MICRO FOCUS

Micro Focus Visual COBOL 9.0 for Eclipse

Release Notes

2024-01-10

Contents

Micro Focus Visual COBOL 9.0 for Eclipse 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.

Visual COBOL is the industry leading solution for COBOL application development and deployment on Windows, UNIX and Linux systems. Visual COBOL offers smart editing and debugging, enabling developers to manage complex problems easier and faster than before.

Visual COBOL for Eclipse enables you to:

- Develop COBOL applications within the Eclipse IDE
- Deploy COBOL applications across a wide range of enterprise platforms including Windows, UNIX, Linux, and JVM

Visual COBOL for Eclipse can be used with an optional add-on, Visual COBOL Development Hub, that enables developers to centrally store source code and application artefacts as well as debug their applications remotely on UNIX from their local Eclipse environment. This makes fault detection and correction easier, enabling higher quality standards for application development efforts.

This product Help includes information about how to use Visual COBOL for Eclipse for local development as well as for remote development using the Visual COBOL Development Hub.

Upgrading from earlier Micro Focus products

Note: Windows-only.

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

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

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

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:

- *Learn Micro Focus™ Learn COBOL extension and Micro Focus™ COBOL Fundamentals Course*
- *Micro Focus COBOL Extension for Visual Studio Code*
- *.NET Support*
- *Application Workflow Manager*
- *COBOL Language*
- *Compiler Directives*
- *Data Modernization Advice*
- *Database Connectors for Visual COBOL*
- *Debugging*
- *Eclipse Integration*
- *Enterprise Server*
- *Enterprise Server Common Web Administration (ESCWA)*
- *Enterprise Server Security*
- *Interface Mapping Toolkit*

Learn Micro Focus™ COBOL Extension for Visual Studio Code and Micro Focus™ COBOL Fundamentals Course

Back to Top

Micro Focus has released a new video-based training course in COBOL, Micro Focus™ COBOL Fundamentals Course. The course teaches the fundamentals of the COBOL language, introduces the Micro Focus™ COBOL syntax, and usage of Micro Focus COBOL tools.

The course is ideal for developers familiar with C, Java, or .NET who want to learn COBOL. It doesn't matter what language you know, as long as you have experience of standard programming concepts, this course is for you.

A new Learn Micro Focus™ COBOL Extension for Visual Studio Code is available. The extension comes with the training materials for the COBOL training course. For information about the COBOL course, and the Learn Micro Focus™ COBOL Extension for Visual Studio Code, visit *www.cobol.com*.

🖉 **Note:** This extension is not included with the Visual COBOL installer.

Micro Focus™ COBOL Extension for Visual Studio Code

Back to Top

The following features are now available in the Micro Focus™ COBOL Extension for Visual Studio Code when you use it with Visual COBOL 9.0:

- JVM COBOL debugging
- COBOL notebooks where you can have text and executable blocks of COBOL code in the same file.
- Colorization for COBOL directives files, `cobol.dir`.
- A new button, , **Debug COBOL Program** or **Run COBOL Program** in the top right corner of the editor, present for the current COBOL program.

- Configuration setting for custom tab stops.
- A Micro Focus COBOL terminal in the TERMINAL pane.
- You can now specify the COBOL main file context for copybooks if a copybooks is referenced in more than one program.

   Note: This extension is not included with the Visual COBOL installer.

.NET Support

This release provides the following enhancements to *.NET* support:

- This release installs several NuGet packages each of which contains the assemblies for a specific Micro Focus functionality. New .NET projects, as well as existing projects you edit or build in 9.0 are linked to a core package, MicroFocus.COBOL.Runtime.Core, that includes the basic functionality for the projects. You need to add any additional packages (such as a specific file handler, COBOL Accept/Display etc.) manually to the projects. The new packages enable better granularity of distributions, and provide more flexibility and control over what is packaged with the application.
- New SDK version - the Micro Focus SDK version has changed to version 2.1. See *Upgrading existing .NET COBOL project files* in your product Help for details on how to upgrade your existing projects.

Application Workflow Manager

This release offers the following improvements:

- A new Git Function Package - provides tools that support common Git interactions such as Clone, Add, and Commit. This function package provides tool types to integrate the distributed revision control system Git into your AWM model and enabling you to build a development workflow that includes Git version control actions within the **AWM Team Developer** perspective.
- The Micro Focus z/Server connection is now supported in Visual COBOL (UNIX) in the Remote Systems view. A Micro Focus z/Server connection provides access to an IBM z/OS system enabling you to work on data sets of the MVS subsystem, manage job output from the JES subsystem, and work on files of the USS file system.

COBOL Language

This release provides the following new features and enhancements to the COBOL language:

- Double-colon, `::`, qualification is now available as a qualifier for data names and when dereferencing pointers.
- PERFORM frame local variables - variables that are DECLAREd are now properly scoped. Reentering the SECTION, whether recursively or after leaving, gives a new instance of such variables. This provides better locality of data, and helps with writing of better structured code.
- Parameterized sections - syntax that allows program sections to accept arguments and return values.

   - PERFORM of a SECTION can now pass arguments to that SECTION.
   - A result can be returned to the code that PERFORMed the SECTION.
   - Sections that return a value can be used as functions, in contexts where an identifier is expected.

- Compiler can identify platform at compile time - the compile-time constants `__unix`, `__windows`, `__dotnet`, `__jvm`, and `__native` have been introduced. These can be tested in $if statements to tailor code to the platform being used.
- Enhanced CBL_STRING_CONVERT library routine - CBL_STRING_CONVERT can now convert strings to and from Base64.

The following enhancements add further support for the IBM Enterprise COBOL version 6.4:

- User-defined functions - user-defined functions are now available in an Enterprise COBOL dialect for version 6.4 compatibility. Reference the product Help, *General Reference > COBOL Language Reference > Part 3. Additional Topics > Additional Dialect Support > Enterprise COBOL Syntax Support > User-Defined Functions* under ENTCOBOL dialect. A new Compiler directive, MANAGED-FNC-PARAM-BY, enables you to specify whether the managed behavior of numeric function parameters should default to BY VALUE or BY REFERENCE.
- Enhanced mechanism for interoperation between Java and COBOL - The COBOL and Java interoperability has been enhanced to extend the capabilities of your COBOL applications with Java. It removes the need to write object-oriented (OO) COBOL, as your native COBOL and Java programs can now interoperate in the following scenarios:

  - COBOL programs can be marked as JAVA-CALLABLE, meaning that they can be called from Java as though they were Java static methods.
  - COBOL program can call Java static methods using the java.class.method call.
  - COBOL data can be shared with Java programs by marking it as JAVA-SHAREABLE.
- Comprehensive support for automatic conversion between a wide variety of popular Java data types and their corresponding COBOL types so that parameter passing and returned value handling require no special processing in user code.

Compiler Directives

Back to Top

This release provides the following enhancements.

A new mechanism for setting Compiler directives (Technology Preview):

- Common directives files - this release introduces common directives files, `directives.mf` files, that enable you to automatically provide all required directives needed to compile multiple COBOL applications without having to specify the directives individually. This feature is not available for Assembler or IMS.

  Note: This is a technology preview feature only. It is being made available to allow you to test and provide feedback on this new capability; however, this feature is not intended for production use and it is not supported as such. Furthermore, Micro Focus does not guarantee that this feature will be delivered at a GA level and if it is, then the functionality provided might differ considerably from this technology preview.

New Compiler directives:

- ALPHA-LIT-CONT - determines whether the right margin or the end-of-line is used to delimit the continuation of a non-numeric literal.
- DECLARE - defines the behavior of locally declared variables.
- ILEXPOSEALPHA/ILEXPOSEGROUP - these two directives can expose alphanumeric or group items passed by value to parameterized sections or methods in JVM COBOL programs as byte arrays (the default is to expose as string objects).
- ILSTRINGLOAD - where JVM COBOL programs with a very large number of distinct alphanumeric literals cause internal limits to be exceeded, use this directive to create these literals in a backing file, which can then be converted to strings at run time.

- MANAGED-FNC-PARAM-BY - determines whether user-defined function parameters are passed BY VALUE or BY REFERENCE by default when compiled with JVMGEN.
- INITIAL - determines how Working-Storage is initialized for programs marked as IS INITIAL.

A family of new Compiler directives has been introduced to support the new mechanism for interoperation between Java and native COBOL:

- JAVA-SHAREABLE - use the JAVA-SHAREABLE ON and JAVA-SHAREABLE OFF directives to bracket one or more WORKING-STORAGE data items to indicate that they are to be made read and write accessible from Java applications interoperating with this COBOL program.
- JAVA-CALLABLE - instructs the Compiler to make the COBOL program automatically callable from Java.
- JAVA-GEN-PROGS, JAVA-GEN-STRG, JAVA-OUTPUT-PATH, and JAVA-PACKAGE-NAME - control the behavior of COBOL programs that interoperate with Java through the JAVA-CALLABLE or JAVA-SHAREABLE directives or by calling Java static methods using the CALL statement.

Data Modernization Advice

The product Help now includes advice on moving your COBOL data files, such as flat files, VSAM, indexed or sequential files, etc. to a relational database (RDBMS). The documentation lists the solutions included in Visual COBOL that enable you to achieve this, including advice on the best option for your application as well as performance considerations.

Database Connectors for Visual COBOL

This release provides the following enhancements:

- Better control of permissions granted on newly created tables.

  When creating a table, the SQL Server interface also creates an index, and grants loose permissions to everyone via the A-MSSQL-GRANT-PERMISSIONS and A-MSSQL-GRANT-USERNAME configuration variables with their default values. If database permissions are not set to allow these loose permissions, the GRANT statement fails, causing OPEN OUTPUT to fail.

  See *A-MSSQL-GRANT-PERMISSIONS* and *A-MSSQL-GRANT-USERNAME* for details.
- Increased table and column name sizes for ODBC

  To accommodate the number of characters the ODBC driver allows, this release increases the allowable table name and column name sizes for ODBC via two new ODBC configuration file variables. For details, see *A_ODBC_MAX_COLUMNNAME_LEN* and *A_ODBC_MAX_TABLENAME_LEN*.
- Support for all currently available versions of the MIcrosoft SQL Server ODBC Driver, which have been tested through version 18.

  See the following *Configuration Variables* topics for details:

  > *A_MSSQL_ODBC_DRIVER_NAME*
  > *A_MSSQL_ENCRYPT_CONNECTION*
  > *A_MSSQL_TRUST_SERVER_CERTIFICATE*
  > *A_MSSQL_EXTRA_CONNECTION_INFO*
- The A_MSSQL_IDENTITY_TYPE configuration variable has been added to enable you to configure the identity column to be a larger type, and to store a 64-bit value internally. Set

A_MSSQL_IDENTITY_TYPE to a string value that represents a fully qualified data type for your database. The default is:

```
A_MSSQL_IDENTITY_TYPE="numeric(9,0)"
```

Debugging

This release provides the following new feature:

- In Eclipse, new Debug and Run configurations have been added for debugging and running COBOL/Java Interoperability applications. These enable you to debug COBOL programs calling Java static methods. To debug Java code calling a COBOL program, you must create a **Java Application** launch configuration and manually define the **VM arguments** property -Djava.library.path with a value representing the output path to the native library produced from the COBOL builder.

Eclipse

Enhancements are available in the following areas:

Eclipse IDE:

- Eclipse 4.24 (2022-06) support, which is shipped and installed with Visual COBOL. Versions of Eclipse prior to this one are not supported.
- Exporting code coverage results - an option has been added to the **Code Coverage** view to allow you to export the current code coverage results to a `.tcz` file.
- The Problems view now displays a sequence number column.
- A new project template is available for COBOL/Java interoperability applications. The project enables you to compile both COBOL and Java sources at the same time.

COBOL editor:

- Auto-indenting on `end-*`.
- Collapsible regions for EVALUATE statements, and for 01 group items - a new option, **Enable folding for group level items**, has been added to the Eclipse preferences (**Window** > **Preferences** > **Micro Focus** > **COBOL** > **Editor** > **Folding**).
- Local variables support.
- Parameterized sections - support is available in the editor for parameterized sections.
- Paste JSON as COBOL classes - you can now copy JSON data and do a **Paste JSON As Classes** into a JVM COBOL file. This generates COBOL classes which enable you to deserialize the data in those classes.
- A Quick Fix is available for end of scope termination. To enable this, your project must have the NOIMPLICITSCOPE Compiler directive set, and error level to warning as errors.
- Renumber lines on save - line numbers can be automatically applied to a source file when it is saved, by selecting **Perform line numbering on save** from **Window** > **Preferences** > **Micro Focus** > **COBOL** > **Editor** > **Line Numbering**.
- Case preference for COBOL keywords on code clean up. A new preference in the code clean up profiles enables you to convert all COBOL keywords to uppercase or lowercase, if required.

Enterprise Server

This release provides the following enhancements:

- A new `casverify` command-line utility is available. This utility enables you to verify the configuration of a specified enterprise server region without attempting to start it, and also enables you to create immediate diagnostics information in JSON or human-readable output. Verification stages are modular, enabling you to specify which validation checks to run.
- You can now list job steps to enable users to perform advanced restarts. Job steps can be output to JSON by specifying `casout /%jnumber` or output to a table by specifying `casout /%tnumber`. See *casout* for more information.
- Installation improvements on UNIX - when upgrading from releases 6.0, 7.0, or 8.0 on UNIX, Visual COBOL now preserves more configuration details. During the installation of the product, a set of configuration files are moved to a config location before the upgrade occurs. These are linked back to the product install location on completion. When you reinstall the full product, install a patch update, or install an upgrade to the same location, the previous configurations settings are maintained.

  Previously, the upgrade process required manual intervention to redeploy existing configuration settings. This now occurs automatically.

