Micro Focus Visual COBOL 5.0 for Eclipse Distributed Edition

Release Notes

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Contents

Micro Focus Visual COBOL 5.0 for Eclipse Distributed Edition 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 SupportLine Web site* for any updates to the documentation which might have been uploaded.

Product overview

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

- Visual COBOL for Eclipse - the product provides an Eclipse-based integrated COBOL development environment for Windows or Linux. Visual COBOL for Eclipse provides COBOL JVM support and enhanced compatibility with ACUCOBOL and can be used standalone for developing local applications or in conjunction with the Visual COBOL Development Hub to develop remote projects in Linux and UNIX.
- Visual COBOL Development Hub - the product provides a rich desktop development environment based on the Eclipse IDE with high-performance server-based tools for managing builds, source code access and the debugger engine. Visual COBOL Development Hub also provides a central administration site, simplifying the development tool distribution and maintenance process.

Upgrading from earlier Micro Focus products

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

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

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

If you are using 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

This release provides enhancements in the following areas:

COBOL Formatting

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You can now reformat your COBOL code in the editor according to your preference and standards. Formatting sets the indentation based on the configuration options which you can set in **Windows > Preferences > Micro Focus > COBOL > Editor > Formatter** (for Eclipse).

You can find the COBOL formatting features on the editor context menu (for Eclipse) menu.

Code Analysis

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You can now create the following views for your code:

- Program Flow Graph - enables you to view the overall structure of the COBOL program with nodes representing sections and paragraphs. PERFORM statements between them which affect the program flow are represented by links joining the nodes. External calls to other programs are shown but cannot be expanded in the Program Flow Graph view. Hovering over the nodes shows a tooltip containing the code representing the respective sections or paragraph. Clicking a node or a link joining said nodes positions the code editor to that point in the source, allowing quick and easy navigation of the program.
- Data Flow Analysis Tree - enables you to select a data item and then either statically trace what might change its value or what other data items it might affect.

Enterprise Server Common Web Administration

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Note: This feature is in Early Adopter Product (EAP) release status.

Visual COBOL now includes a new Enterprise Server Common Web Administration interface (ESCWA). ESCWA is a web user interface and server for modern administration, monitoring and control of Enterprise Server. It offers improved usability that consolidates the different Enterprise Server user interfaces so that native and managed regions, and security stores can be managed in one place. Features include:

- Administering directory servers across multiple hosts.
- Monitoring and control of Enterprise Server instances.
- Configuring and administering a security store, defined in an LDAP-compatible security manager such as Microsoft Active Directory or OpenLDAP.
- Administering the Scale-Out features - enable you to specify logical groups of Enterprise Server instances, and configure and run Performance Availability Clusters (PACs) and their related Scale-Out Repositories (SORs).
- Administering, monitoring and control of Enterprise Server for .NET regions and listeners.
- The use of current web frameworks that have a greater focus on security.
- (Included with 5.0 Patch Update 2) - support for Enterprise Server XA, MQ and PL/I configuration and monitoring. This includes support for XA resources, configuring MQ, Listeners and Writers, PL/I, MFCS console, Region Trace options, displaying the current ESMs on logon page and Local/loopback connections warning changes.

Application Workflow Manager

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Improvements have been made in the following areas:

- Tools from the AWM, Eclipse, and ISPF Function Packages have been restructured and improved:
  - Tool parameters are now named so that the position of the parameter is not significant anymore.
  - You can only specify parameters which are supported by the tool.
  - Only the parameter types String and File are now supported.
  - Mass Processing is now an attribute of a tool parameter and is no longer a special input/output parameter type.
  - The tool relationship "Resource Operation Value" replaces the parameter type "ToolDefinedResourceOperation".
- A new REST Function Package has been added. It provides support for the following functions - DELETE, HEAD, GET, PATCH, POST, and PUT.

  The new JSON File Descriptor has been provided to support REST payloads. This function package enables you to integrate RESTful API with your AWM workflow. See *REST Function Package* in your product Help.
- New tools in the Eclipse Function Package enable you to store and retrieve information from the Eclipse secure store:
  - Save To Secure Storage; Read From Secure Storage; Delete From Secure Storage

  You can use these tools to securely store login credentials to a remote system and reuse the information for subsequent access.
- A new attribute is now available to enable you to add comments to every model component in the AWM model editor. See *Comments in the AWM Model Editor* in your product Help.

COBOL Language Enhancements

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The following enhancements have been made to the COBOL syntax:

- ISO2002 conditional compilation - an additional mechanism for conditional compilation, the ISO2002 Conditional Compilation method, is now available. This has been implemented as part of the support for Enterprise COBOL 6.2.

  The following compiler directing statements are supported:

  ```
  >>DEFINE
  ```

  ```
  >>IF/>>ELSE/>>END-IF
  ```

  ```
  >>EVALUATE/>>WHEN/>>WHEN OTHER/>>END-EVALUATE
  ```
- The JSON PARSE statement enables you to convert JSON text into COBOL data formats. This has been implemented as part of the support for Enterprise COBOL 6.2.
- INSPECT statement - the performance of INSPECT... CONVERTING has been improved, particularly for cases where `source-alphabet` is long.
- Support has been added for the portable syntax for SET - set[string].

Compiler Directives

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The following Compiler directives are new in this release:

JVMTARGET	Specifies the JVM version number targeted by the class files generated in this compilation unit.
ILNORMALIZENAMES	Determines the program elements that are normalized when a program is compiled to .NET or JVM COBOL. Normalization in this context results in replacing all $ and - (hyphen) characters with _ (underscore) characters in the name of the generated class file.

Consolidated Trace Facility (CTF)

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This release provides the following enhancements:

- Availability of CTF from the Eclipse interface - a new property tab, CTF, in the Eclipse launch configuration dialog box helps to enable CTF tracing and specify a CTF configuration file. By default, the trace files are then saved in a **Logs** subfolder within the project's folder.
- Dynamic CTF - it is now possible to configure the CTF dynamically from outside the process being traced. This feature is only currently available on Windows platforms.

  Using a new command line utility - `cblctd` - you can alter the tracing events of running applications that already have CTF tracing enabled. You can alter trace levels, add or remove components to or from the trace, and also configure the emitters in effect.

  Additionally, there is also a new component that you can trace - mf.mfdbfh enables you to trace activity of the Micro Focus Native Database File Handler.

Data File Tools

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This release provides the following enhancements:

- The Data File Editor now includes a Compare Files tool that enables you to compare the contents of two data files side-by-side.
- Structure files, and the layouts within them, can now be created within the Data File Editor; you no longer need to use the Classic Data File Tools utility to manage your layouts.
- When connecting to a VSAM dataset stored in an enterprise server region, you can store any passwords required for access, for the duration of your current session.
- You can view archived JES spool jobs that have been merged into one spool file using the merging archived spool files process.
- You can now quickly duplicate records in non-indexed files, using the Duplicate Record option.

Database Connectors

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You can now create an identity column in your database by using a new XFD directive - IDENTITY_COLUMN. This must be specified on a numeric field.

Debugging

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This release includes the following enhancements:

- Animate - Eclipse now includes an additional menu option when debugging a COBOL program for setting the speed and toggling Animate mode. When active, the program will automatically step through each line of source code, updating the source code in the editor, the Debug Stack, Outline and Variables Views. See *Debugging Commands and Options* in your product Help.
- Conditional watchpoints - you can now specify conditions and hit counts for COBOL watchpoints. A condition can be in the form of an expression or it can be a hit count (for the number of times memory associated with a data item has been updated). The condition is evaluated each time the data item being watched changes. If the condition evaluates to true, then program execution stops. This enables more fine-tuning of the current watchpoint support and is useful when debugging large, complex programs.
- Dynamic core dumps - you can now invoke a core dump programmatically and continue execution of your program. A new library routine, CBL_CREATE_CORE, enables you to produce a core file for the current process or a process owned by the same user that owns the current process.
- Improved visibility of the PERFORM stack - the PERFORM stack and PERFORM range names are visible in system debuggers such as gdb in many cases on 32-bit Linux with Intel architecture and Solaris with Intel architecture. This was already the case on AIX, 64-bit Solaris-Intel, and all other Linux platforms (including 64-bit Linux-Intel).
- Live Recording - a new environment variable, COB_LIVE_RECORD_SIZE, is now available to aid performance during the creation of a live recording file. Use it to specify the amount of memory (in MB) that is to be used to store events that are to be written to the live recording file. When the limit is reached, the buffer is cycled so that the oldest events are removed to make space for the most recent events.
- In order to include source line numbers in run-time error messages, which makes the diagnosis of issues in your program easier, the COBOL compiler now produces `.idy` files by default when building from the command line, unless the NOANIM directive is specified. You can safely remove `.idy` files after compilation if you do not need them; they do not need to be distributed with your application unless you want to debug your code. However, unless you specify the ANIM directive, generated executables such as `.dll` and `.gnt` will not be debuggable, which is consistent with prior behavior.

Note: Behavior has not changed if you are using an IDE or build scripts generated by an IDE.

- Stackdump files (Linux Intel 64-bit, Solaris Intel 64-bit, and Linux/390 platforms only) - you can produce a stack trace for applications in a production environment that encounter a Run-Time system error. Use the stackdump_on_error and stackdump_filename tunables to configure the production of a stackdump file when an error occurs, from which you can locate the exact line of failing code in your program.
- A new configurable tool is now available that dumps to a file stack traces of all threads in process on any Run-Time System error. [Linux Intel, Solaris Intel, zLinux only – requires ANIM on 32-bit Linux Intel]. This is only supported for native COBOL.
- Line number information is now being output for optimized builds (on Linux Intel 64-bit, Solaris Intel 64-bit, PowerLinux, zLinux, and Solaris SPARC platforms only). This is only supported for native COBOL. Because of what optimization does, the information is imperfect, but it remains highly indicative. This gives the following advantages:
  - Enables the use of the stackdump utility (where available) for optimised builds.
  - Provides location information should a signal occur when running in a system debugger such as gdb.
  - Provides some limited ability to step through optimized code in system debuggers.

Eclipse Integration

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This release includes enhancements in the following areas:

- Supported Eclipse versions - this release supports Eclipse 4.7 (Oxygen) and 4.8 (Photon). The setup file installs Eclipse 4.8.

  Eclipse 4.6 (Neon) is no longer supported.
- Java support - the 64-bit Java 8 is required to run the Eclipse IDE. The setup file installs Adopt OpenJDK 8 (u202) with Hotspot. Java 8 (32 or 64-bit versions), and Java 11 (64-bit version only) are supported for executing JVM COBOL code and for native COBOL and Java interoperability. For full details on the supported Java versions, see *Software Requirements* in your product Help.
- COBOL editor:
  - Automatic insertion of END statements - Eclipse now automatically inserts the end clause for IF, EVALUATE, PERFORM, EXEC and TRY statements.
  - Automatic insertion of closing symbols - by default, Eclipse now automatically adds closing quotes and brackets where required.
  - Search text positioned between specified columns - the **Micro Focus Find/Replace** dialog box now includes options to search between specified columns in the code.
- Directive sets - Compiler directives for your projects are now saved in language-specific `.mfdirset` XML files stored within a `.settings` subfolder in the project's folder. You can create your own versions of `.mfdirset` files and verify them against an XML schema that Micro Focus supplies.

  Previously, all settings were stored in a single, proprietary IDE project file. Existing projects which currently specify directives and other similar settings in the `.cobolproj` file will be upgraded to use the new `.mfdirset` files when imported or loaded in Visual COBOL 5.0. If you are storing your source code in a source control system, ensure that you add the `.mfdirset` files to source control as well.
- Remote connections - support is available for automatic SSH tunnelling of Visual COBOL Development Hub network traffic. You can route most Visual COBOL Development Hub network traffic using SSH port forwarding. This makes developing on a remote UNIX host running a firewall easier to configure. In addition, the network traffic is encrypted as it is being sent within an SSH tunnel. See *To create a connection to a remote UNIX host running behind a firewall* in the product Help.
- User Interface:
  - The **COBOL Explorer** view uses an icon overlaid with P to indicate COBOL programs that will not be built because they are preceded by another of the same name on the build path.

- Improved settings UI - the COBOL, and the Run-time Configuration settings pages now use a property grid that also shows the definitions of the settings.

Enterprise Server Security

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This release includes the following enhancements:

- Security - security features can now be employed when developers and administrators install new COBOL services (web services and EJBs) into an enterprise server instance over the network. There are a number of authentication and authorization options that can be enabled. See *Deployment Listeners* and *The .mfdeploy File* in your product Help.
- Vault Facility - a new security feature has been added that enables some Enterprise Server components to keep certain sensitive information in a form of storage defined as a vault, accessible via a configurable vault provider. The default vault provider stores data in encrypted format on disk.
- OpenSSL 1.1.1 - the OpenSSL security provider has been updated to OpenSSL version 1.1.1.

  This is the stable Long Term Support version of OpenSSL.

  - Added support for the ratified TLS protocol version 1.3. TLS 1.3 benefits include:
    - Much shorter initial connection negotiation sequence. This reduces the time taken to establish a link before starting to transmit data.
    - Using only the most secure ciphers and hash methods.
    - TLS 1.3 will be negotiated in preference to the older TLS protocols.
  - Added support for new Ciphers and Key Exchange groups in line with TLS 1.3 requirements.
  - The default security level for previously configured endpoints has been moved from Security Level 0 to Security Level 1. This removes the ability to accidentally make use of known-weak elements such as SSL3 and MD5. Similar changes to the default Security Level have recently happened to Java, Chrome, Firefox, and other systems providing secure connections.
- Fileshare Security - the Fileshare Secure TCP/IP transport provider now supports the trusted use of X509 certificates bearing the name of the Fileshare service as the Common Name element of the certificate.

