



Micro Focus Visual COBOL 3.0 for ISVs

Release Notes

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Micro Focus Visual COBOL 3.0 for ISVs Release Notes

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



Note:

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

Product Overview

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

- Visual COBOL for Visual Studio - delivers the richest development experience for COBOL programming available on Windows using Microsoft's Visual Studio in one of the following versions 2012, 2013, 2015 or 2017. Visual COBOL supports the development and deployment of both managed .NET and native COBOL applications.
- Visual COBOL for Eclipse - provides an Eclipse-based integrated COBOL development environment for Windows or Linux. Provides COBOL JVM support and enhanced compatibility with ACUCOBOL. Can be used standalone for developing local applications or in conjunction with the Development Hub to develop remote projects in Linux and UNIX.
- Visual COBOL Development Hub - provides a rich desktop development environment based on the Eclipse IDE with high-performance server-based tools for managing builds, source code access and debugger engine. The Development Hub also provides a central administration site, simplifying the development tool distribution and maintenance process.

Upgrading from earlier Micro Focus products

Application executables that were compiled using earlier Micro Focus products must be recompiled from the sources using Visual COBOL.


What's New

This release provides enhancements in the following areas:

- *Integration with Visual Studio*
- *Integration with Eclipse*
- *Application Server JCA support for Enterprise Server*
- *Azure support*
- *Building applications*
- *Character encoding*
- *COBOL language enhancements*
- *Code analysis*
- *Code coverage*
- *Compiler control*
- *Data File Tools*
- *Database access - DB2*
- *Database access - MySQL*
- *Database access - OpenESQL*
- *Debugging applications*
- *Deployment on multiple platforms*
- *Documentation*
- *Enterprise Server*
- *Interface Mapping Toolkit in Visual Studio*
- *iFileshare*
- *Micro Focus Unit Testing Framework*
- *XML processing*

Integration with Visual Studio

This release provides enhancements in the following areas:

- Integration with Microsoft's Visual Studio 2017, the most recent version of world's most popular integrated development environment (IDE) for the Windows platform, offering significant benefits for developers and businesses developing software for Windows.
- COBOL Editor:
 - Brace completion - a closing quote mark or bracket is automatically inserted when you type the opening quote mark or bracket at the end of a line.
 - Brace matching for IF and EVALUATE statements - clicking on any of the clauses of these statements highlights the opening and closing statements and all clauses. Use **CTRL +]** to move the cursor to the next clause in the statement.
 - Collapse to definitions - closes all sections, entry points and methods in an open file. Use the **Outlining > Collapse to Definitions** editor context menu command.
 - Colorization is now available for QuickInfo, completion tooltips and signature help.
 - Completion of statements - IF and EVALUATE statements are now automatically aligned and completed.
 - Indentation - smart indentation is now available to control how lines indent within IF and PERFORM statements and after continuation statements.
 - Locate definition, , on the COBOL toolbar enables you to search for data items and identifiers by specifying any string of characters that might be part of their name. This command replaces **Edit > Go To Location**.

- Outlining - outlining is now available for 01 level for group items (for expanding and collapsing the entire group)
- Quick actions (a feature of Visual Studio versions 2015 and later) - Visual COBOL now supports Visual Studio's quick actions for rename refactoring, and finding or creating missing copybooks.
- Tooltips are now available for managed COBOL members.
- COBOL toolbar - the commands on the COBOL toolbar have been updated in order to optimize your editing experience. A number of commands (renumber and unnumber) have been removed from the context menu in the editor and are now only available from the toolbar.
- Directives determination - there is now a preview dialog box when the IDE scans your sources for Compiler directives. This enables you to review and approve the directives before they are set.
- Error reporting - you can now sort the errors and warnings **Error List** window by their COBOL error code.
- Import, export and synchronization of the IDE options - you can now export a number of the COBOL global options as a Visual Studio .settings file. You can import the file into other instances of Visual COBOL.

Visual COBOL for Visual Studio 2015 and later now supports the automatic synchronization of a number of COBOL settings across the copies of Visual Studio installed on different machines. The settings are synchronized through your MSDN account. See the MSDN for more details and for information on any restrictions to the functionality.

- **Project Details** window - provides a number of enhancements, including performance improvement. It is now possible to filter on project or solution, perform a search, and sync with Solution Explorer. Tooltips are available in the Overrides column to show the override directives.
- Net Express import wizard - provides a new option for including copybooks in a project.
- Rename refactoring - this release introduces rename refactoring for COBOL code that can help to improve the readability of COBOL elements or make their purpose clearer. You can rename elements such as variables and identifiers, section and paragraph names, classes, and methods across a program or a solution.
- Support for standalone files - various improvements have been made to how you work with files that are not part of a project:
 - When you first open a standalone file, the editor displays an alert bar with options to browse for a symbols (.idy) file to use to compile the standalone file or to configure the Compiler directives.
 - You can now use the file's properties window to edit the Compiler directives and to specify options for debugging.

In previous versions of Visual COBOL, standalone files were known as "single files". References to "single files" in the IDE and the product help have been changed to "standalone files".

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Integration with Eclipse

This release provides enhancements in the following areas:

- Support for Eclipse 4.6 - Visual COBOL now ships with the 64-bit Eclipse 4.6. By default, Eclipse is configured to compile applications for 32-bit and the default target platform for new projects is 32-bit.



Note: Applications that were created using Visual COBOL 2.3 Update 2 and earlier must be recompiled in Visual COBOL 3.0 to ensure they will compile and execute properly.

The 32-bit Eclipse is still supported on 64-bit Windows platforms and you need to manually install the 32-bit IDE and a 32-bit Java

You can install the Visual COBOL plugin in other instances of Eclipse (32-bit or 64-bit). Support for Eclipse 4.2 and 4.3 has been discontinued.

- Rename refactoring - enables you to rename COBOL elements such as variables and identifiers, section and paragraph names, classes, and methods across a program or a workspace. Renaming

helps improve the readability of an item or make its purpose clearer. Two preferences for renaming are supported in Eclipse - directly in the editor or using a **Rename** dialog box that offers a preview.

- Copybook paths - it is now possible to specify copybook paths to folders that are outside the project folder.
- Standalone files:
 - It is now possible to specify the locations where the IDE will search for the program symbol files (.idy) for standalone files: **Window > Preferences > Micro Focus > COBOL > Standalone Files > Program Symbols (.IDY)**.
 - It is now possible to use the Eclipse debug configurations to debug standalone files, including core dump files.

In previous versions of Visual COBOL, standalone files were known as "single files". References to "single files" in the IDE and the product help have been changed to "standalone files".

- Error reporting - errors reported in the **Console** view now include a link for opening the source file at the line where the error originates.
- Editor improvements - an option for removing trailing whitespaces has been added to the IDE preferences for the COBOL editor.

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Application Server JCA support for Enterprise Server



Restriction: This feature applies only when the Enterprise Server feature is enabled.

In this release, EJBGEN has been updated to generate an EAR file as a part of the COBOL deployment process, which enables you to deploy EJBs to Java Application Server.

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Azure support

Visual COBOL now supports the following versions of Microsoft Azure SDK - version 2.9.6 with Visual Studio 2013 and version 3.0 with Visual Studio 2015 and later.

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Building applications

This release provides the following improvements:

- Support for faster, parallel building on multi-CPU machines - support has been added for multi-processor compilation of the sources in native COBOL projects on multi-CPU machines.