Enterprise Server Common Web Administration (ESCWA)

Back to Top

Enhancements are available in the following areas:

- Accessibility improvements - provide improved compliance with 508 and WCAG 2.1 standards.
- API, version 2 extensions - includes updated versions of some of the existing API version 1 endpoints, and has been extended to contain more endpoints.
- Merged Archived Spool - you can now configure an enterprise server region to view a merged archived spool in the UI. You can view multiple archived spools from a single region, and view old spool information for multiple jobs that have ran under a previous name
- Page search facility - you can now search for a page that contains a specified search string. This enhancement is part of the WCAG 2.1 requirements for accessibility.
- PAC clients - the ESCWA UI lists all TN3270 clients connected to a PAC. This enables you to administer and monitor clients across the entire PAC from a single PAC region.
- TLS-enabled Redis connections. ESCWA now supports administering and monitoring PACs with a TLS Redis SOR.

Enterprise Server Security

Back to Top

This release provides the following new features and enhancements:

- Demo CA - the component has been completely redesigned and is now included as part of Visual COBOL. Demo CA supports multiple installations, uses up-to-date cryptographic support, and generates modern version 3 certificates with SANS, PKIDs, AKIDs, etc. signed by an intermediate CA. Demo CA is now easier to use and has improved interoperability with third-party SSL/TLS systems.

  Note: Micro Focus strongly recommends that Demo CA is only used for SSL/TLS development and testing and is not intended for use in a production environment.
- `esfupdate` support for the Vault Facility - the `esfupdate` utility now supports the use of the Vault Facility for credentials it needs to connect to MFDS.
- OpenSSL 3.0 - OpenSSL has been updated to use the current Long Term Supported OpenSSL cryptographic library.
- VSAM External Security Manager (EAP) - the VSAM ESM Module is a new option for Enterprise Server security which is simpler and more convenient than using LDAP-based security. The VSAM ESM

Module provides a security manager for Enterprise Server which keeps security data in COBOL data (VSAM) files. It provides many of the features of the MLDAP ESM Module but does not require an LDAP server or other third-party solution. Security data can be imported from a YAML file, facilitating the securing of Enterprise Server and the modification of its security data.

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

HCO for SQL Server

Back to Top

This release includes support for the following:

- The Define Lists tool in the HCOSS UI has been enhanced to enable you to select a dependency mode to use when creating a transfer list. The available modes are:

Default	Automatically include all parent objects of the selected object.
Family tree	Automatically include all parent objects of the selected table.
	Automatically include the child objects of each parent object.
	Repeat until no more parents and children are found.
No dependency handling	Include the selected table only (do not include any parent or child objects).

- The Transfer Data Tool now includes the start and end date and time for each table transfer.

Interface Mapping Toolkit

Back to Top

This release provides the following enhancements:

- YAML support is now available for COBOL client generation. OpenAPI schemas can now be in YAML, in addition to JSON format.

- A new option, **Refresh Service**, has been added to the **Web Services** and **Java Interfaces** context menus. Use the **Refresh Service** option to update the bitism of the program for an existing Web Service or Java interface after changing the bitism of the Eclipse project or the COBOL program.

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 Incident Numbers followed by the Defect number (in parentheses).

- *.NET Support*
- *Application Workflow Manager*
- *Compiler*
- *Data Tools*
- *Eclipse IDE*
- *Enterprise Server*
- *File Handling*
- *Micro Focus Directory Server*
- *Runtime System*
- *Setup Issues (Windows)*

.NET Support

Back to the list

- The 9.0 release installs several .NET 6 NuGet packages each of which contains the assemblies for a specific Micro Focus functionality. New .NET projects, as well as existing projects you edit or build in 9.0 are linked to a core package, `MicroFocus.COBOL.Runtime.Core`, that includes the basic functionality for the projects. You need to add any additional packages (such as a specific file handler, COBOL Accept/Display etc.) manually to the projects.

  Building existing .NET COBOL projects created prior to 9.0 might result in build errors. You can ensure compatibility by enabling the use of the `MicroFocus.COBOL.Runtime` metapackage. Alternatively, you need to add any required NuGet packages manually to the older projects.

  See *Upgrading existing .NET COBOL project files* in the product Help for details on how to upgrade.

Application Workflow Manager

Back to the list

- The related AWM resource (required to perform the resource operation) of the open file is now cached.

  02307586 (278005)

Compiler

Back to the list

- Preprocessor options of more than 256 bytes are now supported, and no longer cause the Compiler to crash.

  02289875 02308713 (272069)

Data Tools

Back to the list

- A new print function available from the **File** group and the **File** menu enables you to print the records shown in the editor.

00367084 (12432)

- An enhancement to the **Compare Files** function has been added, so that when a comparison is made, the **File Information** option shows a statistics overview of the comparison being displayed.

02200177 (222157)

- In the Data File Editor, the **Compare Files** function has been enhanced to allow you to select start and end columns in which to compare, so only a subset of a record is compared, rather than the entire record.

02306654 (222159)

- A **Quick final page access** option has been added to the **Preferences** dialog box of the Data File Editor. When selected, large variable sequential files (files > 10,000 records) immediately jump to the last page of the file when it is opened.

02330923 02365033 02399254 (294002)

Eclipse IDE

Back to the list

- When creating a new remote project using the SSH file system, the wizard now allows you to create a new **Micro Focus DevHub using SSH** connection. (Previously, only the **Micro Focus DevHub SSH Only** connection was available.)

(301058)

- The **Import Server option** (from within **Server Explorer**) is now working correctly with an XML if the XML file type is known. If the XML file is in an unknown format, an error message is displayed, and import is not possible.

02345573 (310017)

Enterprise Server

Back to the list

- A new option to uninstall a PAC installed on an enterprise server region before deleting the region has been added to ensure that all PAC components are properly removed.

01907370 (124107)

- ESCWA now validates the TLS properties to help prevent errors on entry.

  Note: If ESCWA has an invalid TLS configuration, it reverts to starting without TLS enabled.

01983736 (203178)

- In ESCWA, a **Stop** for IMS MPRs, JES Initiators, and JES Printers now operates correctly.

02311796 (286178)

- An issue with not being able to update or navigate the ESCWA UO though the job output in the spool while it is still running has been resolved.

02322494 (286142)

- In ESCWA, the default dashboard can now be modified for all users of a server.

02458710 (392040)

- In ESCWA, the FCT Fix Up button has been added to the Active FCT page. See *Active FCT* in your product Help for more information.

(374021)

- The **Job View** page in ESCWA now includes a list of job steps that have run during the current enterprise server region up time.

(347033)

- A new configuration property has been added to ESCWA to enable the default language the UI displays to be overridden from the user's browser locale.

  02227239 02307446 (260128)
- ESCWA now supports TLS enabled Redis repositories.

  (306097)
- In ESCWA, the **Process ID** column has been added to the table on the **Dynamic Debug** page. See *Dynamic Debug* in your product Help for more information.

  (350029)
- In ESCWA, a new PAC **Client List** page has been added. This page displays a list of PAC members and associated information. See *PAC Client List* in your product Help for more information.

  (384037)
- An alternate index has been added to the non-recoverable temporary storage file TXTSNR. This is to enable queues to be returned in alphabetical order when browsing with INQUIRE. When warm starting non-recoverable TS, if TXTSNR has only a single key then the file will automatically be upgraded to include the alternate index. If there is a problem during the upgrade process then message CASI1405S will be written to the console indicating the failure and that the enterprise server region will fail to start. In this case, the file will either need to be repaired or temporary storage will need to be cold started.

  🖊 **Note:** Once TXTSNR has been upgraded it can no longer be used on an older version of the product that does not contain this fix.

  02441509 (389045)
- Corrected the spelling for the **db_server_name** Configuration Manager property. You will need to update existing 8.0 enterprise server region configurations by either applying any change on the ESCWA **General >Advanced** page, or by updating the **mfConfigManagerData** MFDS property through the ESCWA API. If this is not performed, the warning message `CASCF0071W Configuration Manager - The requested property (db_sever_name) was not found` will be displayed in the Console log during region initialization. This will not cause any issues if the **Region Database Server Name** property was not previously used, or if it was set though the ES_DB_SERVER environment variable. Otherwise, you will need to reset this property using the above methods as the previous configuration for **Region Database Server Name** will not be honored, which might result in the region failing initialization.

  (350050)
- In the context of a multi-hop Distributed Program Linking (DPL), if the last stage used the default mirror transaction, its back-end could be left hanging if a SYNCPOINT was invoked by the upstream partner. This has been fixed.

  02432614 02434318 (377071)
- You can now list job steps to enable users to perform advanced restarts. Job steps can be outputted to JSON by `casout /%jnumber`. Job steps can be output to a table by `casout /%tnumber`. See *casout* in your product Help for more information.

  (401023)
- The Redis server supplied with the product is now version 6.2.6.In ESCWA, you must now specify the **Certificate Authority Filepath**, **Certificate Filepath**, and **Private Key Filepath** properties on the **Advanced Region Properties** page for all enterprise server regions that are members of a PAC that has a TLS-enabled Redis Scale-Out Repository (SOR). See *Scale-Out Repositories* in your product Help for more information.

  00373756 (12618)
- During XA recovery, if a resource manager reports an in doubt transaction which has no log entry, a CASXO0040W message will now be displayed in the console.

  (425081)
- If a SOR cannot be connected during enterprise server region start up, then the region no longer starts. Previously, this only applied to the PSOR, but now applies to other SORs which were only used for TS

and TD queues. This change was made because the previous behavior could lead to queues being written to different locations (SORs or disk) across the PAC. If a PSOR cannot be connected during a process start up when the region is already running, then the process will be blocked until the connection can be established. Retries will be attempted at increasingly longer intervals. If a (non-PSOR) SOR cannot be connected to at process start up when the enterprise server region is already running, then the process will continue to start up. At queue access time, for a queue that must go to that SOR, the connection will be retried. If this is unsuccessful then the command will receive an IOERR.

02399193 (356005)

- ESMAC is disabled by default. ESMAC can be enabled from the **Advanced Region Properties** page in ESCWA.

(397027)

File Handling

Back to the list

- The SQL Server ENQ/DEQ implementation has been modified to eliminate any possibility of ENQ request failures occurring due to an intermittent Service Broker problem. The new implementation introduces a new ENQ stored procedure, and modification of the existing DEQ one to allow it to work with both the Service Broker and non-Service Broker implementations.

(285197)

- The OPEN EXTEND operation now follows the behavior expected from the OPEN statement as documented.

02454638 (386087)

Micro Focus Directory Server

Back to the list

- The External Security Manager (ESM) checks did not occur when an enterprise server region started or stopped. This has been fixed.

02402188 (355001)

- To query Enterprise Server security configuration information (details of configured external Security Managers and so forth) from the Micro Focus Directory Server when access is restricted, the authorized Enterprise Server user must have at least **Read** permission for the **Enterprise Server Administration** resource class **User Administration** entity.

(285199)

- Micro Focus Directory Server now restricts access to enterprise server regions that a signed-on user is not authorized to view.

02305916 (285169)

- Four new MFDS-only audit event codes (2 300, 2 301, 2 302, and 2 303) have been added. See *Audit Event Codes* in your product Help for more information.

02412285 (365149)

Run-Time System

Back to the list

- By default, CTF information no longer appears in AUX Trace of an enterprise server region. To enable it, you now need to set `mftrace.emitter.es#level` in the MFTRACE_CONFIG.

(328008)

- If an error occurs during thread clean-up, the runtime will now attempt thread clean-up again. If it fails for a second time the runtime will call `_exit()` to terminate the process immediately.

02286519 (258130)

- On UNIX platforms, when linking using the cob command in place of ldpli, you must include all of the specified ldpli -l options on the cob command line.

(410018)

- Attempting to call COBOL functionality after calling the `cobtidy()` API, to de-initialise the COBOL RTS, will now result in a COBRT090 error message. Previously it was documented that the results were undefined and it could cause subsequent problems, and/or errors, especially in a threaded environment. The aim of this change is to give a more meaningful error message, earlier, to help diagnose such issues.

(301136)

- The limit for the MAXGENERATION emitter property (for both BINFILE and TEXTFILE) has been increased from 10 to 100. The file size limit for each of these generations, as set by the MAXFILESIZE property, is 1000000KB.

02405466 (359001)

Setup Issues (Windows)

Back to the list

- Micro Focus Host Access for the Cloud emulator replaces the Micro Focus Rumba+ Desktop emulator previously supplied with the installer for Enterprise Developer for Eclipse or Visual Studio. Customers that have Rumba+ Desktop entitlement can continue to use it within Rumba+ Desktop.

(335003)

- In Windows 11 it is now possible to open COBOL 32-bit and 64-bit command prompts from the Terminal application.

(421016)

- On Windows, you must uninstall earlier versions of this product before installing 9.0.

(380028)

- 32-bit Windows is no longer supported.

(382034)

Known Issues

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

In addition, note the following:

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

- 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.

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

- On the Solaris platform, Enterprise Server Common Web Administration (ESCWA) cannot enable the External Security Facility (ESF). This results in ESCWA failing to enable user authentication and authorization. However, you can still enable authentication and authorization for the Micro Focus Directory Server (MFDS) and corresponding enterprise server regions.

Resolved Issues

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

- *Application Workflow Manager*
- *COBOL Language Server*
- *Code Analysis*
- *Codeset Support*
- *Common Communications Interface*
- *Compiler*
- *Containers*
- *Database Connectors for Visual COBOL*
- *Data Tools*
- *Debugger*
- *Dialog System*
- *Documentation*
- *Eclipse IDE*
- *Enterprise Server*
- *File Handling*
- *Micro Focus Common Client*
- *Micro Focus Cryptographic Library*
- *Micro Focus Directory Server*
- *Micro Focus License Administration*
- *Run-time System*
- *Setup Issues (UNIX)*
- *SQL: COBSQL*
- *SQL: DB2 ECM*
- *SQL: OpenESQL*
- *XML Support*

Application Workflow Manager

Back to the list

- Text area dialog fields are now checked after the dialog **OK** button is clicked. An error message appears in the dialog description area if the max line or chars per line is exceeded.