  In previous releases, a secure connection to a Fileshare server was made using a certificate that represented the network location upon which the Fileshare service was located. This method is still supported, but does not distinguish between the exact Fileshare server that is being connected to when more than one service can exist on a single host system. With this change, individual Fileshare services can identify themselves by using a unique certificate. While running on the same host and registered with the same network endpoint.
- Support for Active Directory user groups and group name mapping - the Enterprise Server External Security Facility's MLDAP ESM Module can now use Active Directory user group objects for Enterprise Server user groups. Also, the module can now map long group names to the 8-character-maximum names required for mainframe emulation.
- Selective auditing - administrators can audit only security activity of particular interest, reducing audit overhead and the volume of events. The Enterprise Server External Security Facility's MLDAP ESM Module can now enable ESF Audit events only for particular users, groups, and resources.
- Improved interaction with LDAP client libraries resulting in fewer LDAP-related issues and easier diagnostics - the Enterprise Server External Security Facility's MLDAP ESM Module has improved interoperation with LDAP client libraries:

  - The client library vendor and version information is logged after the library is loaded
  - The module has better heuristics for loading the correct library supplied by the OS vendor, so the "provider" configuration option can generally be omitted
  - For OpenLDAP, the module sets its proprietary "connect timeout" option

- SNI support (requires 5.0 Patch Update 1 or later) - support has been added in Patch Update 1 for the Server Name Identification (SNI) extension to TLS. This helps to avoid connectivity issues related to a growing number of Web services being hosted on SNI servers.

Micro Focus Unit Testing Framework

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This release provides support for the following functionality:

- Data-driven unit tests - a new type of test suited to testing data where values read from a source are passed through the same tests.
- Test output colorization - test output can now include basic colorization for supported terminal emulations. This feature must be run from the command line.

Platform Support

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Support is now available for the following additional or updated operating systems:

- SUSE (Power) 11 SP3, 12
- Red Hat (Power) 7.2, 7.3
- Windows Server 2019

For a full list of supported platforms, check *HTTPS://SUPPORTLINE.MICROFOCUS.COM/PRODAVAIL.ASPX*.

Product Documentation

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The following is new in this release:

- The *Comparison of COBOL with Other Managed Languages* document has been updated to reflect the recent enhancements in the .NET and JVM COBOL support.

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.

Where present, the numbers that follow each issue are the Support Incident Numbers followed by the Reported Problem Incident (RPI) number (in parentheses).

Common Communications Interface

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- Certificate subject names are now correctly checked against the name the client is attempting to connect to. Certificates registered to "localhost" should now work as expected.
- The default Cipher Suites List now includes @SECLEVEL=0. This indicates that backwards compatibility with old certificates such as MD5 is to be retained. As a result of this change, you need to review your use of the Cipher Suites List and of any old certificates.
- If using Micro Focus Common Client(MFCC) or Micro Focus Communications Server(MFCS) to connect to a non-existent remote host, it was possible to create a connection to a server listening on the same port on the local system. This is no longer possible and a bad address error is reported in the error logs.
- By default, in this and previous releases an SSL/TLS CCI client can trust a server which resides on an IP address that is not an intended connection target. You can now specify the ssl_only_verify_literally option in your CCI.INI file to restrict the certificate check to improve security. See “CCITCP Security Options in the CCI.INI File” in your product Help for more information. When connecting to a non-CCI protocol server, all clients perform strict certificate checking as the new default behavior

Compiler

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- The Search order has been updated, to allow the Compiler to find Java.

Data Tools

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- Accessing a dataset through the Data File Editor now obtains a shared lock on Enterprise Server when you open the file in shared mode.

  3170479 (1115346)

Documentation

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- The ANIM Compiler directive has changed its default when compiling from the command line on Windows platforms. The default is now ANIM. (Compiling from the IDE still defaults to ANIM.)
- The validation of server certificates for TLS (also known as SSL) connections has been corrected. This is likely to cause connection failures in cases where previously connections were incorrectly allowed. For example, if Fileshare is secured with TLS, client applications must be configured to use the hostname of the Fileshare server as it appears in the server's certificate. If the Micro Focus Directory Server is secured with TLS, then MFDS clients, such as the casstart command-line utility, will need to connect to it using a hostname that appears in the certificate MFDS is using. (Note that a certificate can contain multiple hostnames.) Consult your Certification Authority administrator for more information.

  3192497 (1117068)

Eclipse IDE

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- In the Expressions view, there has been a change to the way that the number of characters displayed is controlled. The Hex part now always displays the same number of characters as the raw data part (note that Eclipse enforces the character limit, so the number entered by the user will include those used to display the hex values). A maximum length entry of 0 is now correctly interpreted as "no limit".

  3161694 (1114658)
- Eclipse now colorizes files that it will not build because they are preceded by other files of the same name on the build path. The icon of such files is overlaid by an I or P and Eclipse shows a tooltip with an explanation. This is to clarify the difference between this scenario and build-action-ignored.

  3161416 (1114607)
- Micro Focus Find/Replace now provides a Column Scope group that enables you to limit searches between columns. You can specify columns or alternatively you can search only in the main code area for the file type open in the editor. By default, it searches in all columns.

  3142899 (1112931)
- Compiler directives are now stored in .mfdirset files which can be specified for particular languages, at project/config/folder/file level.

  2853665 (1104556)
- By default, COBOL, COBOL JVM, and Mainframe COBOL Projects have the EXITPROGRAM"ANSI" directive set in the Project Settings > COBOL Properties. This specifies that if the EXIT PROGRAM statement is executed in a program that is not under the control of a calling program, it causes execution of the program to continue with the next executable statement. See EXITPROGRAM in your product Help for more information.
- The COBOL JVM method breakpoint can now be toggled on the heading of the method.
- The Eclipse IDE has an improved user interface for settings. The COBOL, IMS, and the Run-time Configuration settings pages now use a property grid that also displays the definitions of the settings. As part of these changes the **Output path**, **Target type**, and **Bitism** are now specified in the project's Link properties, click **Micro Focus** > **Build Configurations** > **Link**.

Enterprise Server

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- A number of audit events now contain some additional information.

  3140310 (1112666)

- Previously, the /x option of the CASRDTEX utility had been duplicated to drive XML output. This prevented the export of transactions which was the original meaning of /x. To generate an XML export, you must now specify the option /xm.

  3180233 (1116108)
- casfhsf could hang when processing HSF files that contain records from tasks that ran in different months.

  3177385 (1115884)
- A new system transaction, CRCN, is now available to monitor the state of XA connections for each resource manager (RM) entry defined in the system. CRCN is a replacement for the former XA Reconnect facility that recycled SEPs on connection loss. The XA Reconnect facility was configured by setting the ES_XA_RECONNECT environment variable. CRCN also uses this environment variable, although its usage differs slightly. For more information see your product Help.

  3174272 (1115727)
- On Windows, any casout and cassub messages are displayed on cassub and casout API invocation if the environment variable ES_CAS_API is not set to "ON".

  3160400 (1114458)

Enterprise Server Auditing

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- Auditing on big-endian platforms now correctly interprets numeric audit data.

File Handling

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- RELFORMAT=MF|RM is now enabled for FOLDER and other filename tags.

  3164916 (1114803)
- The SORT-CONTROL special register is now supported during a SORT statement.

  3159740 (1114389)
- To direct the handling of relative files to a particular file handler (either MF COBOL or RM/COBOL), use the RELFORMAT=MF or RELFORMAT=RM configuration options within the [REL-DEFAULT] tag of the EXTFH.CFG file. (The default is RELFORMAT=MF.)

  3157247 (1114149)

Interface Mapping Toolkit

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- If you try to deploy a stateful EJB SVI from the Visual Studio IDE after unchecking the “Reuse container after application termination” check box (in the Deployment Characteristics tab of the Runtime Environment Configuration dialog box), you receive a warning message informing you that the “Reuse container after application termination” setting will be set to true for the deployment in order to prevent the crash. In the Eclipse IDE, the unchecking of this option will just be ignored, and the option re-selected. A warning to not uncheck the option for stateful EJB SVIs is also displayed on the prior page (to the dialog box).

  2663812 (1090987)
- WSDL and JSON Schema files generated for bottom-up CICS Web services now include a "maxLength" parameter for all string fields.

  3175039 (1116241)

Micro Focus Directory Server

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- The event codes for several MFDS audit points have changed.
- On Windows, by default, the Enterprise Server Administration Web interface can only be contacted using the loopback address (localhost or 127.0.0.1). You can enable remote access to the Web interface by turning off the loopback mode. See "Using the Loopback Address" in your product Help for more information.

MFCRYPTLIB

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- Passing an incorrect keyfile passphrase no longer results in receiving an RTS115 error in MFDS.

  3181743 (1116186)

Request Packet Interface API

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- The default behaviour for TLS certificate Common Name (CN) matching has changed for release 5.0. It now requires a strict match on the CN value or any Subject Alternate Name (SAN). For example, 127.0.0.1 and localhost are no longer implicitly equivalent, nor are hostname and its IP address or fully-qualified domain name (FQDN) variants. When starting a region from the Enterprise Server Administration Web interface, a resolved IP address is used for the casstart -m parameter value. A resolved IP address is also used even if a hostname is specified on a command line startup.

  To change this behavior and use a resolved hostname value (as determined by the machine TCP configuration, for example, hosts file entries.) set the environment variable MFDS_DNS_RESOLVE=Y. To use an unresolved string literal hostname, for example, a value explicitly passed in via the casstart –m command line parameter, set MFDS_DNS_RESOLVE=N.

  3194613 (1117203)

Known Issues

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

In addition, note the following:

- In Visual COBOL 4.0 and 5.0, in an extremely small and limited set of cases, an issue could occur with running older .NET executables and .dll, and older JVM .class files. 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, and executed in Visual COBOL 4.0 or 5.0.

  In these rare cases, the IS NUMERIC test could provide the wrong answer. To resolve the issue, you need to recompile any programs that uses this construct in Visual COBOL 5.0.

  Program that do not use NATIONAL data, or those that have already been recompiled in Visual COBOL 5.0 are not affected.

- On Linux, the marketplace client in the supplied version of Eclipse will not work correctly if the product is installed in a spacey directory. Micro Focus recommends that you avoid installing the product in a spacey directory on Linux, if you want to install any additional plugins from the Eclipse marketplace.

Resolved Issues

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

Adis

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- ERASE EOL no longer stops Keisen attributes being inherited when enabled by x"AF" function 81.

  3169584 (1115178)
- ACCEPT LINE POSITION data-item, where data item has the JUST clause, now works as expected when the ADISCF pre-clear option is selected.

  3126794 (1111471)
- BLANK SCREEN BACKGROUND-COLOR n, where n > 7, now sets the intensity so that the bright version of the color is used to fill the screen.

  2856949 (1103978)

Application Workflow Manager

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- AWM now supports processing output parameters returned by z/OS jobs submitted by ISPF tools.

  3176750 (1115818)
- An issue with resource out-of-sync exceptions while loading AWM systems has been resolved.

  3174553 (1115645)
- Added additional trace options for debugging problems related to AWM function packages. See "Gathering information for Micro Focus SupportLine" in the product Help for more information.

  3169085 (1115199)
- The "Compile" context menu command was not visible when multiple programs were selected in the "Application Explorer" view.

  3161802 (1114563)
- Viewing VSAM files from the MVS Explorer with the Micro Focus Data File Tools editor caused an exception and locked the mainframe file. This is now fixed. Opening a non-VSAM file with any external editor now produces a descriptive exception.

  3149730 (1113716)
- When Link with Editor is active in the Remote Systems view, the corresponding remote element is selected in MVS Explore and JES Explorer depending on the active editor.

  3142129 (1112852)
- You can now edit or browse data sets or members referenced by DD DSN statements from the JCL editor.

  3140150 (1112968)
- The effective record length of z/OS files opened through MVS Explorer is now displayed as a dark red dotted margin in Micro Focus editors.

  3139675 (1112970)
- Password property values are now masked in AWM views and basic trace messages. They do not offer encrypted password security.
- The default value for a property is now also respected for mass processing input parameters of tool descriptors.
- Jobs are now sorted by their local submit time in the Jobs view with the most recent positioned at the top of the list.
- The z/Server Search function did not work properly on data set names with special characters - for example "§" with code page IBM01141.

  3182423 (1116249)
- Using the AWM Eclipse Base Model template caused exceptions on loading cached elements, for example, after restarting Eclipse. This has been fixed.

Character Animator

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- Animator no longer slows down when continuously pressing Step.

  3175862 (1115750)
- Animator can now successfully locate executables via the COBPATH environment variable when the COBPATH value is longer than 1024 characters.

  3160496 (1114416)
- Breakpoints are saved (that is, an .aif file is created) when CBL_DEBUG_START is used and the process terminates.

3143776 (1113225)

Cob/Cbllink/Cblnames (32-bit PC)

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- Creating an executable or shared object with the cob flags -U or -d no longer results in an assembler error message.

Codeset Support

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- Conversions from ASCII to EBCDIC, with null data, no longer get corrupted.

  3155499 (1114114)

Compiler

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- A GO TO statement that references a qualified data name, rather than a procedure name, is now correctly rejected by the Compiler.

  3191922 (1117013)
- A DBCS data item with a VALUE clause specifying ALL NX literal is now correctly rejected by the Compiler.

  3191623 (1116974)
- Large UNSTRING statements no longer produce the following error: "001-f internal error 49".

  3189648 (1116838)
- A SET 88-level TO TRUE statement when the associated field is national is now working as expected.

  3185855 (1116554)
- A valid data declaration with a RENAMES THRU clause referencing other level 66 items no longer produces Compiler error "COBCH0239S First data name does not precede second".

  3184128 (1116376)
- Parsing programs that contain numerous errors no longer causes Eclipse to crash.