You can specify the maximum number of concurrent compilations from the IDE preferences - **Tools > Options > Micro Focus > Projects** for Visual Studio and **Window > Preferences > Micro Focus > Builder** for Eclipse. In Visual Studio, multi-processor compilation must also be enabled in the project's properties.

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Character Encoding

A new utility, cobutf8, is available. cobutf8 enables you to seamlessly run applications that require non-UTF-8 character encodings in a UNIX environment that is using a UTF-8 locale.

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COBOL language enhancements

This release includes the following enhancements to the COBOL syntax:

- The DISPLAY-OF and NATIONAL-OF intrinsic functions are now able to process conversions using any IBM CCSID value.

The following enhancements are available in managed COBOL:

- To avoid an exception being thrown if an explicit conversion fails, use the AS IF syntax, which results in the target object being set to null and no exception thrown.

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Code analysis

This release provides the following improvements:

- A new group of predefined rule sets for 64-bit readiness is now included in Visual COBOL.
- Support for importing code analysis reports produced with one of Micro Focus's advanced tools for code analysis, Enterprise Analyzer or COBOL Analyzer.

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Code coverage

The following improvements are available within the IDE:

- Information about unexecuted programs - the code coverage reports in the **Code Coverage** window now show the unexecuted programs.
- Code coverage support for standalone COBOL files - you can import existing code coverage reports in the **Code Coverage** window and use it to supply code coverage information for standalone files.
- Remote code coverage files - in the **Code Coverage** window in Eclipse, it is now possible to import code coverage report files that are stored in remote locations.
- Test coverage files - it is now possible to use a test coverage file to debug applications.

If you are using Test Coverage from the command line, you can now use the following features:

- A new Compiler directive, COLLECTION - the directive enables test coverage to gather information about unexecuted programs. In the IDE, this directive is automatically set on a project when you enable code coverage for it.
- A new command line utility, tcutil - the utility enables you to convert the test coverage binary results file into XML format.
- It is now possible to integrate test coverage in a Continuous Integration (CI) system. You can use tcutil and an XSLT processor to transform test coverage data into a format suitable for including in a CI.

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Compiler control

The following Compiler directives are new in this release:

- COLLECTION - provides a mechanism for code coverage to identify unexecuted programs.
- ILSTDLIB (.NET COBOL only) - helps you to ensure that your .NET COBOL code compiles with the correct version of the .NET Framework Microsoft Common Object assembly `mscorlib.dll`. When building from Visual Studio or using MSBuild to compile a COBOL project, the NOILSTDLIB directive is set, and an ILREF is generated pointing at the version of mscorlib appropriate for the target framework selected in the project's properties.

The following Compiler directives have been updated:

- ALIGN - this directive has new parameters (FIXED and OPT) that can be used in conjunction with the integer taken, which can aid performance. The default is ALIGN"8 OPT"; see the Comments section of the ALIGN Compiler directive topic for details of its affect on memory boundaries.
- ARITH - this directive emulates the IBM mainframe option of the same name. Defines the maximum number of digits for numeric data items.

- FASTINIT - this directive is now on by default when setting the MF dialect; it remains not set by default for other dialects.
- SSRANGE - this directive now has an additional option (3), which permits zero-length reference modified items at run time when bounds checking.
- XMLPARSE - includes a change in the way entities are processed when XMLPARSE(COMPAT) is set

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Data File Tools

This release provides the following enhancements to Data File Tools:

- Opening files in shared mode - it is now possible to switch between read-only shared and edit modes. While a file is open in shared mode, others users can only open it in shared mode to ensure data consistency between users.
- Enterprise Server-level of security when accessing files - there is an improved level of security when exchanging data between Data File Tools and the targeted enterprise server instance. Users must now provide a user ID, group and a password when they try to access and view datasets in enterprise server instances. These are used for authentication and authorization checks to provide the same access level as Enterprise Server.
- Opening datasets using SSL - communication to a region is now possible using SSL. To enable the SSL communication, you need to provide a Java trust store which contains either a CA root certificate or a self-signed certificate of the region that it is communicating to. Java and the targeted region SSL configurations need to meet each other's standards in order for the communication to succeed.

This feature enables you to secure the information exchange between Data File Tools and the targeted enterprise server.

- Auditing of access and updates on datasets - Audit Manager now audits the access and updates on datasets via Data File Tools.
- Support for existing .pro files - enables you to use your existing editor profiles.
- Support for existing .str files - enables you to use your existing COBOL structure files.
- Automatic timeout - if no internal operations or external actions (such as a mouse click) have been detected for 30 minutes, Data File Tools now displays a countdown message. If the user does not take any decision within the specified period, Data File Tools closes all opened files.

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Database access - DB2

This release provides a new DB2(QUALIFY-CALL) Compiler directive that enables stored procedure invocations to include a schema name.

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Database access - MySQL

This release provides support for MySQL with ODBC.

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Database access - OpenESQL

This release provides the following new features:

- Statement prefixes for the SQL(CHECK) Compiler directive that enable the creation of temporary tables and other SQL objects at compile time, ensuring full SQL syntax checking during compilation.
- SQL(OPTIMIZECURSORS) Compiler directive that enhances processing for traditional embedded SQL cursors that use WITH HOLD and FOR UPDATE clauses.
- SQL(CLOSE_ON_COMMIT) Compiler directive to leave cursors open for further result set processing after a commit.

- SQL(GEN-SQLCA) Compiler directive that generates an SQLCA similar to the z/OS DB2 directive STDSQL(YES).

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Debugging applications

This release provides the following new features:

- Debugging core dump files without a project.
- Reverse debugging (Technology Preview) - it is now possible to step backwards through an application to view a recording of the previous steps executed in the current debug session. Input is not accepted while viewing recorded execution.



Restriction: This feature is supported on Red Hat Linux x86 platforms only. Additional restrictions apply. For details, see the *Reverse Debugging and Live Recording* topic in the *Known Issues and Restrictions* section of this documentation.

- COBOL Live Recording debug configuration (Technology Preview) - it is now possible to record an application execution and view its execution path in the debugger. This method of debugging enables stepping both forwards and backwards, but does not accept input.



Restriction: This feature is supported on Red Hat Linux x86 platforms only. Additional restrictions apply. For details, see the *Reverse Debugging and Live Recording* topic in the *Known Issues and Restrictions* section of this documentation.

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Deployment on multiple platforms

This release provides support for deploying JVM COBOL applications on multiple platforms. You can compile an application on one platform (such as Windows) and then deploy its class files to a different platform (such as Linux or UNIX).

Some features of the COBOL language, however, are platform-specific and their behavior on different platforms might vary. See *Multi-Platform Deployment of JVM COBOL Applications* in your product Help for details.

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Documentation

The following new sections have been added to the product help:

- *Where do I start?* - located on the launch page of the product help, this section provides the information you need in order to get started depending on which aspects of the product you need to get to grips with first.
- *Multi-Platform Deployment of JVM COBOL Applications* - includes information about how to ensure the portability of your JVM COBOL applications between Windows and UNIX or Linux platforms.

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Enterprise Server

Improvements are available in the following areas:

Integration with Visual Studio and Eclipse:

- Exporting an enterprise server definition from the IDE in XML format.
- Importing an enterprise server into the IDE using its definition file.
- In Visual Studio, it is now possible to configure an enterprise server to produce a core dump file directly from the IDE, from the server properties.

Long user IDs and passwords:

- Enterprise Server now supports user IDs and passwords of up to 100 characters. It is possible to map IDs from long to short (or vice versa) to enable compatibility with programs that do not support long names.