  02472205 (394108)
- In the default MVS file mapping, the local code page value for the data set template `*.AWMMODEL*` is set to UTF-8. As the default file mapping is only effective for a new workspace, Micro Focus recommends that you change the local code page value in the file mapping for `*.AWMMODEL*` from DEFAULT to UTF-8 in existing workspaces manually.

  (380032)
- Local file copying from the MVS Explorer are now encoded and saved with the connection local code page.

  02070256 (207007)
- Else (If) action descriptor statements did not always work as expected when multiple If statements were specified. This has been fixed.

  02287350 (259118)

- If a property of type SelectValue with unspecified Label Keys was used as a non-editable modeled dialog field, this resulted in an exception. This has been fixed.

  02345550 (297117)

- The new attribute **Local File Encoding** has been added to the Operation System function package. See *Attributes for the Operating System Function Package* in your product Help for more information.

  (204054)

- Calling z/OS functions (Submit JCL to z/OS) before establishing a connection can now be executed without error.

  02258259 (256018)

- Using the Eclipse function package AWM tool **Create Resource** to update the location of linked folders sometimes resulted in their being removed from the project dependency paths. This has been fixed.

  02340680 (296046)

- z/OS data sets with volume serial ARCHIVE were not detected as migrated. This is now fixed.

  02532719 (443003)

- AWM Modeling Support 8.0 was tested against IBM IDz v16.0 based on Eclipse 4.23. It can be used with an IBM z/OS connection. There is a known issue using AWM Modeling Support 8.0 in IBM IDz 16.0 together with a MFA z/Server connection when trying to connect. Using an MFA z/Server connection is not possible with Modeling Support 8.0 under IBM IDz 16.0.

  02486829 (400021)

- Empty string values in the deprecated **Affected Resource Name** attribute sometimes resulted in unexpected behavior when executing modeled actions. This has been fixed.

  02367680 (314010)

- Parallel evaluation of modeled enabled conditions (for example, in modeless action descriptors) could lead to unexpected behavior. This is now fixed.

  02406754 (364046)

- The AWM master configuration now enables you to specify a URL as the platform under the keyword Conf which points to an AWM model accessible via an http(s) link.

  01825646 (123020)

COBOL Language Server

Back to the list

- Some performance issues when requesting workspace symbols in large workspaces have been resolved. The operation is now limited to files that are open or parsed.

  02384141 (338011)

Code Analysis

Back to the list

- MFDASMX no longer crashes when download process is initiated.

  02411250 02427959 (363118)

Codeset Support

Back to the list

- The DISJOINING clause now works as expected when a DBCS hyphen is specified as part of the prefix or suffix.

  (296145)

Common Communications Interface

Back to the list

- A handle leak on failed ISC connection attempts has been fixed.

  02413198 (381021)
- TLS connections failed when a trust anchor was not specified. This has been fixed.

  02534509 (446004)

Compiler

Back to the list

- An 013-R error generated on compilation has been fixed.

  02501331 (401125)
- JVM COBOL only. Some large and complex programs that used the DECLARE syntax gave a Run-Time System error of the form: java.lang.VerifyError: Local variable table overflowThese programs now give a Compiler error of: 15-S Procedure division too large

  02379096 (335018)
- Within Eclipse, a program with an empty PROGRAM-ID in a JVM COBOL project no longer causes the IDE to close.

  (445004)
- A new directive, ILSTRINGLOAD, is now available for JVM COBOL programs, which can help in situations where a program with a very large number of distinct alphanumeric literals causes internal limits to be exceeded in a class (and at which point, an error is generated). Use the directive to create these literals in a backing file, which can then be converted to strings at run time.

  02170649 (380058)
- A program containing a debug line as its first line of source now compiles with an expected syntax error, rather than a Compiler crash.

  (306070)
- Querying the subordinate items of a group defined in a DECLARE statement now works as expected.

  (414100)
- Debugging of a program with a copybook located via COBCPY, where the value of COBCPY is extremely long, now works as expected.

  02298722 (276005)
- Using a PROPERTY as a call parameter now compiles and executes as expected.

  (5357)
- A query expansion of OCCURS DEPENDING ON tables now correctly reflects the current size.

  02500813 (405134)
- The Outline view in the IDE is now available for all programs, irrespective of syntax errors encountered.

  02297623 (285151)
- An ALLOCATE statement RETURNING a subscripted pointer now executes as expected.

  (369004)
- An ADD .. TO *property* statement now executes as expected.

  (6503)
- The 'AT END' phrase of a file statement is now correctly distinguished from dereferencing syntax specified in the same context.

  (6149)

- The CP preprocessor now respects the setting of the SOURCE-ENCODING Compiler directive.

  02463619 (394012)
- Reference modification with an implicit length on the result of an intrinsic function now executes as expected.

  02269123 (258090)
- A MOVE CORRESPONDING statement with nested subscripting now executes as expected.

  02473286 (395097)
- A background parse of COBOL source containing illegal code and characters before the main COBOL program now produces full syntax checking consistent with previous releases.

  02393247 (352074)
- INSPECT .. REPLACING *more-than-one-byte* BY SPACE is now producing the expected execution results.

  02521582 (411107)
- The CP preprocessor now correctly expands copybooks when COPY REPLACING is active and the copybook name partially matches the replacing text.

  02541659 (427024)
- A COPY REPLACING statement that results in a replacement line of more than 256 bytes is now processed as expected.

  (301078)
- Programs called with a CHAIN statement, which use their own file handler to access the filename pointer in the FCD, now execute as expected.

  (286017)
- A query of an item in a variable-length group with an UNBOUNDED table now returns the correct value.

  02500660 (403177)
- Error message `COBCH1554 More than 65535 statements in a paragraph. Cannot produce debugging information` is no longer reported for compilations where debugging information was not requested (i.e., NOANIM specified).

  02525192 (415062)
- A CALL statement using the 'DATA AT' syntax to pass a dereferenced parameter BY REFERENCE now compiles and executes as expected.

  (351091)
- The user responses for the ERRQ Compiler directive are now all respected correctly.

  (350010)
- COMP-1 and COMP-2 data types compiled with DIALECT"ACU" now receive a syntax error when a PICTURE description is absent.

  (296032)
- When the LANG environment variable is correctly set to match the source encoding of the COBOL source file, the Compiler now completes the compile successfully.

  (390023)
- The DIALECT"MF" Compiler directive no longer affects the user-specified setting of the SETTING directive.

  02449496 (390008)
- A STRING statement with 'DATA AT' operands now executes as expected.

  (260018)
- Level 88s defined in a typedef may now be referenced through pointer dereferencing.

  (377067)

- $if syntax is now processed correctly in all cases.

  (318040)
- When using a typdef-item at pointer that was not unique in the typedef group, the Compiler compiled without error; however, the pointer sometimes dereferenced at the incorrect address. This scenario now produces a `COBCH0005-S User-name not unique` error message.

  (415140)
- The DISPLAY-PICU(UTF-8) option now operates correctly with OUTDD when using Enterprise Server.

  (297005)
- A new Compiler directive, ALPHA-LIT-CONT, determines whether continuation of non-numeric literals includes spaces up to the right margin, or simply to the end of line.

  (380072)
- A DECLARE value can now be expressed as an arithmetic expression in native COBOL.

  (386138)
- The `INITIALIZE` *condition-name* syntax erroneously compiled without error. This now correctly returns a syntax error for all scenarios.

  02468662 (394064)
- An INSPECT statement used inside a class method no longer causes generation of invalid .NET or JVM code. (This problem did not apply to procedural COBOL programs.)

  02504599 (403183)

Containers

Back to the list

- We strongly recommend that you create Micro Focus base product images with the `bld.sh` script using the provided Dockerfile/Containerfile. Images created using alternative methods might fail with the message `245 There are no valid product licenses` unless the image includes the CONTAINER environment variable. This release ensures that the provided Dockerfiles/Containerfiles include this environment variable.

  02555217 (439070)

Database Connectors for Visual COBOL

Back to the list

- When accessing a SQL Server table with Database Connectors, and when the primary key allowed duplicates (which is not recommended), the interface sometimes incorrectly handled a direct READ, especially when it was followed by a READ NEXT. This has been corrected.

  02336856 (297028)
- The following issues that occurred when a primary key allows duplicates have been fixed:

  Rewriting or deleting a row sometimes affected more than a single row.
  Executing READ followed by READ NEXT returned the wrong record.

  To use this fix, both of the following conditions must be met:

  - An identity column must be included. This can be either a hidden column using A-MSSQL-ADD-IDENTITY when the table is created, or an explicit column using the IDENTIY-COLUMN XFD directive.
  - The record to update or delete must be the last record read.

  Failure to meet either of these conditions results in run-time error code 9/7. See *Run-Time System Errors* in your Visual COBOL Database Connectors documentation.

02324219 (285156)

- All special characters used in a user name or a password must be surrounded by {} brackets. If the } closing bracket is used as a special character, it must be doubled to escape it. For example:

```
my{@}user{}}name
```

Translates to:

```
my@user}name
```

02393584 (352036)

- When doing a REWRITE or a DELETE on record that was constructed by the COBOL program (as opposed to having just READ the record), the wrong record could be affected. This has been corrected.

02497731 (401111)

Data Tools

- The Data Tools editor could display incorrect record numbers for variable sequential files following a Find operation. This has been fixed.

02516058 (411005)

- In the Data Tools editor, there was an issue with viewing the last page of records in a sequential variable file when the **Quick final page** preference setting was enabled and the file was defined with a minimum record length of 0 or a large variable record size range combined with a large **Records per page** preference setting. This has been fixed.

02487096 (397034)

- The performance of the **Search > Go To navigation** feature of the Data Tools editor has been improved for variable and line sequential files.

02399254 02480008 (399043)

- Editing/deleting line sequential file records no longer hangs when using Date File Tools.

02239120 (259127)

- When attempting to open data sets in the Data File Editor, file names containing a $ sign are no longer incorrectly trimmed.

02194216 (221086)

- Data File Tools no longer attempts to open unrecognized file formats. Instead, an error message appears explaining which format is invalid.

02308449 (281015)

- You can now copy hex values of selected records from the unpacked rows at the bottom of the screen using the **Copy Hex** option available on the context menu the **Edit** menu. This option is visible only when the hex toggle is enabled.

02396732 (352067)

- When copying a record to an external destination, the NULL Byte character is replaced by a character specified in the **Preferences** dialog box. The default replacement character is a period (.).

02396678 (350053)

- The **Toggle Hex** function now shows hexadecimal values under each line in the editor, not only the selected one.

02342260 (297080)

- Field values of the Data File Tools **File Information** dialog box can be selected and copied to clipboard.

02396730 (352047)

- Horizontal scrolling in files with variable-length records did not work as expected when a short record was selected. This is now fixed.

02150974 (202028)

- It is now possible to start `mfdatatools2` from the command line to open a catalogued file from an enterprise server region.

  00501248 (71267)

- In the Data File Editor, a preference has been added to specify the maximum number of requested data sets in the **Data Explorer** view. If a catalog contains more data sets than the maximum requested number, a `More data sets in catalog` stub appears at the end of the list.

  02396657 (350052)

- You must configure a TS model to ensure that Data File Editor correctly honors file locking across all enterprise server regions in a PAC.

  02529725 (413062)

- Previously, the DFCONV utility would produce an error when converting `sql://` database files. This has been fixed.

  02497741 (403103)

Debugger

Back to the list

- Debugging a statement that goes up to column 255, with the Autos window active, now works as expected.

  02289017 (271031)

- Expanding a dereferenced group item in the debugger now correctly shows the data for subordinate items.

  (363158)

- Previously, CBL_DEBUGBREAK did not invoke the debugger in .NET COBOL applications. This has now been fixed and the built-in "Choose Just-In-Time Debugger" dialog box appears during invocation.

  02388923 (348042)

- An issue has been fixed where the list of processes for 'attach to process' debugging could be displayed incorrectly.

  02458536 (386153)

Dialog System

Back to the list

- An issue with the dialog system painter clearing the screen when resizing a control has been resolved.

  02367685 (330012)

Documentation

Back to the list

- Enterprise Server security configuration options have been updated. See *Security Configuration Custom Configuration Information* in your product Help for more information.

  (411024)

- Information on configuring an OpenLDAP server has been updated. See *Configuring the OpenLDAP server* in your product Help for more information.

  02387889 SF:02437494 02437494 (356021)

- The CASESM Security Manager was part of the legacy security model used in the Net Express and Server Express 5.0 and earlier products. As part of this, the legacy ESMAC user interface pages had Security Keys as configurable options. In ESCWA, these can only be accessed by the Client Web API

and are not available in the ESCWA user interface pages that are equivalent to the corresponding ESMAC pages.

02276034 (259095)

- The OSESM tracing option has been added to the configuration information in the product Help.

02145921 (202197)

- Setting ES_PRODUCTION=Y will prevent debugging on Enterprise Server regions.

02208272 (346026)

- The documentation sample in the *Using CobolBean for Instance Data Java* topic has been corrected.

(409036)

- UNIX documentation has been updated to correct the case of the mfcatxml command.

02386876 (335024)

- The product documentation has been updated with the current name and contact information for Micro Focus Customer Care. Any instance of the older terms for customer support remain in the documentation because it is present within the product itself.

(377012)

- The SQL Server RM Switch Module topic has been updated to remove the [directives] option for build mssql. The option is not valid and ignored by the system.

3172383 (13152)

- The documentation has been corrected to describe the duplicate cursor effect.

