)

## Eclipse IDE

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- COBOL formatter functionality has been enhanced with the introduction of a 'Code Clean Up' feature. The code clean up preferences are stored in profiles, similar to the COBOL formatter preferences, and are also applied in a similar way, within the COBOL editor. See *Formatting COBOL code* in the documentation for more details.  
(123034)

## Enterprise Server

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- The Security Manager passwords no longer appear in the `commonwebadmin.json` configuration file.  
(203052)
- The X-XSS-Protection header will now be set on all requests instead of only on API requests.  
01938835 (138176)
- In ESCWA, the colors and contrast have been adjusted to improve visual accessibility.  
01995403 (158071)
- ESCWA now displays an improved message if there is an issue with loading the application, especially in the case where there is a browser incompatibility.  
(241013)
- ESCWA now handles enterprise server regions that use character encodings other than windows-1252.  
00370773 (11742)
- In ESCWA, the **Console Log** page now enables you to easily traverse and navigate the log. The new paging feature uses an API call from the Communications Server group documented in the Enterprise Server Administration Server API, typically located at `http://localhost:10086/docs/#/Communications_Server` on the machine where you have the product installed.  
02085456 (191017)
- ESCWA now supports multiple PACs in a single Redis store.  
(248003)
- ESCWA now handles enterprise server regions that use character encodings other than windows-1252.  
(91001)
- In ESCWA, on the **Communications Process** page you can now specify a Requested Status for the communications process.  
00669779 OCTCR50A69378 (69378)
- In ESCWA, the **Catalog DCB** page now displays the file size in bytes.  
01909652 (138002)
- ESCWA now supports Circular Logging. On the **Tracing and Logging Settings** page you can now specify the **Log Max File Size** and the **Log File Count** fields. By default, these fields are set to 1024kB and 5 respectively. See *Tracing and Logging Settings* in your product Help for more information.  
02083633 (191019)

- In ESCWA, a new optional **Logon security resource** has been added. This can be used to control users' ability to log on. See *Security Resources to Control ESCWA* and *API Access* in your product Help for more information.

01886579 (124022)

- You can now define and install shared SOR Models. In the **SOR Model** dialog box, check **Shared** to enable the SOR Model to be shared between PACs.

(244088)

- For LDAP-based security in Enterprise Server, the processing of password changes has been modified to address security issues, inconsistencies among configurations, and other issues. See *Understanding passwords with LDAP-based security* in your product Help for more information.

(118088)

- Enterprise Server with LDAP-based security now denies a sign-on attempt by default if it includes a password-change request (a new password is supplied), and the password change fails. This was the existing behavior in some configurations but not in others. It is now consistent and configurable. See *MLDAP ESM Module Custom Configuration Information* in your product Help for more information.

(108046)

- A change has been made to the way that TS queues and TD queues are stored in a PAC. This was to ensure that deleting a 0TSQ did not also delete all queues that had a 0TSQ\_ name prefix.



**Note:** After the update is applied you must cold start your PAC.

(183044)

- In a PAC, the SIT setting is now honored when a TS or TD is to be applied to the enterprise server region if the TS or TD is not under a SOR, MFDBFH, or Fileshare. This means that if a SIT has to cold start for TS or TD and the files are either in the workarea or on disk then the SIT settings will be applied, otherwise the PAC-wide settings will be applied.

02149316 (204020)

- EZASOKET traffic will now be assigned to Communications Process instance #1. You might need to consider this if you use load balancing.

02060014 (201009)

- When a PAC is cold started, the configuration file specified by MFDBFH\_CONFIG will be uploaded to the PSOR and a temporary file created in the enterprise server region's workarea. This temporary file will be used by all the processes for that enterprise server region. Subsequent enterprise server regions joining the PAC will then create a temporary file in its workarea for the MFDBFH\_CONFIG from the PSOR store. If an enterprise server region in the PAC is killed or is terminated abruptly than the restart of the enterprise server region will try to recover the previous UUID left in the PAC and DEQ all remaining ENQs in MFDBFH that were created from the previous run. New messages will be created in the `console.log` identifying if the recovery was initiated and successful, if the enterprise server region could not be recovered automatically, the region will stop. A log file will be created in the workarea with the following file naming convention:

```
Caspac_Recover_UUID_XXXXXXXXXXXXX.log
```

For example: CASCD4012W Region was not stopped properly, recovering previous region UUID 14BAAA87B4C010BFBDE278A5F65B350C 18:15:17CASCD4014I UUID recovery file log C:\Users\mag.CORPDOM\Documents\Micro Focus User\Enterprise Developer\WORKAREA\RAS1\Caspac\_Recover\_UUID\_14BAAA87B4C010BFBDE278A5F65B350C.log 18:15:18. Using the `caspac` utility with the `-aStatus` parameter will display if the enterprise server region in a PAC has lost its connection to the PSOR. If you determine that the region is no longer in the PAC, then you can run the `caspac` utility with the `-aRecoverUUID` parameter to recover the enterprise server region. If the `-aRecoverUUID` parameter is used, then a file will be created in the current directory with the following file naming convention:

02081952 02123645 (182093)

Caspac\_Recover\_UUID\_XXXXXXXXXXXXX.log.

See *caspac* in your product Help for more information.

- Functions have been added to `file_utilities` which check a given file name against either a default blacklist containing operating system reserved file names, or a passed blacklist. Read, write, and delete in AES and MSCPD use this function to disallow secret names which are inappropriate names.

OCTCR50A7844 (112022)

- Fileshare is no longer used to locate the Resource Definition and CNV file.

00468648 (69010)

- MQ updates did not rollback on step failure. This has been fixed.

01976727 02161235 (155010)

- PSOR stores are now prefixed by the PAC NAME and a version number enabling you to run multiple PACs in the same PSOR, simplifying the incompatible upgrade process. The `caspac` utility enables you to add the PAC Name as part of the command line parameters using `-pPACName` or if not specified using the `ES_PAC` environment variable. See *caspac* in your product Help for more information.

(202162)

- The XA reconnect mechanism now attempts to reconnect to all XA entries marked as "enabled" at the start up of the enterprise server region. To prevent the reconnect attempts, do one of the following:
  - Remove the XA manager from the enterprise server region definition.
  - Set the XA manager as disabled before starting the enterprise server region.

01991481 02003277 (151008)

- A new MLDAP ESM custom configuration section has been added. The `[Prefix Search]` option enables the Prefix Search wildcard optimization for limiting the scope of wildcard resource entities checked under a resource class. See *MLDAP ESM Module Custom Configuration Information* in your product Help for more information.

00726158 (73180)

- For LDAP-based security in Enterprise Server, the processing of password changes has been modified to address security issues, inconsistencies among configurations, and other issues. See *Understanding passwords with LDAP-based security* in your product Help for more information.

(118088)

- Enterprise Server with LDAP-based security will now by default deny a signon attempt if it includes a password-change request (a new password is supplied), and the password change fails. This was the existing behavior in some configurations but not in others. It is now consistent and configurable. See *MLDAP ESM Module Custom Configuration Information* in your product Help for more information.

(108046)

## File Handling

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- The `dbfhadmin` utility has been enhanced to allow the integrity of a datastore to be verified, and optionally, fixed up: use the `dbfhadmin -verify -list|-recover` options. See *The dbfhadmin Command Line Utility* in your product Help for more information.

00778044 (90143)

- The `dbfhadmin` command-line utility has been enhanced to provide the capability for verifying and optionally repairing (cross-)region databases.

02123645 (193071)

- The cross-region database heartbeat interval can now be configured using the `dbfhconfig -add|-update -heartbeat interval-in-seconds` command. The default heartbeat interval remains as



5 seconds. A warning message is now output to the Enterprise Server console during region database start-up if the heartbeat interval is configured to be >15 seconds. The larger the heartbeat interval, the longer the time that is required to be able to recover (cross-)region database resources. Recovery can only take place for a process if its associated heartbeat record has not heartbeat within the last "heartbeat-interval + 5" seconds.

02155269 (202149)

- The performance of PostgreSQL optimized I/O has been improved. If you use the `psqlodbc` device driver, you will need to ensure that you are running with version 12.02.0000 or later. This change has been tested with version 13.01.0000. To take advantage of the performance benefits of this change, specify `BatchSize=100` for each of your ODBC DSNs. Using a version of the driver earlier than 12.02.0000 could result in a performance degradation when deploying large files to datastores.

(125032)

- Table record locking and database record locking are incompatible and may lead to data corruption if used together by separate processes when processing the same file. MFDBFH has been enhanced to ensure that if a file is already opened in a process with table locking, all other processes attempting to open the same file, even if requesting database locking, will also use table locking. However, if a process has a file opened using database locking, other processes attempting to open the file will only be allowed to do so if they are transactional files (i.e. database record locking can only be used for transactional files). An attempt to open the file as non-transactional will fail. Refer to the *Record Locking Strategies* documentation for more information.

(102011)

- MFDBFH now enforces the existing requirement that a region database used by a PAC, or a region database used by an ES region configured to use `ES_LOCK_DB`, is not used by any other PAC or `ES_LOCK_DB` regions. This is necessary to avoid problems such as jobs with the same name submitted to two separate regions, but erroneously using the same region database, from being blocked by waiting on `SYSZJOB` and/or `SYSZJOB` ENQs. A check is now performed during region start-up to ensure that the region database is not already being used by another region. If it is, the region start up will fail, with error messages indicating the cause of the failure output to the ES console. Existing ES PACs/regions will need to be stopped and restarted for these new region database state checks to take effect. The `dbfhadm -region -status [-reset]` command has been introduced to allow a region database's state to be displayed and, optionally, reset. See *Resource Locking* in your product Help for more information..

(121030)

## Machine Administration

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- A problem with using the .NET 3.5 framework has been fixed.

(204144)

- A problem with CPU conversion has been corrected.

(199042)

## Micro Focus Directory Server

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- The `mfd /s` option supports the specification of the optional Enterprise Server `user id` and `password` parameters using a configured Micro Focus Vault Facility location rather than using literal strings for credentials. For example:

```
mfd /s 1 mfsecret:user/user_001/id mfsecret:user/user_001/pwdwhere user/
user_001/id and user/user_001/pwd
```



Are secrets stored in the default-configured vault. These values can be populated and administered using the `mfsecretsadmin` utility. See *Vault Facility* in your product Help for more information. The `mfds /x` and `/g` command-line options also support credentials stored in the vault.

02131532 (193088)

- If MFDS is configured to store sensitive values in the vault (for example, XA openstring or autostart credentials), these values were not being included in legacy data format or XML export of Enterprise Server configuration information. Subsequently, these values could not be reimported. These sensitive values are now included in the exported data. Micro Focus recommends that you protect the exported files with appropriate access control.

(202272)

## Run-time System

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- The native COBOL multi-threaded demo is now available for Windows development products.

(3765)

- Basic support for `xterm-256color` has been implemented.

(57591)

## SQL: OpenESQL

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- A performance problem in a SQL program using fixed-length character arrays when compiling a COBOL program and using array fetch has been resolved.

02152406 (203060)

- A new feature to assist migration between databases has been added. SQL error codes and messages may be mapped to different values or suppressed to match those expected by the application.

(193003)

# Known Issues

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

In addition, note the following:

- Problems with Microsoft's Visual Studio 2022, release 17.2, might cause the following issues with Visual COBOL or Enterprise Developer for Visual Studio 2022. The issues do not exist in release 17.1. See the points below for the workarounds to these issues:

- An issue with Microsoft's Visual Studio installer might result in the IntelliSense and editor colorization not working. To repair your installation, execute the following command from a Visual Studio command prompt:

```
devenv /updateconfiguration
```

This issue is resolved by Microsoft in Visual Studio 2022, release 17.3. You need to update your Visual Studio installation.

- Mixed-language multi-project builds might fail as a result of the project dependencies not working correctly. This means that some projects might build in parallel when they should build in a specific order. As a result, the build might fail due to a dependency not always being available. To work around this issue, click **Tools > Options > Preview Features**, and check **Load projects faster (some features may be delayed)**.