SHA-256 support in DemoCA:

- By default, the Demonstration Certificate Authority (CA) now signs certificates with SHA-256. This ensures that the demonstration or evaluation certificates will be accepted by modern browsers and other software that has enhanced security requirements.

Syslog auditing:

- Enterprise Server now supports auditing using syslog events, which can be consumed by a wide range of Security Information and Event Management (SIEM) products. This replaces the Audit Manager auditing solution. Syslog auditing provides a much more efficient auditing mechanism, with significantly less impact on overall speed.

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Interface Mapping Toolkit in Visual Studio

The Interface Mapping Toolkit (IMTK) contains the following enhancements in this release:

- Cross Origin Resource Sharing (CORS) support for REST Web services, enabling Web service access from a CORS-supported Web browser.

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iFileshare

iFileshare is no longer considered an Early Adopter Program, and contains the following enhancements in this release:

- An improved failover and recovery process. iFileshare now supports full recovery of nodes in the group. For high availability (HA-VSAM) groups, servers can now rejoin the group without the entire group having to be restarted. In addition:
 - A primary failover now results in a takeover from the most suitable node.
 - If configured, external clients will automatically reconnect to the new primary and will issue a notification if the transaction has been lost.
 - A failed node, when restarted, will rejoin the group, recover its files and request a log update from the current primary. Once this task has completed it will be considered an active hot-standby and will continue to process replication requests as normal.
 - Users will experience a higher level of uptime/availability with their Fileshare configuration and will be able to recover from errors more easily.
- A new exit procedure, `ifsexitproc.cbl`, can be configured to automate some aspects of iFileshare behavior.
- The iFileshare Control page in ESMAC contains details of the current iFileshare high availability group.
- The following new iFileshare-specific environment variables are available:
 - `FSWRKDIR` - enables you to specify the Fileshare working directory, overriding the default, which is the system directory of the region.
 - `FSCHKLFH` - determines if a check is performed when a high availability group is started, to test the consistency of the data files within the group.
- The database reference file (`dbase.ref`) now supports wildcard matching for filenames, allowing you to perform operations on multiple files at once; for example: `fs /d dbase.ref /f data*` adds the entire contents of the data directory to the database reference file.

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The Micro Focus Unit Testing Framework

The Micro Focus Unit Testing Framework is now available from within the IDE. It includes much of the architecture you would expect of an xUnit framework to create, compile, run and debug unit tests, including the following features:

- A unit test project template.
- A test creation wizard that enables you to generate tests from your source code.
- Code snippets (Visual Studio) and code templates (Eclipse) for each element of a test case.
- Support for running tests with Code Coverage enabled.
- The Micro Focus Unit Testing window (Visual Studio) and view (Eclipse), where you can manage your test runs and view test output.

There has been a number of enhancements to the command line version of the Micro Focus Unit Testing Framework. Support has been added for:

- Generating NUnit-style reports (in Visual Studio).
- Running test fixture files using Apache Ant.
- Applying traits to your test cases, then performing a test run based on those traits.
- Applying a high, medium, or low priority to test cases, which affects the order in which they are run.
- Adding coded command line options directly into your test code.
- Using a test run-specific configuration file, in which you can set environment variables.

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XML processing

XML PARSE now works in a purely managed COBOL environment. It is now supported in JVM COBOL and, in both .NET and JVM COBOL, it has a fully managed implementation. XML PARSE working without calling out to native code ensures it can be used in restricted rights environments.

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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).

- [Compatibility AddPack](#)
- [Compiler](#)
- [Documentation](#)
- [Enterprise Server](#)
- [File Handling](#)
- [IDE](#)
- [Micro Focus Directory Server](#)
- [OpenESQL](#)
- [Reserved words](#)
- [SQL Option for DB2](#)

Compatibility AddPack for Visual COBOL

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Compatibility AddPack for Visual COBOL is now deprecated and will not be available with release 3.0 and later.

The Dialog System GUI and run-time components and Dialog System Character Mode (on Windows and UNIX) which were part of the AddPack are now installed as part of Visual COBOL for Visual Studio. The run-time components are installed as part of COBOL Server. These are only included for backward compatibility and Micro Focus does not recommend that you use them for new development.

The other components which were part of the AddPack, the Character-Based Data File Editor, CSBIND and Screens, will be available upon request from Micro Focus SupportLine.

Compiler

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- Replacing a partial token no longer causes the second part of the token to appear on a new line. This could happen if the new text was larger than the text being replaced.
2869185 (1105763)

Documentation

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- There have been a number of new reserved words added to the language in this release; these are all in effect under MFLEVEL"19", which is the default level when running under the MF dialect. Any of the following words are now not allowed under default conditions, and you will need to remove/rename them, or specifically configure your environment to allow them: ALLOCATE FREE JSON END-JSON

Enterprise Server

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- WEB CONVERSE now supports a value of 0 for the USERLEN and PASSWORDLEN options which matches the behavior on the mainframe. There is no change to the behavior of WEB SEND (client) which is to return LENGERR 139/140 when USERLEN or PASSWORDLEN are 0.

2989188 (1108602)

IDE

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- You can now open data files in RSE configured remote projects using the mfdatatools2 on the remote machine displaying back to an X display. You can configure the remote tools display by clicking Window > Preferences > Micro Focus > X Display. In the X Display (DISPLAY) field, type the display details. In addition, COBOL Explorer displays the Open With Remote Data File Editor context menu item for remote data files.

2852872 (1104085)

- Enterprise Server sign on credentials which were created on Windows when using the 32-bit versions of Enterprise Developer or Visual COBOL for Eclipse are not compatible with the 64-bit versions of those products, and vice versa. Users are required to re-enter credentials which are not compatible with the current version of the product. You only need to do this the first time they are used in the current product.

(625819)

- Disabling CICS support from the properties of a file in your project within the IDE now correctly sets the NOCICSECM Compiler directive on that file.

File Handling

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- Under certain circumstances, retry-lock requests on UNIX systems were sleeping for a second before re-attempting to acquire the lock. This no longer happens.

2988222 (1108521)

- A problem that generated a 39 error when attempting to access a VSAM file via an alternate index PATH element has been fixed.

2874622 (1106562)

Micro Focus Directory Server

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- In the Enterprise Server Administration HTML GUI, the "Scripts" page functionality is only available if administration access is restricted and the logged on user has sufficient authority.

3101625 (1109025)

- Some additional CSRF security measures have been added to the Enterprise Server Administration HTML GUI.

3101205 (1108916)

OpenESQL

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The new OpenESQL OPTIMIZECURSORS SQL compiler directive option is turned on by default for both ADO.NET (DBMAN=ADO) and ODBC (DBMAN=ODBC). For ADO.NET, this reduces cursor memory consumption thereby providing optimal performance. This also ensures that, for ODBC, embedded SQL cursors that use WITH HOLD and FOR UPDATE clauses have the same data integrity across all databases.

If your applications require the OpenESQL preprocessor to use the behavior provided in an earlier release, compile them using OPTIMIZECURSORS=NO.

Reserved words

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- There have been a number of new reserved words added to the COBOL language; these are all in effect under MFLEVEL"19", which is the default level when running under the MF dialect. Any of the following words are now not allowed under default conditions, and you will need to remove/rename them, or specifically configure your environment to allow them:

ALLOCATE
FREE
JSON
END-JSON

SQL Option for DB2

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- Help buttons previously available on the XDB Server Configuration Utility, XDB Service Controller, Options Dialog, Bind Utility, and Linker Config (Link Profile) UIs have been removed with the exception of error messages in the SQLWizard, Migrate, and Declaration Generator.