  3183896 (1116502)
- A WHEN OTHER clause directly following another WHEN clause in an EVALUATE statement is now rejected by the compiler when an Enterprise Cobol dialect is specified. This emulates the mainframe behavior.

  3183810 (1116464)
- An RM dialect now supports data names up to 128 bytes in size.

  3182342 (1116261)
- Specifying an inline method invoke inappropriately (such as in a SUBTRACT statement) now receives a Compiler error, as expected. Passing inappropriate operands BY REFERENCE is similarly rejected.

  3180642 (1116128)
- A program compiled with the prexml preprocessor and the directive 'NOQUAL' now compiles as expected.

  3179843 (1116304)
- A REPLACE statement that caused the last token of a copyfile to be replaced with a longer token, and thus caused the creation of an extra line, now works as expected.

  3178437 (1115957)
- A COBOL program compiled with a mainframe dialect should treat mainframe KSDS files correctly. They are of variable length regardless of whether the "record varying" phrase is used in the FD.

Previously, this was not being honored and when program A was calling program B using external files, you received an RTS 226 error message.

3176783 (1115839)

- User-defined functions with LOCAL-STORAGE data now compile and execute as expected.

3176478 (1115792)

- A DISPLAY statement as the last line of an ON EXCEPTION clause of another statement, with a following NOT ON EXCEPTION clause for the containing statement, and compiled with the RM compiler option, now compiles as expected without internal errors.

3175442 (1115876)

- An INSPECT CONVERTING statement with hexadecimal literals and compiled with CHARSET(EBCDIC) now executes as expected.

3174833 (1115673)

- Constructions of type INSPECT CONVERTING ZERO to <variable-name> now produce correct object code and execute as expected.

3174064 (1115580)

- An SQL program with file declarations and a missing WORKING-STORAGE header now executes as expected.

3169882 (1115216)

- During compilation, if the LIST directive had been specified and a license error occurred, an RTS error 114 would result. This has been fixed.

3169377 (1115474)

- During compilation, if the LIST directive had been specified and a licensing error occurred, you received an RTS error 114.

3169377 (1115319)

- A COPY REPLACING statement spanning multiple lines, with commas on the end of those lines, is now processed as expected; that is, those commas are treated as meaningful characters rather than simply separators.

3168125 (1115173)

- PARAGRAPH and CYCLE are now correctly treated as context sensitive reserved words under an Enterprise COBOL dialect, allowing them to also be defined as user data names.

3167488 (1115004)

- COPY SUFFIXING and COPY PREFIXING syntax now compiles and works as expected for long DBCS words.

3166159 (1114885)

- The IMTK wizard can now process COBOL source that contains non-standard characters, such as an ampersand.

3164533 (1115157)

- Syntax involving an EXEC keyword, within an EXEC SQL statement, is now processed as expected.

3162629 (1115879)

- The INSPECT ... CONVERTING ... TO FUNCTION ... syntax is now working as expected.

3160325 (1114393)

- Compilation with the CP preprocessor, of a source that has very long lines and unexpanded tab characters at the end of those lines, now works as expected.

3160255 (1114436)

- A DISPLAY of a group item containing a large table, in a program containing the 'CONSOLE IS CRT' special-name clause now compiles successfully.

3157068 (1114326)

- The performance of the following syntax has been significantly improved, especially where source-alphabet is long: INSPECT CONVERTING source-alphabet TO target-alphabet

  3157067 (1114137)
- DISPLAY of a SCREEN SECTION sub-group no longer gives a COBRT153 error if there are other sub-groups with OCCURS items with un-initialized indexes.

  3154391 (1113915)
- Printer files under an RM dialect are now emulated correctly.

  3143299 (1113494)
- DISPLAY UPON ARGUMENT-NUMBER now behaves as expected under CHARSET"EBCDIC".

  3116649 (1110478)
- When evaluating a method invoked inline as in the example below, the method was executed for each WHEN statement which could result in undesired side effects. Example:

  ```
  evaluate object::"method"(1)
  when 0
  when 1
  when 2
  ```

  Now, the result is stored in a temporary item and used in any comparisons with the expressions in the WHEN clause.
- Compiling a very large COBOL program with many GO TO statements to JVM no longer results in a verification error on program load.

  3188208 (1116743)
- A CALL statement USING by reference the address of a non-01-level linkage item no longer causes the containing linkage record to have a new address on return from the call.

  3179701 (1116403)
- Very large programs including XML PARSE or XML GENERATE statements no longer produce system errors during compilation to JVM.

  3179669 (1116054)
- An INSPECT phrase without BEFORE/AFTER, followed by another with either BEFORE or AFTER, no longer leads to incorrect results.

  3172678 (1115458)
- With the ODOSLIDE directive on, bad code is no longer sometimes generated for JVM, and you no longer receive a verification error at program load.

  3167786 (1115063)
- Very large programs with highly overlapping perform ranges could generate bad class files, causing verification errors when attempting to load. This has been fixed.

  3166644 (1115146)
- This release provides a new utility, GetBias. It enables mapping of line numbers output from large COBOL programs compiled to JVM onto real sequential line numbers. If the length of a COBOL program exceeds 65536 lines, the compile will adjust the line numbers output to the JVM class file, but subtracting a 'bias' value from the actual value. In cases where such a program throws an exception, and the line number is therefore displayed as part of the stack trace, the GetBias utility enables you to discover the true sequential line number.

  3161708 (1114641)
- When compiling for managed code, if a variable length group is passed as a parameter to another program, the generated code was attempting to evaluate the current length of that variable length group. In native code, this evaluation only happens in the case where the OCCURS DEPENDING ON item is not itself part of the variable length group. This difference meant that in some cases a null pointer exception could occur in managed code, whereas native code executed without error. Managed code behavior has now been modified to be compatible with that of native code.

3154134 (1113891)

- When debugging an SQL program, stepping an EXEC SQL OPEN statement could cause the final line of the program to be incorrectly highlighted.

3191710 (1117009)

- In native generated code, on all platforms except Intel x86 32-bit, a COMPUTE statement with fixed-point operands and a floating-point (comp-1 or comp-2) target could give the wrong result if a fixed-point operand was used twice in the expression. This bug has been fixed.

3188676 (1116745)

- On the IBM mainframe, when code is compiled with NOPFD, and when an unsigned COMP-3 item containing an invalid sign nibble (such as 0xD) is the source item in a MOVE to another COMP-3 item, the sign nibble is fixed up to the correct value: 0xC for a signed COMP-3 target, and 0xF for an unsigned COMP-3 target. Micro Focus COBOL now emulates this behavior when code is compiled with SIGNFIXUP.

3173432 (1115972)

- An issue where the COBIDY directive was handled inconsistently between the Compiler and NCG has been fixed.

3163263 (1115112)

- A generate time error where the following message was produced has been fixed: `FATAL ERROR in ../coil/cio_jopt.c:deleting_bc() line 41; expected compare .`

3160837 (1114435)

- For 32-bit generated code on Intel x86 platforms only: A bug has been fixed where a DISPLAY statement in generated code, compiled with LINKCHECK, would not give an RTS 203 error when using an unassigned linkage item.

3159106 (1114292)

- In generated code, a move of the form "MOVE NATIONAL-ITEM TO NATIONAL-ITEM-JUSTIFIED" produced incorrect results when the target item was longer than the source.
- CHAIN <literal> ON EXCEPTION and CHAIN <literal> ON OVERFLOW did not work correctly when the overflow case occurred in native generated code on all platforms, with the exception of Intel x86 32-bit. This has been fixed.

Enterprise Server

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- There is no longer an issue with the order of file retrieval for the list of console logs affecting the calculated maximum log number.

3192214 (1117023)

- LRECL fields are now displayed correctly in Data File Tools when accessing Enterprise Server hosted data files.

3186524 (1116586)

- An issue with stopping printer terminals has now been resolved.

3185553 (1116498)

- MQ Security is now used when using DSNRLI.

3183523 (1116641)

- In Data Files Tools, the performance of opening a PO dataset that is hosted within Enterprise Server has been improved.

3178780 (1116293)

- An issue that caused CTG requests using SNT users to be rejected has now been resolved.

3178729 (1115967)

- An issue with IBM PCOM was resulting in different colors in BMS in RUMBA and PCOMM. To work around this, use the new environment variable ES_3270_REMOVE_NULL_COLOR_ATTRIB. Set ES_3270_REMOVE_NULL_COLOR_ATTRIB to y or Y to prevent the color attribute set to null from being sent in a 3270 flow.

  3176924 (1115831)
- The MQ XA switch modules now supports the BATCHONLY option.

  3173781 (1115552)
- Previously, xwbauth user exit was not invoked if URIMAP path was greater than 64 characters.

  3173349 (1115514)
- When a region was configured to use Extended User Storage, the associated memory was not registered with MFPM. This resulted in issues when using GETMAIN SHARED from a program compiled with the AMODE directive.

  3173307 (1115549)
- casout will no longer crash when using the /v option and there are more than 256 initiators/batch printers/mprs.

  Information for approximately 1300 processes can now be returned. If more than that exist, then casout will return as much as it can and set return-code to 4.

  This may be caused by schedulers using the entry point 'casout_getSEPS'. This can be called after using the casout API with the /v option. The signature for this entry point is:

  entry 'casout_getSEPS' using lk-casout-area.

  lk-casout-area is defined in casbout.cpy but can only hold information for up to 256 processes. If there are more than 256 processes then a call to this entry point will return truncated data (that is, 256 instances) and set return-code to 4.

  Since casout /v can now return data for more than 256 processes, a new optional parameter, which is a pointer, has been added to casout_getSEPS:

  entry 'casout_getSEPS' using lk-casout-area lk-casout-user-area-ptr.

  If there is data for more than 256 processes, then this pointer will be set to the address of the entire block of data.

  3171604 (1115376)
- Transaction routing requests from the same terminal to an ISC connected region involving a DPL request to an APPC connected SYSTEM now execute successfully.

  3170073 (1115270)
- Transactions with a timeout that was running over midnight were timing out prematurely at midnight.

  3169194 (1115144)
- Event manager exits that are enabled for SEP termination events are now invoked when a SEP, Initiator, MPR or a printer is stopped cleanly (from ESMAC and casout) and not just when they are killed.

  3168159 (1115051)
- The cursor position is now correctly identified when using floating maps - a map on top of another map.

  3166543 (1114958)
- If created from a previous run, cas_ipcs.lst and cas_ps.lst will now be deleted at the next region startup.

  3165807 (1114872)
- In a heavily loaded Enterprise Server cluster, it was possible for jobs to be dispatched to a printer process instead of to a batch initiator. This would result in the job's lock being permanently held and prevent further submission of jobs of that name.

  3162806 (1116082)

- When Enterprise Server activates an LU62 connection to the mainframe or to another APPC linked system, you can now leave the modename to SPACE. This indicates that the remote side of the APPC connection should use an elected default modename.

  3162296 (1114713)
- The position of a cursor on a map which size is different from that of the terminal size was incorrect. This has been fixed.

  3158745 (1114273)
- In an ESM secure region, when the userid field in a terminal definition was populated, there were issues at region startup or when trying to install the TERMINAL resource.

  3158468 (1115137)
- The environment variable ES_DDBG_PORT_RANGE now supports ports that include less than five characters.

  3158205 (1114237)
- With ES_XA_NB_RETRIES=-1 specified, Enterprise Server would leak SHM if the connection to the XA RM was lost.

  3158011 (1114246)
- An issue where a region would take too long to start up and eventually fail to start has been resolved.

  3153774 (1113875)
- Return codes from file operations on the spool files are now displayed correctly when there is an error.

  3153516 (1113882)
- When Data File Editor accesses files managed by an enterprise server region, users now need UPDATE permissions in order to access the file exclusively.

  3152798 (1113831)
- When connecting a TN3270 to an Enterprise Server instance, if the connection was lost, the printer could not be reconnected. Now you can navigate back to ESMAC, then Clients, and stop the printer in order to reconnect it after a loss of the connection.

  3142113 (1112847)
- Formatting a trace that was captured during the period when the clocks went back an hour will now format the entire trace. Previously, the formatter would exit at the point when the clocks changed.

  2876312 (1106883)
- An issue with exporting PCT resources has been resolved.
- Enterprise Server, LDAP-based security: The use of Active Directory groups, or other group classes that specify membership using LDAP Distinguished Names, now works correctly when the "user ID attribute" configuration option is also used.

  3187284 (1116696)
- The Enterprise Server External Security Facility (ESF) now strips leading and trailing whitespace from the user ID and other relevant fields in Verify (user authentication) requests.

  3185569 (1116548)
- For Enterprise Server LDAP-based security, recent fixes to group processing exposed an issue when multiple LDAP repositories are used and all-groups mode is enabled. This could cause some or all of a user's group memberships to be disregarded, leading to incorrect denial of access to resources. The problem has been corrected.

  3182724 (1116269)
- Enterprise Server's MLDAP ESM Module now supports setting LDAP passwords using salted SHA2-512 hashes. Otherwise known as the SSHA512 LDAP password type.

  3178540 (1116077)
- In Enterprise Server with LDAP-based security where a security configuration uses two or more LDAP-based Security Managers, and use-all-groups mode and group federation are enabled, in some cases

group membership was not processed correctly. Messages about "configured number of groups exceeded" could be logged. This issue has been resolved.

3178071 (1115917)

- With certain Enterprise Server security configurations, the Data File Editor could display a "signon failed" error when attempting to edit a dataset. This has now been fixed.

3177366 (1116022)

- The cache feature of the Enterprise Server External Security Facility now ignores some metadata when comparing requests with cache entries. This is configurable. By default, the subsystem (CICS, JES, etc.) and facility (terminal name, if any) are ignored. No ESM Modules supplied with the product use that information in making security decisions. This significantly improves the cache hit rate and system performance in some environments. See "Enabling and Configuring Caching" in the product documentation for more information.