This issue is resolved by Microsoft in Visual Studio 2022, release 17.3. You need to update your Visual Studio installation.

- The expanded copybook visualizations are missing. This includes breakpoint, current statement when debugging, and others. These features might not always function correctly in non-expanded source (in the main programs) if that program contains expanded copybooks. To work around this issue, you can disable inline copybook expansions.
- Visual Studio 2022 requires that the `global.json` file of .NET 6 projects is placed at the directory level of the solution file in order for the project to successfully open and build. In previous versions of Visual Studio, the file could be located in subfolders of the solution such as in the project folder.

This can affect existing .NET Core 3.1 COBOL projects that you upgrade from a prior release if the `global.json` file is not at the directory level of the solution file. It also affects .NET 6 COBOL projects that you add to an existing solution.

In these cases, you might receive the following error message if building from the MSBuild command line, or in the IDE Output window if the project fails to load:

```
"The SDK 'MicroFocus.Sdk' specified could not be found"
```

To work around this issue, you need to move the `global.json` file to the directory level of the solution file.

New .NET 6 COBOL solutions and projects created with VS2022 create the `global.json` file in the required location.

- It is not possible to upgrade from a 7.0 version of the Visual Studio-based product, if you are targeting a different version of Visual Studio. For example, it is not possible to upgrade from Visual COBOL 7.0 for Visual Studio 2017 to Visual COBOL 8.0 for Visual Studio 2019.
- It is not possible to install the 8.0 version of the Visual COBOL Build Tools as an upgrade of an existing 7.0 installation. You must first uninstall the 7.0 product.
- The Server Core form of Windows Server 2019 is not supported.

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

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

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

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

# Resolved Issues

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

- [Character Animator](#)
- [Code Analysis](#)
- [Common Communications Interface](#)
- [Compiler](#)
- [Containers](#)
- [Data Tools](#)
- [Dialog System](#)
- [Debugger](#)
- [Documentation](#)
- [Eclipse IDE](#)
- [Enterprise Server](#)
- [File Handling](#)
- [Interface Mapping Toolkit](#)
- [Micro Focus Common Client](#)
- [Micro Focus Directory Server](#)
- [Micro Focus License Administration](#)
- [Micro Focus Support](#)
- [Panels](#)
- [Run-time System](#)
- [Setup](#)
- [SQL: COBSQL](#)
- [SQL: DB2 ECM](#)
- [SQL: OpenESQL](#)
- [Visual Studio Code](#)
- [Visual Studio IDE](#)

## Character Animator

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- The `cobesdebug` command now functions correctly on s390 Linux machines.  
02126702 (204053)

## Code Analysis

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- Some memory leaks causing a crash in the process have been fixed.  
00506227 (69251)
- An issue with Data Flow analysis has been fixed.  
(245019)
- Visual Studio now supports analyzing COBOL Unit Test Projects.  
(234009)
- Added support for analysis using the `ChildrenCount` attribute.

02068434 (174080)

- A new code rule has been added to general queries to identify COBOL statements ending with a period.

00488450 (204164)

- A new code rule has been added in general queries that identifies COBOL statements ending with a period.

00488450 (202186)

## Common Communications Interface

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- An invalid request no longer gives an unexpected "GkCWI: OPEN: unable to open connection: (8)" on Solaris 64-bit.

(221007)

- Improvements have been made to the validation of server certificates for SSL/TLS connections.

(244007)

## Compiler

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- 32-bit Intel x86 generated code only: when a statement of form 'set length of dynamic-item to var-a' is followed immediate by an arithmetic statement using var-a, incorrect code could be generated. This has been fixed.

(124033)

- JVM COBOL only: with ARITHMETIC(OSVS|VSC2|ENTCOBOL) set, a multiply expression that resulted in zero due to truncation of least significant digits could result in a `java.lang.ArrayIndexOutOfBoundsException` exception. This bug has been fixed.

02194495 (220102)

- SORT operations using files greater than 4Gb no longer fail for JVM COBOL programs launched with the 'java' command instead of 'cobjrun'.

00779891 (101099)

- For JVM COBOL applications running in time zones that follow daylight savings, CURRENT-DATE returns the wrong offset when the run-time tunables, `current_year`, `current_month`, `current_day`, `current_hour`, `current_minute`, and `current_second` are set to a datetime that falls outside of daylight savings, and the machine's time zone falls within daylight savings. This also occurs in the opposite case where the datetime set falls within daylight savings but the machine's falls outside. Additionally, if `timewarp_dynamic` is set to `false`, issues might occur if the machine's current time zone falls within daylight savings while the datetime set by the run-time tunables does not (and vice versa). The hour output in the return from CURRENT-DATE can differ depending on the actual machine time zone setting.

When run-time tunables are left at their default values, JVM\_COBOL CURRENT-DATE behavior is correct.

(246040)

- The following code:

```
move address of item-1 to ptr-item
```

Where `item-1` is a group item, created incorrect code. This has been fixed.

02108263 (189014)

- The following command:

```
cob -x prog.cbl
```

Where `prog.cbl` contained user-defined functions, would create an executable with the wrong name, which did not behave correctly. This has been fixed.

(7760)

- Spurious background parse errors no longer occur when switching between DIALECT"ENTCOBOL" and DIALECT"MF" programs.

(246064)

- An EXEC statement containing incorrect syntax now receives a single appropriate error without additional spurious messages.

(5093)

- COPY statements specifying a filename with an extension longer than 10 characters are now successfully processed, as they were in earlier products.

02223965 (246061)

- A WRITE statement following a WRITE AFTER statement no longer produces extra, spurious blank lines.

02177282 02212276 02202768 (212006)

- Use of ANY LENGTH arguments in user functions now work as expected.

00507152 (98059)

- Generation of a program with implied linkage parameters now completes successfully.

(202177)

- Use of `$DISPLAY VCS =` syntax in a multi-program source now compiles as expected.

02033283 (167013)

- A syntax error for a statement appearing on the same line, and after a COPY statement, is now reported with the correct error location.

(4795)

- A syntax error for a statement appearing on the same line, and after a COPY statement, is now reported with the correct error location.

(3860)

- INSPECT REPLACING operands of unequal size now receive a run-time system error, thus preventing data corruption from occurring.

(4667)

- A STRING statement in a program with a large amount of data now executes as expected.

02132926 (202023)

- When scrolling upwards in Character Animator, correct source lines for nested copybooks are now always shown correctly.

02209782 (246075)

- A bracketed abbreviated condition with implied subject and leading 'NOT' now compiles as expected.

(5249)

- Non-ASCII characters in comment entries now appear correctly in EA reports.

00428434 (87204)

- Compilation of a DECLARE statement that is missing the AS keyword now reports a syntax error and completes without looping.

(202291)

- A **Quick Browse** of data names containing DBCS characters now returns correct results.

(2840)

- Reference modification on the results of an intrinsic function now returns the correct result in all scenarios.

(3877)

- SSRANGE messages have been enhanced to show line and file information.

00732371 (91169)

- The reference count for data items used in CALL statements is now shown correctly.

02130511 (193060)

- A program using AS as a data name now compiles successfully and is processed correctly by EA when using an Enterprise COBOL dialect (where this is a context-sensitive reserved word only.)

(221073)

- All currency sign values that are valid for Enterprise COBOL are now correctly accepted under that dialect.

(220072)

- In Visual Studio, **Find all references** for an ambiguous name that is the subject of a REDEFINES clause now shows expected results.

02093998 (190032)

- EA analysis is now correct for an item referenced in the COUNT clause of an XML GENERATE statement.

(222066)

- Non-ASCII characters in long comment lines are now correctly processed by Enterprise Analyzer tooling.

(120026)

- A SEARCH ALL operation that contains another SEARCH ALL operation inside of the AT END clause now evaluates its WHEN clauses correctly.

01829511 (110077)

- The EA and XMLGEN directives now produce separate XML files if the file name option in the EA directive and the path option in the XMLGEN directive are both used.

01726038 (110026)

- Reference information in the IDE for qualified paragraph names is now correct.

(73204)

- The insertion of large amounts of replacement text from the REPLACE statement no longer causes execution to hang.

01803571 (106074)

- A new directive, DISPLAY-PICU has been added to determine how PIC U items are displayed to the console: either as UTF-8 or ANSI.

(142003)

- The TYPEDEF clause cannot be used in conjunction with the DYNAMIC LENGTH clause.

(254008)

- When used with some formats of icon file, the ILICON directive could result in a system error during compilation. This is now fixed.

00733709 (87102)

- A new directive, ILLOADSTRING "1", has been implemented which, if specified, changes the way string loads are generated in a program compiled to .NET. This may be useful when compiling very large projects for which the error 'COBCH0857 System error - failure during ILASM phase' is returned.

00722937 (83144)

- The new NAME OF expression is now available in .NET COBOL, and returns the unqualified name of the type or member specified.

(158040)

- The new NAME OF expression is now available in JVM COBOL, and returns the unqualified name of the type or member specified.  
(158040)
- The IS GLOBAL clause is now permitted for Linkage Section items in .NET COBOL code.  
(70254)
- The IS GLOBAL clause is now permitted for Linkage Section items in JVM COBOL code.  
(70254)
- When compiling for JVM COBOL, large programs could sometimes produce invalid code, leading to a java.lang.VerifyError on program load. This has been fixed.  
01976935 (170014)

## Containers

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- When building a base Docker image on UNIX/Linux platforms, you can now supply the `odbc` or `odbc-dev` parameters to install the odbc run-time library or odbc developer tools library respectively.  
(183056)

## Data Tools

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- When a filter is set on a data file, records outside of the filter are no longer inadvertently deleted when deleting filtered records.  
02151283 (204027)
- In the Data File Editor, records are now inserted correctly, even when the files are not stored on the C:\ drive.  
02084190 (194028)
- Within the Data File Editor, when data files are opened through Enterprise Server, they will now close correctly when the related SEP is manually removed.  
(235011)
- When working with data sets via ESCWA in the Data File Editor, if you attempt to filter the catalog without first logging in to ESCWA, you will now be prompted to log in instead of being shown an error. Also, entering correct login credentials after a previous failed login attempt no longer shows a 403 error, but will instead correctly log in and open the catalog.  
01984967 02031391 (163059)
- Cosmetic changes have been made to some of the Data File Editor dialog boxes to ensure that all button/screen text is displayed correctly.  
01984967 02031391 (162069)
- Within the Data File Editor, MFDBFH files (that is, those stored in a database) can now be opened as either shared or exclusive.  
(234017)
- In the Data File Editor, hexadecimal values can now be used in the **Value** field when applying a filter to a data set.  
02306658 (246107)
- In the Data File Editor, when the ruler is on, a vertical guideline is displayed down the page every 10 columns. Toggle the ruler off to remove the guidelines.  
02306661 (246106)



## Debugger

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- Opening a large core dump file in the debugger now displays an error if the file is too large to be debugged.  
01872464 (124123)
- Core files larger than approximately 1.5Gb can now be debugged on Windows, provided enough memory is available to the debug process. If there is insufficient memory, error 1050 will be displayed by the debugger.  
02166754 (220131)
- Level-78 items longer than 512 bytes no longer cause the debugger to crash when querying.  
02096915 (185023)
- A new argument (`progbponly`) is available to allow program breakpoints to be used when dynamically debugging Enterprise Server applications - see *How to debug services and applications with Enterprise Server Dynamic Debugging* in the product Help for more details.  
00468081 (70023)

## Dialog System

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- The create-window, show-window and create-dialog-box events are now correctly handled when multiple versions of a dialog system application are running.  
02074907 (181035)

## Documentation

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- The list of available samples in the documentation has been corrected. Previously, it incorrectly stated that the 'airport demo' was an available sample on Linux/UNIX platforms.  
(10126)
- Due to restrictions now placed on the target type of applications from which a program test originates has meant a tweak to the *Running Unit Tests in the IDE* tutorial in Eclipse.  
(231020)
- Additional details have been added to the documentation for *Calling MVSCASPB* about calling the program for different bitisms, on UNIX platforms.  
3177268 (8027)
- Context-sensitive help now exists when editing a clean-up profile (**Window > Preferences > Micro Focus > COBOL > Code Style > Clean Up**)  
(211016)
- Some minor changes have been made to the *Packaging JVM COBOL* tutorial in the documentation.  
(230027)
- Minor amendments have been made to the *Compiling a COBOL Program to JVM Byte Code* tutorial in the documentation.  
(230025)
- Minor and cosmetic changes made to the documented *Creating a Native COBOL Application* tutorial in Eclipse products.  
(232012)
- The definitions for the ASSIGN directive parameters have been corrected in the documentation.