Known Issues

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

In addition, note the following:

- [Azure support](#)
- [Debugging](#)
- [Enterprise Server](#)
- [Eclipse](#)
- [Resource Adapters](#)
- [REST/JSON IMTK implementation and the same-origin policy \(SOP\)](#)
- [Visual Studio](#)

Azure support

- When compiling COBOL Azure Role projects in Visual COBOL for Visual Studio 2013 you receive warnings at build time and the code fails to execute when deployed to Azure.

To work around this issue, you need to manually add the code below to the configuration section of the `web.config` file in your project for Web Roles or in the `app.config` file for Worker Roles:

```
<runtime>
  <assemblyBinding xmlns="urn:schemas-microsoft-com:asm.v1">
    <dependentAssembly>
      <assemblyIdentity name="Microsoft.Data.Services.Client"
publicKeyToken="31bf3856ad364e35" culture="neutral" />
      <bindingRedirect oldVersion="0.0.0.0-5.7.0.0"
newVersion="5.7.0.0" />
    </dependentAssembly>
    <dependentAssembly>
      <assemblyIdentity name="Microsoft.Data.OData"
publicKeyToken="31bf3856ad364e35" culture="neutral" />
      <bindingRedirect oldVersion="0.0.0.0-5.7.0.0"
newVersion="5.7.0.0" />
    </dependentAssembly>
    <dependentAssembly>
      <assemblyIdentity name="Microsoft.Data.Edm"
publicKeyToken="31bf3856ad364e35" culture="neutral" />
      <bindingRedirect oldVersion="0.0.0.0-5.7.0.0"
newVersion="5.7.0.0" />
    </dependentAssembly>
    <dependentAssembly>
      <assemblyIdentity name="Newtonsoft.Json"
publicKeyToken="30ad4fe6b2a6aeed" culture="neutral" />
      <bindingRedirect oldVersion="0.0.0.0-8.0.0.0"
newVersion="8.0.0.0" />
    </dependentAssembly>
  </assemblyBinding>
</runtime>
```

This information is added automatically when you create COBOL Azure projects in Visual Studio 2015 or later.

Debugging

- When debugging `.gnt` code on early builds of Windows 10 and Windows Server 2016, execution fails to stop at COBOL breakpoints. To resolve this, you should install the most recent Windows updates for your operating system, as this problem is only known to be present with the earlier versions.
- When debugging a remote program, the performance of the network, specifically the latency between the local and remote machines, will have an effect on the responsiveness of Eclipse. Whenever Eclipse has to show the new execution position, a number of messages are sent from the remote machine, over the network, to get the required information. The effect of this is that it can take a few seconds after a Step command is issued before Eclipse has updated the screen and is ready for the next command.

You can mitigate this delay by closing any unnecessary debug views. For instance, by closing the Expressions view and the Variables view, the number of messages that are sent is reduced, which allows Eclipse to update quicker.

- Large programs can suffer from a large delay the first time that the program is displayed in the debugger and an expression is evaluated. You can reduce this delay by following these steps:

1. Create a text file called `debugconfig.xml`.
2. Add the following lines, and then save the file:

```
<?xml version="1.0" encoding="utf-8" ?>
<NativeDebuggerOptions>
  <DebugOption Option="REMOTECHECKER" Value="yes"/>
</NativeDebuggerOptions>
```

3. At a command or shell prompt, set the environment variable `DEBUG_CONFIG` to the full path name for `debugconfig.xml`.
 4. Start Eclipse from the same command or shell prompt.
- Remote debugging does not work for programs running on AIX or HP machines, if you are trying to debug using Visual COBOL installed on a Linux machine.

Enterprise Server

- On Windows 10, if you are using Microsoft's EDGE browser to access the Enterprise Server Administration GUI, issues with EDGE can cause the automatic refresh feature to display a dialog asking whether you want to resubmit a form. To work around this issue, cancel the resubmit request and then refresh the server list page or the Home page of Enterprise Server Administration. You can also turn off the automatic refresh by setting the **Auto-refresh interval** setting on the Home page of Enterprise Server Administration to 0.

Eclipse

- Opening a COBOL project in Visual COBOL modifies the `.cobolProj` file. Once modified the `.cobolProj` file is no longer backward compatible with older versions of Visual COBOL. This prevents you from opening the same projects in earlier versions of Visual COBOL.



Note: Micro Focus recommend that you backup your `.cobolProj` file before opening projects created in earlier versions of Visual COBOL.

Resource Adapters

- Trying to deploy the local resource adaptor `mfcobol-localtx.rar` to WebLogic may fail with a `ClassCastException`. To work around this issue, you need to deploy `mfcobol-xa.rar` first, then need to undeploy this file and deploy the local one, `mfcobol-localtx.rar`. If there are issues deploying using the WebLogic GUI, you can use the command line. If there are issues with this as well, try reducing the length of the command (for example, by moving the file to a location with a shorter path).

REST/JSON IMTK implementation and the same-origin policy (SOP)

- HTTP requests sent from scripts within a web browser to REST services deployed on an enterprise server might fail due to the same-origin policy (SOP). Some browsers might implement (or support plugins that implement) techniques for relaxing SOP such as cross-origin resource sharing (CORS) that enable sending cross-origin requests successfully. For REST services, Enterprise Server does not implement a method for relaxing SOP. This means that browsers that implement CORS (or any other SOP relaxation technique) might still forbid requests made from scripts due to Enterprise Server not implementing the equivalent technique on the server side.

Visual Studio

- The Visual Studio 2017 option **Lightweight Solution Load** is not supported for COBOL. It must not be used with solutions that contain COBOL projects as it could result in problems with building the projects properly.
- In certain installation scenarios, after you install Visual COBOL for Visual Studio 2015, the COBOL language service can be uninstalled. This results in the following features missing from the COBOL editor: colorization, IntelliSense for COBOL and any other COBOL language support. This is an issue with Visual Studio's MEF component cache becoming corrupted.

To resolve this issue and restore COBOL language support in the editor:

1. From a command prompt, navigate to `C:\Program Files (x86)\Microsoft Visual Studio 14.0\Common7\IDE`.

2. Execute the following commands:

```
devenv /updateconfiguration
```

And then:

```
devenv /clearcache
```

Resolved Issues

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

- [Adis](#)
- [Character Animator](#)
- [COBOL to XML Schema generation](#)
- [Codeset Support](#)
- [Common Communications Interface](#)
- [Compiler](#)
- [Data Tools](#)
- [Debugger](#)
- [Documentation](#)
- [Editor Writing Assistance](#)
- [Embedded HTML Pre-Processor](#)
- [Enterprise Server](#)
- [File Handling](#)
- [IDE](#)
- [Interface Mapping Toolkit](#)
- [Micro Focus Directory Server](#)
- [Monitoring and Management](#)
- [OLE Class Library](#)
- [OpenSSL](#)
- [REX Support](#)
- [RM/COBOL](#)
- [Run-Time System](#)
- [SQL: COBSQL](#)
- [SQL: OpenESQL](#)
- [SQL Option for DB2](#)
- [XML Support](#)

Adis

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- PIC N items are now filled with double-byte space when required by ADISCTRL options 15 and 16.
2913183 (1108448)

Character Animator

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- The Break>Cancel-All option no longer occasionally freezes the Animator.
2879817 (1107460)

COBOL to XML Schema generation

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- CBL2XML now handles namespace correctly.