3172719 (1115513)

- When using LDAP-based security for Enterprise Server with an OpenLDAP-based provider (client) library, the "connect timeout" setting now works correctly.

3172554 (1115522)

- When using Enterprise Server with LDAP-based security, it is now possible to specify an LDAP attribute for user-group objects which specifies an alternative name for the group using the group short name attribute. See "MLDAP ESM Module Custom Configuration Information" in your product Help for more information.

3171437 (1115364)

- Enterprise Server LDAP-based external security no longer experiences a rare failure ("error code 7") when verifying a user with advanced group processing options enabled.

3168197 (1115048)

- LDAP-based security for Enterprise Server could produce MD5 password hashes (using the "mode=bind" and "password type=MD5" configuration option; note this is rarely used) which did not use the canonical Base64 encoding. Some LDAP servers did not recognize these password verifiers, resulting in sign-on failures after users changed their passwords. This has been fixed.

3162441 (1114843)

- In Enterprise Server, the MLDAP ESM Module now supports the short-to-long username mapping option of the External Security Facility (ESF).

3160464 (1114394)

- Enterprise Server now includes LDIF (LDAP Data Interchange Format) files suitable for configuring LDAP-based security using the OpenLDAP server.

3147666 (1113475)

- Enterprise Server's optional LDAP-based security (External Security Facility with MLDAP ESM Module) now supports the Microsoft "group" LDAP class, as used by Active Directory and AD/LDS. Consult the online product Help or ask Micro Focus Customer Care for additional information.

3109881 (1110084)

- On Linux and UNIX platforms, the MLDAP ESM module in Enterprise Server LDAP-based security, by default searches for an appropriate LDAP provider (client shared object) in the default locations used by the OS vendor's preferred LDAP client package. It is also no longer necessary to specify the "provider" option in a Security Manager configuration.

- An issue which resulted in the DELETE and DETAILS button staying disabled in the casrdo45 page has now been fixed.

3181230 (1116351)

- Previously, when viewing cataloged datasets or Spool files in ESMAC, it was not possible to view any lines beyond line 99,999. Now the limit for the START field in ESMAC has been increased to hold any number up to 99,999,999.

3181032 (1116152)

- An RTS error 153 occurred when more than 6400 PCT entries were displayed in ESMAC. This has been fixed.

3167388 (1115007)

- With some specific LDAP configurations there were problems with accessing datasets from ESMAC where the configuration should have allowed access. This has now been fixed.

3167364 (1114989)

- The response time for catalog searches using 44 character strings in ESMAC has been improved.

3162969 (1114933)

- Remove locks is now enabled if the user has authorization in ESMAC.

3157534 (1114372)

- Deprecation of set-cookie meta tag in newer versions of some browsers such as Chrome or Microsoft Edge caused issues with the cookies used by ESMAC. This has now been resolved.

3154175 (1113973)

- The esfadmin command-line utility now allows command-line and option-file parameters of any length, up to the maximum command-line length of 8192 bytes. All esfadmin parameters can appear in the option file except -o (which specifies the name of the option file).

2881372 (1107519)

- When using Enterprise Server with LDAP-based security, with two or more LDAP External Security Managers, with the use-all-groups mode enabled, and with federation either enabled or in compatibility mode (the default), it is no longer necessary to have a definition for each user in each LDAP ESM. Specifically, once one LDAP ESM has identified the user, subsequent ESMs (those specified later in the list of security managers) can specify additional groups for that user without having to define the user again. For example, a security configuration specifies two LDAP security managers, LDAP-A and LDAP-B. LDAP-A contains only user records. LDAP-B contains only group records and resource access rule records. All-groups mode and federation are enabled. This configuration now works as expected.

2545079 (1081762)

- xa_open in the switch module now returns the correct return-code.

3171133 (1115386)

- The path of ESDB2XA switch module is not required in the environment variable LD_LIBRARY_PATH when the application is compiled with XAID option and the dynamic switch module is used.

3164301 (1114734)

- Within the DB2 LUW switch module, issues associated with ESLOGGING xa_open string parameter have been addressed, and better handling of impersonated userid when using USERP has been provided.

3156639 (1114209)

Data Tools

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- The cursor is now visible in the free-text editing pane when the pane has focus whether it is in Shared or Exclusive mode. The cursor position will start counting from column 1, rather than column 0 as well.

3154869 (1113954)

- On systems with a Japanese Locale, the Data File Tools utility no longer includes the phrase "Technical Preview" in its title.

Database Connectors

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- The compiler recognizes a new XFD directive that names an identity column. A Database Connectors interface is free to use this information to optimize access to a particular row of a table. Instructions for use:

  The directive can be used on a numeric field, and has the following format: XFD IDENTITY-COLUMN.

  If the directive is used on a non-numeric field, a warning will be displayed and the directive ignored.

  If the directive is used on more than one field of a file, all but the first will be ignored, and a warning issued.

  This directive should only be used once per file, though no warning will display if you specify it multiple times. Behavior in this case is undefined.

  The directive should not be used on a KEY field, though no warning or error will be issued if you do this.

  3184559 (1116426)

Debugging

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- The COBOL debugger could fail to determine the correct line to highlight in certain situations such as 'stop run', when run in the Docker environment on Windows.
- During animation on SUSE Linux Enterprise Server (SLES) 12, if the process being debugged was waiting in a system-call and you attempted to exit the debug session, the session would have been terminated rather that executing a 'stop run' in the debugger. This was due to a change in the operating system between versions 11 and 12, which has now been corrected so that a 'stop run' is now correctly executed.
- While using the Character Animator to animate a program, if its stack overflows, the debug session no longer stops - it now returns you to your source code and displays an error message.
- Whilst debugging, examining variable values by hovering over the variable no longer causes an error.

  3179385 (1116025)

Dialog System

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- An issue which prevented character mode Dialog System from recognizing ctrl-J and other key combinations has been resolved.

  3189921 (1116908)

Documentation

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- The documentation for the compiler option -rc has been updated.

  3184345 (1116419)
- Result precision has been added to the following built-in functions topics in the LRM: INDEX, MAXLENGTH, SEARCH, SEARCHR, VERIFY, VERIFYR.

  3183332 (1116336)
- The product help now includes a clarification in the topic "To run a native COBOL application from a network server". It states that you must remove any individual copies of run-time system modules (for example, cblrtsm.dll) that might have been copied into your application’s working directory. This is to avoid issues with running the application such as "245 no valid licenses found" as the run-time system is not loading from the expected location, or where the copied run-time modules are from other versions of the product versions. Removing such modules ensures that any run-time system modules are only loaded from the Enterprise Server instance installed on the server.

3176098 (1116309)

- The Database Connectors for MSSQL publication now includes a full set of configuration options, and installation details.

3173722 (1115542)

- The Software Requirement on UNIX topic in the docs and in the Release Notes now specifies that SafeNet licensing requires that you have glibc-locale-32bit library installed on 64-bit machines.

3167672 (1115010)

- The UNIX syntax example for the MAKESYN Compiler directive has been corrected in the documentation.

3164533 (1115496)

- Depending on the environment, you need to export (UNIX) or set (Windows) environment variables in a script. See “To specify environment variables for an application” for more information.

3164533 (1116625)

- The documentation now includes the instruction that when deploying a subset of Run-time System files, you must include run.cfg in a sub-directory named 'etc'.

3160902 (1114441)

- The syntax example, listed in the documentation for the ILPARAMS Compiler directive, has been corrected.

3154632 (634308)

- When performing a sort that specifies more than one input file, you cannot specify one of those same files as the output file unless it is the first input file specified.

3153333 (1113833)

- Details of how to use ILBOABN0 have been added to the documentation.

3148996 (1113634)

- The documentation (in the COBOL Language Reference) has been updated to clarify the use of the OPTIONAL keyword, and the use of (managed) optional parameters within the Procedure Division Header.

2883545 (1107792)

- The National Locale Support (NLS) Library Routines section of the documentation now contains all available NLS routines.
- The *Significant Changes in Behavior* section of the documentation now includes the default change for FASTINIT. (This change occurred in version 3.0, as stated in the release notes on release.)
- The documentation has been improved for the CBL_LOCATE_FILE library routine concerning the use of space- and null-terminated strings.
- The Rebuild syntax differs between UNIX and Windows platforms. For any of the Rebuild options, UNIX platforms use a hyphen (-) prefix before the letter, and Windows platforms use a forward-slash (/) before the letter.
- The recommended method of high availability for VSAM files in Enterprise Server is to use standalone Fileshare. The documentation has been changed to reflect this.
- The documentation has been updated to reflect that 'DEFAULT' is a reserved word when running under an ENTCOBOL dialect.
- In the documentation, the code example given in the 'Thread-specific Data Handling Routines' topic now compiles cleanly.
- The called program search order, as documented in the 'Backward Compatibility' section of the documentation, has been corrected for Windows platforms.
- The parameter definition for OOCTRL"+/-W" has been clarified in the documentation.
- The documentation now contains a topic - Using a File Handler in JVM COBOL - detailing how to manually configure the File Handler that a JVM COBOL project uses.

- A link to the IBM documentation added to the 'DSNRLI Functions used for RRSAF' topic - this is to enable you to locate full details on required parameters, and to give examples of its use.

  3184952 (1116524)
- The documentation now states that the section heading when adding environment variables through the Enterprise Server UI is case sensitive.

  3177135 (1115979)
- The documentation explaining the scope for the HOST-NUMCOMPARE directive has been simplified.

  3156368 (1114075)
- The "To specify the location of application files" topic has been updated to clarify the location of IMS copybooks.

  3111136 (1109993)
- Documentation for all Java API classes is now provided in HTML format and contained in an archive file located by default in the %ProgramFiles(x86)%\Micro Focus\<product name>\javaee-ccl\docs directory. See the Java API Classes topic in your product documentation for details.

  3109273 (1109725)
- Documentation for all Java API classes is now provided in HTML format and contained in an archive file located by default in the %ProgramFiles(x86)%\Micro Focus\<product name>\javaee-ccl\docs directory. See the Java API Classes topic in your product documentation for details.

  3109271 (1109724)
- The sample code listed in the CBL_DIR_SCAN_READ documentation has been formatted to enable you to copy and paste the code, ready for compilation.
- The sample in the documentation on 'Using FHRedir and an allocation override rule' has been corrected to show the spool filenames in their correct case (upper case).
- The documentation now includes a definition for the system abend code S913 (which is "Security Violation - the user is not permitted to access the resource").

Embedded HTML Pre-Processor

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- An issue that caused the embedded HTML preprocessor to display incorrect banner information has been corrected.

  3160255 (1114437)

File Handling

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- Under certain circumstances, opening a sequential file in the editor could result in the editor throwing an exception during close-down. This has now been resolved.

  3145420 (1113132)
- Warning messages when checking disk space for Fileshare advanced logging are now only displayed when necessary. Previously, a disk space warning was given even if sufficient space was available.

  3174510 (1116078)
- A Fileshare server shutdown no longer leaves files opened or users remaining logged on.

  2837526 (1108076)
- CFLE updating large record no longer results in an RTS252 error with the HA-VSAM configuration.

  3167973 (1115057)
- You will no longer receive an RTS114 error when a failing primary node is restarted and attempts to re-join the HA group (as a standby node), as long as it closed all files successfully before the failure.

3159872 (1114360)

- Rollback recovery will no longer hang when processing a bad log entry during a scan of the transaction log file.

  3168055 (1115049)

- A new MFJSORT option allows input LSEQ files to be treated as FB through setting the environment variable MFJSLSEQFB=ON.

  3190089 (1116876)
- SORT operations no longer compare field data that is outside of the current record length.

  3187044 (1116633)
- MFJSORT now ignores the RECORD TYPE value if the SORTIN dataset is non-VSAM.

  3163293 (1114669)
- During a SORT, the SUM statement now correctly handles 8-bytes BI fields.

  3161349 (1114540)
- An internal SORT program no longer returns a COBRT252 error for cataloged files when being compiled with AMODE"31" and dialect"entcobol".

  3161100 (1114586)
- SORT no longer produces an RTS114 error when both outfil and sortout datasets are not defined.

  3154290 (1113901)
- MFJSORT now correctly honors MFJ_INPUTDS_ERROR=N on missing physical concatenated datasets.

  3153313 (1113826)
- MFJSORT OUTREC now applies the correct length for EDIT patterns.

  3145526 (1113484)

IDE

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- Multi-dimensional arrays are now displayed correctly in the Expressions view.

  3188114 (1116718)
- We have resolved an issue where sources using $set P(cobsql) _and_ a directives file were not correctly background parsed

  3187247 (1116715)
- The Show Console Log menu item in Server Explorer now works correctly for servers that have a 'Configuration information' property larger than 1024 characters.

  3186091 (1116545)
- References to .dir files that are located on a separate drive from that containing the project now resolves the correct drive.

  3185960 (1116529)
- You can now configure the Eclipse Content Assist to list proposal is alphabetical order. You can do this from Window > Preferences > Micro Focus > Editor > Content Assist, and from the Proposal order section.

  3185289 (1116494)
- Data items which contain XML or HTML data during debugging now display correctly in hover popups.

  3182322 (1116238)

- Text search errors caused by Eclipse's File Search functionality being multi-threaded and being designed for local projects only have been fixed. File Search might now sometimes be slower but this is unavoidable due to limitations in how third-party code can be modified.

  3182272 (1116231)
- Error messages were sometimes displayed on the wrong line when background parsing using the AWM Remote Preprocessor. This has now been fixed.

  3181225 (1116179)
- You could experience an issue with starting Eclipse where Java Tooling would fail to initialize. This was a result of a known issue with JNA and installing certain Windows updates.