(10604)

- A restriction has been added to the documentation stating that you cannot call COBOL programs containing COMP-1 or COMP-2 parameters specified BY VALUE, and conversely, you also cannot call a C program using a COBOL program containing COMP-1 or COMP-2 parameters specified BY VALUE.

(8415)

- The documented syntax for CBL\_GET\_ERROR\_INFO has been corrected.

(124059)

- The parameter block for CBL\_GET\_OS\_INFO has been updated. The `cblte-osi-rtscapabilities` flag now contains a bit that indicates MFDBFH enablement.

(118068)

- When debugging in the IDE, you cannot extend the length of dynamic-length variables beyond their current size at the point of execution. Any data beyond the current size is truncated.

(209031)

- The documentation has been updated to clarify that the PREPLIST directive only affects preprocessors. It will not produce additional content for external compiler modules (ECMs), such as the DB2 ECM.

01717477 (97172)

- A note has been added to the `mftrace.application` and `mftrace.time` CTF documentation topics to state that these properties cannot be altered once the specified application has been started.

(4881)

- The documentation for the TEXTFILE and BINFILE Emitter properties has been updated to state when the LOCATION property is used.

(3896)

- The properties for the `mf.rts` CTF component have been updated/corrected in the documentation.

(195073)

- Additional links have been added to the documentation for 'dynamic length' items, to allow easier access to all information relating to this subject.

(230024)

- The documentation has been updated to better explain some of the options available when installing the Micro Focus License Manager.

(97130)

- A note has been added to the documentation to point out that the level numbers used in a segment layout file do not correspond to the level numbers that are used in the COBOL source (although the same group structure is maintained).

00778667 (97101)

- The Data File Tools restriction 'National data items are not supported in record or segment layouts' has been removed from the documentation.

(123088)

- The Large File Support for Fileshare documentation now points you towards the permissible file limits for indexed files.

(104263)

- The *Prerequisites* topic in the *Scale-Out Performance and Availability Clusters* section has been updated to include the support for Oracle 19c.

02038850 (167027)

- The *Application Server JCA support for Enterprise Server* topic has been updated to clarify support for 64- vs. 32-bit, and to remove indications of support for Red Hat 6.x EL on UNIX platforms.

(161102)

- The *Configuring Security using Active Directory* topic contained a broken link to the video covering how to define an external security manager. This has been fixed.

02004032 (158052)

- Anonymous binds have been disabled by default on MFDS instances which use "Restrict administration access". This means that applications such as ESCWA and MFCS which query MFDS Enterprise Server configuration data will be required to specify some form of credentials based on the MFDS security configuration. See *Class - Enterprise Server Administration* in your product Help for more information.

02209662 (244017)

- Within the documentation, refinements have been made to the tutorial: *Developing a PL/I application in Eclipse*.

(236024)

- Slight amendments have been made to the documented *Running Unit Tests in the IDE* tutorial in Visual Studio products.

(231022)

## Eclipse IDE

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- Catalog Explorer filters now persist.

02113386 (191001)

- An issue when opening copybooks using F3 (Go To Definition) has been fixed.

02168679 (216016)

- In Breakpoint view, the line description for COBOL JVM line breakpoints is now displayed.

02163641 (207044)

- Alphanumeric fields that contain a low-values character are no longer truncated when using the **Variables** view (or **Expressions** view) for JVM COBOL.

02159374 (204133)

- An issue when creating a new remote project using a SAMBA connection, through a template, has been identified and fixed.

02122144 (203185)

- An issue where the incorrect line may be highlighted when debugging COBOL has been fixed.

02173765 (202295)

- An issue has been fixed where copybooks may not have been found during compilation when using linked folders with Copybook projects projects.

(224013)

- You can now successfully import an enterprise server instance from a path name containing spaces.

(244144)

- An issue has been fixed where 'COPY statement hovers' in the editor were being shown for incorrect lines.

(209044)

- The **Console** view in Eclipse no longer hangs.

02085456 (190013)

- A problem where the spool or catalog tables in Eclipse could lock up whilst editing has been resolved.

(186032)

- A fix has been applied for the font used in the **Catalog** view in Eclipse.

(158058)

- A focus issue has been resolved in both the COBOL and Server explorers, as well as in the context menu handlers. Previously, consecutive context menu actions in some places would cause context menu to appear empty until refocused; also, the Enterprise Server sub menu on a project in the COBOL explorer did not seem to do anything.  
(167113)
- On Linux, layout screen corruption has been fixed in the Spool view.  
(158057)
- A restriction has been removed which prevented associating a project with an enterprise server region through a remote ESCWA and further remote MFDS.  
02026484 (162106)
- The generate process for Profiler/Code Analysis set on an enterprise server instance is no longer performed when the instance is stopped during Eclipse's shutdown process.  
(233009)
- You can now enter values larger than 100 in the record length fields when editing data sets in the **Catalog** view in **Server Explorer**.  
02099686 (190009)
- A bug in **Server Explorer** was expecting all servers underneath an **mfds** to have debug settings, which is not the case for Fileshare servers. This has been fixed so that all valid servers are shown in both **Server Explorer** and the launch configuration.  
02155887 (203066)
- The target path for linked folders was not being calculated correctly when determining the output folder for profiling results. This has been resolved.  
(110096)
- There was a bug in the environment variable handling when starting regions from **Server Explorer**, which caused existing environments to be overwritten, as well as aborting when comment characters were encountered. This has been fixed.  
02132903 (193080)
- COBCPY was not being constructed correctly when generating IMTK information and when using linked folders in a copybook project. This has been resolved so that all expected paths are now resolved and included in the path.  
(10252)
- When generating IMTK information, the copy path for the COBOL program was not being correctly constructed in the case where copybook paths are defined in a dependent project. This has been resolved.  
02104242 (191018)
- The string used for constructing the path to the destination of symbolic links on Windows was not being processed correctly. This has been resolved so that all target paths of Windows symbolic links are now resolved correctly.  
(62176)
- Remote COBOL Unit Testing projects can now be created using SSH connection types.  
02232653 (246125)
- It is now possible to specify input/output parameters with the same name but different direction for 01 level data items. For any other cases on same level, duplicate names are not allowed.  
01894253 (124128)
- While debugging on UNIX, the variable structure is now displayed consistently when you hover the cursor over a variable in the program.  
01717087 (161001)

- The error thrown when resolving conflicts in COBOL source files using the Git Merge tool has been fixed.  
02075324 (182051)
- The **Perform automatic directives determination** preference has changed from a check box to a group of radio buttons (**Always**, **Never**, and **Prompt**).  
(6335)
- When running the client-side connection tests for a remote server connection, the test for the Java version on the remote host requires a minimum of version 1.8.0.192 in order to pass.  
(226012)
- A new preference page has been added in the Eclipse preferences, which allows you to adjust certain timeout settings for certain long-running queries executed against a remote EA server. Access the preference page via **Window > Preferences > Micro Focus > COBOL > Code Analysis > Application Wide Knowledge**.  
(238015)
- The **Determine Directives** option is not supported for JVM COBOL projects, and so has been removed from context menus relating to such projects.  
(97069)
- Two new options are available to control the behavior of new dependency/copybook paths, available from the **Preferences** pane - **Micro Focus > Builder > Project**. Select **Insert to the beginning of dependency/copybook paths list** or **Append to the end of dependency/copybook paths list** to control the initial position of new items added to the list.  
02168679 (216017)
- Local enterprise server instances (running on a local MFDS, connected to a local ESCWA) use the `casstart` and `casstop` commands when started/stopped. These commands are run under the local user's credentials.  
02147034 (198054)
- The **ESCWA** field has been added to the dialog box you must complete when using the **Submit JCL to Enterprise Server** context menu option in Eclipse.  
(232002)
- The **Program breakpoint on main entry point only** option has been added to the **COBOL Enterprise Server** debug configuration. If selected, a program breakpoint causes execution to stop only when the Procedure Division entry point is called.  
02159204 (203241)
- An enhancement has been made to enable nested rule sets (sub folders) in the XML used for rule set import.  
01947033 (148047)
- When working with Web Services within Eclipse, the **Mapping Properties** dialog box has been renamed to the **Properties** dialog box, and the **Mapping Properties** tab within this dialog box was also renamed **Exit Point Handler**.  
(10172)
- The **Analysis View** page from the **Code Analysis** preferences has been renamed to **Analysis Results**. An additional colorization option has also been added for remote analysis servers.  
(233003)

## Enterprise Server

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- The CPU Warning for a threshold incorrectly calculated that the process was using CPU. This has now been fixed.

00367274 (26052)

- An RTS 114 resulted when using the MQPUT1 with the ES\_MQMONE exit. This has been fixed.

02026475 (161077)

- In an HSF-enabled enterprise server region, a task that was killed for exceeding a threshold sometimes caused shared memory corruption if it was purged during a local trace table rollover. This would cause `casmgr` to trap and bring down the enterprise server region. This has been fixed.

02133017 (194118)

- A SEP could stop producing system traces. This has been fixed.

02068443 (195029)

- The list of SOR models was truncated if it exceeded 256 bytes for a given type (TS or TD). Previously, truncation could occur midway through a prefix, resulting in an incorrect prefix being applied to TS/TD processing. This has been fixed so that truncation occurs only after the last complete prefix. In addition, a warning message (CASSI9042W) is sent to the console log. If this message is detected, then the SOR models need to be reviewed and reduced to less than 256 bytes or, if not possible, then the user exit TSTDSRUE can be used instead.

(245129)

- A performance improvement has been made so that there is no attempt to access a TSQ during REQID generation in the START processing triggered by the EZASOKET listener.

(153017)

- A transient SEP in a PAC could hit a runtime error on process shutdown. This has been fixed.

(221080)

- The `casmgr` could crash after killing a process that exceeded a threshold and the enterprise server region was configured with a positive `dump_limit` value. This has been fixed.

(204106)

- When a terminal is installed without a `termtype` defined, and the `netname` is already in use, a new message "CASCL0002S Auto-install error, NETNAME xxxxx already in use" will be written to CSSL.

02166861 (221052)

- When using `casout` in a PAC, the PACNAME was not added as a prefix to the security call. This has been fixed.

02008463 (156097)

- A memory corruption when synchronizing a PSOR in shared memory has been fixed.

02211316 (245052)

- If an alias transaction was marked disabled and used in a URIMAP, the transaction was still executed. This has been fixed.

02180247 (222112)

- The EZASOKET listener will now reject connections when no more sockets are available instead of terminating and waiting for new sockets to be available to continue working.

02049614 (170013)

- A timing issue that could have resulted in a SEP registered in the dispatch chain even after a registration error has been fixed.

02176557 (211023)

- An issue where a job could be dispatched after the enterprise server region had started to shutdown has been fixed.

02103857 (191022)

- Previously a dump of all the SOR stores was taken when a dump command was issued. In future, a dump of the SOR stores will only occur when a system dump has been requested. This will reduce the number of dumps generated in the system.