3172533 (11320)

- The product documentation now correctly states PF_RO_CURSOR=8 as default when using BEHAVIOR=MAINFRAME with SQLServer.

00372417 (12688)

- The documentation has been corrected in respect to enabling JIT debugging in Eclipse, on Linux\UNIX platforms.

(365015)

- The *To convert Net Express projects to Eclipse projects* cheat sheet is no longer available on UNIX-only products.

(238031)

- The documentation has been updated to highlight the requirement of associating a region with a project if that region was created using one of the available enterprise server templates.

02152983 (256022)

- Instructions have been added to the Documentation that detail using Ant to build selected files in a project, from the command line.

02212776 (304089)

- The sample Java code in the documentation topic *Examples of Calling COBOL From Java* has been corrected.

02509559 (405065)

- The documented description of the SSH Only remote host connection has been amended to explain the limitations when using the Console view for output.

(464063)

- Some minor documentation amendments have been made to the IMTK tutorial *SOAP Web Services*.

(415185)

- An entry has been added to the *Containers* known issues and restrictions documentation concerning memory issues under Windows 10.

(297140)

- Some of the COBOL cheat sheets in Eclipse have been updated/corrected.

  (238037)
- Error message text for COBCH1882 in the has been updated.

  (425030)
- The Data Files Tools tutorial has beenupdated to correct import instructions in Eclipse.

  (319006)
- The documentation has been updated to show that only under an MF dialect can you omit the Working-Storage Section heading.

  3245726 (28060)
- The documentation has been updated to clarify support for the following: the CBL_GET_ERROR_INFO and CBL_CREATE_STACKDUMP library routines, the stackdump_on_error tunable, and the cobgeterrorinfo function.

  (385041)
- The `cob` command examples in the documentation have been updated.

  (403044)
- New documentation has been added that gives more detail on how to use the CBL_CTF_* library routines. See *Using the CTF Library Routines* in the product documentation for more information.

  (264040)
- The Micro Focus Unit Testing Framework documentation has been updated to explicitly state that the MFUPP preprocessor is intended for use only within the confines of the testing framework.

  02259026 (258085)
- Some of the screen shots in the MFDBFH documentation have been updated to show MFDBFH-specific URLs in ESCWA.

  (301083)

Eclipse IDE

Back to the list

- A problem that prevented command-line-based code analysis rule execution from completing successfully was identified in the generation of linked resource information in the COBOL build files. This has been fixed.

  (297077)
- An issue was identified where compiling dependent programs of a specified copybook could fail when dependencies spanned project boundaries. This has been fixed so that all dependent programs can now be built.

  02514846 (421007)
- A code issue was stopping the SQL preprocessor from being used when the initial indexing phase was being run after project import (a process that determines the copybook usage), when no `.idy` files were present. This has been resolved so that the preprocessor should now be invoked and copybook usage information harvested.

  00470009 (58319)
- A problem was identified with the paste functionality in the COBOL editor when Smart Edit Mode was enabled, where the paste operation was not correctly taking into account the source format of the document being edited (and so attempted to preserve the right margin when it shouldn't have been doing so). This has been resolved.

  (365196)
- An issue has been resolved where enterprise server region XML files were failing to import when using the IDE-generated Dockerfile and associated script.

02398225 (364091)

- An issue has been resolved where the **Configure Enterprise Server Run-time Environment** dialog box no longer adds an extra entry into the `.rtc` file, which was causing it to be invalid according to the XML schema.

(393143)

- An issue has been fixed where hover text sometimes did not work when debugging source files from a network share.

02213842 (251008)

- The generated Dockerfile helper scripts have been updated to use the `--replace` flag when calling `mfdepinst`.

  > **Note:** If there is a pre-existing helper script in the project, it will need to be deleted before re-running the **New Dockerfile Wizard** to generate the new script.

(362004)

- The generated Dockerfile helper scripts have been updated so that they fail a Docker image build when an error is encountered.

  > **Note:** If there is a pre-existing helper script in the project, it will need to be deleted before re-running the **New Dockerfile Wizard** to generate the new script.

(364010)

- Subscripted variables are now displayed correctly in the **Variables** window. Previously, they did not when the debugging source files did not match the location specified in the IDY file (i.e., the source files were moved after compilation).

02214996 (271021)

- Colorization of string literals in the COBOL editor has been improved. Text is only colorized as string literals within the code area and not within the left or right margin.

(10010)

- Generated dockerfiles may contain entries for installing xterm into the image. This is to enable certain debugging scenarios.

(301110)

- Within the JVM COBOL debugger, a variable-length field now shows the odoslide optimized data.

02167560 (220023)

- An issue when evaluating COBOL table elements nested in grouping variables, with subscripts, has been fixed.

02028149 (346031)

- The **Run to Line** debugging option has been added to the context menu of the COBOL and the COBOL Copy View editors when debugging COBOL JVM projects.

02229815 (301049)

- Run to line debug support is now available for JVM COBOL projects.

02229815 (246120)

- An issue where the cursor jumps to a breakpoint line when hovering over variables has been fixed.

02407213 (363025)

- The **Extract to Copybook** option now flags file names that include apostrophes as invalid.

(7248)

- Within Eclipse, conditional fields are now updated in the Variables and Expressions views after an update of a related elementary field.

02296412 (258266)

- The version of Ant that is shipped with COBOL development products is now version 1.10.12; at the time of writing, it does not have any reported vulnerabilities.

(296038)

- An issue has been fixed so that enterprise server regions now correctly show their output console information. Previously, where regions had stored credentials at the time the IDE was started, they would fail to output any console information.

(258191)

- Error messages are now parsed correctly so as to avoid crashing the IDE.

(427004)

- The Console view in Eclipse now correctly shows information for an enterprise server (if the credentials are valid).

(409082)

- JVM COBOL local variables are now shown in the Variables view during a debug session.

(393091)

- Within Eclipse, when generating a client COBOL program for a web service, the Bit Mode and Charset properties are now honored correctly.

02483744 (397005)

- The **Automatically find new updates and notify me** preference is turned off by default to prevent a `!`
`MESSAGE Unhandled event loop` exception. Several default update sites have also been removed during installation.

02319011 (285069)

- In the Eclipse editor, if the vertical or horizontal split functions are enabled and then removed, syntax highlighting continues to work. Previously, you were required to reopen the source file for syntax highlighting to work.

02328546 (297008)

- A new option enables you to set COBOL keyword conversion to upper case, lower case, or as-is during Code Cleanup.

(451073)

- Support of Micro Focus base images has been improved by adding a new wizard page to allow users to select the base layers used in a generated Dockerfile.

02398225 (365108)

- You can now set conditional breakpoints within JVM COBOL programs; see *Setting conditional breakpoints and watchpoints* in your product Help for more information.

02178115 (355027)

- Dependency was not being updated when source files were modified external to the Eclipse IDE. This has been addressed by a new option in the preference (**Micro Focus > General**) which, when selected, updates the information when the resource is refreshed using the **Refresh** context menu item or by pressing **F5** on a resource in the explorer views). The dependency information will also be updated when the file is open in an editor window and is modified externally.

02445610 (393008)

- The values of COBOL JVM variables can now optionally be displayed as hexadecimal values and byte values. The inclusion of these value formats can be configured using the **Value** display options group in the **Micro Focus > Debug** preferences page.

02229819 (246121)

- A problem that prevented the **UnGroup** menu option from being enabled has been fixed. Ungroup is enabled for group items only. It removes the current group and places its group children one level above.

02356137 (307002)

- Table variables in JVM COBOL programs are now displaying the correct value for subscripted and index fields, both in the Expressions view and in hover mode over the variable. Also, table variable values are

now automatically changing in the Expressions view when the index is updated. The supported expressions are:

- data-item(numeric)
- data-item(counter-data-item)
- data-item(operand operator operand)

Where operator is an operator for arithmetic operation (+, -, *, /) and operand is numeric or counter-data-item. Multidimensional tables are also supported.

02153242 (203116)

- A new option has been added to the Search view for COBOL JVM projects - **COBOL JVM Search Presentation**. It toggles between two types of presentation of the data: one that you may be familiar with when working with Java projects, and one familiar when working with COBOL projects.

02290437 (259158)

- For COBOL JVM projects, the Variables view now shows the value of the first 32 bytes of the memory block pointed by the pointer. Also, a new pointer expression is available in the Expressions view for COBOL JVM projects (this was already available for native projects): `expression data(x:y)my-pointer` at `my-pointer` queries the memory block pointed by the pointer, where *x* is the starting offset of the memory block, *y* is the number of bytes to query and *my-pointer* is the name of pointer variable.

02153242 (321036)

- A new option, **Refresh Service**, has been added to the Web Services and Java Interfaces context menus. Use the **Refresh Service** option to update the bitism of the program for an existing Web Service or Java interface after changing the bitism of the Eclipse project or the COBOL program.

(294014)

- A new option is available from the X Font preference of the **Preferences > Micro Focus > Debug** dialog box: select **Use X Server font** from the drop-down list to ensure that the application being debugged through the X window uses the default font configured for the X Server.

02410279 (363047)

- If you attempt to create a self-contained unit test for a program that is already under test for an existing self-contained test in that project, you are prompted to overwrite the existing test or select a different program to put under test.

(222044)

- A new option that enables you to export code coverage results in a `.tcz` file has been added to the Code Coverage view in Eclipse.

(5183)

- A new preference is available that, when selected, automatically adds line numbering to your program when it is saved. This preference negates the need to use the **Renumbering** option when editing a program that already has line numbering in place. The preference **Perform line numbering on save** is available from **Window > Preferences > Micro Focus > COBOL > Editor > Line Numbering**.

02285269 (260138)

Enterprise Server

Back to the list

- Now users who have overlapping long names like `USER1234` and `USER12345` will not have overlapping permissions when they have distinct mapped short names.

02529441 (440070)

- In Enterprise Server External Security Facility (ESF), requests to generate a passtoken (including for RACF-style passtickets used by DCAS) could sometimes be rejected as unauthorized attempts to

create surrogate passtokens even though the passtoken request was not for a surrogate. This was due to a case mismatch between the request and ACEE. This has been fixed.

02433532 02442474 (399097)

- The ESF could corrupt the credentials used to connect to an LDAP server when auditing was enabled, causing a critical security failure and preventing enterprise server regions from starting. This has been fixed.

02518028 (415116)

- MLDAP ESM now supports the use of the `mfsecret:` syntax for retrieving the security manager credentials (authorized ID and password) from the vault. Those fields in the Security Manager definition in ESCWA can be specified using the forms:

    `mfsecret:configuration-name:secret-path`

    or:

    `mfsecret:secret-path`

02548082 02554256 (440042)

- `Mfsecrets` crashed when running as multithreaded. This has been fixed.

(381004)

- A problem that prevented the AES provider on big-endian platforms from correctly reading vault secrets has been fixed.

(430032)

- An incorrect signal 11 was generated from `mfsecrets` when getting the username for audit. This has been fixed.

(382026)

- For Enterprise Server LDAP-based security, two new options, **[Operation] group membership uses short name** and **[Operation] search users by short name**, permit applying user and group data to users known to that Security Manager only by their short name (the Enterprise Server user ID). See *MLDAP ESM Module Custom Configuration Information* in your product Help for more information.

02344601 (301036)

- In ESCWA on the **Catalog** page, you can now use the **Line Wrap** switch to toggle line wrapping for long lines.

02289615 (258187)

- The ESCWA SEPs page displays Transient and Debug SEPs.

(327011)

- In ESCWA, accessing the Catalog file data has been improved by modifying the page layout.

02154749 (202107)

- In ESCWA, focus would not be put into modal dialogs when opened. This has been fixed.

01995433 (156067)

- ESCWA now displays more clearly when operating in Windows high contrast mode.

01995438 (161036)

- In ESCWA, the maximum height of list menus have been limited so that they do not overflow the screen from their position, with a scroll bar to access all items.

02499988 (403117)

- In ESCWA, the **SEP List** page did not correctly sort the list by ascending or descending order. This has been fixed.

02382568 (352007)

- ESCWA was not able to bind to a hostname containing the `w` character. This has been fixed.

(296023)

- The ESM password is no longer disclosed in the `/esf` endpoint request.

  02554256 (450046)
- Reduced the number of password save prompts encountered when navigating ESCWA using the Firefox Web browser.

  02324422 (306001)
- In ESCWA, the FCT Backward and Forward Recovery will no longer be disabled when **Use Catalog** is selected.

  02416596 (364107)
- When ESCWA was configured for TLS, it failed to stop when using `escwa --shutdown` from the command line. This has been fixed.

  02405704 02004795 (365071)
- Added missing annotation for ESCWA trace point.

  02538486 (415187)
- ESCWA had duplicate CTF trace IDs. This have been fixed.

  02524827 (409072)
- In ESCWA, the additional column File Size has been added to the catalog list view.

  (403123)
- ESCWA might fail to disconnect from a Redis instance and reconnect to another. If this occurs you can manually trigger a reconnect action by clicking the **Reconnect** button on the **Scale-Out Repository Information** page.

  (363105)
- If ESCWA auditing is enabled from the **Configuration** page, or when ESCWA ESF auditing is enabled from the **Security > ESCWA Configuration** page, then an auditing event is emitted, `2 19 (auditing stopped)`, or `2 20 (auditing started)`. See *Audit Event Codes* in your product Help for more information.

  02412285 (365156)
- In ESCWA, you can now rename catalog data sets from the **Catalog** page. See *Adding and Editing the Catalog Entry* in your product Help for more information.

  02501074 (403136)
- In ESCWA, the "**Historical Statistics Detail for Transaction**" and "**Historical Statistics**" pages now display time in milliseconds and the accuracy for latency and response information has been improved.