  3179471 (1116030)
- SQL Include files were not always resolved when background parsing using the AWM Remote Preprocessor. This has now been fixed.

  3178446 (1115943)
- COBOL Copybook project references in .cobolBuild files could be lost after importing the project in Eclipse.

  3177566 (1115903)
- Users who have configured ESF passtoken generation can now access certain pages from the Server Explorer view in Eclipse without having to reauthenticate. These include the spool and catalog pages of regions, and the administration pages of directory servers.

  3177270 (1115887)
- It is now possible to compile individual programs within a COBOL JVM project, provided that the "Use Dynamic Call" option is set within the project's properties.

  3176560 (1115882)
- Information about variables is now displayed correctly when debugging JVM COBOL using a Remote Java Application debug configuration.

  3173978 (1115582)
- we now support ${ipaddress} and ${hostname} in the display preference, the latter is now used in the default value

  3170934 (1115477)
- Smart Edit functionality has been updated to linewrap text, with new line characters pasted into the editor correctly.

  3168633 (1115534)
- Visual COBOL for Eclipse now starts correctly, with no errors.

  3165560 (1114888)
- When debugging a remote application via a DevHub server it is now possible to use Remote File System Directory entries in the Source Lookup search path. Previously, they were ignored unless a remote project was selected in the launch configuration.

  3165087 (1114802)
- When debugging a remote application using source code held in local COBOL projects, program sources were not found if the folders containing them were not included in the project's Copybook search path. This is now fixed.

  3165086 (1114804)
- It is now possible to cancel the launch of a "COBOL Wait for Application Attachment" (that uses a specified host and port).

  3164766 (1114784)
- The Terminate and Remove menu item is now correctly handled for wait for attachment debug sessions that have not yet attached.

  3164766 (1115747)

- A message to clarify the behavior of the environment script location field was added.

  3164533 (1116627)
- It is now possible to specify the default cobdebugremote port in Eclipse preferences. See "Preparing Remote Projects for Debugging" in your product Help for more information.

  3164533 (1114754)
- The X Server font can now be set on the Debug preference page.

  3164533 (1115214)
- The "Server port, replaces ${port} in command" remote connection attribute has been added to enable the configuration of the DevHub server port value when launching the server using the SSH daemon. See "To launch a server on the remote host using a Secure Shell daemon process" in your product Help for more information.

  3164533 (1114753)
- The COBOL Explorer filter facility is no longer disabled when the view is configured to exclude COBOL Elements such as the COBOL Programs category.

  3164096 (1114782)
- Compilation of assembler files now respects the file specific settings when compiling individual files.

  3162115 (1114600)
- You can now right-click on a data item name anywhere in the working-storage or procedure division, and click "Toggle Watchpoint". This adds a watchpoint to the breakpoints view in the same way as selecting it from program outline.

  3161772 (1114579)
- There is now a Compile option in the context menu for folders in the COBOL Explorer and the PL/I Explorer views.

  3161499 (1114526)
- Opening a project properties page in AWM without a project selected in the Application Explorer view no longer throws a NullPointerException.

  3160690 (1114434)
- The "Inherit values from the build environment of the associated project" option in the project properties (Micro Focus > Run-time Configuration > Environment Variables) was not being honoured. This has been fixed.

  3159999 (1114419)
- Paths to dependent projects are now stored using relative paths if they can be determined.

  3159506 (1114321)
- The PL/I include dependency view did not always show the correct files if the macro pre-processor was enabled.

  3158083 (1114846)
- A workspace with several projects that share an output directory no longer rebuilds projects infinitely in a case when one of the projects compiles unsuccessfully.

  3155067 (1113970)
- Double-clicking on file search results now correctly jumps to the line containing the result.

  3154115 (1113894)
- Linked resource entries in .cobolBuild are now stored using relative paths.

  3153143 (1113836)
- Micro Focus project types now correctly translate copy paths to the new pasted project location.

  3152826 (1113856)

- Copying and pasting remote projects has changed its behavior. A new "Copy Micro Focus Project" dialog box is displayed asking you to confirm the remote details. Note: Micro Focus only support pasting projects to the same remote connection as the project being copied.

  3151350 (1113648)
- When running the Remote Connection Diagnostics function, an unhandled exception was intermittently logged. This has now been fixed.

  3151350 (1114547)
- This release includes initial support for formatting COBOL code. Access the formatting preferences from Window > Preferences > Micro Focus > Editor > Formatter.

  3146261 (1113549)
- END-EXEC and CALL-CONVENTION are now correctly highlighted as keywords in COBOL programs.

  3146260 (1113238)
- Hit count and conditions are now supported for COBOL watchpoints.

  3128708 (1113196)
- The COBOL Run-Time System container has been updated to include a reference to mfle370.jar.
- Copybooks and include files were not found during background parsing of remote COBOL programs if they were located in a directory specified by the COBCPY environment variable before the DevHub daemon was started. This has been fixed.

  3165397 (1114851)

Interface Mapping Toolkit

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- For clients and services generated from WSDL, generated copybooks are no longer missing declarations for complex WSDL fields with duplicate names.

  3188506 (1116761)
- A problem that caused invalid xsd:date types in a CICS Web Service WSBIND file generated from a WSDL file has been fixed. xsd:date types are now generated as collapsed fields.

  3184571 (1116456)
- A limitation in the Interface Mapper that prevented the simultaneous editing of Field Properties for all selected fields of a like field type has been fixed.

  3164533 (1115571)
- An issue that prevented manually created field mappings from correctly matching IMTK behavior has been fixed.

  3164533 (1115657)

Licensing

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- cesadmintool.sh now searches for " version" string in the Java version and ignores any additional output that might appear.

  3185425 (1116559)
- In Docker environments, the license administration program, MFLicenseAdmin, now copes with longer-than-usual license strings. These occur with longer pieces of customer information embedded in the license.

  3174371 (1115634)
- There is no longer an entry in the Uninstall column for licenses installed on remote machines.

3131570 (1112101)

Micro Focus Common Client

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- Applications which use the Micro Focus Common Client (MFCC), such as the Interface Mapping Toolkit (when deploying a COBOL web service or EJB to Enterprise Server), can now specify credentials when binding to the Micro Focus Directory Server. This provides additional security. If credentials are not configured, MFCC will use an anonymous bind, as it did in earlier product versions. Credentials are specified using the mf-client.dat configuration file.

Micro Focus Directory Server

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- The Enterprise Server Administration Web UI will only display user session details if the logged in user is authorized.

  3190235 (1116886)
- Additional Enterprise Server Administration Web UI server-side checks were added to guard against non-editable field value changes for started Enterprise Server instances and active security configurations.

  3185626 (1116719)
- Establishing a connection to a TLS-enabled MFDS process if non-default (non-DemoCA) certificates were used now works as expected.

  3174276 (1115675)
- The MFDS journal data format has been enhanced to be platform and bitism independent.

  3169565 (1115249)
- Improved validation of data input to Enterprise Server Administration Web UI.

  3163386 (1114693)
- Adding or editing TCP listener-requested endpoint values using the Enterprise Server Administration web UI so that a port clash may occur now gives a warning rather than being disallowed and treated as a user input error.
- If the Enterprise Server Administration Web UI is hosted in a Docker container, the displayed hyperlinks to reach the Micro Focus Communications Process web pages can now be configured to use an address which is valid outside the container.
- URLs to SSL-enabled MFCS Control Channel addresses displayed in the Enterprise Server Administration HTML UI now use an https prefix.
- A new field, "Server CA Root Certificate", is available in the Communications Process Control Channel page (id: c400). The value specified here is used unless the MFDS_server_CAROOT environment variable was specified as it takes precedence. You must specify the server CA root certificate if the Communications Process Control Channel is SSL/TLS-enabled and if communications with the MFDS process are required such as to respond to keepalive and any other administration control requests.
- Enterprise Server Administration Web UI would sometimes display the successful logon splash screen instead of a logon error message.
- The MFDS process could terminate when copying the definition of an Enterprise Server instance if it contained a very long description text.
- Trying to view or edit the properties of a Security Manager that is not in the Directory Server Security Manager list now results in receiving an appropriate warning message instead of an HTTP 404 error.
- MFDS now saves any changes made to the Communications Process immediately instead of at shutdown.

Micro Focus Server Administrator

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- If Enterprise Server Administration was set to restricted access, some MQ listener configuration pages would not be displayed.

  3152874 (1113782)
- The Enterprise Server Administration HTML UI no longer displays the IP address but only the host name used by the Web administration server process.

  3140974 (1112912)

OpenSSL

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- Visual COBOL, Enterprise Server, and Enterprise Developer now include an updated collection of public Certification Authority root and intermediate certificates (CARootCerts.pem) derived from the public collection maintained by Mozilla.org.

Run-Time System

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- Under certain circumstances, if a file was opened multiple times and an error occurred, then any physical locks on the file could be lost.

  3177819 (1116043)
- In a threaded environment, when using critical-sections and simultaneously loading/unloading shared-objects, a race condition would sometimes create a deadlock. This no longer occurs.

  3177711 (1116154)
- The use of the P(COBSQL) Compiler directive in a Visual Studio or Eclipse project no longer causes the IDE to crash intermittently at termination.

  3133807 (1112077)
- The COBRT243 Class could not be loaded error message now contains the name of the class that could not be found.

  3104988 (1109420)
- Calls to CBL_MEM_VALIDATE might not have given the full memory corruption details if the corruption occurred in freed memory. This is now fixed.
- When using the Character Animator, you can enter Ctrl+C to interrupt the running process you are debugging. This would sometimes fail to stop the running process, but should now behave as expected.
- When setting the out-length parameter of the CBL_STRING_CONVERT API to zero in order to get the size of the buffer required for the conversion, the API no longer fails with a ArgumentNullException when running on the .NET environment. Under JVM COBOL, this API no longer corrupts the output buffer if the output length has been set to 0.
- In managed COBOL, for a very small set of cases for exponentiation and DIVIDE ROUNDED, performance was very poor. Also, for some of this set of cases, the result of DIVIDE ROUNDED could round in the wrong direction. These issues have been fixed.

  3185807 (1116589)
- Within JVM COBOL, a MOVE operation from a COMP-2 item containing a negative value to an unsigned COMP-5 item now gives the correct result.

  3175547 (1115719)
- Under JVM COBOL, RunUnit GetEnvironmentVariable() is now case insensitive on look-up of environment names.

  3161925 (1114545)
- CALL "SYSTEM" in a JVM COBOL program that is executed from a run unit in Java no longer produces a COBRT200 error if RunUnitStartupOptions.UseSingleThreadedRuntime is set.

3151448 (1114573)

- JVM COBOL only. An issue has been resolved whereby some arithmetic expressions using a binary item (COMP, COMP-5) that had the value -2147483648 (- 2**31) could result in stack overflow.

Setup Issues

Back to the list

- The Data File Tools AddPack can now be installed alongside Enterprise Server.

  3158290 (1114230)
- The installer error handling has been extended to cater for certain conditions.

  3152023 (1113706)

SQL: COBSQL

Back to the list

- COBSQL now handles "ELSE EXEC SQL" correctly when it is all on the same line in the source file.

  3176046 (1115778)
- The XAID option did not work properly for COBSQL when CHARSET(EBCDIC) was used.

  3174070 (1115697)
- A compilation error that was caused by the COBSQL preprocessor incorrectly handing sections declared inside of a copybook has been fixed.

  3164533 (1116863)
- An unreadable copybook caused COBSQL to loop when stacked with the CP preprocessor. This has been fixed.

  3156374 (1114103)
- An unreadable copybook caused COBSQL to loop when stacked with the CP preprocessor. This has been fixed.

  3156374 (637041)
- An issue that caused a compilation error when COBSQL encountered inline comments in an EXEC SQL statement has been fixed.

  3123025 (1111044)
- COBSQL messages have been updated to provide more information when failure is due to a missing list file, and when the list file is missing due to use of the LTYPE=NONE directive.

  2883514 (624749)
- To prevent exceeding the COBSQL directive buffer size, the maximum directive buffer size has been increased to a maximum of 8000 characters.

  2852872 (1104084)
- To prevent hanging or a compilation error, COBSQL has been updated to properly handle conditional statements in the same line as EXEC SQL statements.

  2804004 (1097225)
- An issue that sometimes caused SQL error text to display as truncated on the command line has been fixed by increasing the maximum error length to 250 characters, and updating the logic used to construct the message.
- An issue that caused an error when a space was present between an END-EXEC statement and a period has been fixed.
- The COBSQL precompiler interprets the SOURCETABSTOP COBOL compiler directive as SOURCETABSTOP(8) in all cases. This is due to Pro*COBOL honoring only SOURCETABSTOP(8), and is a permanent restriction for COBSQL.

SQL: DB2

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- An optional 'FROM' keyword in SQL statements such as 'FETCH FROM <cursor-name>' used to cause compiler errors.

  3191635 (1116976)
- There is no longer an issue with negative line numbers being generated in the .bnd file when the COBOL source file has more than 32700 lines of code.

  3188178 (1116814)
- An issue with the DB2 preprocessor caused it to incorrectly classify PL/I variables greater than 4000 bytes as LONG VARCHAR when it should have classified PL/I variables less than 32767 bytes as VARCHAR as it does for COBOL variables. This has been fixed.

  3185976 (1116539)
- DB2 XA switch source is now shipped for Linux ppc64le platforms.

  3184287 (1116424)
- The DB2 pre-compiler incorrectly generated a compile error when hyphen was used in SQL command without a space between the hyphen and host variable name. This has now been fixed.

  3180089 (1116102)
- DB2 LUW now supports dashes in cursor names, so the DB2 pre-compiler no longer changes dashes to underscores in cursor names.