- 02131841 (193081)
  - When using query security for TRANSATTACH the wrong class XPCT was used instead of XTRAN, this has been fixed.
- 02198966 (244051)
  - In a PAC, if an enterprise server region could not be started and `casmgr` failed in initialization before connecting to the PAC, `cascd` could decrement the number of enterprise server regions contained in the PAC. This has been fixed.
- 02055658 (176012)
  - A dead lock could occur if a process had been killed whilst in a third-party program by the threshold monitor thread. This has been fixed.
- 02064488 (175076)
  - PCT block was not addressed under certain circumstances. This has now been fixed
- 02202935 (224016)
  - If the entry point mapper was used to map MQ calls and the connection had been lost to MQ, a trap in `dfheibmq` could occur. This has been fixed.
- 02082822 (182086)
  - When an enterprise server region is running in a PAC, certain locks that were unnecessarily stored in the database will now be stored in the enterprise server region's shared memory, improving performance.
- 01932670 (146018)
  - Values returned in ESCWA/ESMAC for active TRANCLASS could be corrupted if CTF was active. This has been fixed.
- (244052)
  - When switching for MIQM from one MQSERVER to another MQSERVER, a network error could be returned by MQ resulting in an XA error code -5. If this happens the SEP will be recycled as the work cannot be processed in that state any longer.
- 02211334 (246063)
  - If an error occurs when calling SAFMGR on SEP initialization after the enterprise server region was started successfully because the LDAP connection was lost, the SEP will now stop but the enterprise server region will not, and the next SEP will have a chance to reconnect to LDAP.
- 02031096 (174010)
  - If the `casout` utility times out, it will now close the session enabling another request to reconnect to the server side.
- 01994995 (203057)
  - If a TCLASS key contained the '@' character then Enterprise Server could not correctly read it. This has been fixed.
- 02287206 (260120)
  - An issue where the group name specified on the `casstart` command line was not being passed and used correctly causing the region to not stay up has been fixed. The condition was that the default group associated with the user did not have permissions to start the region (`OPERCMD5 casstart`).
- 02163023 (245046)
  - In a PAC setup, ENQ's on the pipeline and webservice resources are no longer stored in the DB. They are stored in SHM.
- 00775012 (91020)
  - An issue with EXEC CICS DELAY API when compiling with DIALECT(OSVS) has been fixed.
- 02206914 (236048)
  - The TABLE resource under MFESMAC now controls whether the user can modify the services in ESMAC or ESCWA.

02131841 (194095)

- Security checks were being performed against an incorrect resource when cataloged datasets were accessed using the data file editor. This has been fixed.

02160499 (203144)

- A mutex was taken too early resulting in a serialization of work been processed when a terminal disconnect was issued. This has now been fixed.

02068931 (181001)

- A link to a remote PPT was not correctly removing the PPT from the PAC resulting in a subsequent inquire to find the PPT local. This has been fixed.

02206930 (235037)

- An issue where enterprise server regions did not start with the COBOL Server or Development Hub products has been fixed.

(199060)

- Improve performance by opening spool files once at the start of the process and not open/close for each request.

01994995 (194119)

- Custom HSF fields now correctly handle the maximum data length of 255 characters.

(5794)

- In ESMAC, a Cross-Site Scripting (XSS) vulnerability has been fixed.

00376857 (104212)

- The very first record written by an initialized SEP to an extended variable length ESDS file gave an error of EIBRESP2=110 with EIBRESP=0. This has been fixed.

00367116 (86028)

- When using the Micro Focus External Call Interface (ECI) over TCP/IP, the request and response data flows are now compressed using RLE.

3207572 (13314)

- Under some conditions, when a security look up failed the administrative LISTRESOURCE request would be driven. If the target class contained a significant number of members, the time taken to complete this could impact performance. A change in the ESM interface means the LISTRESOURCE request is no longer being executed.

00748245 (88213)

- When a LINK explicitly or implicitly specifying a remote transaction ID, EIBTRNID would be incorrectly populated with the target transid. This has been fixed.

02250109 (252012)

- When performing a dynamic remote LINK; that is, when using the SYSID option a PPT entry was being erroneously created in the local enterprise server region. This has been fixed.

02156790 (203165)

- When starting a debug session, particularly when remote, an internal shared memory lock would result in the enterprise server region becoming unresponsive until the session was established. This has been fixed.

02158284 02177256 (203215)


- Enterprise Server now appropriately populates the entity name when validating remote file access for mfDataTools2.

02111703 (191045)

- CASCD will no longer clear all remaining locks in the region database if it is being shut down while in quiesce mode.

(185025)



- A buffer insertion logic error resulting in a truncated Enterprise Server Environment has been fixed.  
01920281 (142016)
- The ESMAC HTTP status codes have been updated to be more appropriate for certain errors.  
(202271)
- Enterprise Server will no longer perform a recursive call while waiting for a TRANCLASS dispatch in a PAC.  
02168754 (204246)
- The THRESHOLD CICS resource and its attributes are now prefixed by an underscore when exported with `casrdtex` as they are Micro Focus specific. The `casrdtup` import utility now also requires this underscore.  
(245063)
- Parameters given to `mfconfigmanagerapi` calls were misaligned. The API was also using an incompatible library causing exception handling to fail when attempting to read the definition file. This has been fixed.  
(194046)
- Dynamic debugging port operations are now under a Mutex.  
02155297 (203227)
- Fixed an issue with the display of RTS error messages in the `console.log` file.  
01838001 (116004)
- An issue where a SEP did not recycle on xa-start failure has been fixed.  
01839273 (112032)
- The new user exit BKAUXTRC has been added. The BKAUXTRC exit will be called when a trace switch occurs in an enterprise server region. The current aux trace will be closed and renamed to `.bkp` and the BKAUXTRC exit is then called to archive the file so that trace is not lost in a busy system. See *Exit When a Trace Switch Occurs in an Enterprise Server Region* in your product Help for more information.  
(162021)
- A new `RemShrQueues` action has been added to the `caspac` utility. This option enables you to delete all stores called `Shared_CasTSQ_RC`, `Shared_CasTSQ_NR`, `Shared_CasTDQ_RC`, and `Shared_CasTDQ_NR`. See `caspac` in your product Help for more information.  
(217010)
- In ESCWA, a new option has been added to the **ES Control** page to enable CTF to be dynamically enabled/disabled on a started enterprise server region. See *ES Control* in your product Help for more information.  
01926245 (142040)
- A new `caspac` action, `RemOldPAC`, has been added to enable the removal of old PAC stores not prefixed. See `caspac` in your product Help for more information.  
(252007)
- You can now use the `caslock` command to view a list of locks for enterprise server regions that are members of a PAC. See *Lock Processing* in your product Help for more information.  
 **Note:** You cannot use `caslock` to remove locks in a PAC.
- The HTML document `lang` attribute now changes when the language of the ESCWA application changes.  
02205807 (236041)
- In ESCWA, removing a dynamic debugging session was incorrectly returned from the API request. This resulted in a "Request Failed: Unexpected error processing request" message on the dynamic debugging request page in the UI. This has been fixed.  
02010059 (156074)

02135527 (193107)

- The ESCWA UI files are now included in Solaris builds.

(103080)

- An issue with ESCWA encoding when operating with SJIS encoding has been fixed.

02157606 (204076)

- The ESCWA Client Web API documentation has been corrected for two endpoints:`:/native/v1/regions/{host}/{port}/{region}/enqmodel/view/{resource}/discard` has been corrected to `:/native/v1/regions/{host}/{port}/{region}/enqmodel/view/{resource}/uninstall` In addition `:/native/v1/regions/{host}/{port}/{region}/tsmodel/view/{resource}/discard` has been corrected to `:/native/v1/regions/{host}/{port}/{region}/tsmodel/view/{resource}/uninstall`

(259031)

- The `MfRequestedEndpoint` value in the ESCWA configuration file (typically `commonwebadmin.json`) was being set to an invalid endpoint. When the ESCWA server starts, it uses this value as the endpoint for it to start on; if it is invalid, the ESCWA server would error and fail to start. This issue has been fixed by added server-side validation for the `MfRequestedEndpoint` field: the value must be in the format `protocol:host:port`; protocol must be "tcp" or "tcpssl"; host must be a valid hostname, IPv4, or IPv6 address, or "\*". The port must be a valid port number or "\*". Any request attempting to set `MfRequestedEndpoint` to a value that does not meet these validation requirements is rejected with a 400 "Bad Request" HTTP error. If the ESCWA configuration file has already been set to an `MfRequestedEndpoint` value, the ESCWA server will still fail to start, but will now output a more specific error message. In this case, the issue can be resolved by either manually editing the `MfRequestedEndpoint` value in the ESCWA configuration file, or by starting the ESCWA server with the following command line options: `BasicConfig.MfRequestedEndpoint=tcp:localhost:10086 --write=true` Replacing "tcp:localhost:10086" with the required endpoint.

01983736 (148074)

- Timeouts and performance issues on initially loading the spool table have been mitigated by preventing the spool table from sending an automatic request upon visiting or reloading the page. The "List" button now needs to be pressed to trigger the load or to apply a filter. This enables you to avoiding unnecessary requests that might timeout.

02152418 (203033)

- The ESCWA server now has improved handling of unexpected and unsupported properties in the configuration (`commonwebadmin.json` by default). An unsupported property in the default configuration file will result in the ESCWA server logging a warning, removing the property in question, and continuing. If an unsupported property is found and the configuration has been supplied or overridden using command line arguments, the ESCWA server will log an error and exit. This behavior can be controlled using the new `--strict-config` command line argument.

(143008)

- Safety checks for POST/PUT requests with empty bodies have been improved.

(178001)

- Improved usability of IMS API endpoints by expanding property descriptions in schemas to incorporate relevant sections and labelling from the product documentation. The improvements will enable you correlate API to relevant UI functionality, and to discern the purpose and relevance of schema properties in an endpoint from reading the descriptions.

00372390 (24044)

- The browser title is now set to the name of the selected enterprise server region.

00748187 (90012)

- In ESCWA, you can now download the information you can display on the JES Catalog Entry and Spool Job Output pages. The download functionality retrieves the values starting from page 1 and is not restricted to a page limit. Note: The download will use the Codeset and Details values as set on the page.

00366654 (12735)

- Issue where table row buttons could be moved past the right edge of the table and made inaccessible has been fixed. In addition, the cosmetic bug where table row separators and row highlighting did not extend to the right edge of the table in some circumstances has been fixed.  
(237046)
- In ESCWA, to switch users you now need to logoff and then log back in using the appropriate credentials.  
(101032)
- In ESCWA, incorrect instances of "Job Control Table" have been corrected to "Journal Control Table".  
(87028)
- The spool table now caches the results of the last query executed and persists those results between pages, preventing the query from being unnecessarily rerun.  
02198043 (221138)
- In ESCWA on the JES Catalog page, the RECFM list now has the VBS option.  
00777434 (91091)
- In ESCWA, the catalog table now displays the error or information message when ESMAC would have display one, including when accessing a corrupt CATALOG.  
00779645 (97184)
- There is no longer an issue with incorrect error/success messages when deleting a dataset without relevant permissions in ESCWA. In this case, ESCWA now correctly handles the response from ESMAC.  
01810271 (123009)
- In ESCWA, modifying the SOR Connection Path(s) field in the Scale-Out Repository Configuration dialog box did not update the SOR connection information. This has been fixed.  
01907342 (127044)
- In ESCWA, you can now resize the columns for the Spool table.  
02022132 (162025)
- Errors in the ESAdminAPI.yaml file have been fixed.  
(124111)
- In ESCWA, while submitting JCL through the browser, special characters are now correctly preserved.  
(91119)
- The issue where the Apply button was left disabled when changing values on a Communications Process page has been fixed. The 'Client CA Root Certificates File' field is now correctly disabled when 'TLS Enabled' is unchecked. This will not have affected Communications Processes that had 'Client Authentication' set to "Accept all clients" before unchecking 'TLS Enabled' as the 'Client CA Root Certificates File' is removed under that condition.  
02183154 (222089)
- In ESCWA, the **Spool** page no longer uses deprecated ESCWA API.  
(71382)
- In ESCWA, the services table now auto resizes correctly when expanding tree elements.  
(99075)
- In ESCWA on the **Services** page, the name fields in the Service table rows are now aligned correctly.  
(62209)
- In ESCWA on the **Monitor** page, the graph now displays **Milliseconds** on the left y-axis label when it is set to display milliseconds.  
(57469)