2861655 (1104748)

- CBL2XML now correctly handles non-default type within <restriction>.

2826345 (1100279)

Codeset Support

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- The Codeset DBCS tables MFTR0886.A2E MFTR0886.E2A have been updated to match the latest IBM Traditional Chinese conversion tables below: Description of 9027: T-Ch Host Double-Byte including 6204 UDC including euro. Description of 21427: T-Ch DBCS-PC (IBM BIG-5) including 13493 CNS, 566 IBM selected, 6204 UDC & euro.

3104948 (1109314)

Common Communications Interface

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- Using CCI shared memory and receiving data with a max receive length less than the total amount of data received resulted in the data being received incorrectly on the final receive. This has now been fixed.
- After a communications failure, Enterprise Server shared-memory listeners would sometimes stop accepting new connections. This has now been fixed.

Compiler

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- Level-88 VALUE clauses that inadvertently contain fixed point numeric literals, which cannot be matched with the associated numeric type, are now flagged with an E-level message.

3106909 (1109479)

- A new ARITH"COMPAT|EXTEND" Compiler directive is now supported to emulate the IBM mainframe option of the same name. This option defines the maximum number of digits for numeric data items.

3105597 (1109340)

- An extended ACCEPT of a PIC N data item now compiles successfully, as expected.

3101615 (1108944)

- The reference to an ASSIGN name in the SELECT clause is now included in the IDE's 'Find All References' list irrespective of whether the ASSIGN name is explicitly declared later in the source or not.

3100084 (1108817)

- When an intrinsic function is used as a parameter to an inline method invoke, which is also a parameter to another inline method invoke, the Compiler would produce invalid code, leading to a COBRT200 error. This is now fixed.

2991106 (1108786)

- Prototype checking for OMITTED parameters in inline method invokes is now working as expected.

2991031 (1108800)

- An error when an OBJECT PROPERTY is used in subscript calculation, or reference modification index or length calculation, has been fixed.

2990388 (1108738)

- A directives file with an explicit end of file character is now processed correctly.

2913115 (1108474)

- A DISPLAY of ADDRESS OF <data item> now executes as expected.

- 2913005 (1108635)
 - Prototype checking for nested inline method invokes is now working as expected.
- 2912463 (1108437)
 - A bug where compilation of very large managed projects could fail with error "COBCH1500: memory allocation failure – module 'allocmem'" has been fixed.
- 2886156 (1108156)
 - Using COBSQL with CP for a program with complex multi-line COPY REPLACING no longer results in spurious errors.
- 2884493 (1107939)
 - A move from a group to a reference modified PIC N field now executes as expected.
- 2884093 (1107883)
 - Producing a test coverage report in Eclipse no longer gives an exception for SQL programs with ENTRY statements.
- 2882106 (1107558)
 - Sign-included numeric usage DISPLAY items now display as expected under a mainframe dialect; that is, they display with the included sign shown exactly as stored, without conversion for readability.
- 2879364 (1107340)
 - The use of N" national literals in STRING statements no longer produces incorrect results.
- 2878504 (1107053)
 - A bug where COBDATA was set prior to starting the Visual Studio IDE, and was then blank when applications were executed, has been fixed.
- 2878431 (1107160)
 - A user class condition where the subject has the potential to be zero length now compiles and executes as expected when compiled with a mainframe dialect (which sets the ZEROLENGTHFALSE directive).
- 2878426 (1107044)
 - The same names used for data items in both method local and object storage could sometimes result in wrong execution results when the wrong duplicated name was used.
- 2878370 (1107207)
 - Class conditions defined in the SPECIAL-NAMES paragraph now work when SELECT statements are defined before the SPECIAL-NAMES paragraph.
- 2876808 (1106853)
 - Under CHARSET(EBCDIC), a MOVE of PIC G/N data items to PIC N/G data items now pad with x"4040" (an EBCDIC DBCS space). Comparisons of such data items will now also work correctly.
- 2876109 (1106752)
 - VALUE clauses with hex literals now pad correctly with x"40" under CHARSET(EBCDIC).
- 2875748 (1106704)
 - Statements involving properties and 'OCCURS DEPENDING ON' tables now compile and execute as expected.
- 2875074 (1106626)
 - Concatenation of alphanumeric literals in a VALUE clause for a national item is now treated as intended.
- 2873871 (1106451)
 - Queries of reference modified national data items now work as expected.
- 2873639 (1106443)
 - Using INSPECT <national-data-item> with the BY SPACE clause now works as expected. When dealing with national data items, SPACE is now treated as a national space - NX"0020£.

2873388 (1106390)

- A user class condition test, where the item being tested is a reference modified item with a length that is an expression, and when the directive ARITHMETIC(OSVS) is set, no longer causes an internal error on compilation.

2873219 (1106409)

- Nested inline method invokes now work as expected.

2872741 (1106315)

- A MOVE statement referencing a property name now compiles and executes as expected.

2872488 (1106304)

- A program containing DBCS characters in the sequence area of an otherwise blank line now compiles correctly and without error.

2868802 (1105699)

- An issue with using DECLARATIVES without a USE statement has been fixed.

2867168 (1105446)

- If more than one report shared the same FD, for example: REPORTS ARE REPORT-1 REPORT-2. then under HOSTRW, the record length was wrong. This has been corrected.

2865849 (1105553)

- The use of the HOSTRW and CURRENT-DATE directives no longer causes an excessive number of lines in a report produced from the Report Writer.

2853789 (1105472)

- A USE FOR DEBUGGING statement that references a table item and is triggered by a condition where the table item is referenced but not evaluated (due to short-circuit evaluation) now executes as expected.

2433731 (1073167)

- A bug in the Compiler, when REPLACE is used and the final line in the main source file is a copy statement containing a separate program, has been fixed.
- An error reporting the size of return-code by the Eclipse IDE has been fixed.
- A bug has been fixed in programs compiled with CHECKDIV"OSVS" that contain a statement of the form: COMPUTE r = a / (b - b)

3105637 (1109410)

- A bug in ON SIZE ERROR for arithmetic statements using floating point variables has been fixed.

2886077 (1108151)

- A bug has been fixed in generated code on Linux/390 for statements of the form: compute rounded a = b / constant where a and b are both comp-3 variables, and constant is an integral power of 10 (e.g. 10, 100, 1000).

2874143 (1106479)

- A COBRT114 error that was occurring at run time in generated code has been fixed.

2871410 (1106100)

- An error in debugging on Intel 32-bit platforms, such that a breakpoint set on an "exit method" statement is ignored if it immediately follows a statement such as "end-perform", "end-if" or "end-evaluate", has been fixed.

2861424 (1104587)

- A bug in generated code with the opt(3) directive, on Intel x86 64 bit (Linux and Windows) and Linux/390 has been fixed.
- For programs compiled with JVMGEN, the directive HOSTFD is not currently supported, and is switched off by the Compiler. However, for programs compiled using the ILSOURCE directive, this switching off did not happen, and as a consequence, bad code was generated that led to exceptions at run time - this has now been fixed.

3103829 (1109174)

- Debugging is now working correctly for JVM COBOL programs where the PROCEDURE DIVISION spans more than 65535 lines.

3102742 (1109264)

- A spurious warning 'Reference to undeclared extern assembly' is no longer generated for programs using the PREXML preprocessor, when built in Visual Studio.