  3177271 (1115912)
- The DB2 pre-compiler incorrectly passed COBOL variable names to PL/I programs when generating code to handle EXEC SQL SET CURRENT PACKAGE PATH statements.

  3175885 (1115744)
- The DB2 and OpenESQL pre-compilers now qualify generated code that uses SQLSTATE to qualify SQLSTATE similar to this one: SQLCA.SQLSTATE.

  3173295 (1115512)
- An issue that caused the DB2 preprocessor to incorrectly reject FILLER as a valid host variable name in PL/I programs has been fixed.

  3164600 (1114767)
- An issue that occurred with user personalization on user names exactly eight characters long has been resolved.

  3156639 (1114163)
- When a DBCS database is used with CHARSET(EBCDIC), the data of a char field following a varchar field will no longer be corrupted.

  3155499 (1114065)

SQL: OpenESQL

Back to the list

- JDBC now returns SQLCODE=+1 when the fetched value is NULL and NULL indicator is not used.

  3191192 (1116953)
- Decimal value is now inserted correctly into Oracle DB when DECDEL=COMMA is set.

  3189836 (1116947)
- An issue that caused performance degradation when using a STATIC cursor has been fixed.

  3185894 (1116518)
- The OpenESQL run-time now handles the compiler directive SQL(NOAUTOFETCH) correctly.

  3177780 (1115994)

- OpenESQL has been updated to provide cobrhcedsn64.so for 64-bit only platforms.

  3174065 (1116801)
- HCOSS now accepts FOR READ ONLY clauses in cursors before FETCH FIRST clauses. This is undocumented behavior for DB2 z/OS but HCOSS now supports it to ensure mainframe compatibility.

  3173586 (1115528)
- An issue where WITH HOLD cursors could remain open after an IMS transaction had terminated for SQL Server, ODBC and PostgreSQL XA resources has been fixed. SQL(NOCHECKDUPCURSOR) can now be used to override duplicate cursor checking when SQL(DIALECT=MAINFRAME) is used.

  3172382 (1115430)
- A new SQL directive [NO]ALLOWSERVERSELECT supports server-specific SELECT statements that are not recognized by OpenESQL as valid ESQL SELECT ... INTO statements. This behavior was the default in Net Express.

  3165092 (1114866)
- An issue that caused the OpenESQL runtime to incorrectly handle binary parameter markers for PIC X(n) VARYING host variables has been fixed.

  3163759 (1114719)
- The SQL Directives dialog box that appeared for .NET project types in the Visual Studio IDE erroneously omitted the SQL(HSFTRACE) option for DBMAN=ADO. This has been fixed.

  3162428 (1114593)
- Data type information that was incorrectly mapped by the OpenESQL Assistant caused it to display column information improperly when using an IBM DB2 ADO.NET provider connected to a DB2 z/OS data source. This has been corrected.

  3161285 (1114478)
- An issue that occurred when the SQL BEHAVIOR compiler directive option was set to UNOPTIMIZED caused the OpenESQL runtime to generate an RTS 114 error when the COBOL application exited. This has been fixed.

  3158065 (1114288)
- Problems with SQL Server and PostgreSQL that surfaced when working with large binary columns have been fixed.

  3156215 (1114335)
- An issue that caused the OpenESQL preprocessor to generate an incorrect error message when SQL(DBRMLIB) was not set prior to specifying SQL(VERSION) has been fixed; the OpenESQL preprocessor now generates the correct error message.

  3155275 (1114004)
- SQL FETCH ABSOLUTE CURSOR was not returning rows. A COMP position value is now supported in the SQL FETCH ABSOLUTE/RELATIVE statement and it behaves as expected.

  3153738 (1113903)
- An issue that prevented HCOSS from correctly handing IS [NOT] DISTINCT predicates has been fixed.

  3152630 (1113764)
- An issue that caused HCOSS to incorrectly apply QUALIFIERs to common table expression names has been fixed.

  3152008 (1113714)
- The DSNRLI function SWITCH TO is now supported for Enterprise Server Mainframe Subsystem applications using DB2, Microsoft SQL Server, and PostgreSQL.

  3151779 (1113680)
- An issue that caused HCOSS to incorrectly handle FETCH FIRST ROW ONLY when no literal row count was present has been fixed.

  3151398 (1113734)

- An issue that caused the OpenESQL runtime to execute a core dump on exit when the MEMORY_STRATEGY tunable was set has been fixed.

  3142107 (1113077)
- A program that contained zoned decimal host variables used in SQL statements and compiled using charset(EBCDIC) and dialect(MF) sometimes caused a run-time error. This has been corrected.

SQL Option for DB2

Back to the list

- The XDB pre-compiler incorrectly generated line and column number information used by the IDE to get COBOL information about field on EXEC SQL INSERT statements.

  3182574 (1116350)
- The XDB pre-compiler incorrectly tried to generate interface logic in nested COBOL routines without checking if a SQLCA copybook was defined. This resulted in an "Undefined ECM error" error message. This has been fixed.

  3168445 (1115099)
- An issue caused by an uninitialized stack variable that resulted in a server violation has been fixed.

  3168714 (1115237)
- A number of XDB components have been enhanced to better implement bulk INSERT/UPDATE/MERGE statements using both local XDB engines and XDB Link in dynamic and static mode to z/OS DB2.

  3175084 (1115695)
- XDB Link has been updated to support the invocation of stored procedures that return multiple result sets on z/OS DB2.

  3168036 (1115315)
- A memory leak in DRDA Continue Query Reply Message processing has been fixed.

  3160580 (1114426)
- An issue that prevented XDB Server configuration from allowing the full length of 16 characters in the Global Security Location text box has been fixed.

  3168821 (1115106)
- An issue with SQL step processing related to CASE expression evaluation that caused the SQL COALESCE scalar function to return the wrong result has been fixed.

  3160595 (1114413)
- Support has been added for the SOUNDEX() and DIFFERENCE() scalar functions.

  3155733 (1114043)
- An issue that caused a buffer overflow when processing a very large UPDATE WHERE CURRENT OF in the XDB Link has been resolved.

  3151725 (1113807)
- An problem with XUTLB (XDB emulation of DSNUTILB) erroneously reporting an invalid isolation level has been resolved.

  3134586 (1112183)
- An issue with join optimization using differing lengths of DECIMAL data has been resolved.

  3131870 (1111903)
- An issue with a scalar query using a DATETIME value returning an error indicating that the value was invalid has been resolved.

  3129637 (1111872)

- An issue with Query Descriptor mapping when performing XDB Server to Server connectivity has been fixed.

  3112564 (1110514)
- An issue with an uninitialized stack space causing a thread abend in XDB SQLDA code page processing has been fixed.

  2990360 (1108708)

Web Service Client

Back to the list

- When a generated Web service client executes, an additional optional user-supplied exit program, exit-http-resp-headers, is now called to provide access to any and all HTTP headers present in the response message from the service.

  3172598 (1115452)

XML Support

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- XML PARSE now handles "WITH ENCODING" clauses correctly.

  3175231 (1115707)
- Data within the CDATA tag is now processed by the managed XML syntax support run-time.

  3166588 (1114954)
- XML PARSE did not handle lengthy CONTENT-CHARACTERS correctly which caused the event to be returned twice.

  3162231 (1114582)
- Literals positioned beyond column 72 in the editor are now being handled correctly and compile without any issues.

  3152550 (1114087)

z/Server

Back to the list

- AWM tools of type "Execute ISPF Command" within the ISPF function package can make use of the ISPF table TAUTOJOB if the tool submits more than one job via the 'Tool Job' method or if the tool submits a job via the 'Tool Job' method and is used in a MassProcessing action.

  3151143 (1113669)

Other Issues Resolved in This Release

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

- 3177187 (1115851)
- 3181887 (1116201)
- 3177661 (1116118)
- 3134735 (1112201)
- 3170148 (1115245)
- 3171080 (1115373)
- 3161109 (1114775)
- 3160774 (1114530)
- 3187599 (1116668)
- 3176925 (1115833)
- 2802311 (1097060)
- 3140337 (1112673)
- 3175137 (1115685)
- 3170946 (1115402)
- 3128586 (1111526)
- 3105876 (1109394)
- 2990180 (1108737)
- 2854004 (1103682)
- 2851622 (1103230)
- 2844942 (1102368)
- 2841043 (1102369)
- 2590883 (1085717)
- 3181941 (1116211)
- 3103315 (1109252)
- 2990950 (1108778)
- 2865338 (1105207)
- 2597474 (1088223)
- 3164898 (1114811)
- 3150507 (1113583)
- 3122080 (1110968)
- 3122020 (1110949)
- 3114654 (1110269)
- 2887726 (1108356)
- 2885799 (1108108)
- 2873642 (1106416)
- 2835954 (1101265)
- 2795293 (1096771)
- 2652488 (1090826)
- 2587952 (1086146)
- 3123593 (1111108)
- 2642528 (1090004)
- 2594601 (1086032)
- 3181445 (1116188)
- 3168020 (1115032)
- 3164533 (1115215)
- 3162064 (1114546)
- 3158311 (1114231)
- 3158072 (1114399)
- 3141381 (1112770)
- 3164533 (1115570)
- 3193749 (1117140)
- 3158936 (1114346)
- 3156405 (1114097)
- 3152246 (1113749)
- 3157702 (1114217)
- 3157956 (1114290)
- 3127953 (1111577)
- 3159456 (1114310)
- 2867519 (1105516)
- 3191105 (1116958)
- 3174042 (1115569)
- 3176098 (1115962)
- 3172981 (1115501)
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- 3189442 (1116934)
- 3188582 (1116744)
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- 3141381 (1112770)
- 3164533 (1115570)
- 3193749 (1117140)
- 3158936 (1114346)
- 3156405 (1114097)
- 3152246 (1113749)
- 3157702 (1114217)
- 3157956 (1114290)
- 3127953 (1111577)
- 3159456 (1114310)
- 2867519 (1105516)
- 3191105 (1116958)
- 3174042 (1115569)
- 3176098 (1115962)
- 3172981 (1115501)
- 3127698 (1111446)
- 3189442 (1116934)
- 3188582 (1116744)
- 3178509 (1115958)
- 3160759 (1114427)
- 3150188 (1113906)

- 3161964 (1114569)
- 3172126 (1115445)
- 3103315 (1109252)
- 3187219 (1116640)

Unsupported Functionality

This section includes information about features or functionality that are no longer supported.

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

Installation

Installing Visual COBOL for Eclipse

Before Installing

Downloading the Product

1. Use the download links in your Electronic Product Delivery email.

   For more information follow the links for the installation instructions and the End User License Agreement.

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 the supported operating systems, check the *Product Availability* section on the Micro Focus SupportLine Web site: *http://supportline.microfocus.com/prodavail.aspx*.

Note:

- Support for development on Windows 8 and Windows Server 2012 has been discontinued. These platforms are still supported for deployment. Windows 8.1 and Windows Server 2012 R2 are supported.
- Visual COBOL installs fully only on 64-bit Windows platforms. On 32-bit Windows, the setup file does not install some of the components. See *Issues with the Installation* in *Known Issues and Restrictions*.
- Visual COBOL enables you to produce both 64-bit and 32-bit applications on 64-bit operating systems.

Software requirements

Note: This product includes OpenSSL version 1.1.1b.

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

Eclipse requirements

- The setup file installs Visual COBOL and the 64-bit Eclipse 4.8.

  Some earlier versions of Eclipse are also supported. See *Installing Visual COBOL into other instances of Eclipse* in the *Advanced Installation Tasks*.
- Visual COBOL installs fully only on 64-bit Windows platforms. On 32-bit Windows, the setup file does not install some of the components. See *Issues with the Installation* in *Known Issues and Restrictions*.
- Visual COBOL supports both the 32-bit and the 64-bit Eclipse. You can use the 64-bit Eclipse to create both 32-bit and 64-bit applications.

Software requirements

- Java 8 (64-bit) is required to run the Eclipse IDE. The minimum recommended version is AdoptOpenJDK's OpenJDK 8 (u202) with Hotspot, which the Windows product installs automatically. Java 8 (32 or 64-bit versions), and Java 11 (64-bit version only) are supported for executing JVM COBOL code and for native COBOL and Java interoperability. You can download AdoptOpenJDK's OpenJDK 8 with Hotspot from *AdoptOpenJDK's Web site* and unpack the archive anywhere on your machine.

  Note: Eclipse does not run using Java 11.
- Visual COBOL requires:
  - A 32-bit Java installation if using the 32-bit Eclipse.
  - A 64-bit Java installation if using the 64-bit Eclipse.
- The setup file also installs Microsoft's Visual C++ 2012, 2013 and 2017 Redistributables.

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

Important: 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 a network server, you must update the license server before installing the product as the client is not able to communicate with license servers of versions older than 10000.2.660. On Windows, you can check the version of your license server by clicking **Help > About** in the Micro Focus License Administration tool. To check the version of the license server on UNIX, run `/var/microfocuslicensing/bin/mfcesver` or `/var/microfocuslicensing/bin/cesadmintool.sh`.

If Micro Focus License Manager version 10000.2.02070 or older is installed, it must be uninstalled before the product installation or upgrade can continue.

You can download the new version of the license server software from the Micro Focus SupportLine Web site: *http://supportline.microfocus.com*.

Supported Third Party Software

The table below lists some of the software requirements and Third Party Software this product is tested with.

For full details on the supported software, see *Software Requirements* and *Additional Software Requirements* in this product's install notes.