  02504559 (405096)
- A new CGI threshold type has been implemented in Enterprise Server. This enables you to set up threshold values for ESCWA and ESMAC requests by applying the global `=CGI` to all ESCWA and ESMAC requests, or by specifying the corresponding `casrdo` or `casrdj` module that you want to control.

  (377073)
- MFDS no longer supports XA reconnect attempts.

  (427068)
- In ESCWA, the **PCT Security** flag is now displayed on the **Active PCT** page. See *Active PCT* in your product Help for more information.

  (335002)
- Resolved an issue with a mutex deadlock created when MFDBFH attempted to emit a message during a `cascd` shutdown.

  02468209 (406002)
- A problem that caused Web Service client calls to fail after an upgrade has been fixed.

  02320601 (307054)

- An intermittent Access Violation in `mfredis.dll` sometimes occurred when a batch job abended. This has been fixed.

  02328218 (296144)
- ECI transactions were not being committed at the end of task. This has been fixed.

  02497005 (403085)
- An issue that resulted from pressing the **Clear** key following a EXEC CICS SEND PAGE command has been fixed.

  02423737 (375058)
- The recovery of processes by `casmgr` now occurs in the same order in which they were terminated.

  02449487 (389051)
- A bitism issue with the triggers provided with the product has been fixed.

  02554978 (449002)
- An issue with updating a transaction ID in ESMAC has been fixed.

  (264059)
- A WEB RECEIVE SESSTOKEN sometimes threw an RTS 114 error in `cascwi`. This has been fixed.

  (409046)
- Dynamically enabling HSF sometimes resulted in shared memory corruption. This has been fixed.

  (411104)
- In a PAC, closing an FCT that referenced a catalogued file sometimes resulted in a truncated filename after 44 characters. This has been fixed.

  02421476 (364152)
- The `casfile`, `casout`, `casstop`, `cassub`, `castran`, and `casutl` commands now find the enterprise server region successfully when `mfds` is started with the `-b` option.

  02307940 02202467 (286003)
- An error message was unnecessarily exposing input credentials. This has been fixed.

  02409369 (363126)
- When using `casout`, the `/y` option could fail depending on the order of options used. This has been fixed.

  02371843 (313041)
- An internal transaction (ITR) was not sent to a SEP that had an EZASOKET listener started. This sometimes resulted in a close file request failing to be processed by the SEP running the EZASOKET listener. This has been fixed.

  02394276 (350047)
- When an XA issue occurred, the reason code was not always returned. This has been fixed.

  02532560 (425053)
- An intermittent crash in `casmgr` has been fixed.

  02431740 (377040)
- When performing a NEWCOPY on a data table in a PAC, not all enterprise server regions in the PAC reloaded the new member. This has been fixed.

  02406797 (364015)
- Thresholds are now started before the XA start for a transaction has been issued, enabling the process to be killed if the transaction is stuck in the Resource Manager.

  02365811 (306124)
- When using the CICS command `castran` with the `-b` option, the message was not sent to the `console.log` file. This has been fixed.

02389970 (348041)

- When multiple requests were made from the same browser, a new TCTS was allocated, resulting in an SOS situation. This has been fixed.

02419170 02404921 (364124)

- When using TRANCLASS and refreshing ESMAC, the data sent to a started transaction could be lost, resulting in ENDDATA returned on the retrieve. This has been fixed.

02526457 (451029)

- The sample exit program DFHUSYNC has been modified to not return cics-syncpoint-normal-88 by default as this could overwrite the correct return-code set on a previous call to an RM.

02492604 (409026)

- The RAS process is now correctly identified on a dump.

(385051)

- Fixed a memory corruption that occurred when logging in-doubt XA transactions in the PAC.

02304565 02319810 (284038)

- Replaced ESF Admin API LISTRESOURCE with ESF Auth for querying MQ Security Resources.

02154003 (202145)

- Updated XID generation to support UTF-8 code pages with PostgreSQL.

02296723 (273006)

- A shared memory corruption issue occurred when reinstalling a TCPIP Service or URIMAP. This has been fixed.

(204047)

- Improved error reporting when applying advanced configuration updates in a PAC environment.

(364113)

- The `casesxml` utility now provides a relevant error message when no work location is provided.

02531150 (413115)

- The `casstop` command output misleading error messages when immediate shutdown was used. This has been fixed.

02490512 (403132)

- The dynamic region configuration updates occasionally failed to apply. This has been fixed.

(245030)

- If an enterprise server region contained $ES_SERVER in its configuration, then it would not be handled by `casesxml`. This has been fixed.

02531150 (417037)

- To improve efficiency, when an enterprise server region is configured with multiple RMs and a task uses only one, no XA log is created for the transaction.

02537701 (430016)

- When calling APPC functions, you could pass an invalid value in the first parameter which would result in an error in the communications server layer. This has been fixed.

02428147 (372009)

- When using LU6.2 communications infrastructure between enterprise server regions, when a COMMIT was executed by the originator, the target would incorrectly attempt to send a commit request back to the region which sent the sync point request. This has been fixed.

02339327 (296039)

- When using LU6.2 communications infrastructure between enterprise server regions, the processing of SYNCONRETURN on a Distributed Program Link was preventing switching between remote systems (SYSIDs). This has been fixed.

02336501 (296104)

- When using LU6.2 communications infrastructure between enterprise server regions, an ABEND in the target region would result in the SEP which was processing the request hanging. This has been fixed.

02287147 (259103)

- A DPL request from Tuxedo over LU6.2 could result in an RTS 114 error being reported. This has been fixed.

02531060 (421001)

- HSF records for Java ECI transactions now display the transaction name instead of CASECIP.

02338437 02353043 02394280 (296126)

- The latency value in HSF records could be incorrect for transactions started via DPL. This has been fixed.

02504559 (407143)

- Some Redis connections from `castmc`, `castrc`, and `cassi` processes were not being disconnected and remained open. This has been fixed.

02198949 (222162)

- The `casstart` utility now accepts variable wait times for the `/w` parameter. See *casstart* in your product Help for more information.

(365010)

- HSF now reports that 100% of transactions meet performance criteria when no transactions are measured for that period.

(385065)

- Dynamic Debugging failed on secure enterprise server regions with certain security configurations. This has been fixed.

02408468 (363059)

- Enterprise Server Clustering is now deprecated. Micro Focus recommends that you adopt the Scale-Out Performance and Availability Cluster (PAC) solution for your clustering requirements. See *Scale-Out Performance and Availability Clusters* in your product Help for more information. In addition, the LOCKDB feature has been added to replace the functionality of the Enterprise Server Cluster Global Lock Manager (GLM). See *Enterprise Server LOCKDB* for more information.

(363157)

- An enterprise server region sometimes crashed after MFCS and the ADMIN SEPs were killed. This has been fixed.

02415369 (364089)

- A new CGI threshold type has been implemented in Enterprise Server. This enables you to set up threshold values for ESCWA and ESMAC requests by applying the global `=CGI` to all ESCWA and ESMAC requests, or by specifying the corresponding `casrdo` or `casrdj` module that you want to control.

02426463 (370004)

- You can use the new ES_HARD_KILL_PROCESS environment variable to modify how Enterprise Server kills a process. See *General Enterprise Server Environment Variables* in your product Help for more information.

02365440 (355015)

- Added a new Retrieve action to the `caspac` utility to enable you to retrieve binaries loaded on an SOR. See *caspac* in your product Help for more information.

(284104)

- A new `/z` parameter has been added to the following commands-line utilities: `casfile`, `casout`, `casstart`, `casstop`, `cassub`, `castran`, and `casutl`. The parameter enables you to pass user

credentials through an interactive prompt or a redirection from the console. See the respective command-line topics in your product Help for more information.

(303013)

- In Enterprise Server with LDAP-based security, the effect of the value `0` for the attribute `microfocus-MFDS-User-MTO-Timeout` was documented incorrectly. When this value is `0`, the enterprise server region's default user timeout is used. See *Defining a User with LDIF* in your product Help for more information.

02305957 (276010)

- The following environment variables can now be configured as properties on the ESCWA **Advanced Region Properties** page: ES_SEP_DORMANT_TIME, CAS_SRV_CANCEL, and ES_MAX_CATALOG_LINES.

(348002)

- The following environment variables can now be configured as properties on the ESCWA **Advanced Region Properties** page: ES_DDBG_PORT_RANGE, ES_ESMAC_DISP_MAX_OVERRIDE, and ES_SOR_RETRIES.

(306023)

- The supported list of cipher suites has been updated to TLS v1.3.

02320601 (401139)

- An issue that prevented the user ID from being found and that then failed to report this back to the application has been fixed.

02459379 (395007)

- When running with futex support, enterprise server regions would no longer start due to a logic error. This has been fixed.

(308024)

- In TRANCLASS enterprise server regions, non-TRANCLASS Temporary Storage Queue (TSQ) processing can now be enabled by setting ES_TRANCLASS_EXCEPT_TS=Y.

(387013)

- Support for TS queues of type Exclusive has been improved by correcting error conditions and now retaining queue recoverability after a DELETEQ.

(386014)

- A bug in the `castsc` process meant that it could trap in casstore when a terminal disconnects. This has been fixed.

(368001)

- In a PAC, access to an FCT could immediately reopen an FCT that had just been closed by another enterprise server region. This has been fixed.

02421476 (375005)

- A WRITEQ TS using the REWRITE option against a non-existent queue was incorrectly returning ITEMERR instead of QIDERR when running with ES_TRANCLASS_EXCEPT_TS=Y. This has been fixed.

02515519 (405171)

- An issue with the start initiator button not being correctly disabled when a user was not authorized for the `casout` resource (OPERCMDS) has been fixed.

02503261 (401173)

- A loop that occurred when trying to recover PIDs after MFDBFH lost the connection to the database has been fixed.

02373280 02362273 (322009)

- MQ security was being disabled when **Allow unknown resources** was enabled. This has been fixed.

02328521 (288019)

- When a process dies in a PAC, `casmgr` in the recovery process tries to call MFDBFH to recover the process, close all files opened by that process, and release all the locks. If the connection to the database was lost, the call to MFDBFH would fail and the process only recovered if the connection was restored at region termination. Updates in this release now keep track of the process that could not be recovered and retries when the connection is restored. On region shutdown, all orphan ITRs that belonged to the current region are now removed. At start up, all orphan ITRs that were targeted to the region are removed.

02345487 (303043)

- An incorrect HSF latency calculation when the transaction was using a TCPIPSERVICE has been fixed.

02439855 (387136)

- When using DEFINE LIBRARY, `casrdtup` was hanging. This has been fixed.

02422104 (372043)

- You can now specify thresholds for ESCWA and ESMAC requests using the new type CGI and by specifying the `casrdxxx` module name or a global threshold =CGI. This ends the request abnormally if the threshold is exceeded, and stops the admin SEPs from being blocked on long requests accessing ESCWA or ESMAC.

(372055)

- Invalid messages have been removed from the Catalog Display when details are enabled.

02501609 (405074)

- A local memory leak that occurred when logging XA transactions in a PAC has been fixed.

02319834 (285102)

- An issue with MQ security checks when security resource prefixes are used has been fixed.

02483959 (397010)

- Ambiguous MQ security rules failed to enable security checks. This has been fixed.

02375426 (314055)

- The subsystem security switch was not being set to OFF when the MQADMIN class was not defined. This has been fixed.

02483959 (399003)

- All authentication checks for Dynamic Debugging operations are now skipped if the `casdebug` entry is not available under the OPERCMDS security resource.

02367824 (314007)

- An issue with MQ security console messages not containing the actual resource being checked has been fixed.

02483959 (399002)

- Return code handling for create process requests on Windows platforms has been improved.

02290153 (307032)

- When using LU6.2 communications infrastructure between enterprise server regions, an ABEND raised by the target application would result in subsequent attempts to establish a conversation to fail. This has been fixed.

02339327 (297043)

- HSF reported latency for incoming remote DPL requests were not being reported correctly. This has been fixed.

02455011 (392023)

- Windows Performance Counters now work using a V2 provider DLL and will appear in Performance Monitor under 'Micro Focus Server System V2'.

(286029)

- Security checks are now supported for Dynamic Debugging operations. Checks are carried out against the `casdebug` entry under the OPERCMDS resource class.

  02337725 (296095)
- When using `casesxml`, if the enterprise server definition has been exported using the `-c` option then you must import using the `-c` parameter.

  (351045)
- An issue with the TType page (Signoff attribute) affecting ESCWA and ESMAC has been fixed.

  (402014)
- In ESCWA, the field did not display the correct time. This has been fixed.

  02470813 (393069)
- The JSON ESMAC spool details module now reports the UUID of the PAC member which processed a batch job back to ESCWA.

  (293036)
- The ESCWA API call `/native/v1/regions/host/port/region/users/resource` has been fixed.

  02382647 (340024)
- When using the OpenLDAP client library on Linux, if the Timeout parameter is set in the [LDAP] configuration section, the MLDAP ESM Module will instruct OpenLDAP to set the TCP_USER_TIMEOUT socket option to correspond to the Timeout value. This improves OpenLDAP's ability to honor the timeout. However, the TCP_USER_TIMEOUT socket option only applies when sent data goes unacknowledged, or data cannot be sent because the server's receive window is closed.

  02446931 (387139)
- In some circumstances MFDS incorrectly granted permissions. This has been fixed.

  (365086)
- An Enterprise Server Security Manager using the MLDAP ESM Module with caching enabled no longer incorrectly caches partial results when an LDAP search cannot return the full result set due to the server's size limit on responses. The module will always switch to an LDAP paged search when necessary, bypassing the cache. This corrects an issue where customers with a large number of resource rules might sometimes get incorrect security results (typically access denied when it should not be) after the first time that resource class was queried.