3106908 (1109475)

- Icons consisting of PNG images are now being loaded successfully into applications using the ILICON directive, and no longer causing compile-time errors. (The ILICON directive is generated implicitly in Visual Studio when an icon is selected in the 'Icon and manifest' drop-down in Project Properties.)

2988305 (1108523)

- In some cases, use of the PROFILE directive could generate invalid code; those cases have been fixed.

2882325 (1107625)

- If the level 66 RENAMES phrase refers to two items in different 01 level records (which is non-standard and not recommended), the offset of the resulting item is no longer calculated wrongly; previously it was, leading to incorrect behavior at run time.

2882119 (1107568)

- If the first procedure in a PERFORM...THROUGH statement terminated (e.g. with GOBACK or STOP RUN), then the PERFORM itself terminated, and control did not trickle through beyond the PERFORM statement. The compiler has now been modified to recognize this condition, which means that the procedure division can be broken down into disjoint methods, avoiding stack overflow during program execution.

2880315 (1107465)

- An arithmetic expression involving an intrinsic function and a non-integer COBOL numeric item (e.g. PIC 9V9) no longer produces a result with incorrect decimal alignment.

2878918 (1107116)

- A load failure, which was the result of bad code caused by a constructor containing a GO TO statement that referenced a label (either a section or a paragraph) at the start of the procedure division, no longer occurs.

2878817 (1107114)

- The use of report-writer syntax in a class program no longer leads to bad code generation. Previously, it could result in 'field not found' errors when the class was loaded.

2878260 (1107158)

- When a PIC X data definition is used as a parameter to a method expecting an IEnumerable<char>, or when used as the object for an extension method on IEnumerable<char> (e.g. System.Linq.Enumerable.ToArray<char>), bad code is no longer generated.

2877859 (1106974)

- Use of the DIALECT"ENTCOBOL" directive no longer causes incorrect behavior when dealing with EXTERNAL files.

2875493 (1106685)

- When compiling for managed code, specifying an object reference in the file section will now produce an appropriate error message. Previously, the Compiler was allowing the use of object references in the file section, which was causing the generation of bad code, and inappropriate system error messages.

2872605 (1106287)

- Report Writer syntax directly under class-id (that is, not within static/end static or object/end object) no longer causes the generation of invalid code, which was leading to errors at run time.

2872555 (1106283)

- In managed COBOL, a large amount of CONTROL clauses no longer causes the SCREEN SECTION to produce a buffer overflow.
2870942 (1106053)
- When ILSMARTLINKAGE was specified for a program compiled with the directive ODOSLIDE (which is set automatically when a mainframe dialect is used), and when the program contained a linkage section record with multiple OCCURS DEPENDING ON items, then illegal code was being produced with multiple error messages. This is now fixed.
2870166 (1105899)

Data Tools

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- Vision and RM files that contain a null (0x00) byte in the key now function correctly in the Data File Editor.
2882159 (1107598)
- The following minor enhancements have been made to the Data File Editor: - Previous filter conditions are now remembered for each file when the dialog is loaded. - The default filter operator now defaults to 'Contains'. - Field attributes for reference conditions now default to 1:max-rec- length, instead of 1:1.
2878521 (1107104)

Debugger

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- Querying DBCS items in Character Animator now works as expected.
3107408 (1109521)
- The debugger no longer hangs when debugging remote Enterprise Server regions.
2882367 (1107659)
- Examining the value of large data items in 64-bit applications or when debugging remote applications no longer causes the debugger to exit.
2872732 (1106322)
- When debugging a remote COBOL program on Linux from Eclipse, you no longer encounter a spurious RT 115 Signal 5 fault.
2852872 (1105048)
- When debugging .gnt code, execution fails to stop at COBOL breakpoints. To resolve this, you should install the most recent Windows updates for your operating system, as this problem is only known to be present with early Windows builds of both Windows 10 and Windows Server 2016.
- COBOL JVM programs consisting of more than 65534 total lines can now be debugged in Eclipse provided that the total number of lines after the first line of PROCEDURE DIVISION code is less than 65535 lines.
2885726 (1108172)

Documentation

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- The product documentation has been updated to include information and syntax for secure access to MFDS (mfd /b).
2854625 (1103606)
- Documentation for environment variables has been improved.

- The casstart /w parameter prevents the casstart process from exiting until the region has either started or failed to start correctly.
2868898 (1105712)
- A "redundant" or "high-availability" mode is now available in the Enterprise Server External Security Facility. It enables you to configure multiple equivalent Security Managers and let processing continue as long as at least one Security Manager is available. To enable this feature, add the following to the configuration text area for the security configuration (either in the default Enterprise Server Security, the MFDS Security, or on the Security tab for a specific enterprise server): [Operation] redundant=yes
2989911 (1108665)
- Additional information on the Web Services and J2EE conversation type has been added to the "Configuring Listener Conversation Types" chapter in the product documentation.
2877270 (1106896)
- The product documentation has been updated to include information on converting the input file used by casrdtup from EBCDIC to ASCII.
2863611 (1104940)
- The documentation for bit zero of the 'thread-state' parameter of CBL_THREAD_LIST_START and CBL_THREAD_LIST_NEXT has been corrected.
- Documentation of CBL_LOCATE_FILE parameter corrected.
- The installation instructions included incorrect information about users having to stop and uninstall an existing Micro Focus Directory Server (MFDS) or CCITCP2 Windows service (on Windows) or a process (on UNIX) from an existing product. This has been removed from the product help.
2877431 (1106934)

Editor Writing Assistance

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- IntelliSense and Content Assist now provide the appropriate suggestions after a CONTAINS expression.

Enterprise Server

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- An issue where SOAP elements were not mapped to COBOL code has been resolved.
3106199 (1109416)
- When SOAP headers were part of the SOAP request, you no longer receive a "SOAP header malformed" response.
3105803 (1109367)
- An issue where a handler program in the pipeline caused issues with JSON GET/DELETE/HEAD requests has been fixed.
3104977 (1109274)
- An UNDEFINED_ELEMENT error message occurred when a JSON message (under CICS WEB SERVICES) did not include an object that was present as a "record 1" item in the wsbind or the jsbind files.
3102943 (1109085)
- When a CICS Web Service was invoked with no port in the URI, the default port for the scheme was not set up.
3100280 (1108870)
- EXEC CICS SEND and CONVERSE commands now send all user-written headers (EXEC CICS WRITE HTTPHEADER) even if the user provided values that contain null bytes. When browsing

headers with EXEC CICS WEB READNEXT HTTPHEADER, CICS will now initialize the buffers that were supplied for the header name and value.

2990561 (1108733)

- A problem where a system process (CASTRC) was unable to allocate any local storage and, as a result, became unresponsive, has been resolved.

2886741 (1108236)

- Casout commands running in a loop from the same process used to exhausting resources. This was caused by an invalid path concatenation.

2886407 (1108426)

- An issue resulting in a Run-Time System error 205 "Invalid mainframe pointer" has been fixed.

2885280 (1108041)

- TRANSFORM was failing in situations where an XMLTODATA TRANSFORM contained an XML declaration with EBCDIC encoding.

2885262 (1108040)

- The EZASOKET traces are now controlled by a COMMS trace flag.

2884491 (1108174)

- Caching has been added for TS queues security checks.

2884070 (1108789)

- Commarea overrides are now honored for non-facility transactions.

2884049 (1107879)

- Usernamelen and passwordlen options are not mandatory on exec cics web converse and web send (client).