Software	Requirements
Integrated Development Environment	Eclipse 4.8 - installed with Visual COBOL.
	Eclipse 4.7 is also supported.*
Java	64-bit Java 8 is required for running Eclipse.
	Java 8 (32 or 64-bit versions), 11 (64-bit only) is supported for running applications.
Java application servers	Tomcat 9.0
	JBoss EAP 7.1
	Oracle WebLogic 12c R2
	IBM WebSphere 9.0
Relational databases	Oracle 12c R2 and 18c
	Microsoft SQL Server 2012, 2014, 2016 , 2017
	IBM DB2 10.5, 11.1
	Postgres 10.5
	MySQL 5.7
Middleware	Oracle Tuxedo and Tuxedo ART 12.1.3c
	IBM TXSeries for Multiplatforms 9.1
	IBM's MQ series 8.0
Platform support	See *http://supportline.microfocus.com/prodavail.aspx*.

* See *Installing into other instances of Eclipse* in your Product Help.

Additional Software Requirements on Windows

To ensure full functionality for some Visual COBOL features, you might be required to obtain and install additional third-party software in addition to the prerequisite software installed automatically by the Visual COBOL setup file.

Click here to see this information on the Product Documentation pages on Micro Focus SupportLine.

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:

- Visual COBOL and Enterprise Developer cannot coexist on the same machine.
- 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.

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	Sentinel RMS license server
x86-64 running Red Hat Linux	Micro Focus	905 GB	3.62 GB	1.81 GB	50 MB
x64 running SUSE SLES	Micro Focus	781 GB	3.12 GB	1.56 GB	50 MB

Operating Systems Supported

Note: You can produce both 64-bit and 32-bit applications on 64-bit operating systems.

For a list of the supported operating systems, check the *Product Availability* section on the Micro Focus SupportLine Web site: *http://supportline.microfocus.com/prodavail.aspx*.

Software Requirements

Eclipse requirements

- Visual COBOL installs the 64-bit Eclipse IDE by default and requires a 64-bit Java installation.
- On SUSE 12, you can only install and use the 64-bit version of Visual COBOL.
- On other platforms, Visual COBOL supports both the 32-bit and the 64-bit Eclipse. You can use the 64-bit Eclipse to create both 32-bit and 64-bit applications.
- The setup file installs Visual COBOL and the 64-bit Eclipse 4.8. After the installation, you can install Visual COBOL as a plug-in into other Eclipse installations available on the same machine. The supported versions are 4.7, and 4.8 for both the 32-bit and the 64-bit Eclipse. See *Installing Visual COBOL into other instances of Eclipse*.

  Note: On Red Hat platforms, you need Red Hat 7 or later, if you want to install Visual COBOL into Eclipse 4.8.

Other software requirements

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

- The unzip utility is required by the setup file.
- The "awk", "ed", "sed" and "tar" utilities must be installed and added to the PATH.
- The pax archiving utility is required by the setup file. Pax is distributed with most UNIX/Linux systems but, if it is missing, you must install it separately. To verify pax is installed, run `pax --help` or `pax --version` at the command line.
- Required libraries - 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	32-bit Library Name	64-bit Library Name	Platform			
			s390	SUSE 12[1]	Red Hat 6.*x*	Red Hat 7
glibc	glibc-*.i686	glibc-*.x86_64	glibc-*.s390		X	X
libgcc	libgcc-*.i686	libgcc-*.x86_64	libgcc-*.s390		X	X
libstdc++	libstdc++-*.i686	libstdc++-*.x86_64	libstdc++-*.s390		X	X
glibc-locale	glibc-locale-32bit	glibc-locale-2	N/A	X		
gtk2	N/A	libgtk-2_0-0-2	N/A	X		
gtk2	N/A	gtk2-tools-2	N/A	X		
gtk2	N/A	libXcomposite1-0	N/A	X		
gtk2	N/A	libgdk_pixbuf-2_0-0-2	N/A	X		
gtk2	N/A	gdk-pixbuf-query-loaders-2	N/A	X		
gtk2	N/A	libjasper1-1	N/A	X		
gtk2	N/A	gtk2-*.x86_64	N/A		X	X
gtk2-x11	N/A	libgthread-2_0-0-2	N/A	X		
libXtst	N/A	libXtst6-1	N/A	X		
libXtst	N/A	libXtst-*.x86_64	N/A		X	X
glibc-devel	glibc-devel-*.i686	glibc-devel-*.x86_64	N/A		X	X
PackageKit-gtk	N/A	PackageKit-gtk-module-*.x86_64	N/A		X	
PackageKit-gtk3	N/A	PackageKit-gtk3-module-*.x86_64	N/A			X
gtk2-engines	N/A	gtk2-engines.*.x86_64	N/A		X	
libcanberra-gtk2	N/A	libcanberra-gtk2-*.x86_64	N/A		X	X

Library	32-bit Library Name	64-bit Library Name	Platform			
			s390	SUSE 12[1]	Red Hat 6.*x*	Red Hat 7
webkitgtk	N/A	webkitgtk.x86_64	N/A		X	
webkitgtk3	N/A	webkitgtk3.x86_64	N/A			X
xterm	Any version	Any version	Any version	X	X	X
unzip	Any version	Any version	Any version	X	X	X
libgnome	N/A	libgnome.x86_64	N/A		X	X
gcc[2]	gcc*.i686	gcc*x86_64	X	X	X	X
cpp[2]		cpp*x86_64				X
libnotify-tools[3]		libnotify-tools*x86_64	X	X		

Note:

- [1] On SuSe 12, you can only install the 64-bit version of Visual COBOL. The glibc-locale-32bit library is still required by the SafeNet Sentinel licensed 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] On Red Hat these libraries are required to enable COBOL to compile.
- Libraries marked with an 'X' are not included in the platform and need to be installed separately.
- [3] 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
  ```

Visit the *Red Hat Web site* for more information.

- Xterm, the terminal emulator for the X Window System, is part of your UNIX/Linux distribution but is not installed by default. Use your UNIX/Linux installation media to install it.
- Java 8 (64-bit) is required to run the Eclipse IDE. The minimum recommended version is AdoptOpenJDK's OpenJDK 8 (u202) with Hotspot, which the Windows product installs automatically. Java 8 (32 or 64-bit versions), and Java 11 (64-bit version only) are supported for executing JVM COBOL code and for native COBOL and Java interoperability. You can download AdoptOpenJDK's OpenJDK 8 with Hotspot from *AdoptOpenJDK's Web site* and unpack the archive anywhere on your machine.

  Note: Eclipse does not run using Java 11.

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

- You need to 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`
- You need to 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. The LANG settings are English and Japanese only.

Important: 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 a network server, you must update the license server before installing the product as the client is not able to communicate with license servers of versions older than 10000.2.660. On Windows, you can check the version of your license server by clicking **Help > About** in the Micro Focus License Administration tool. To check the version of the license server on UNIX, run `/var/microfocuslicensing/bin/mfcesver` or `/var/microfocuslicensing/bin/cesadmintool.sh`.

If Micro Focus License Manager version 10000.2.02070 or older is installed, it must be uninstalled before the product installation or upgrade can continue.

You can download the new version of the license server software from the Micro Focus SupportLine Web site: *http://supportline.microfocus.com*.

Additional Software Requirements on Linux and UNIX

To ensure full functionality for some Visual COBOL features, you might be required to obtain and install additional third-party software in addition to the prerequisite software installed automatically by the Visual COBOL setup file.

Click here to see this information on the Product Documentation pages on Micro Focus SupportLine.

UNIX and Linux Installer 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 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_50.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 4.8 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

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

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_5.0_platform
   ```
2. Run the setup file with superuser permissions:
   ```
   ./setup_visualcobol_deveclipse_5.0_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_5.0_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:

- 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_5.0_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, remove the file and install Sentinel RMS server manually.

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/Visual COBOL/.

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 SupportLine
- *Installing into other instances of Eclipse* - available in the product Help and on the Product Documentation pages on Micro Focus SupportLine
- *Installing on Microsoft Terminal Server and Citrix* - available in the product Help and on the Product Documentation pages on Micro Focus SupportLine

See this information on the Product Documentation pages on Micro Focus SupportLine - for Visual COBOL for Eclipse for Windows *click here* and for Visual COBOL for Eclipse for UNIX *click here*.

Click here to see this information on the Product Documentation pages on Micro Focus SupportLine for Visual COBOL Development Hub.

On Windows

Installing as an Upgrade

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

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

Visual COBOL Installation Options

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.

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_50.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
  ```

Installing silently

Use the `/q` parameter to install silently:

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

Examples

- To silently install Visual COBOL into a directory other than the default:
  ```
  start /wait vce_50.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_50.exe /q InstallFolder2=c:\EclipseInstallDirectory
  ```

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.

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_5.0_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_5.0_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_5.0_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_5.0_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 SupportLine Web site* for any updates to the documentation which might have been uploaded.

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.

Installing X Windows on Windows

Some features of Visual COBOL for Eclipse on Windows require an X Windows installation, hence Micro Focus ViewNowX is provided with the product.

To install ViewNowX:

1. Using Windows Explorer, navigate to the folder that contains the ViewNowX executable. By default, this is `%ProgramFiles(x86)%\Micro Focus\Visual COBOL\ViewNowX`.
2. Execute `ViewNow_X_Server.exe` and then `vnx_HF_11327.msp` in that folder.

ViewNowX requires that your client machine has Microsoft Visual C++ 2008 SP1 Redistributable Package (x86) installed. If it is missing from your machine, the ViewNowX installation will offer a link to download the package.

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.

To repair your installation on versions of Windows Vista or later:

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.

When you uninstall, the only files deleted are those that the installation software installed. 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 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
   ```

Repairing

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

Uninstalling

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

To uninstall this product:

1. Execute as root the `Uninstall_VisualCOBOLEclipse5.0.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.

Installing Visual COBOL Development Hub

Before Installing

Downloading the Product

1. Use the download links in your Electronic Product Delivery email.

   For more information follow the links for the installation instructions and the End User License Agreement.

UNIX and Linux Installer 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 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.

System Requirements for Visual COBOL Development Hub

Hardware Requirements

The disk space requirements are approximately:

Platform	Installer type	Setup file size	Disk space required for the installation	Disk space required for running the product	Sentinel RMS license server
POWER running AIX	Micro Focus	462 MB	1.85 GB	924 MB	41 MB
HP IA	Micro Focus	847 MB	3.39 GB	1.74 GB	79 MB
System Z running Red Hat Linux	Micro Focus	382 MB	1.53 GB	764 MB	39 MB
x86-64 running Red Hat Linux	Micro Focus	455 MB	1.82 GB	910 MB	50 MB
ppc64le running Red Hat Linux	Micro Focus	267 MB	1.07 GB	534 MB	1 MB
SPARC running Solaris	Micro Focus	456 MB	1.82 GB	912 MB	41 MB
x86-64 running Solaris	Micro Focus	431 MB	1.72 GB	862 MB	33 MB
System Z running SUSE SLES	Micro Focus	280 MB	1.12 GB	560 MB	39 MB
x64 running SUSE SLES	Micro Focus	333 MB	1.33 GB	666 MB	50 MB

Platform	Installer type	Setup file size	Disk space required for the installation	Disk space required for running the product	Sentinel RMS license server
ppc64le running SUSE SLES	Micro Focus	247 MB	988 MB	494 MB	1 MB

Operating Systems Supported

For a list of the supported operating systems, check the *Product Availability* section on the Micro Focus SupportLine Web site: *http://supportline.microfocus.com/prodavail.aspx*.

Software Requirements

Note: This product includes OpenSSL version 1.1.1b.

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

- Xterm, the terminal emulator for the X Window System, is part of your UNIX/Linux distribution but is not installed by default. Use your UNIX/Linux installation media to install it.
- The "awk", "ed", "sed" and "tar" utilities must be installed and added to the PATH.
- On SUSE 12, you can only install and use the 64-bit version of Visual COBOL.
- The pax archiving utility is required by the setup file. Pax is distributed with most UNIX/Linux systems but, if it is missing, you must install it separately. To verify pax is installed, run `pax --help` or `pax --version` at the command line.
- Required libraries for Red Hat and SUSE Linux platforms - the installer checks that both the 32-bit and 64-bit libraries listed below are installed on both 32-bit and on 64-bit Operating Systems for this product to install and work correctly.

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

Table 1: Default Libraries

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

Library	32-bit Library Name	64-bit Library Name	s390 Library Name	Platform	
				SUSE 12[1]	Red Hat 7
glibc	glibc-*.i686	glibc-*.x86_64	glibc-*.s390		X
libgcc	libgcc-*.i686	libgcc-*.x86_64	libgcc-*.s390		X
libstdc++	libstdc++-*.i686	libstdc++-*.x86_64	libstdc++-*.s390		X
glibc-devel	glibc-devel-*.i686	glibc-devel-*.x86_64	glibc-devel-*.s390		X
glibc-locale	glibc-locale-32bit	glibc-locale-2	N/A	X	
gtk2	N/A	libgtk-2_0-0-2	N/A	X	

Library	32-bit Library Name	64-bit Library Name	s390 Library Name	Platform	
				SUSE 12[1]	Red Hat 7
gtk2	N/A	gtk2-tools-2	N/A	X	
gtk2	N/A	libXcomposite 1-0	N/A	X	
gtk2	N/A	libgdk_pixbuf-2_0-0-2	N/A	X	
gtk2	N/A	gdk-pixbuf-query-loaders-2	N/A	X	
gtk2	N/A	libjasper1-1	N/A	X	
gtk2	N/A	gtk2-*.x86_64	N/A		X
gtk2-x11	N/A	libgthread-2_0-0-2	N/A	X	
libXtst	N/A	libXtst6-1	N/A	X	
libXtst	N/A	libXtst-*.x86_64	N/A		X
glibc-devel	glibc-devel-*.i686	glibc-devel-*.x86_64	N/A		X
PackageKit-gtk	N/A	PackageKit-gtk-module-*.x86_64	N/A		
PackageKit-gtk3	N/A	PackageKit-gtk3-module-*.x86_64	N/A		X
gtk2-engines	N/A	gtk2-engines.*.x86_64	N/A		
libcanberra-gtk2	N/A	libcanberra-gtk2-*.x86_64	N/A		X
webkitgtk	N/A	webkitgtk.x86_64	N/A		
webkitgtk3	N/A	webkitgtk3.x86_64	N/A		X
xterm	Any version	Any version	Any version	X	X
unzip	Any version	Any version	Any version	X	X
libgnome	N/A	libgnome.x86_64	N/A		X
gcc[2]	gcc*.i686	gcc*x86_64	X	X	X
cpp[2]		cpp*x86_64			X

Visit the *Red Hat Web site* for more information.

- [1] On SuSe 12, you can only install the 64-bit version of Visual COBOL. The glibc-locale-32bit library is still required by the SafeNet Sentinel licensed components.

- [2] On Red Hat these libraries are required to enable COBOL to compile.

- Java 8 (64-bit) is required to run the Eclipse IDE. The minimum recommended version is AdoptOpenJDK's OpenJDK 8 (u202) with Hotspot, which the Windows product installs automatically. Java 8 (32 or 64-bit versions), and Java 11 (64-bit version only) are supported for executing JVM COBOL code and for native COBOL and Java interoperability. You can download AdoptOpenJDK's OpenJDK 8 with Hotspot from *AdoptOpenJDK's Web site* and unpack the archive anywhere on your machine.

  Note: Eclipse does not run using Java 11.

  Note:

  - On AIX and zLinux, you need to have IBM's JDK. The earliest supported release of IBM's JDK is 7.0 Service Refresh 8. If you install IBM's JDK 8, on AIX you must install its latest fix - JDK 8 SR5 FP16. You can get IBM's AIX JDK from *IBM's Web site*.
  - On HP-UX, you need to have HP-UX JDK. The earliest supported release of HP-UX is JDK 7.0.11. You can get the HP-UX Java JDK from *HP's Web site*.
  - On Solaris platforms (both SPARC and Intel) only the 64-bit version of Java 8 and later is supported.

To execute JVM COBOL code, you need to set the environment as follows:

- You need to 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`
- You need to 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. The LANG settings are English and Japanese only.

Important: 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 a network server, you must update the license server before installing the product as the client is not able to communicate with license servers of versions older than 10000.2.660. On Windows, you can check the version of your license server by clicking **Help > About** in the Micro Focus License Administration tool. To check the version of the license server on UNIX, run `/var/microfocuslicensing/bin/mfcesver` or `/var/microfocuslicensing/bin/cesadmintool.sh`.

If Micro Focus License Manager version 10000.2.02070 or older is installed, it must be uninstalled before the product installation or upgrade can continue.

You can download the new version of the license server software from the Micro Focus SupportLine Web site: *http://supportline.microfocus.com*.

Additional Software Requirements for Visual COBOL Development Hub

To ensure full functionality for some Visual COBOL features, you might be required to obtain and install additional third-party software in addition to the prerequisite software installed automatically by the Visual COBOL setup file.

Click here to see this information on the Product Documentation pages on Micro Focus SupportLine.

Click here to see this information on the Product Documentation pages on Micro Focus SupportLine.

Basic Installation

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

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

Installing Visual COBOL Development Hub

Note: 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.

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

1. Give execute permissions to the setup file:
   ```
   chmod +x setup_visualcobol_devhub_5.0_platform
   ```
2. Run the installer with superuser permissions:
   ```
   ./setup_visualcobol_devhub_5.0_platform
   ```
   If you don't run this as superuser you will be prompted to enter the superuser password during the installation.

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

SafeNet Sentinel considerations

- The installation of this product could affect the SafeNet Sentinel licensed components running on your machine. During installation licensing is shutdown to allow files to be updated. To ensure the processes running on your machine are not affected, you need to use the `-skipsafenet` option, which skips the installation of SafeNet:
  ```
  ./setup_visualcobol_devhub_5.0_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, remove the file and install Sentinel RMS server manually.