- In ESCWA, URIMAP creation is now possible when **Usage** is set to **Pipeline**. Previously, an issue with the field validation incorrectly set the form to be in an error state when **Usage** is set to **Pipeline**, which disabled the **Save/Apply** button; the validation logic has been corrected.  
01858819 (118078)
- In ESCWA, the **Monitor Control** page has been fixed for an enterprise server region.  
(203107)
- In ESCWA, error messages can now be read by the screen reader.  
01995465 (162038)
- In ESCWA, the keyboard navigation of the add widget's dialog has been improved.  
02010047 (157066)
- The ESCWA UI has been re-themed to conform to Micro Focus standards. This changes the font, and uses title case where appropriate along with many other style and color changes.  
01995207 (157061)
- In ESCWA, the keyboard navigation of the tree has been improved.  
02010055 (156075)
- ESCWA now supports various accessibility technologies including text-to-speech voice readers and full keyboard-only navigation.  
01995445 (163045)
- A redundant error message, triggered when shutting down ESCWA, has been removed.  
00370913 (126001)
- ESCWA better reflects the status of enterprise server processes in error cases when starting and shutdown.  
02229975 (246126)
- ESCWA abended when an empty body was sent in a PUT or POST request. This has been fixed.  
(175064)
- An error occurred in ESCWA when trying to log on to an enterprise server region when already logged on. This has been fixed.  
(231033)
- In ESCWA, keyboard navigation issues with tree controls have been fixed.  
01995458 (157059)
- The German translation for ESCWA has been updated.  
(181003)
- The Content Security Policy HTTP headers on ESCWA has been improved.  
(71455)
- In ESCWA, once modifications for a security group had been saved you could not make subsequent saves till the page was refreshed. This has been fixed.  
(138140)
- When creating an ESM user, specifying a group did not add them to that group. This has been fixed.  
(143028)
- In ESCWA, the display of region trace has been fixed.  
(221090)
- ESCWA will now display transient SEPs on the SEP List Page.  
(198051)
- The occasional "Unable to locate translation string!" messages from ESCWA Server on AIX were incorrectly displayed. This has been fixed.

(151015)

- The URIMap **Cipher** field's validation now account for xml files as permitted input.

(107003)

- In ESMAC, a new option has been added to the **Control** page to enable CTF to be dynamically enabled/disabled on a started enterprise server region. See *Control* in your product Help for more information.

(146114)

- ESCWA now supports displaying Queued Requests by TRANCLASS when the enterprise server region is a member of a PAC.

(189004)

- In ESCWA on the **Control** page, a warning has been added above the **Dynamic CTF File Location** field and to the API documentation informing you to set the CTF Action field to `All Off` before changing the **Dynamic CTF File Location** field or the file being referenced.

(244057)

- In ESCWA, check **mfc** on the **ES Control** page to trace the Configuration Manager. See *ES Control* in your product Help for more information.

(220010)

- The **Enterprise Server Administration Configuration** dialog now has an **External Communications Response Timeout** number picker, which is used to set the timeout for ESCWA requests that go through MFCC. This timeout is equivalent to setting the `MFC_TIMEOUT` environment variable, but is only applied on a per-request basis rather than an environment-level setting.

00502152 (76011)

- In ESCWA, on the **Monitor** page the graph's x-axis has been corrected to display time in order from oldest to latest from left to right.

(158066)

- UDP sockets are now closed when not required by MFDS communications.

02181946 02193815 (222040)

- An issue with newly created Communications Processes being set to the started state but not actually being started has been fixed.

(88221)

- `mfsecrets` would intermittently crash on HP UNIX when certain messages were loaded. This has been fixed.

(106063)

- The `mfsecretsadmin` utility no longer displays spurious allocation errors on AIX PPC.

(105093)

- When using `MFSecretsAPI` with the HashiCorp provider on a Solaris SPARC platform you will no longer get an error for referenced symbol not found.

(103082)

- The `mfsecretsadmin` error callback formatting has changed to improve readability and remove unnecessary information.

(8552)

- Secrets written from now on are transferable across platforms with different endianness.

(104103)

- In the ESMSSQL switch, version 17 calls to `SQLSetConnectAttr` now check both the `sqlrtn` code value and the status item of the `XACallParam`.

(110060)

- An extraneous MQ rollback for TM processes has been fixed.  
(231005)
- The DB2 switch module now provides more traces regarding CLI failures.  
02202803 (239025)
- XA switches now contain logic to trace XID in the Consolidated Trace Facility (CTF).  
01965103 02055821 (162072)
- The logic to parse the Open String option `ESLOGGING` now works correctly.  
02172047 (208024)
- The Oracle switch source now has the correct data alignment to prevent RTS 114 error when more than one Oracle XARs are specified in the enterprise server region.  
01802747 (103172)
- When using ESF in Redundant mode and having multiple ESM in the relevant Security Manager List, even though a request was successfully handled by one of the first ESM, an event failure would be returned if the last ESM in the list reported a failure. This has now been fixed so that if the request is successfully handled by any ESM in the list then the last ESM will not return its failure status, instead it will be logged.  
00372409 (11512)
- The MLDAP ESM, OS ESM, and PAM ESM modules now use the RACF password alphabet for encoding short passtokens rather than the base64 alphabet.  
02168078 (202221)
- The `esfadmin` utility is now delivered in 32 and 64-bit versions.  
02182768 (218011)
- The caching mechanism of Enterprise Server's External Security Facility (ESF) is now able to cache some requests it previously could not, such as Verify (signon) requests with long usernames or passwords, and Auth requests for some MQ-related resources. These changes make cache records somewhat larger, so fewer will fit in a cache of a given size. If you are using ESF caching you might want to increase the size of your cache by 20% to 40% to account for this change if you observe a decrease in the cache hit rate reported at enterprise server region shutdown.  
02154022 (203072)
- In some configurations, Enterprise Server security could lose track of users' group membership information in a running region or instance of MFDS after an ESF Update request. This has been fixed.  
00741997 02182494 (86057)
- The validation of server certificates for SSL/TLS connections in the Micro Focus Common Client has been improved. Specifically the standard PKIX (Public Key Infrastructure, X.509) rules are now followed except when connecting to the server using information obtained from the Micro Focus Directory Server (MFDS), if that information only contains an IP address and not a host name. In earlier product releases MFCC did not enforce PKIX when using information from MFDS regardless of whether the information included a hostname.  
(52097)
- An invalid invocation of the SAFROUTE API under certain non-default configurations could cause a divide-by-zero trap. This has been fixed.  
02016793 (163052)
- The performance of the optional "prefix search optimization" feature of the MLDAP ESM Module has been improved.  
00726158 (142020)
- The External Security Facility can now optionally update the "short name" of signed-on users. See *Renaming ACEEs* in your product Help for more information.  
00657507 (70355)

- HSF statistics for some hexadecimal TS/TD queue names could be incorrectly reported. This has been fixed.  
(146013)
- HSF records would be missing when the task number rolled over from 99999. This has been fixed.  
02026013 (165049)
- HSF records for transactions that were killed due to having exceeded a threshold would sometimes have a response time of 0. This has been fixed.  
01687237 01817975 (97116)
- When the `casmgr` process was recovering locks in `mfdbfh`, it was holding the shared memory lock. While recovery was in progress, no other processes in the enterprise server region was able to access shared memory. This was unnecessary and `casmgr` now releases the lock before initiating the recovery.  
02088479 02086462 02085808 (185024)
- A memory corruption that could occur when the monitor thread killed a process under heavy load has been fixed.  
02006375 (158087)
- New messages have been added to the `console.log` for startup sequences in order to be able to troubleshoot enterprise server region startup issues.  
01935739 (138172)
- If a TSQ in the SOR contained a space `x'20'` in the name, then the delete of the queue failed. This is now fixed.  
01829779 (182032)
- An RTS 173 occurred on an `ES_mF_write_record_in_store` entry point when an enterprise server region was not in a PAC and SSTM was used. This has been fixed.  
01806033 (103156)
- If a transaction executing in a PAC environment with TRANCLASS max priority active was killed by the threshold mechanism, a hang could result on subsequent transactions executing in the same class due to the counter not being decremented. This has now been fixed.  
02168754 (209029)
- An RTS 114 occurred when a transaction had a TRANCLASS defined and the purge threshold was reached. This has been fixed.  
02144961 (204147)
- MFDBFH connections are now closed when a task is idle.  
01984788 (150015)
- Enterprise Server now handles bundle manifest files that can contain multiple JSON transform resources.  
01991361 (150057)
- Latency for queued transactions in a TRANCLASS was attributed to their response times, not latency. The latency is now correctly displayed in the latency field.  
02176385 (209033)
- SCB was not being freed after normal shutdown of a transient SEP. Behavior modified to free the SCB after this occurs to avoid issues when a SEP with the same PID is launched.  
02190327 (220061)
- Loading and calling the single-threaded version of support modules within a multi-threaded process was resulting in a hang. This has been fixed.  
00779469 (92169)

- An issue with parallel one and two-phase XA connections has been fixed.

00700923 (73098)

- The XA recovery processing now supports a retry mechanism:

```
ES_XA_RECONNECT=Y,delay,retry_count
```

Where *retry\_count* is the number of recovery retry attempts to be made if the XA verbs return an *xa-retry* (04) return code. In this case, messages are sent to the console. See *Environment variables in alphabetical order* in your product Help for more information.

02157658 (203087)

- The command-line utility *caspac*, now has the *RecoverUUID* action that enables you to specify the UUID of an enterprise server region that has left the PAC. The action will remove all entries related to that enterprise server region from the PSOR. See *caspac* in your product Help for more information.

(185013)

- The *casToken* and *csrf-token* security has been increased by increasing the token regeneration frequency.

00368452 (12551)

- The performance of the ESCWA Spool View has been improved when using a database hosted catalog file and when specifying a filter with a leading wildcard character.

01856008 (138119)

- An issue with the format of messages caused ESCWA to report success as a failure. This has been fixed.

(125020)

- The "job user" filter string entered in ESCWA or ESMAC were being folded to upper case and sometimes resulted in records not being displayed. This has been fixed.

00469828 (57335)

- Missing JSON properties have been added to the ESCWA active PCT API.

(222149)

- Character validation for HTTP cookie values in secure regions has been added.

02132269 (202051)

- The fix for OpenSSL Denial-of-Service (DoS) issue CVE-2022-0778 has been applied to the product.

(221130)

- When Enterprise Server's MLDAP ESM Module is used for security, with Micro Focus password hashes and password history enabled, history entries are now created with the correct type of hash (Argon2 by default).

(120086)

- In Enterprise Server, when using LDAP-based security, all-groups mode, and username mapping ("long names"), if a user's group membership was changed and the *esfupdate* utility was invoked with the *user* option to update information in the region for that user only, the user's new group membership is now calculated correctly. Previously some of the user's groups might have been missed when determining the set of groups.

(98040)

- For LDAP-based security with Enterprise Server, a new configuration option (password change failure) determines whether a failed attempt to change a password causes signon to fail. See *MLDAP ESM Module Custom Configuration Information* in your product Help for more information.

00736902 (99142)

- When a PAC uses Enterprise Redis, set up a custom hashing policy using the following rules:

- Rule 1: `.*?\{(?<tag>.*?)\}.*`



- Rule 2: (?<tag>.\* )

01872664 (152015)

## File Handling

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- The `mfdbcatc` utility sometimes lost a directory element in a path when expanding an environment-based pathname. This is now resolved.