  > **Note:** If you cannot apply this fix, you can work around it by disabling caching for the Security Manager. ESF caching, which is set in the Security properties for the enterprise server region, can remain enabled.

  02475614 (397047)
- Enterprise Server security did not always assign supplemental groups to users in certain configurations with multiple **Security Managers**, **Federation** enabled, and **All Groups** enabled. This has been fixed.

  02145921 (202146)
- The ability to change passwords through the OS ESM Module was broken in version 1.10.4 of that module. That has been fixed.

  02408023 02417238 (363081)
- Issues with changing passwords through the OS ESM Module have been fixed.

  02408023 02425417 (370007)
- When using the OpenLDAP client library on Linux, the MLDAP ESM Module can now optionally set the connection-specific TCP keepalive parameters (idle time, interval, and number of lost probes before terminating the connection). See *MLDAP ESM Module Custom Configuration Information* in your product Help for more information.

  02446931 (385125)

- For Enterprise Server LDAP-based security, a new configuration option, **[Operation] check constraints for already-verified users**, lets an MLDAP Security Manager deny sign-on for a user even if an earlier Security Manager has chosen to allow the Verify request. See *MLDAP ESM Module Custom Configuration Information* in your product Help for more information.

  02346703 (297133)
- The `esfupdate` utility now supports the Micro Focus Vault Facility for retrieving secrets. See *To Update Security Manager Changes Using esfupdate* in your product Help for more information.

  02510669 (406066)
- When both BATCHONLY and LOCALTX are set to true, one-phase-commit batch jobs no longer trigger two-phase commit connection in the recovery transaction.

  02407338 (364098)
- The XA ODBC switch module now gets the correct server status, enabling the Enterprise Server RECONNECT feature to work correctly.

  02408845 (362020)
- XA switch modules that use OpenESQL now work correctly when the applications in Batch transactions are compiled with XAID directive option.

  02327393 (293012)
- The DB2 switch module now sets the PackagePath after switching to the user.

  02269497 (258224)
- XA switch modules no longer return an MFDBFH registration error to Enterprise Server, ensuring that non-MFDBFH transactions continue using the XA connection.

  02452753 (385055)
- The correct OCI_ATTR_SERVER_STATUS is now used to query Oracle Server status.

  02391332 (335016)
- XA recovery is now performed correctly for DB2 in-doubt transactions when the enterprise server region is next started.

  02474721 (402001)
- You can now build the SQL Server RM switch module on UNIX platforms. See *SQL Server RM Switch Module* in your product Help for more information.

  (365126)
- The Region Trace Control process (`castrc`) was incorrectly creating multiple connections to Redis after a RD-NOAUTH return code. This has been fixed.

  02319798 (335004)
- Intermittent CONNECT_ERROR issues occurred when accessing data from MF Directory Server via ESCWA. This has been fixed.

  02532852 (425068)
- A socket handle leak occurred if the connection to the MF Directory Server process failed. This has been fixed.

  02435329 (382013)

File Handling

Back to the list

- The performance the Data File Editor has been improved when navigating within variable-sequential or line-sequential files accessed through a Fileshare server.

  (401106)
- File Status no longer returns `corrupt index file` for a non-corrupt file, under high traffic.

02513640 (406155)
- A COBRT114 error no longer occurs when using read-direct on VB file header records.

02490607 (400074)
- Background changes have been made to the external file handler when dealing with sequential files.

(382072)
- Performance improvements have been made when navigating to the last page of a variable-length file in the Data File Editor.

02476713 (394163)
- Fileshare could crash when processing some unexpected sequences of operations for a connected Data File Editor. This has now been fixed.

02409270 (365144)
- In some scenarios, zombie processes could result in an incorrect reporting of open files in the system. This has now been corrected to better detect when such scenarios occur.

(297118)
- It was possible for an ODBC/OCI exception (such as a connection timeout) to occur in the optimized I/O thread when accessing files via MFDBFH. This could cause the process to hang, and so defensive measures have been taken to resolve this.

02481017 (405157)
- An issue where MFDBFH would incorrectly return a 9/139 error when attempting to open a file that did not have a key definition area specified in the FCD has now been fixed. The behavior is now the same as it is on disk.

02394334 (350036)
- Oracle statements were previously using deprecated `OciStmtPrepare` calls, which meant that the Oracle application failover/transaction replay could not be used. This has been updated to now use `OciStmtPrepare2`.

02441885 (384027)
- A timing issue when closing the connection to the database caused an SEP to crash on region shutdown. This has been resolved.

(254034)
- The time required to return after reading a large number of records from large files hosted in MFDBFH was excessive due to the large number of SQL queries being executed. These queries have now been optimized to improve performance.

02396919 (384007)
- Enterprise Server sometimes failed to recover processes that died after losing and then reestablishing a connection to the database. To mitigate this, Enterprise Server has been updated to attempt recovery of these processes at a later time in the event that the database connection cannot be reestablished.

(326009)
- SYSOUT SSTM data sets were being incorrectly marked as using an In-Memory record-locking strategy when hosted within MFDBFH, which returned a 9/100 status due to multiple processes attempting to write display statements to the data set. In this scenario, SYSOUT SSTM data sets now use the default Table record-locking strategy.

(299014)
- MFDBFH has been updated to be sensitive to the FAN settings on an Oracle Database, and is now immediately notified when the database attempts to drain connections. In this case, MFDBFH attempts to establish a new connection.

(375030)
- When registering an XA connection with MFDBFH, the registration process attempted to connect to each entry in the `MFDBFH.cfg` file to determine if it matched the details of the XA resource. Underlying

improvements have been made to reduce the number of connections made when the `MFDBFH.cfg` file contains duplicate entries.

02459182 (390041)

- If the connection to an Oracle RAC environment was lost at a specific time, a COBRT114 error was sometimes thrown in the XA Switch module. Additional checks have been added to the code to ensure that this is no longer the case.

02366126 (350015)

- When using an Oracle database, if the connection was lost, the process failed to reconnect once the connection to the database was reestablished. This has now been resolved.

02410660 (363051)

- Oracle queries that issued searches against large files used a full-table scan, slowing performance. Performance has been improved by instructing the Oracle optimizer do a range scan instead of a full-table scan in this case.

02516560 (406164)

- Additional diagnostics information has been added to assist in determining the cause of an RC 3 on MFDBFH recovery processing.

02344102 (299021)

- A WRITE operation that used ADVANCING *mnemonic-name* sometimes threw an error. Support has now been added to handle WRITE operations with mnemonic usage.

02209654 (246009)

- When a database ran out of available connections, stored procedures and functions were sometimes lost. This release contains updates that reduce this risk.

02155281 (203093)

- A progress bar has been added to `dbfhdeploy` operations.

(381028)

- A new environment variable, MFDBFH_GRANT_USER_PERMISSIONS, has been added for Oracle databases only to allow MFDBFH to grant execute privileges on types/procedures to specific users/roles. This provides easier user privilege restriction on Oracle and creates a more secure environment without having to manually modify the MFDBFH scripts.

02459320 (389032), 02441860 (384006)

- Additional checks have been added to verify the integrity of the region/cross-region database tables before running `dbfhadmin -casprocess -recovery`. If required, you are prompted to run `dbfhadmin -verify` to fix the table integrity before recovery can continue.

02326339 (297036)

Micro Focus Common Client

Back to the list

- Programs using the Micro Focus Common Client (MFCC) component, such as COBOL applications invoking a Web Service proxy created by the Interface Mapping Toolkit (IMTK), can now be built as single-threaded applications on Linux and UNIX. They no longer need to be executed under the multi-threaded COBOL runtime. Note: Multi-threaded applications are still supported.

(306131)

- The Micro Focus Common Client now adds Accept and Origin headers with default values to HTTP requests if the invoking program has not set its own values for those headers. This improves interoperability with some Web services.

    Note: This affects COBOL Web service client proxy programs.

(104096)

Micro Focus Cryptographic Library

- The version of OpenSSL provided with the product has been updated to 1.1.1t.

  (407184)

Micro Focus Directory Server

- MFDS stopped when supplied with the incorrect mfServer property when updating an enterprise server region. This has been fixed.

  02547102 (442003)
- The `casstart /s` option incorrectly copied the start-type parameter. This has been fixed

  02250159 (244185)
- An issue that sometimes caused MFDS to crash when starting multiple enterprise server regions simultaneously has been fixed.

  02310876 02409262 (286081)
- Micro Focus Directory Server internal session identifiers have been increased in size and complexity to reduce vulnerability to attack.

  02365249 (344004)
- Starting or stopping an enterprise server region using ESCWA or the MFDS UI intermittently terminated the process. This has been fixed.

  (415049)
- Modifying or deleting an enterprise server region's MFRHBINP Request Handler via the ESCWA user interface or API is no longer allowed.

  02525461 (413117)
- The **Validate** feature on an enterprise server region running on a UNIX platform sometimes incorrectly flagged a valid Web Services and J2EE listener as not startable.

  02370910 (318020)
- Enterprise server region start-up performance was slow when a large number of regions were specified on a Micro Focus Directory Server with a large number of values stored in the vault facility. This has been corrected.

  (394122)
- If the MFDS process could not access the TCP port it was configured to use, it failed to start and emitted the error message `HS0001S HTTP server failed to initialize, rc=6: CCITCP-0006E An invalid server or machine name was presented to CCITCP.` It now fails with the message `HS0001S HTTP server failed to initialize, rc=57: CCITCP-0057E Insufficient permission to complete an operation.`

  (388038)
- If the MFDS process could not access the TCP port it was configured to use, it failed to start and emitted the error message `HS0001S HTTP server failed to initialize, rc=6: CCITCP-0006E An invalid server or machine name was presented to CCITCP.` It now fails with the message `HS0001S HTTP server failed to initialize, rc=57: CCITCP-0057E Insufficient permission to complete an operation`

  02433110 (380037)
- Some audit events output when setting the **Create Audit Events** option for the MFDS process using the MFDS Web interface were not being output when using ESCWA to change the same configuration. This has been corrected.

  02412285 (365078)

- MF Directory Server Enterprise Server Administration HTML Web interface was accepting UNC paths as input values for some import and export operations. This has been fixed.

    02423785 (369017)

Micro Focus License Administration

Back to the list

- Micro Focus License Administration now displays the licenses for the same product and serial number but with a different expiry date on separate lines.

    (365148)
- Some libraries have been updated to fix current known vulnerabilities.

    (295042) (295068) (309006)
- The SafeNet server list can now be used as expected.

    02341760 (259135)

Run-time System

Back to the list

- The memory associated with a dynamic length item declared in local-storage was not released when the program instance exited, which led to memory leakage. This has been fixed.

    (443004)
- The Run-time System now produces an RTS error if the Profiler attempts to output an `.ipf` file in a read-only directory.

    (407092)
- An issue in the native Run-Time System's clean-up logic sometimes resulted in a crash when a .NET AppDomain running a .NET COBOL program was unloaded. This has now been fixed.

    02259505 (301047)
- Previously, in some ES region configurations, enabling CTF tracing for RTS API events could result in very large CTF trace log files, and cause an ES region to take a very long time to start. This has now been fixed.

    02320601 02497148 (403104)
- If a debugger process was killed on Linux (using kill -9 <pid>) then the debugger process could hang in certain circumstances. This has now been resolved.

    (387100)
- If multiple asynchronous run-units are created, with CBL_EXEC_RUN_UNIT on UNIX/Linux, then it was possible for some of them to be left marked as "<defunct>" in the OS process table. This has now been resolved.

    02537643 (422001)
- The CBL_CULL_RUN_UNITS API now more closely complies with the documented behavior on UNIX. It now clears all asynchronous run-units, when multiple run-units have terminated, and does not clear child processes that are not run-units.

    (439075)
- The event priority of a CTF API entry is set to a default value of 0 when CBL_EXIT_PROC is called with a function code that does not expect a priority or provides an invalid one.

    (380019)

Setup Issues (UNIX)

Back to the list

- The RPM installer for Enterprise Developer for Eclipse was missing some of the required components. This has been corrected.

  02366247 (306126)
- You can use the environment variable TMPDIR when installing the product. See *Visual COBOL Development Hub Installation Options* in your product Help for more information.

  (252002)

SQL: COBSQL

Back to the list

- A problem with COBSQL that prevented it from handling the FETCH conversion of more than 100K rows has been fixed.

  02236464 (260248)
- COBSQL has ben updated to handle ENTRY statements broken into multiple lines.

  02417156 (367003)
- COBSQL has been modified to handle inline comments in EXEC SQL statements when using the SYBASE precompiler.

  (285007)
- COBSQL has been updated for SYBASE such that it no longer inserts a period when an EXEC SQL statement is coded inside of an IF block.

  01886033 (125015)
- COBSQL has ben updated to handle inline comments inside DECLARE blocks when Informix is used.

  02380790 (348020)
- The COBSQL preprocessor has been updated to support the ALPHA-LIT-CONT directive.

  02544092 (430025)

SQL: DB2 ECM

Back to the list

- The DB2 ECM now correctly sets the length of the PIC G host variables before CHARSET conversion.

  (424053)

SQL: OpenESQL

Back to the list

- A problem that caused erroneous memory usage in the OpenESQL run time has been fixed.

  02321779 (293023)
- A problem that prevented parameters in the ADO UNBIND CONNECTION statement from being replaced has been fixed.

  (406004)
- A problem that prevented a temporary table from being created has been fixed.

  02494026 (401152)
- A problem that prevented PostgreSQL from applying the expected values when set statements contained three or more host variables has been fixed.

  02506484 (405077)
- The .NET 6 ODBC Nuget package was missing some dependencies. These are now included.

  02474422 (395110)

- The column length of a VARCHAR type column was returned incorrectly when the SQL statement was being prepared dynamically. This has been corrected.

  02503856 (405091)

- A problem that prevented database locks from being released at the end of an DSNALI transaction when using switch modules that use OpenESQL has been fixed.