Note:

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

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

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

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 in the Micro Focus Infocenter
- *Installing into other instances of Eclipse* - available in the product Help and in the Micro Focus Infocenter
- *Installing on Microsoft Terminal Server and Citrix* - available in the product Help and in the Micro Focus Infocenter

See this information on the Product Documentation pages on Micro Focus SupportLine - for Visual COBOL for Eclipse for Windows *click here* and for Visual COBOL for Eclipse for UNIX *click here*.

Click here to see this information on the Product Documentation pages on Micro Focus SupportLine for Visual COBOL Development Hub.

Installing as an Upgrade

This release works concurrently with the previous version of Visual COBOL Development Hub, 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 Development Hub installer with the –installlocation option:

1. Execute the following command:
   ```
   ./InstallFile -installlocation="/opt/microfocus/VisualCOBOL"
   ```
   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.

Visual COBOL Development Hub 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_devhub_5.0_platform -installlocation="full path of new location"
```

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

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

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

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

Configuring the Enterprise Server installation

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

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

- The information about Visual COBOL Development Hub is part of the Visual COBOL for Eclipse product help.
- Check the *Product Documentation* section of the *Micro Focus SupportLine Web site* for any updates to the documentation which might have been uploaded.

Setting up the product

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/Visual COBOL/.

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.

Note: If there are two or more products installed on the machine or the products are installed in non-default locations then the `/opt/microfocus/logs/MicroFocusProductRegistry.dat` data file can be used to find the product locations.

The file contains the following entries:

```
[ Install Location ]#[ Date of Installation ]#[ Product Name ]
```

For example:

```
/home/user1/VisCobol30#2017-01-20#Micro Focus Visual COBOL Development Hub 3.0
```

```
/home/user1/CobolServer30#2017-01-20#Micro Focus COBOL Server 3.0
```

Configuring the Remote System Explorer Support

Note: The following only applies if you are using Visual COBOL Development Hub with Visual COBOL for Eclipse.

The remote development support from the Eclipse IDE relies upon Visual COBOL Development Hub running on the UNIX machine and handling all requests from the IDE for building and debugging programs. Visual COBOL Development Hub provides a UNIX daemon, the Remote Development Option (RDO) daemon, which initiates the RDO as Eclipse clients connect to it. Whichever environment is used to start the RDO daemon will be inherited for all servers and hence all build and debug sessions.

Configuring the Environment

You may need to configure some aspects of the environment before you start the daemon. This is because when a build or debug session is initiated on the Development Hub from one of the Eclipse clients, the environment used will be inherited from whatever was used to start the daemon. A typical example of the kind of environment that might need to be set up would include database locations and settings for SQL access at build/run time.

Starting the Daemon

Important: Before starting the daemon you must have the following on your UNIX machine:

- A version of Perl.
- A version of Java 8 or later.
- The `as` (assembler) and `ld` (linking) programs on the path, as specified by the PATH environment variable.

To start the daemon on the default port (4075) as a background process, perform this command with superuser authority:

```
$COBDIR/remotedev/startrdodaemon
```

The daemon will now listen for any Eclipse client processes connecting to that machine on port 4075. If you want to use another port, specify another port number on the `startrdodaemon` command.

The daemon can also be configured to instantiate the servers on a specified port or range of ports. This is particularly relevant when you want to only open certain ports through a firewall. To do this, perform this command with superuser authority:

```
$COBDIR/remotedev/startrdodaemon [<port> | <low port>-<high port>]
```

where:

- *<port>* is the port number the daemon should use to listen for connections from Eclipse on the client machine. If no value is given, it will be assigned a default value of 4075. This value matches the value assigned within the Eclipse installation.

  For example,

  ```
  $COBDIR/remotedev/startrdodaemon 4999
  ```

This command will start a daemon listening on port 4999 and will use random server ports.

- *<low port>-<high port>* is the range of ports on which the servers (launched by the daemon) should use to communicate with Eclipse on the client machine.

  For example,

  ```
  $COBDIR/remotedev/startrdodaemon 4080 4090-4999
  ```

  This command will start a daemon listening on port 4080 and server ports will be in the range 4090 to 4999.

Stopping the Daemon

To stop the daemon, type the following command with superuser authority:

```
$COBDIR/remotedev/stoprdodaemon <port>
```

Repairing on UNIX

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

Uninstalling

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

To uninstall this product:

1. Execute as root the `Uninstall_VisualCOBOLDevelopmentHub5.0.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 license either for a 30-day trial or 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 SupportLine*.

To buy and activate a full unlimited license

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

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

To start Micro Focus License Administration

Windows

Windows 8.1	• From the Windows **Start** screen, click the **License Administration** tile
Windows 10 and Later	• From your Windows desktop, click **Start > Micro Focus License Manager > License Administration**

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) or an authorisation code which consists of a string of 16 alphanumeric characters.

If you have a license file

Windows

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`).
   - Drag and drop the license file from Windows Explorer to the **License file** field.
   - Open the license file in a text editor, such as Notepad, then copy and paste the contents of the file into the box below 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. Ensure **I have a full Visual COBOL license** is checked.
4. Click **Browse** next to the **License file** field.
5. Select the license file (which has an extension of `.mflic`), and then click **Open**.
6. Click **Finish** to install the license.

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

Authorizing your product when you have an Internet connection

Note:

- 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

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.

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

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

1. Start Micro Focus License Administration.
2. Click **Manual Authorization** on the Install page.
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 SupportLine 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 SupportLine 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**.

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 inputting 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 inputting 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 SupportLine.

Updates and SupportLine

Our Web site gives up-to-date details of contact numbers and addresses.

Further Information and Product Support

Additional technical information or advice is available from several sources.

The product support pages contain a considerable amount of additional information, such as:

- The *Product Updates* section of the Micro Focus SupportLine Web site, where you can download fixes and documentation updates. Go to *https://supportline.microfocus.com/websync/productupdatessearch.aspx*
- The *Examples and Utilities* section of the Micro Focus SupportLine 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 SupportLine 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* in your browser to go to the Micro Focus home page, then click **Support & Services** > **Support** > **Support Resources** > **All Support Resources by Product**. In the **Browse by Product** field, click the product you require, and then click **Log into SupportLine**.

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 *https://www.youtube.com/user/MicroFocusIntl*.

Information We Need

However you contact us, please try to include the information below, if you have it. The more information you can give, the better Micro Focus SupportLine can help you. But if you don't know all the answers, or you think some are irrelevant to your problem, please give whatever information you have.

- The name and version number of all products that you think might be causing a problem.
- Your computer make and model.
- Your operating system version number and details of any networking software you are using.
- The amount of memory in your computer.
- The relevant page reference or section in the documentation.
- Your serial number. To find out these numbers, look in the subject line and body of your Electronic Product Delivery Notice email that you received from Micro Focus.

On Windows, if you are reporting a protection violation you might be asked to provide a dump (`.dmp`) file. To produce a dump file you use the **Unexpected Error** dialog box that is displayed when a protection violation occurs. Unless requested by Micro Focus SupportLine, leave the dump setting as `Normal` (recommended), click **Dump**, then specify a location and name for the dump file. Once the dump file has been written you can email it to Micro Focus SupportLine.

Alternatively, you might be asked to provide a log file created by the Consolidated Tracing Facility (CTF) - a tracing infrastructure that enables you to quickly and easily produce diagnostic information detailing the operation of a number of Micro Focus software components.

On Windows, you can use the Micro Focus SupportLine Support Scan Utility, MFSupportInfo, to create either:

- a `.log` file that contains the details about your environment, Micro Focus SupportLine products, and settings.
- a `.zip` archive that includes the same information as the `.log` file plus some product configuration files from **c:\ProgramData** and the product installation log files.

`MFSupportInfo.exe` is stored in `<install-dir>\bin`.

To run MFSupportInfo:

1. Start a 32-bit Enterprise Developer command prompt.
2. Enter `MFSupportinfo` at the command prompt to start the utility.
3. Create a `.log` file or a `.zip` archive as follows:

   a. To create a `.log` file, click **File > Save**.

      This prompts to save the `.log` file, `MFSupportInfo_Log_`*`MachineName_YYYY-MM-DD_HH-MM-SS`*`.log`, in the `%temp%` directory.

   b. To create a `.zip` archive, click **Tools > Create Zip Package**.

      This creates a `.zip` archive, `MFSupportInfo_Log_`*`MachineName_YYYY-MM-DD_HH-MM-SS`*`.zip`, in the `%temp%` directory.
4. Send the diagnostic information to your Micro Focus SupportLine representative:

   The following requires an Internet connection and an Email client:

   a. Click **Tools > Email Log to SupportLine** to open the **Email Log** dialog box.
   b. Fill in the required fields and click **Send**.

   If the machine is not connected to the Internet or if there are no Email clients installed, copy either the `.log` file or the `.zip` archive to a machine that is connected to the Internet. Use your Email client to email the files to Micro Focus SupportLine at *supportline@microfocus.com* together with the Support Incident (SI) number, if available, and any additional details that might be useful to diagnose the issues that you are experiencing.

On UNIX, you can use the Micro Focus UNIX Support Scan Utility, `mfsupport`, to create a log file that contains the details about your environment, product, and settings. The `mfsupport` script is stored in `$COBDIR/bin`.

To run `mfsupport`:

1. Start a UNIX shell.
2. Set COBDIR to the product with issues.
3. Execute `mfsupport` from a directory where you have write permissions.

   This creates a log file, `mfpoll.txt`, in that directory.
4. When the script finishes, send the `mfpoll.txt` file to your Micro Focus SupportLine representative.

Note:

If COBDIR is set to a location that does not contain `etc/cobver`, the script outputs the contents of `/opt/microfocus/logs/MicroFocusProductRegistry.dat` which keeps a list of the installed Micro Focus products.

Creating Debug Files

If you encounter an error when compiling a program that requires you to contact Micro Focus SupportLine, your support representative might request that you provide additional debug files (as well as source and data files) to help us determine the cause of the problem. If so, they will advise you how to create them.

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