00707621 (69585)

- In response to a SORT215E error, an identifier has been included to locate the fail position when the reformatting error occurs; also, some OUTFIL variables are initialized.

01832594 (119050)

- The maximum line length of `fhredir.cfg` has been increased to allow for the full MFPORT/MFNODE to be set.

01971422 01970683 (138292)

- An issue with Fileshare performance has now been resolved.

(70294)

- An issue when trying to run Fileshare in background mode has been fixed.

(101104)

- An error where incorrect results may have been returned when a READ on an alternate index was attempted without first performing a START has now been fixed.

(138152)

- Temporary files should now be created correctly in the Data File editor when connecting to a remote file.

(92087)

- WRITE operations to variable-length output pipes are no longer being treated as fixed-record-length WRITE operations; previously, the variable length set by a program was being ignored.

02183108 (220017)

## Interface Mapping Toolkit

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- The HWTJGTST API now returns a correct value in the `JSONType` parameter when invoked with the `objOrEntryValueHandle` parameter set to a value of null, indicating the top of the JSON tree being parsed.

02102661 (220107)

- COBOL clients no longer have duplicate data names in certain scenarios when the WSDL or JSON field name is greater than 30 characters.

01815167 (111010)

- COBOL client data items now have the correct size for JSON fields with "int64" format.

01815173 (104242)

## Micro Focus Common Client

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- The Micro Focus Common Client (used by COBOL web-service proxy programs) now supports the "gzip" content-encoding for HTTP messages. MFCC recognizes gzip'd response and request messages, respectively.

00370460 01901934 (12322)

- A 114 Attempt to access item beyond bounds of memory (Signal 11) no longer occurs during FST101A test.  
(231036)

## Micro Focus Directory Server

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- The MFDS TLS redirect code has been hardened to improve security.  
01938276 02124054 02232906 (157050)
- HPUX `snprintf` caused TLS redirects to fail. This has been fixed.  
(216005)
- If a shortened hostname fails to resolve, then resolution of the full hostname is attempted.  
02207755 (240012)
- If there is a problem resolving the machine local hostname the MFDS process will display the following startup failure message rather than a "Bind fail=136" message: "CCITCP2-0252E hostname resolution error."  
(221047)
- On import of an MFDS repository, some configuration types (such as XRM and MQ Listener) were double-counted, which could result in the configured object limit being breached even though the number of imported items did not exceed it.  
(202284)
- The status of whether the vault is enabled and in use by the MFDS process was not displayed in the MFDS Web user interface as it was in Visual COBOL and Enterprise Developer 5.0. This has been fixed.  
(217031)
- The MFDS process could hang if too many enterprise server regions were defined and started. This has been fixed.  
02190282 (222092)
- MPR PWF1 support has been added to MFDS via the `mfIMSMRPWFIDispatch` MLDAP API MPR property.  
(80014)
- In ESCWA, an error would occur when trying to modify a listener on a communications server other than the first. This has been fixed.  
02191654 (222078)
- There is no longer a long delay when attempting to shut down an enterprise server region that is retrying an ISC connection.  
01689657 OCTCR50A193010 OCTCR50A181100 (101059)

## Micro Focus License Administration

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- In a system where many licensed processes are attempting to get responses from the `mfcesd` daemon, it is possible for the underlying system kernel to constrain resources used by the UNIX domain sockets. This can cause the send response to fail with a resource unavailable temporarily error. This caused the `ces` daemon to lose its contact with the requesting client, resulting in a hung client process.

The CES daemon now recognizes this temporary constraint condition and throttles the connection slightly and retries. The daemon now always sends a response to the client process.

Micro Focus recommends that you also tune the kernel parameters shown below to allow more resources for a heavily used system, to prevent the underlying condition.

The following examples show the parameters to change and show very high values. Micro Focus recommends that a network expert or an administrator reviews these values and adjusts them to achieve a sensible balance:

```
# Increase number of incoming connections  
net.core.somaxconn = 65535  
  
# Increase number of incoming connections backlog  
net.core.netdev_max_backlog = 65535
```

02196423 (245004)

- Before performing a Repair of the Visual COBOL installer, Micro Focus recommends that you create backups of any configuration files of the product that you might have changed.

02084082 (227001)

## Micro Focus Support

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- The `mfpoll.txt` file now includes a new section that has information about whether the machine the `mfsupport` script is running on is a Virtual Machine or a physical one.

00466174 (59146)

## Panels

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- Windows 10 Console Windows resizing has different behavior than some previous releases where the screen buffer size was constantly resized. Some applications, such as a COBOL Accept/Display applications, depend on this behavior, which uses a fixed line and column format. To work around this problem, enable legacy mode in the Console's properties. This disables automatic window resizing. If legacy mode is not enabled, the screen buffer resize event is captured and the window is resized back to the original size, which causes some flickering.

02179388 (212008)

## Run-time System

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- The correct set of synchronization routines using semaphores are now defined in `$(COBDIR)/cpylib/cblproto.cpy` and `$(COBDIR)/include/cblproto.h`.

(166016)

- There was an issue in the internal logic of the `cobutf8` utility, which could have resulted in a hang when a very large amount of data was converted to the application's input and the application was unable to process the data quickly enough. This has now been fixed.

02115599 (190051)

- Timeouts larger than 35 minutes are now permitted with the use of `CBL_SEMAPHORE_ACQUIRE`, for 32-bit UNIX applications.

02168295 (220103)

- On Solaris platforms, the `escwa32` command now starts `ESCWA`, as expected.

(104059)

- If a shared object was created with `cob -z -d symbol_name -l shared_library`, where `symbol_name` is resolved in the shared library linked into the shared object, then a potential `SIGSEGV` sometimes occurred when the shared object was unloaded. This has been resolved.

01848664 (118012)

- The Consolidated Tracing Facility (CTF) is now better protected when the process is processing asynchronous signals on UNIX.

(218021)

- Issues relating to MFDBFH after a recoverable error that occurs in Enterprise Server have been resolved.

(97119)

- The `-U` option of the Micro Focus Configuration Utility for the Microsoft Build Tools and SDK (command name: `cb1ms`) now works correctly if it specifies both a path and a version.

(86023)

- A memory stomp, which was caused by text wrapping code when multi-byte characters were used, has been fixed.

02175685 (208014)

- A memory leak caused by alias symbols has been resolved.

01912000 (146043)

- Code has been removed that assumed that `Disk space exhausted` was the only failure mode for a disk write operation. It has been replaced with a query of `errno` when a write operation fails to output the expected number of bytes (so the run-time system now copes as well as the operating system does).

01978959 (195086)

- Previously, it was not possible to use the old Microsoft bitmap fonts such as Courier, MS Serif and MS Sans Serif with the `PC_PRINTER_SET_FONT` library routine. This has now been corrected.



**Note:** Helvetica and Times fonts are no longer available on Windows, and Arial and Times New Roman fonts should be used instead.

02011925 (160003)

- The `cobfile` utility is not supported for Docker images that do not contain the `file` command. See your *Development Hub* product Help for more information.

(221036)

- When using the `PC_PRINTER_DRAW_RECTANGLE` library routine, if `box-style` is set to 1 (filled), and no pen has been set using `PC_PRINTER_SET_PEN`, the rectangle fill will be solid black.

(127027)

## Setup

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- Before installing the 8.0 version of COBOL Server, COBOL Server 64-bit, Visual COBOL Build Tools, or Visual COBOL Build Tools 64-bit, you must uninstall the corresponding 7.0 product.

(258023)

- This release no longer requires Microsoft's Visual C++ 2013 redistributable.

00486278 (71117)

## SQL: COBSQL

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- COBSQL now exits when the CA-DB precompiler is specified but not installed.

(9638)

- The `SQLBGP` option has been added to the IDE.

(138181)

- The COBSQL preprocessor has been modified to insert Procedure Division Initialization logic after each ENTRY statement.

01780938 (118075)

## SQL: DB2 ECM

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- A new exit for `ESXACUSTOMEXT` has been added to the DB2 switch module. The build scripts have also been updated with some new options to enable this logic.

01688275 (104007)

- For custom exits, the XA-inquiry block must now be specified in the LINKAGE SECTION in the custom exit sources.

02170335 (204264)

- A problem with compiling VARCHAR or LONG VARCHAR arrays in a COBOL SQL program sometimes has been resolved.

02105414 (152006)

- A COBOL program using EXEC SQL INSERT or FETCH statements without a FOR N ROWS clause with arrays caused compiler errors. This has been resolved.

(155003)

## SQL: OpenESQL

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- A problem that prevented the ESMSSQL switch from detecting when the PIP1 transaction is occurring caused `setCurrentConnection` to be performed on the incorrect connection. This has been fixed.

01916096 (142006)

- OpenESQL has been modified to process RELEASE TO SAVEPOINT statements in RDBMSs.

00370819 (13104)

- A problem that caused the OpenESQL native runtime to incorrectly handle WITH HOLD FOR UPDATE cursor against Oracle in 64-bit has been fixed.

00745593 (121047)

- OpenESQL now supports a SYNC clause specified in a variable-length host variable declaration.

02169632 (204218)

- A problem that prevented a properly executed EXEC SQL statement from returning the correct RETURN-CODE has been fixed.

02036138 (167041)

- A problem that caused the OpenESQL runtime to incorrectly handle SQLDA when the .NET SQL application used the ODBC driver has been fixed.

01993609 (158003)

- A problem that sometimes prevented an XA connection used with dynamic registration from working properly with MFDBFH with has been fixed.

00779680 (146073)

- A problem with compiling an EXEC SQL statement of DECLARE CURSOR in which CTE starts with SELECT \* has been resolved.

01798310 (105107)

- A problem that occurred when using CTE in SELECT INTO statement has been corrected.

02117758 (194003)

- When an error occurs, the get error loop now exits if the last error message retrieved is the same as the current one.

02172041 (209005)

## Visual Studio Code

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- You no longer receive a Null Reference exception when running `MicroFocus.VSCodeJIT.exe /r` on machines that do not have Visual COBOL or Enterprise Developer for Visual Studio installed.

01855303 (120034)

## Visual Studio IDE

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- There is no longer an issue with setting the source format to Fixed for .NET COBOL Core and .NET COBOL Standard projects.  
01763326 (104079)
- Right-clicking on an element in a group item or table in the **Watch** window in Visual Studio no longer results in an error.  
(158134)
- The Windows system folder is now excluded from build dependency checking. This is to avoid full rebuilds from occurring when building projects after you have installed any Windows updates.  
02173365 (222086)
- A performance issue when stepping through native code in the debugger when the memory window is visible and showing an invalid address has been resolved.  
(182090)
- The console log for an enterprise server was not displayed correctly in Visual Studio when the server was started using different credentials, for example from the Enterprise Server Common Web Administration.  
(236006)
- Dialog boxes displayed when using menu options in the **Micro Focus Servers** nodes in **Server Explorer** now display correctly when the environment font used by Visual Studio is changed.  
(167021)
- The code analysis results highlighting is now shown in the correct position within source lines that contain tabs.  
(91125)
- If the Determine Directives command cannot identify the dialect for a source file, any file-level dialect override for that file is preserved.  
02191877 (246123)
- The CoreDump profile for native COBOL projects now correctly launches the selected core file.  
(124048)
- An issue with the case sensitive string check when attempting to launch an "Executable" debug profile of a .NET COBOL project has been resolved.  
01906352 (132008)
- When debugging through .NET Code, an **Edit and Continue** dialog box could appear that never completed and could not be cancelled requiring the Visual Studio process to be terminated. This has been fixed.  
(158107)

- You can now select multiple test cases (using the usual **Ctrl** and **Shift** techniques) and click **Run Selected** to perform a test run of specific test cases.