  02307521 (296031)

- A problem that occurred when specifying the SQL(CLOSE_ON_ROLLBACK=NO) directive caused SQL Server to automatically close a cursor after a rollback statement has been corrected. The cursor is now defined as a fast-forward cursor instead of a fire-hose cursor.

  (401104)

- A problem with the ODBC ECM that produced a subscript-out-of-range error when using a host variable with a leading FILLER item before a data item in an SQL statement has been fixed.

  02334866 (312064)

- A problem that sometimes occurred when compiling DBCS code in SJIS locale for embedded SQL applications has been fixed.

  02349559 (301080)

XML Support

Back to the list

- The XML runtime now performs better when reading a large XML file.

  02526445 (417029)

Other Issues Resolved in This Release

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

- (295041)
- 02508043 (407049)
- 02479358 (393153)
- 02504425 (424001)
- 01901711 (127012)
- 02287394 (258209)
- 02558536 (447020)
- 02190101 (363024)
- (381007)
- (384016)
- 02450685 (386098)
- 02423113 (364179)
- 02439474 (382038)
- 02453576 (385060)
- 00373758 (448044)
- 02500115 (406011)
- (402012)
- 02458038 (387132)
- 02544746 (425075)

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 - release 10.0. The SafeNet Sentinel licenses will not be supported after release 9.0. You can only use AutoPass licenses starting with release 10.0.

  You can replace your SafeNet Sentinel licenses with AutoPass licenses starting with release 8.0. However, it is not necessary to switch to AutoPass licenses unless you are adopting release 10.0. 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.

Additional Software Requirements

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

Click here to see this information on the Product Documentation pages on Micro Focus Customer Care, in the product Help for Visual COBOL for Eclipse (Windows).

Click here to see this information on the Product Documentation pages on Micro Focus Customer Care, in the product Help for Visual COBOL for Eclipse (UNIX).

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.

On Windows

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:

Visual COBOL
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. 32-bit Windows is not supported. See *Installation* in *Known Issues and Restrictions*.

  You can produce both 64-bit and 32-bit applications with Visual COBOL on 64-bit operating systems.

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

Software requirements

✏️ **Note:** This product includes OpenSSL version 3.0.

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. 32-bit Windows is not supported. See *Installation* in *Known Issues and Restrictions*.
- The setup file installs Visual COBOL and the 64-bit version of Eclipse 4.24 (2022-06).

  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 17 (LTS) with HotSpot.
- The setup file also installs Microsoft's Visual C++ 2012 and 2015-2022 Redistributables.

Requirements for running the product

- Java 11 (64-bit) or later is required to run the Eclipse IDE. The recommended version is Adoptium's OpenJDK Temurin 17 (LTS) with HotSpot. On Windows, the installer automatically installs Adoptium's OpenJDK Temurin 17 (LTS) with HotSpot. On Linux, you need to install Java before you install this product. You can download Adoptium's OpenJDK Temurin 17 (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 package: the Windows SDK 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 `cblmx`s 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.

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.

Installation Restrictions and Requirements

Before starting the installation you should consider the following:

- You need to be logged in with a user-ID that has write access to the registry structure under HKEY_LOCAL_MACHINE, HKEY_CLASSES_ROOT, and HKEY_CURRENT_USER so the installation software can set the environment appropriately. You also need to be logged on with Administrator privileges.
- Various actions and operations within your COBOL development environment depend on certain Microsoft files distributed in the following packages: the Windows SDK package and the Microsoft Build Tools package. By default, a standard product installation downloads and installs these. Refer to *Microsoft Package Dependencies* to see if these packages are required. If you do not plan to use your development tool in a way that will depend on any of these packages, you can run a non-standard installation, which will skip their download and installation, thus saving disk space and time taken for installation. Refer to *Advanced Installation Tasks* for details on the available installation options.

On UNIX

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	1.49 GB	5.96 GB	2.98 GB	50 MB
x86-64 running SUSE SLES	Micro Focus	1.25 GB	5 GB	2.5 GB	50 MB
System Z running SUSE SLES	Micro Focus	856 MB	3.42 GB	1.71 GB	50 MB
x64 running Amazon Linux 2	Micro Focus	1.21 GB	4.84 GB	2.42 GB	50 MB
x64 running Ubuntu	Micro Focus	1.22 GB	4.88 GB	2.44 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 Rocky Linux	Micro Focus	1.49 GB	5.96 GB	2.98 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 or later from Adoptium (such as the Adoptium OpenJDK Temurin 17 (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[1]	SUSE 15[1]	Red Hat 7	Red Hat 8	Ubuntu 20.4	Amazon Linux 2
glibc[2]	X	X			X	X		X
libgcc	X	X			X	X		X
libgc1c2		X					X	

Library	Bitism		Platform					
	32-bit	64-bit	SUSE 12[1]	SUSE 15[1]	Red Hat 7	Red Hat 8	Ubuntu 20.4	Amazon Linux 2
libstdc++	X	X			X	X		X
glibc-locale[3]	X	X	X	X				
libXtst6		X	X	X			X	
libXtst		X			X	X		X
glibc-devel	X	X			X			
gtk3		X			X[7]	X[7]		X[7]
PackageKit-gtk3		X			X[7]	X[7]		X[7]
libcanberra-gtk3		X			X[7]	X[7]		X[7]
webkitgtk3		X			X[7]			X[7]
webkit2gtk3		X				X[7]		
xterm	Any version	Any version	X	X	X	X	X	X
unzip	Any version	Any version	X	X	X			X
libgnome		X			X			
libgtk-3-0		X	X[7]	X[7]			X	
gtk3-tools		X	X[7]	X[7]				
gcc[45]	X	X	X	X	X	X		X
cpp[4]		X			X	X		X
libnotify-tools[6]		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.
- [1]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.
- [2]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.
- [3]On 64-bit Red Hat 7, you only need to install glibc-2.17*.x86_64 and glibc-2.17*.i686.
- [4]On Red Hat, these libraries are required to enable COBOL to compile.
- [5]On Red Hat, only the 64-bit gcc libraries are required.

- [6]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
  ```
- [7]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 4.24 (2022-06). After the installation, you can install Visual COBOL as a plug-in into other Eclipse 4.24 (2022-06) 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 always installed by default. Use your UNIX/Linux installation media to install it.

Requirements for running the product

- Java 11 (64-bit) or later is required to run the Eclipse IDE. The recommended version is Adoptium's OpenJDK Temurin 17 (LTS) with HotSpot. On Windows, the installer automatically installs Adoptium's OpenJDK Temurin 17 (LTS) with HotSpot. On Linux, you need to install Java before you install this product. You can download Adoptium's OpenJDK Temurin 17 (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.

Installation on UNIX and Linux (Known Issues)

- 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/1b/
af99f26c6b4c00ca499a3199a574b73aeb3854;6092b79c: cpio: symlink failed - No
such file or directory
error: Micro_Focus_cobol_server-7.0.0.0-100700.s390x: install failed
```

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

Installing while using AFS/Kerberos authentication

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

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.

On Windows

Installing on 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_90.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 4.24 (2022-06) 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.

On UNIX

Installing the software

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_deveclipse_9.0_platform
```

2. Run the setup file with superuser permissions:

```
./setup_visualcobol_deveclipse_9.0_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_9.0_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.

> **Note:** See *Installing in an Ubuntu Docker Image Running on Windows 11* for specific installation instructions for this scenario.

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_deveclipse_9.0_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
```

Setting up the environment

If you have installed the product to a directory other than the default one, you need to set the environment as described below.

> **Note:** The default directory is `/opt/microfocus/VisualCOBOL`.

1. To set up your product, execute:
   ```
   . <product-install-dir>/bin/cobsetenv
   ```
2. To verify that your product is installed, execute:
   ```
   cob -V
   ```

> **Important:** These commands set the environment only for the current shell. You need to execute them for each new shell that you start.
>
> To avoid having to run `cobsetenv` for every shell, add these commands to the shell initialization files (such as `/etc/profile, /etc/bashrc`).
>
> Note that `cobsetenv` is only compatible with POSIX-like shells, such as bash, ksh, or XPG4 sh. It is not compatible with C-shell or pre-XPG4 Bourne shell.

Starting the product

To start Eclipse:

* If you are using a GUI interface, double-click the product icon (automatically installed on your desktop).

  > **Note:** The installer automatically creates a shortcut icon for the product on the desktop for the user for which you ran the install script. If you need to create desktop icons for other users' desktops on the same machine, or if the icon was not created on the desktop for the root user, run the following shell script as the user you need to login as: `$COBDIR/bin/createdesktopicon.sh`

* If you are using a non-GUI interface, such as a terminal emulator, type the following from a command prompt:
  ```
  eclipse
  ```

Advanced Installation Tasks

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

The advanced installation tasks include:

* *Installing as an Upgrade* - included in these Release Notes
* *Command line installation options* - included in these Release Notes
* *Installing using an RPM installer on Linux* - available in the product Help and on the Product Documentation pages on Micro Focus Customer Care
* *Installing into other instances of Eclipse* - available in the product Help and on the Product Documentation pages on Micro Focus Customer Care
* *Installing on Microsoft Terminal Server and Citrix* - available in the product Help and on the Product Documentation pages on Micro Focus Customer Care

See this information on the Product Documentation pages on Micro Focus Customer Care - for Windows *click here* and for UNIX *click here*.

On Windows

Installing as an Upgrade

- This release cannot be installed as an upgrade to an earlier release of Visual COBOL. You must uninstall the previous version before installing 9.0.

Visual COBOL Installation Options

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

```
install-file /help
```

where *install-file* for the following products is as follows:

Visual COBOL	vce_90.exe

See the *Examples* section further in this topic for examples of some of the parameters you can use.

Directory considerations

- You must have read and write access for every directory accessed during the installation.
- You can override the default installation folder using the `InstallFolder` parameter.
- Installing creates a group of log files prefixed `Micro_Focus_` in the `%temp%` folder, by default. To change the location or name, use the `/log` parameter on your Setup command line and specify the path and file name, for example:

```
/log drive:\path\LogFilename
```

Skipping installation of the Microsoft package dependencies

A standard installation downloads and installs the latest versions of the Microsoft Build Tools (for Visual Studio 2017) and the Windows 10 SDK packages to their default locations. Using the following option, you can skip installation of these packages, thus reducing the footprint and duration of the installation. See *Microsoft Package Dependencies* to see if you can safely skip installing these packages.

```
vce_90.exe skipmstools=1
```

Offline installations

An offline installation is one where the client running an install is not connected to the internet; the problem this presents is that the installer cannot download and install certain file and package dependencies; see *Microsoft Package Dependencies*. In such circumstances, an administrator (or at least someone connected to the internet) must download and make any dependencies available on the local network beforehand.

To prepare an offline installation, the administrator should run their own (online) installation using the `downloadmstools` parameter: this downloads the package dependencies to *<directory>*, which should be a fully-qualified path to a location accessible to the client when they run an installation.

```
start /wait vce_90.exe /q downloadmstools=<directory>
```

A client can then run an offline installation by pointing their installer at the location of the packages:

```
vce_90.exe installmstools=<directory>
```

This command runs a full product install; during which it uses the locally-accessible *<directory>* to install the package dependencies.

Installing silently

You can install Micro Focus products silently by specifying /q at the command line and using command line parameters to specify the installation directory (`installfolder=path`), user information, and which features to install. You must execute the command with superuser permissions.

```
start /wait install-file.exe /q [parameters]
```

Examples

- To silently install Visual COBOL into a directory other than the default:

```
start /wait vce_90.exe /q InstallFolder=c:\DirectoryName
```

- If you want to silently install the Eclipse IDE in a location other than the default, execute:

```
start /wait vce_90.exe /q InstallFolder2=c:\EclipseInstallDirectory
```

Microsoft Package Dependencies

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

There is a dependency on the Microsoft Windows SDK if you:

- Produce COBOL `.exe` or `.dll` files.
- Call Windows APIs from your COBOL `.exe` or `.dll` files.
- Link a C object file into a COBOL `.exe` or `.dll` file.
- Call Windows APIs from a C object file linked into a COBOL `.exe` or `.dll` file.
- Create MIDL files for OLE RPC.

There is a dependency on the Microsoft Build Tools if you:

- Produce COBOL `.exe` or `.dll` files.
- Manage `.lib` files.
- Convert resource files to object modules.

If you distribute a COBOL product installation to clients that do not have access to the internet, then you need to have downloaded these packages and placed them in an accessible place on the network before clients can run an 'offline installation'. The installer includes options to achieve this: `downloadmstools` enables you to download the required packages to a specific location; and `installmstools` enables an offline client to install the packages from a local network location.

If you do not use any of the features described above, you can use an install parameter (`skipmstools=1`) that will skip the download and installation of these dependencies.

All of these installation options are discussed in more detail in the *Installation Options* topic for your product.

One of the final steps of the installation process configures the downloaded and installed package versions for use in your COBOL environment. You can view these versions using the Windows SDK Configuration Utility - see *Managing the Microsoft Build Tools and Windows SDK Packages*. This utility also enables you to specify alternative versions should you need to depend on a specific package other than the one downloaded, or one stored in a non-default location.

On UNIX

Installing as an upgrade

This release works concurrently with the previous version of Visual COBOL, so you do not need to uninstall it.

Install the latest version in a different location and set the environment to point to it. To do this, run the Visual COBOL installer with the –installlocation option:

1. Execute the following command:

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

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

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

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

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

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

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

Preserving Product Configuration

The following information applies when you are upgrading from releases 6.0, 7.0, or 8.0.

If you install this release to the same install location as release 6.0, 7.0, or 8.0, the product in the current location is moved to a backup directory name.

For example, if the 7.0 product is installed in the default install location, `/opt/microfocus/VisualCOBOL`, during the installation process it is moved to `/opt/microfocus/VisualCOBOL.BKP.YYYY-MM-DD.HH:MM:SS`. The new release will be installed in `/opt/microfocus/VisualCOBOL`. The backup location will store your original installation along with any files you deployed to that directory. It will also contain any configuration files you modified post-install.

When installing 9.0 the installer moves a number of specific configuration files to a different configuration location and symbolically links them back to the new release install location. The configuration location will be one of the following:

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

The setup file creates a directory in the configuration location using a 5-digit checksum of the $COBDIR path. This is so that each configuration location is unique to each product installation. The configuration files and directories are then placed in this COBDIR checksum directory. In the following example, the install location generates a checksum of `39082`.

The file `/opt/microfocus/config/39082/COBDIRlocation.txt` details the COBDIR the configuration area is associated with.

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

You can access the configuration area from `$COBDIR/etc/config`.

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

Source	Destination
`$COBDIR/etc/mfds`	`/opt/microfocus/config/39082/mfds/mfds`
`$COBDIR/etc/ccsid`	`/opt/microfocus/config/39082/config/ccsid`
`$COBDIR/etc/secrets`	`/opt/microfocus/config/39082/secrets`
`$COBDIR/bin/mf370ctl.cfg`	`/opt/microfocus/config/39082/config/mf370ctl.cfg`

Source	Destination
`$COBDIR/bin/CCI.INI`	`/opt/microfocus/config/39082/config/CCI.INI`
`$COBDIR/deploy/.mfdeploy`	`/opt/microfocus/config/39082/deploy/.mfdeploy`
`$COBDIR/etc/cas/CTFesjcl.cfg`	`/opt/microfocus/config/39082/cas/CTFesjcl.cfg`
`$COBDIR/etc/cas/dfhdrdat`	`/opt/microfocus/config/39082/cas/dfhdrdat`
`$COBDIR/etc/commonwebadmin.json`	`/opt/microfocus/config/39082/escwa/commonwebadmin.json`
`$COBDIR/etc/mfdsacfg.xml`	`/opt/microfocus/config/39082/mfds/mfdsacfg.xml`
`$COBDIR/etc/mfdsacfg.dat`	`/opt/microfocus/config/39082/mfds/mfdsacfg.dat`
`$COBDIR/etc/mf-client.dat`	`/opt/microfocus/config/39082/mfds/mf-client.dat`
`$COBDIR/etc/mf-server.dat`	`/opt/microfocus/config/39082/mfds/mf-server.dat`
`$COBDIR/etc/cobol.dir`	`/opt/microfocus/config/39082/config/cobol.dir`
`$COBDIR/etc/cobopt`	`/opt/microfocus/config/39082/config/cobopt`
`$COBDIR/etc/cobopt64`	`/opt/microfocus/config/39082/config/cobopt64`
`$COBDIR/etc/cobjvm.cfg`	`/opt/microfocus/config/39082/config/cobjvm.cfg`
`$COBDIR/etc/cobutf8.cfg`	`/opt/microfocus/config/39082/config/cobutf8.cfg`
`$COBDIR/etc/default.tcf`	`/opt/microfocus/config/39082/config/default.tcf`
`$COBDIR/etc/mfescache.cfg`	`/opt/microfocus/config/39082/config/mfescache.cfg`
`$COBDIR/etc/dsdef.cfg`	`/opt/microfocus/config/39082/config/dsdef.cfg`

Installation Options

Installing into a different location

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

```
./setup_visualcobol_deveclipse_9.0_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.

Skip Java Check

To skip the Java version check, use the `-skipjavachk` option. This skips the parts of the installation that require Java, for example, the Eclipse installation. This can be used when you do not have Java on your path and want to perform a custom installation. You can then manually configure the plug-ins as required:

```
./setup_visualcobol_deveclipse_9.0_platform -skipjavachk
```

Skip Installing Eclipse

To skip the installation of Eclipse, use the `-skipeclipse` option. This enables you to install Visual COBOL into your own version of Eclipse.

```
./setup_visualcobol_deveclipse_9.0_platform -skipeclipse
```

Note: You need to install the COBOL plug-ins manually.

Installing into a 32-bit Version of Eclipse

To skip the installation of the shipped Eclipse version but still install the plug-ins, use the `-32bit` option. This enables you to install your own 32-bit version of Eclipse and manually install the required Visual COBOL components.

```
./setup_visualcobol_deveclipse_9.0_platform -32bit
```

Configuring Enterprise Server

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

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

Installing Silently

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

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

```
-silent -IacceptEULA
```

For example, execute:

```
setup_filename -silent -IacceptEULA
```

After Installing

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

On Windows

Configuring Visual COBOL

If you have used Eclipse from the same workspace before, the Eclipse perspective settings are not reset after installing any Micro Focus product. To pick up any new features, you must reset the perspective you are working with after installation:

1. Open the existing workspace with this product.

   You may receive some warnings or errors which you can ignore.
2. Make sure you are in the perspective you need to reset by clicking **Window** > **Perspective** > **Open Perspective** > **Other**.
3. From the **Open Perspective** dialog box, click the perspective you want to reset.
4. Click **OK**.
5. Click **Window** > **Perspective** > **Reset Perspective**.
6. When prompted, click **Yes**.
7. Reapply any customizations.

Managing the Microsoft Build Tools and Windows SDK Packages

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

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

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

The Microsoft Build Tools and Windows SDK Configuration Utility

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

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

Syntax:
```
cblms <option>
```

Parameters:

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

<option> can be one of:

-U

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

-U*<ms-pkg>*

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

-U*<ms-pkg>*:*<version>*

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

-U*<ms-pkg>*:*<path>*

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

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

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

-L

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

-L*<ms-pkg>*

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

-L*<ms-pkg>*:*<path>*

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

-Q

> Displays the versions currently in use by the COBOL environment.

-Q*<ms-pkg>*

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

-R

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

-H

> Displays the available command line options.

Legend:

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

\<path>	*\<path>* is the path in which to locate packages that are not installed to the default location for their package type.
\<version>	*\<version>* is the package version with which to update when the latest version is not the one required. When specifying *version*, it must be in the form:

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

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

Using an X Server on Windows

Some features of Visual COBOL for Eclipse on Windows require an X Server installation such as Micro Focus OpenText™ Reflection Desktop for X or Micro Focus ViewNow X.

Micro Focus Reflection Desktop for X is provided as part of Visual COBOL. Find the Reflection Desktop for X documentation on the Micro Focus Customer Care *dropdown menu*.

Viewing the Product Help

Visual COBOL is configured to display the product help available online on the Micro Focus Customer Care website: *https://www.microfocus.com/en-us/support/documentation/*.

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

Choose whether to view the help online or locally

You can configure Eclipse to show the Visual COBOL help either online or locally:

1. In Eclipse, click **Window** > **Preferences** > **Micro Focus** > **Help**.
2. Either disable or enable **Use online documentation**, depending on whether you want to see the documentation locally or online.

Online help (default)

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

  This opens a browser with the Visual COBOL help.

  Note: Ensure that you have an up-to-date version of your browser.

Local help

1. Configure Eclipse to use local help as detailed above.
2. Access the local help in one of the following ways:

   - Click **Help > Help Contents** to open the Help Viewer, then open the **Micro Focus**Micro Focus-branded documentation.
   - Alternatively, press **F1** inside the editor or after clicking a dialog within the UI.

Repairing on Windows

If any product files, registry settings or shortcuts are accidentally removed at any point, you can perform a repair on the installation to replace them.

> ⚠️ **Important:** Before performing a repair of the installation, Micro Focus recommends that you create backups of any configuration files of the product that you might have changed.

To repair your installation:

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

Uninstalling

Windows

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

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

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

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

> ⚠️ **Important:** The installer creates separate installations for Micro Focus Visual COBOL Micro Focus Analysis Services Integration, and Micro Focus License Administration. Uninstalling only Visual COBOL does not automatically uninstall the Micro Focus License Administration or any of the prerequisite software.
>
> To completely remove the product you must uninstall the Micro Focus License Administration as well.
>
> You can optionally remove the prerequisite software. For instructions, check the documentation of the respective software vendor.

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

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

On UNIX

Configuring Visual COBOL

If you have used Eclipse from the same workspace before, the Eclipse perspective settings are not reset after installing any Micro Focus product. To pick up any new features, you must reset the perspective you are working with after installation:

1. Open the existing workspace with this product.

   You may receive some warnings or errors which you can ignore.
2. Make sure you are in the perspective you need to reset by clicking **Window** > **Perspective** > **Open Perspective** > **Other**.
3. From the **Open Perspective** dialog box, click the perspective you want to reset.

4. Click **OK**.
5. Click **Window** > **Perspective** > **Reset Perspective**.
6. When prompted, click **Yes**.
7. Reapply any customizations.

Configuring the Environment for Developing RDBMS Applications on UNIX

Note:

- If you are working with remote projects, you need to configure the environment before you start the remote server process.
- On UNIX, if you are working with local projects, you need to configure the environment before you start Eclipse.

1. Ensure the COBOL and the third-party software environments are set.
2. Set up the RDBMS environment.

    Refer to your RDBMS vendor documentation for details.
3. Set COBCPY as required in order for the IDE to locate any copybooks that are external to your project.
4. If working with Pro*COBOL/Cobsql applications you need to set COBOPT. This sets the appropriate linker options for the platform and the COBOL working mode:

    To do this, execute the following at the command line:
    ```
    $COBDIR/src/oracle/set_cobopt_oracle
    COBOPT=$PWD/cobopt.ora
    export COBOPT
    ```

Enabling SHIFT-JIS

By default, support for the character encoding for the Japanese language, Shift-JIS, is not available on Ubuntu and on RedHat OS version 8 or later.

You need to generate the Shift JIS locale on your machine to be able to execute Shift-JIS applications on these platforms. You can do this as follows:

1. On RedHat 8, ensure that the `glibc-locale-source` package is installed.
2. Execute the following command with superuser rights in order to generate a Shift-JIS locale using the charset:
    ```
    sudo localedef -f SHIFT_JIS -i ja_JP ja_JP.sjis
    ```
3. Set the COBUTF8 environment variable to the generated Shift-SJIS locale and LANG to a UTF8 locale:
    ```
    export COBUTF8=ja_JP.sjis
    export LANG=ja_JP.UTF-8
    ```
4. Run the cobutf8 utility:
    ```
    cobutf8 <command>
    ```

    See your product documentation for more details about cobutf8.

Viewing the Product Help

Visual COBOL is configured to display the product help available online on the Micro Focus Customer Care website: *https://www.microfocus.com/en-us/support/documentation/*.

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

Choose whether to view the help online or locally

You can configure Eclipse to show the Visual COBOL help either online or locally:

1. In Eclipse, click **Window** > **Preferences** > **Micro Focus** > **Help**.
2. Either disable or enable **Use online documentation**, depending on whether you want to see the documentation locally or online.

Online help (default)

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

    This opens a browser with the Visual COBOL help.

    Note: Ensure that you have an up-to-date version of your browser.

Local help

1. Configure Eclipse to use local help as detailed above.
2. Access the local help in one of the following ways:

    - Click **Help > Help Contents** to open the Help Viewer, then open the **Micro Focus**Micro Focus-branded documentation.
    - Alternatively, press **F1** inside the editor or after clicking a dialog within the UI.

Repairing

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

Before performing a repair of the installation, Micro Focus recommends that you create backups of any configuration files of the product that you might have changed.

Uninstalling

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

To uninstall this product:

1. Execute as root the `Uninstall_VisualCOBOLEclipse9.0.sh` script in the `$COBDIR/bin` directory.

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

    To uninstall Micro Focus License Administration:

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

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

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

Licensing Information

✏ **Note:**

- 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.
- 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*.

⚠ **Important:** The SafeNet Sentinel licensing system has been deprecated and will be not available in this product starting with the next major release - release 10.0.

The SafeNet Sentinel licenses will not be supported after release 9.0. You can only use AutoPass licenses from release 10.0.

You can replace your SafeNet Sentinel licenses with AutoPass licenses starting with release 8.0. However, it is not necessary to switch to AutoPass licenses unless you are adopting release 10.0. Contact Micro Focus Customer Care for further information.

To activate Visual COBOL Personal Edition

To activate Personal Edition:

1. Start Visual COBOL.

   If you have not installed a license for Visual COBOL, starting the IDE for the first time after you install the product opens the **Micro Focus Visual COBOL Product Licensing** dialog box. If you cancel this dialog box, you can invoke it again from **Help > Micro Focus > Product Licensing**.
2. Copy the authorization code which you were sent after registering for Personal Edition, and paste it into the **Authorization code** field.
3. Click **Finish**.

   You should receive a message that the activation has been successful.
4. Restart Eclipse to complete the activation process.

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 Licensing** to open the **Product Licensing** dialog box.
3. Click **Browse** next to the **License file** field.
4. Select the license file (which has an extension of either `.mflic` or `.xml`), and then click **Open**.
5. Click **Finish** to install the license.

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 Customer Care

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 Portal**.

> **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*.
- Micro Focus webinars: *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).

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.

Copyright and Disclaimer

© Copyright 2023 Micro Focus or one of its affiliates.

The only warranties for this product and any associated updates or services are those that may be described in express warranty statements accompanying the product or in an applicable license agreement you have entered into. Nothing in this document should be construed as creating any warranty for a product, updates, or services. The information contained in this document is subject to change without notice and is provided "AS IS" without any express or implied warranties or conditions. Micro Focus shall not be liable for any technical or other errors or omissions in this document. Please see the product's applicable end user license agreement for details regarding the license terms and conditions, warranties, and limitations of liability.

Any links to third-party Web sites take you outside Micro Focus Web sites, and Micro Focus has no control over and is not responsible for information on third-party sites.