2880669 (1107365)

- Previously, using multiple CICS LINK statements (linking A to B to C and so on) could result in an RTS error 114 in the CAS system modules.

2880542 (1107372)

- The spool active job queue will now display any jobs that were started prior to resetting the time for DST but that have not completed yet.

2879116 (1107204)

- The debug file name generated when using CICS Web Services now includes the process ID and the task number. For example - inquireCatalogClient-19556(00028)-CWS-REQUESTER.TXT.

2878485 (1107077)

- The SOAP to COBOL mapping under CICS Web services was incorrect when an optional element had no child elements (where the schema defined a minimum of one such child element and these child elements have been mapped to a container). In such cases, the number of instances of the child element would have an incorrect value of 1 where it should be 0.

2877043 (1106879)

- If you used XA with more than 7281 transactions or had a number of JCL jobs that used XA, a record could be split across multiple blocks. After restarting the enterprise server, a large number of CASX0029I errors were reported in the console log file. A block that can hold up to 7282 records is now used.

2874024 (1106469)

- When casout is used to release a job, casmgr now attempts to dispatch the job immediately rather than waiting for its next dispatch cycle which previously could take 20 seconds.

2873224 (1106621)

- If there were more than 20 TRANCLASS instances specified in the startup list, this could cause memory corruption.

2868129 (1105682)

- The ESFCA0401I Cache Termination message is now available for JES, IMS DB, IMS TM, MQ, and iFileshare processes.

2866750 (1105376)

- A duplicate security check about whether the user has enough permissions to run a JCL job has been removed.

2866526 (1105336)

- When eci-tpn is used on a call to ECI for CTG or the Micro Focus implementation of ECI, Enterprise Server now verifies the transaction exist and is enabled. If the transaction is disabled, an abend AZI6 is returned. This is mainframe-compatible behavior.

2863500 (1105165)

- An EXEC CICS LINK to a non-CICS module now handles the data context correctly and you no longer receive CDCD abends on any further LINKs.

2858747 (1104275)

- CASxx5006I messages now display a return code.

2853609 (1103516)

- All ESMAC pages are now secured. Users who are not authorized now receive an error message when trying to access any of these pages in their browser.

2843901 (1102247)

- The CICS WEB services now support SOAP 1.2.

2822822 (1099723)

- An issue that could cause an RTS error 119 on a casout command when starting a batch initiator has been fixed.
- An issue with certain length DNs that could cause DNs to become truncated has now been fixed.

3103303 (1109366)

- If nested groups (user groups containing other groups) were used with LDAP-based security for Enterprise Server, it could result in Enterprise Server hanging at region startup, or users might not be assigned all of their groups. This has now been fixed.

2988205 (1108935)

- The "check TLQ first" option has been added to the MLDAP ESM. The option can change the Rule processing algorithm. This option might improve performance when there are large numbers of resources in a class.

2875051 (1106874)

- Enterprise Server no longer crashes on startup if LDAP-based external security with the "all-groups" and "redundant" options are both specified, but the "federated groups" option is not.

2874010 (1106529)

- If the esfupdate utility is used to request an update of security information for a user, and that user was originally signed onto the system using a lowercase representation of their user ID, the update now correctly identifies and updates the user.

2871297 (1106164)

- If the MFDS Security Configuration specifies that verify requests should be cached and the cache TTL and limit values are non-zero, for example, the MF Directory Server Security configuration page Security Facility configuration text contains: [Cache] requests=verify If a new password was specified in a Web interface logon request, then previously it was being ignored. Previously, if the user was logging on with an expired password and attempting to change the password the request would also be ignored and an expired password error would be returned.

2868342 (1105626)

- An RTS 205 error during the execution of an AMODE application could occur when Assembler address 0 was erroneously de-registered. This is now fixed.
3104561 (1109229)
- Under heavy loads, the ESFCA0401I log messages were not appearing at the correct intervals.
2863222 (1104948)
- Enterprise Server listeners that are configured for TLS (also known as SSL) no longer hang if a client connects to them without sending any data.
2873177 (1106408)
- In some HotFix releases of earlier versions of Enterprise Developer and Enterprise Server, SSL or TLS connections to an Enterprise Server could hang if client certificates were used and there was a delay of at least several seconds before the certificate was sent.

Embedded HTML Pre-Processor

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- The XML run-time system did not handle data items with the OCCURS clause correctly.
3107418 (1109566)

File Handling

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- The ESF LDAP Security Administration Web Interface now has a logoff button.
2871551 (1106117)
- If data compression is specified when trying to open a fixed block file, when running under a mainframe dialect, the File Handler now checks to see if it is trying to open a VB file. If it isn't, compression will be turned off and the file will be opened as normal.
2870022 (1105956)
- An internal field used to store the current file status was being overwritten by the allocation of a buffer. Now we store it off beforehand so its value can be restored, and an accurate file status returned.
2868664 (1105707)
- When certain in-flight rewritten records were rolled back at the end of a transaction, the File Handler was setting incorrect values for the length field in some records and various warning messages were displayed during index file validation.
2864802 (1106106)
- A CBL_FREE_MEM statement in Fileshare was missing a 'by value' clause, which was causing a run-time error. This is now fixed.
2883421 (1107767)
- When running under Fileshare, a delete on a locked record no longer results in a record locked status if the same user had previously obtained a read lock on the file.
2832909 (1108287)
- When REBUILDing from SEQ into IND with duplicate key, you will no longer get a corrupted file if you do not specify the target flag /t.
2880311 (1107302)
- CSF to ZD negative sign conversion is now handled correctly during a sort operation.
3103118 (1109125)
- JCL SORT no longer abends if no record is rewritten to a DUMMY data set.

- 3102468 (1109052)
- Sorting ESDS files to RRDS files no longer truncates the first 4 bytes of each record.
- 3101385 (1109112)
- Variable length SORT UTFIL files are now created correctly when more than one data set is specified in the targeted UTFIL.
- 2881629 (1107551)
- MFSORT INCLUDE will no longer include the first record in the concatenated file if, according to the parameters, that record should be excluded; previously, the first record was included regardless of the parameters.
- 2876259 (1106785)
- For an MFJSORT, a combination of numeric tests and logical comparisons now returns the correct records.
- 2870986 (1106216)
- When copying concatenated files in MFJSORT, for sequential fixed block, the correct number of record is now used.
- 2870506 (1106057)
- MFJSort now produces the correct number of records regardless of the value of the SORTSPACE setting.
- 2867668 (1105534)
- An error when writing the ICETOOL listing from an empty input file has been corrected.
- 2866176 (1106459)

IDE

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- Attempting to evaluate a class condition when debugging .NET COBOL code could cause the debugger to crash.
- 2887005 (1108289)
- Previously, you could only use the environment variables specified using the "Environment" button on the Application tab in the project's properties when running the project. There is now a new option, "Use variables when building the project", which enables you to apply these variables when the project is compiled.
- 2881792 (1107641)
- Restarting debugging of native projects is now successful.
- 2878077 (1107005)
- Native COBOL projects that contain an Application.config file now build cleanly when this file is read-only.
- 2875625 (1106694)
- The Web Publish option now works correctly for COBOL ASP.NET applications.
- 2875454 (622986)
- The COBOL margins are now displayed correctly when stepping into an assembly that is not part of the solution being debugged.
- 2874876 (1106604)
- The performance while stepping through a Mainframe Subsystem application running on a remote machine has been improved.
- 2871769 (1108698)
- It is now possible to create projects in folders that contain accented characters.