**Note:** This option is not supported for individual data-driven test cases.

(6435)

- The **Auto-generate binding redirects** project property is now supported for .NET Framework applications

01850991 (131016)

# Other Issues Resolved in This Release

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

- 02150403 (203019)
- 02091353 (187001)
- 02121754 (202065)
- 02132897 02164401 (198046)
- 01995392 (158073)
- 02010044 (157065)
- 2836772 (7336)
- 02293789 (226006)
- 01912000 (142033)
- 01834420 (98086)
- 00620699 (71289)
- 01811748 (124010)
- 02135207 (193101)
- 02051091 (175018)
- 00725550 (92178)
- 01839124 02145513 (112009)
- 02045736 (166043)
- 01947033 (146111)
- 01994995 (195081)
- 02033743 (161099)
- 02110007 (191044)
- 02289051 (258146)
- 01794492 (105047)
- 00430214 (58005)
- 02254118 (253027)
- 02016027 (163039)
- 00367290 (31077)
- 01862519 (118040)
- 3188835 (11348)
- 00365049 (13049)
- 02161981 (204198)
- (259026)
- 00775199 (218016)
- (259059)
- (244058)



# 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

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.

### System Requirements

#### System Requirements for Visual COBOL for Visual Studio

##### Hardware Requirements

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

The maximum disk space requirements are, approximately:

Visual COBOL	Sentinel RMS License Manager
1.2Gb	75MB

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

##### Operating Systems Supported

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

##### Note:

- A 64-bit Windows is required. You can produce both 32-bit and 64-bit applications with Visual COBOL installed on a 64-bit operating system.

## Software Requirements

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

Besides the software listed below, the setup file also installs the 64-bit AdoptOpenJDK 11.0.8 (LTS) with Hotspot.

This product includes OpenSSL version 1.1.1n-mf6 (modified).

- [Visual Studio IDE](#)
- [Selecting the Visual Studio components to install](#)
- [Installing Visual Studio features that are not currently installed](#)
- [License Manager requirements](#)
- [Other Requirements](#)

## Visual Studio IDE

You must have Microsoft's Visual Studio 2017 version 15.9 or a newer one, or 2019 version 16.11 or a newer one, or 2022 version 17.0 or a newer one installed in advance. SQL CLR in Visual Studio 2022 requires version 17.1 or newer.

 **Note:** Problems with Microsoft's Visual Studio 2022, release 17.2, might cause issues with some of the functionality in Visual COBOL for Visual Studio 2022. See *Known Issues* for details.

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

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

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

Professional, Enterprise or Community Edition (for Visual Studio 2022) - see the next section for the Visual Studio components you must install.

Microsoft's Visual Studio Express Edition is not supported.

### **Important:**

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

The following software is also required:

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

## Selecting the Visual Studio components to install

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

If not already installed, the Visual COBOL setup file will install the following components:

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

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

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

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

### Installing Visual Studio features that are not currently installed

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

Rerun the Visual Studio installer:

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

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

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

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

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

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

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

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

### 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 Visual COBOL 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 Visual COBOL 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.

### Other Requirements

Various actions and operations within your COBOL development environment depend on certain files that Microsoft distributes in the following packages: the Windows SDK package and the Microsoft Build Tools package. See *Microsoft Package Dependencies* for a full list of actions and operations that require one or both of these packages.

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

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


## System Requirements for Visual COBOL for Eclipse (Windows)

### Hardware Requirements

Visual COBOL has the following requirements in addition to the requirements of Eclipse. See the Eclipse documentation for details of its requirements.

The disk space requirements are, approximately:

<b>Visual COBOL</b>
2.6GB

 **Note:** The disk space requirements include the size of the Eclipse IDE and the version of Java and the .NET Framework provided with the Visual COBOL setup file. 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.

Also note the following:

- A 64-bit Windows is required. Visual COBOL installs fully only on 64-bit Windows platforms. On 32-bit Windows, the setup file does not install some of the components. See *Issues with the Installation in Known Issues and Restrictions*.  
You can produce both 64-bit and 32-bit applications with Visual COBOL on 64-bit operating systems.
- Visual COBOL Build Tools for Windows x64 is only supported on Windows 10 or Windows Server 2019 operating systems.
- The Server Core form of Windows Server 2019 is not supported.

### Software requirements

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

The setup file will check your machine for whether the prerequisite software is installed and will install any missing prerequisites and the product components.

### Requirements for the setup file

- A 64-bit Windows is required. Visual COBOL installs fully only on 64-bit Windows platforms. On 32-bit Windows, the setup file does not install some of the components. See *Issues with the Installation in Known Issues and Restrictions*.
- The setup file installs Visual COBOL and the 64-bit version of Eclipse 4.20 (2021-06).

Visual COBOL only supports the 64-bit version of Eclipse. You can use the 64-bit Eclipse to create both 32-bit and 64-bit applications.

- The setup file installs Adoptium's OpenJDK Temurin 11.
- The setup file also installs Microsoft's Visual C++ 2012 and 2017 Redistributables.

## Requirements for running the product

- Java 11 (64-bit) is required to run the Eclipse IDE. The minimum recommended version is Adoptium's OpenJDK Temurin 11 (LTS) with HotSpot, which the Windows product installs automatically. You can download Adoptium's OpenJDK Temurin 11 (LTS) with HotSpot from [Adoptium's Web site](#) and unpack the archive anywhere on your machine.
- Visual COBOL requires a 64-bit Java installation to run a 64-bit Eclipse.
- Microsoft Windows SDK and Microsoft Build Tools: Various actions and operations within your COBOL development environment depend on certain files that Microsoft distributes in the following packages: the Windows SDK package and the Microsoft Build Tools package. See *Microsoft Package Dependencies* for a full list of actions and operations that require one or both of these packages.

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

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

See *Java Support Restrictions* in the product help for any considerations when using Eclipse and Java.

## 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 Visual COBOL 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 Visual COBOL 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.

## System Requirements for Visual COBOL for Eclipse (UNIX)

### Hardware Requirements for Visual COBOL for Eclipse

Visual COBOL has the following requirements in addition to the requirements of Eclipse. See the Eclipse documentation for details of its 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
x86-64 running Red Hat Linux	Micro Focus	1.45 GB	5.78 GB	2.89 GB	50 MB

Platform	Installer type	Setup file size	Disk space required for the installation	Disk space required for running the product	Licensing technology
x86-64 running CentOS	Micro Focus	1.45 GB	5.78 GB	2.89 GB	50 MB
x64 running SUSE SLES	Micro Focus	1.29 GB	5.15 GB	2.57 GB	50 MB
System Z running SUSE SLES	Micro Focus	856 MB	3.42 GB	1.71 GB	50 MB
Amazon Linux 2	Micro Focus	1.29 GB	5.15 GB	2.57 GB	50 MB
x64 running Ubuntu	Micro Focus	1.37 GB	5.45 GB	2.73 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 some platforms, there is only a 64-bit version of this product. 64-bit versions of the product support compiling to and running 64-bit programs only.

### Software Requirements

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](#)
- [Software installed by the setup file](#)
- [Requirements for running the product](#)
- [License Manager requirements](#)

### Software required by the setup file

The following software must be installed in advance:

- Java versions 11 through 15 from Adoptium (such as the Adoptium OpenJDK Temurin 11 (LTS) with HotSpot) and Oracle are required for Visual COBOL for Eclipse.
- The unzip utility.
- The "awk", "ed", "ps", "sed", "tar", "sed", and "which" utilities must be installed and added to the PATH.
- 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

The 32-bit libraries listed below are required 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	SUSE 12 <sup>1</sup>	SUSE 15 <sup>1</sup>	Red Hat 7	Red Hat 8	Ubuntu 20.4	Amazon Linux 2
glibc <sup>2</sup>	X	X			X	X		X
libgcc	X	X			X	X		X
libgc1c2		X					X	
libstdc++	X	X			X	X		X
glibc-locale <sup>3</sup>	X	X	X	X				
libXtst6		X	X	X			X	
libXtst		X			X	X		X
glibc-devel	X	X			X			
gtk3		X			X <sup>7</sup>	X <sup>7</sup>		X <sup>7</sup>
PackageKit-gtk3		X			X <sup>7</sup>	X <sup>7</sup>		X <sup>7</sup>
libcanberra-gtk3		X			X <sup>7</sup>	X <sup>7</sup>		X <sup>7</sup>
webkitgtk3		X			X <sup>7</sup>			X <sup>7</sup>
webkit2gtk3		X				X <sup>7</sup>		
xterm	Any version	Any version	X	X	X			X
unzip	Any version	Any version	X	X	X			X
libgnome		X			X			
libgtk-3-0		X	X <sup>7</sup>	X <sup>7</sup>			X	
gtk3-tools		X	X <sup>7</sup>	X <sup>7</sup>				
gcc <sup>45</sup>	X	X	X	X	X	X		X
cpp <sup>4</sup>		X			X	X		X
libnotify-tools <sup>6</sup>		X	X	X			X	
libnotify		X					X	
libjasper1		X	X				X	
libjasper4		X		X				



**Note:**

- Libraries marked with an 'X' are not included in the platform and need to be installed separately.
- <sup>1</sup>On SUSE 12 or 15, you can only install the 64-bit version of Visual COBOL. The glibc-locale-32bit library is still required by the SafeNet licensing components.
- \* Additional libraries required to use the core\_on\_error runtime variable. The gdb packages (for the GNU Project Debugger) can be installed from the install media for your OS.



- <sup>2</sup>The glibc-locale-32bit library is only required if you want to install the SafeNet licensing components. If this is present, the installer installs and configures both SafeNet and AutoPass licensing. If glibc-locale-32bit is not installed, the installer only installs AutoPass licensing.
- <sup>3</sup>On 64-bit Red Hat 7, you only need to install glibc-2.17\*.x86\_64 and glibc-2.17\*.i686.
- <sup>4</sup>On Red Hat, these libraries are required to enable COBOL to compile.
- <sup>5</sup>On Red Hat, only the 64-bit gcc libraries are required.
- <sup>6</sup>For SUSE 12 and later, you might need to install the Notifications Library tools (libnotify-tools). This is to enable notifications to be displayed by the notify-send tool when starting Visual COBOL for Eclipse from a desktop icon. Execute the following command to install the libnotify-tools library:
 

```
zypper install libnotify-tools
```
- <sup>7</sup>The minimum GTK support required is 3.22. Certain platforms meet this requirement without the need of installing the libraries manually; for example Red Hat 7.4 and SUSE 12 SP3.

## Required environment variables

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

- Set the JAVA\_HOME environment variable. When installing the product, set this variable to a 64-bit Java installation or the installation terminates. For example, execute the following:

```
export JAVA_HOME=java_install_dir
```

where *java\_install\_dir* is the path to the JAVA installation directory such as */usr/java/javan.n*

- Add \$JAVA\_HOME/bin to your system PATH variable. To do this, execute:

```
export PATH=$JAVA_HOME/bin:$PATH
```

- You need to set the LANG environment variable to pick up localized messages. If you do not set it as specified here, the installation will run but you might experience unexpected behavior from the installer.

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

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

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

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

```
export LANG=C
```

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

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

See *Using the LANG Environment Variable* for details.

## Software installed by the setup file

- The setup file installs Visual COBOL and the 64-bit version of Eclipse 4.20 (2021-06). After the installation, you can install Visual COBOL as a plug-in into other Eclipse 4.20 (2021-06) instances available on the same machine - see *Installing Visual COBOL into other instances of Eclipse*.



**Note:** On SUSE platforms, you can only use the 64-bit version of Eclipse to produce 64-bit applications; on other 64-bit platforms, you can use Eclipse to produce both 32-bit and 64-bit applications.

- Xterm, the terminal emulator for the X Window System, is part of your UNIX/Linux distribution but is not installed by default. Use your UNIX/Linux installation media to install it.

## Requirements for running the product

- Java 11 (64-bit) is required to run the Eclipse IDE. The minimum recommended version is Adoptium's OpenJDK Temurin 11 (LTS) with HotSpot, which the Windows product installs automatically. You can

download Adoptium's OpenJDK Temurin 11 (LTS) with HotSpot from [Adoptium's Web site](#) and unpack the archive anywhere on your machine.

### 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 Visual COBOL 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 Visual COBOL 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.

## System Requirements for Visual COBOL Development Hub

### 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	806 MB	3.22 GB	1.61 GB	41 MB
System Z running Red Hat Linux	Micro Focus	409 MB	1.64 GB	818 MB	39 MB
x86-64 running Red Hat Linux	Micro Focus	814 MB	2.26 GB	1.63 GB	50 MB
64 running Red Hat Linux	Micro Focus	502 MB	2 GB	1 GB	50 MB
Red Hat for Docker	Micro Focus	652 MB	2.61 GB	1.3 GB	50 MB
Amazon x64	Micro Focus	655 MB	2.62 GB	1.31 GB	50 MB
Amazon for Docker	Micro Focus	652 MB	2.61 GB	1.3 GB	50 MB
SPARC running Solaris	Micro Focus	683 MB	2.73 GB	1.37 GB	42 MB
x86-64 running Solaris	Micro Focus	685 MB	2.74 GB	1.37 GB	33 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 SUSE SLES	Micro Focus	417 MB	1.67 GB	834 MB	39 MB
x64 running SUSE SLES	Micro Focus	655 MB	2.62 GB	1.31 GB	50 MB
SUSE for Docker	Micro Focus	654 MB	2.62 GB	1.31 GB	50 MB
x64 running Ubuntu	Micro Focus	734 MB	2.94 GB	1.47 GB	50 MB
Ubuntu for Docker	Micro Focus	657 MB	2.63 GB	1.31 GB	50 MB
x86-64 running CentOS	Micro Focus	814 MB	3.26 GB	1.63 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 some platforms, there is only a 64-bit version of this product. 64-bit versions of the product support compiling to and running 64-bit programs only.

## Software Requirements

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

The following topic lists the software requirements for Visual COBOL Development Hub.

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

### Software required by the setup file

- The "awk", "ed", "ps", "sed", "tar", "sed" and "which" "tar" utilities must be installed and added to the PATH.
- 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`.
- Xterm, the terminal emulator for the X Window System, is part of your UNIX/Linux distribution but is not installed by default. Use your UNIX/Linux installation media to install it.

### Libraries required by the setup file

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

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

The following table shows which of the required libraries are not installed by default on the specified platforms - X indicates the libraries are missing.

Library	Platform								
	32-bit	64-bit	s390	SUSE 12 <sup>1</sup>	SUSE 15	Red Hat 7	Red Hat 8	CentOS 7	Ubuntu 18 and 20
glibc <sup>2</sup>	X	X	X			X	X	X	
libgcc	X	X	X			X	X	X	
libstdc++	X	X	X			X	X	X	
glibc-devel	X	X	X			X	X		
gcc <sup>3,4</sup>	X	X	X	X	X	X	X	X	
cpp <sup>3</sup>		X				X	X	X	
libgc1c2		X							X

- Libraries marked with an 'X' are not included in the platform and need to be installed separately.
- <sup>1</sup>On SuSe 12 or 15, you can only install the 64-bit version of this product. The glibc-locales-32bit library is still required by the SafeNet Sentinel licensed components.
- <sup>2</sup>On 64-bit Red Hat 7, you only need to install glibc-2.17\*.x86\_64 and glibc-2.17\*.i686.
- <sup>3</sup>On Red Hat, these libraries are required to enable COBOL to compile.
- <sup>4</sup>On Red Hat, only the 64-bit gcc libraries are required.

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

### Required environment variables

- Set the JAVA\_HOME environment variable. When installing the product, set this variable to a 64-bit Java installation or the installation terminates. For example, execute the following:

```
export JAVA_HOME=java_install_dir
```

where *java\_install\_dir* is the path to the JAVA installation directory such as */usr/java/javan.n*

- Add \$JAVA\_HOME/bin to your system PATH variable. To do this, execute:

```
export PATH=$JAVA_HOME/bin:$PATH
```

- You need to set the LANG environment variable to pick up localized messages. If you do not set it as specified here, the installation will run but you might experience unexpected behavior from the installer.

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

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

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

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

```
export LANG=C
```

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

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

See *Using the LANG Environment Variable* for details.

## License Manager requirements

- For local servers, you do not need to install the Micro Focus License Administration tool separately, as the setup file installs a new Visual COBOL 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 Visual COBOL 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

- If you reinstall Visual COBOL for Eclipse on a UNIX machine, it is possible that Eclipse will start without loading the Micro Focus features. To solve this, you must delete the .eclipse folder in your home directory and restart Visual COBOL.

### Installing on Linux

On Linux, the RPM installer for Visual COBOL for Eclipse installs a 64-bit version of Java. When you start the installation, if the 32-bit version of Java is already installed on your Linux machine, you might not be able to install Visual COBOL. This is a *known issue* with the Oracle Java installers for Linux which prevents you from installing both the 32-bit and the 64-bit versions of Java on the same machine. To work around this problem:

- Download the 64-bit Java distribution in a compressed .tar format from the Oracle Web site.
- Untar the distribution into a location different from the one used for the 32-bit Java version. For example, untar in /usr/local/java64 and not in /usr/local/java.
- Set JAVA\_HOME and LD\_LIBRARY\_PATH to the 64-bit version of Java so that it is used to install and run Visual COBOL.

### Installing on Red Hat 8.x s390

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

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

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

### Installing while using AFS/Kerberos authentication

If you are using AFS/Kerberos authentication to log onto your Linux system then you need to ensure you have a local user ID which SOA and Visual COBOL 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.

## Product Co-Existence



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

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

## 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, see *Advanced Installation Tasks* in your product Help.

## Installing Visual COBOL for Visual Studio

To install this product:

1. Run the `vcvsnnnn_80.exe` file (where *nnnn* is the version of Visual Studio you're installing for) and follow the wizard instructions to install the prerequisite software and the product.
2. After installing the Visual Studio 2022 product, you need to execute the following command from a Visual Studio command prompt:

```
devenv /updateconfiguration
```

This fixes an issue with Microsoft's Visual Studio installer in Visual Studio 2022, release 17.2.*n*, that might result in the IntelliSense and editor colorization not working.



**Note:**

- If you are installing onto a machine that has an existing Micro Focus product that uses an older Sentinel RMS License Manager, you might be prompted to remove it and install the Micro Focus License Administration. By doing this you maintain the existing Sentinel RMS license files while adding the Micro Focus License Administration. If you are unsure about existing licenses on your computer or removing the Sentinel RMS License Manager, consult your System Administrator. If you want to proceed, remove Sentinel RMS License Manager by using **Program and Features**, and rerun the installation file.
- Depending on how you plan to use the product, there could be dependencies on the Microsoft Windows SDK and Microsoft Build Tools packages. The installer will install the latest versions of the Microsoft Windows 10 SDK, and the Microsoft Build Tools for Visual Studio 2017, to their default locations. Refer to *Microsoft Package Dependencies* to see if you will require these packages, and if not, you can configure the installer to skip download and installation (see *Advanced Installation Tasks* for more information).

- Trial licenses cannot be used with remote desktop services. If you want to use your product in this way, please contact Micro Focus Customer Care to obtain a relevant license.
- We recommend that you install any updates for Visual Studio and the .NET Framework that are available at the [Microsoft Download](#) site.
- If you install JDK you might be prompted to install the latest update. The latest update is not required for use with Visual COBOL but you can install it if you wish.

## Installing Visual COBOL for Eclipse (Windows)



### Note:

- This version of the product is a full install.
- If you have an earlier version of Visual COBOL installed on your machine, check *Installing as an Upgrade* before you start the installation - see *Advanced Installation Tasks*.

These are the steps to install Visual COBOL:

1. Run the `vce_80.exe` file and follow the wizard instructions to complete the installation.

By default, this installs Visual COBOL in the `%ProgramFiles(x86)%\Micro Focus\Visual COBOL` folder and installs a full version of Eclipse 4.20 (2021-06) 64-bit, with the Micro Focus plugins already installed, in the `C:\Users\Public\Micro Focus\Product Name\eclipse` directory.

The setup file installs any missing prerequisite software as listed in the topic *Software Requirements*.



**Note:** See *Advanced Installation Tasks* for information about non-default installation tasks.

## Installing Visual COBOL for Eclipse (UNIX)

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

1. Give execute permissions to the setup file:

```
chmod +x setup_visualcobol_deveclipse_8.0_platform
```

2. Run the setup file with superuser permissions:

```
./setup_visualcobol_deveclipse_8.0_platform
```

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

The COBOL environment is installed by default into `/opt/microfocus/VisualCOBOL`, (COBDIR). A full version of Eclipse, with the Micro Focus plugins already installed, is present in the `$(COBDIR)/eclipse` directory.

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

```
./setup_visualcobol_deveclipse_8.0_platform -installlocation="full path of new location"
```



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

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

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

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



# Installing Visual COBOL Development Hub

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_visualcobol_devhub_8.0_platform
```

2. Run the installer with superuser permissions:

```
./setup_visualcobol_devhub_8.0_platform
```

If you don't run this as superuser you will be prompted to enter the superuser password during the installation.



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

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

## Enterprise Server System Administrator Process

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

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

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

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

## SafeNet Sentinel considerations

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

```
./setup_visualcobol_devhub_8.0_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
```

## 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 documentation updates.

# Licensing Information



## Note:

- Personal Edition licensing is only available with Visual COBOL for Visual Studio 2022 and Visual COBOL for Eclipse.
- When you activate Visual COBOL Personal Edition, you can use it for a limited period of 365 days. After this period, you can either register a new Personal Edition license for 365 days or acquire a valid full license of Visual COBOL in order to continue using the product.
- This package provides a license per supported Micro Focus Development Hub platform.
- If you have purchased licenses for a previous release of this product, those licenses will also enable you to use this release.
- The latest version of the SafeNet licensing software is required. See the *Software Requirements* section in this document for more details.
- 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 buy and activate a full unlimited license

To buy a license for Visual COBOL, contact your sales representative or Micro Focus Customer Care.

For instructions on using the Micro Focus Licensing Administration Tool, see *Licensing* in the Visual COBOL help.

## To start Micro Focus License Administration

### Windows: To start the GUI Micro Focus License Administration

**Windows 10** From your Windows desktop, click **Start > Micro Focus License Manager > License Administration**.

**Windows 11** Click the **Start** button in the Task Bar. Use the search field in the Start menu to find and start **License Administration**.

### Windows: 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**.

### UNIX

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

### Windows: To use the GUI Micro Focus License Administration

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

Alternatively, you can install the license file from within the IDE as follows:

1. Start Visual COBOL.
2. Click **Help > Micro Focus Product Help > Product LicensingHelp > Micro Focus > Product Licensing** to open the **Product Licensing** dialog box.
3. Ensure **I have a full Visual COBOL license** is checked.
4. Click **Browse** next to the **License file** field.
5. Select the license file (which has an extension of either `.mflic` or `.xml`), and then click **Open**.
6. Click **AuthorizeFinish** to install the license.

You should see a dialog box with a confirmation that the licenses have been installed successfully.


### Windows: 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.

### UNIX

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.

### Windows: 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.

### Windows: 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**.

### UNIX

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.

### Windows: 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**.

### Windows: 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.

## UNIX

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 Visual COBOL, 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, in the product help for Visual COBOL for Eclipse (Windows).

See the *Preparing to Raise a Support Case* topic on the Product Documentation pages on Micro Focus Customer Care, in the product help for Visual COBOL for Visual Studio 2017 ([click here](#)), or Visual COBOL for Visual Studio 2019 ([click here](#)), or Visual COBOL for Visual Studio 2022 ([click here](#)).

[Click here](#) to see the *Preparing to Raise a Support Case* topic on the Product Documentation pages on Micro Focus Customer Care, in the product help for Visual COBOL for Eclipse (UNIX).

## 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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