2858012 (1104133)

- By default, Visual Studio is now configured to insert spaces in the COBOL code when the tab key is pressed in the editor. If you are upgrading from an earlier version of this product, and have changed your tab settings, they will be reset to the default IDE settings as part of the upgrade. For Enterprise Developer, this change also applies to Assembler, BMS, IMS, JCL and PL/I programming code.

- An %INCLUDE statements inside EXEC SQL blocks no longer cause the background parse to hang.

3106015 (1109413)

- A literal inside an EXEC SQL block that contains a % symbol is processed correctly by the background parser.

3105706 (1109385)

- A literal inside an EXEC SQL block that contains a ':' symbol no longer causes the background parser to hang.

3105705 (1109381)

- Spaces that cross the right margin are trimmed on the lines that are pasted into the PL/I editor.

3103484 (1109156)

- The JCL editor no longer reports PDS names that contain keywords as errors.

2988662 (1108553)

- Include files can now be opened in the Include Dependency view either by double-clicking the include file or by right-clicking the include file and choosing Open from the context menu.

2887972 (1108594)

- Background parse is no longer performed for VSE JCL programs.

2886880 (1108245)

- Pressing the Home or End keys when Eclipse editor code blocks were collapsed resulted in the cursor moving to an incorrect location.

2884211 (1107905)

- Debugging source lookup performance has been improved when the "Search sub-folders" option is used with a remote file system directory.

2882252 (1107658)

- The format clause of the PUT statement is now supported by the background parse in the PL/I editor.

2882206 (1107578)

- Opening a SourceConnect copybook no longer displays a Context Lost error dialog.

2882175 (1107611)

- The PL/I %INCLUDE statements of the form "%INCLUDE (filename);" no longer cause errors in the editor if the filename is followed by a space character.

2881410 (1107478)

- The PL/I keywords LIMITED ENTRY and ALIAS are now supported by the background parser.

2881035 (1107480)

- PL/I variables defined using macro preprocessor facilities no longer cause error messages in the PL/I editor.

2879794 (1107332)

- It is now possible to successfully background parse a non-JVM COBOL program that requires use of a preprocessor whilst using either 32-bit or 64-bit build configurations.

2879008 (1107155)

- PL/I variables defined using the macro preprocessor facilities no longer cause error messages in the PL/I editor.

2874348 (1106612)

- Lines are now wrapped in the PL/I editor after using the Find/Replace dialog.
2874166 (1106509)
- A PL/I program opened with 'Browse' in the Team Developer view cannot be modified in the PL/I editor.
2874071 (1106501)
- COBOL editor functions such as Go To Definition now work with programs containing REPLACE statements that generate additional source lines.
2873287 (1106406)
- Copybook dependencies are now shown correctly within Eclipse for 64-bit compilations.
2866406 (1105576)
- A PL/I macro invocation used as a statement parameter is no longer reported as an error.
2862571 (1104763)
- The performance of the "Updating Micro Focus model" job, user interface responsiveness and memory consumption have been improved when folders containing large numbers of files are added to an Eclipse project.
2856154 (1105184)
- Lines are now wrapped in the COBOL editor after using the Find/Replace dialog.
2856003 (1103827)
- The ES_SERVER environment variable is now correctly resolved when viewing the console log or catalog in the Server Explorer view.
2852734 (1103371)
- A problem with the core Eclipse code could cause a full project rebuild to occur when not required. This has now been fixed.
2816310 (1104735)
- Dependency folders can be sorted based on the order they are specified on the Build Path property page.

Interface Mapping Toolkit

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- A problem with Enterprise Server that caused an alphanumeric data item mapped to a SOAP Boolean to give results that were incompatible with the mainframe for invalid data values has been fixed.
2887795 (1108360)
- Client generation now works as expected when invoked from the Team Developer Tree View.
2869050 (1105758)
- The performance of a COBOL Web client has been improved when processing services with interface parameters containing unbounded arrays.
2884760 (1108026)
- When a path specified as part of an ls2ws parameter contained at least one space, ls2ws would fail. This has been fixed.
(622294)
- EJB generation/deployment has been enhanced to produce an EAR file. Unlike the EAR file produced during client generation, this deploy-time EAR does not contain a WAR file and thus does not contain any JSP files.

Micro Focus Directory Server

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- Fixed a memory leak in the MFDS process.
2876419 (1106799)
- A memory leak in the MFDS process occurred if non-SSL-enabled connection attempts were made against an SSL-enabled MFDS. This has now been fixed.
2869493 (1106567)
- The MFDS -g command-line option now correctly handles the import of multiple region definitions from a single XML file.
2840162 (1101798)
- An issue that could potentially cause heap corruption in MFDS if the configuration data for an individual object was greater than 1K has been fixed.
- The "Renew" option available in the Enterprise Server Administration Web interface now works if SSL is enabled.

Monitoring and Management

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- Spurious STEP BYPASSED events for dummy steps were being passed to the user exit and the HSF exit.
2873504 (1106446)
- An issue where duplicate HSF records could be created has been fixed.
2856941 (1103977)

OLE Class Library

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- A problem with accelerator keys being handled by an ActiveX control has been fixed.
2990224 (1108719)

OpenSSL

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- The version of OpenSSL included in this product has been updated to version 1.0.2j.

REX Support

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- When running a REXX EXEC under Enterprise Server or Enterprise Server for .NET, an "Invalid Expression" error occurred for an assignment statement where the expression being assigned to the variable had been omitted. An empty string is now assigned to the variable if the expression is omitted.
2880655 (1107390)
- A REXX exec could fail with a S0C4 abend or an RTS 114 error if it was greater than 4096 bytes in length and specified either as in-stream data or catalogued as an RECFM=F or RECFM=V dataset.
2878613 (1107100)

RM/COBOL

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- When FILETYPE(21) was specified for a LINE SEQUENTIAL print file, you could receive a Run-Time System error "13". Writing to a printer from a Visual COBOL program through the RM File Manager (filetype 21) now works correctly.

2874987 (1106616)

Run-Time System

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- Adis SCREEN SECTION ACCEPT statements for PIC N DISPLAY-1 items now correctly accept DBCS characters with a lead byte of x"87".

3104586 (1109231)

- A error when using very long command lines with Profiler (or cobprof on UNIX) has been fixed.

2884968 (625185)

- You can now double-click (to run) managed executables that use the ACUFH file handler; previously, they may have failed with a COBRT198 error.

2880827 (1107388)

- When debugging a native Object COBOL application, the debugger no longer fails with an intermittent COBRT114 run-time error when getting the type and value of an object's handle.

2875531 (1106808)

- A multi-threaded application that makes use of the COBOL syntax for handling mutexes, monitors, events and semaphores, or the corresponding CBL_ APIs, no longer fails intermittently with various run-time errors due to memory corruption.

2860205 (1104446)

- Animating a core file that has been moved to a different directory, for a core file produced by an application compiled to executable, no longer fails with a "Program is not animatable" error. Previously, it would on certain platforms.

2856631 (1103933)

- Detaching from animation that was started using the debug_on_error tunable could cause animation to re-start again for the initial error - this has now been resolved.

- In managed COBOL, a CANCEL data-name statement no longer fails or crashes if the contained program name is not space-terminated.

2887392 (1108320)

- Using user-defined class conditions in managed code no longer gives incorrect results.

2887005 (1108290)

- When executing a SQLCLR stored procedure for a second time, programs not found during the first execution might not be found dynamically.

2879012 (1107201)

- The backtab key now works correctly when performing ADIS screen i/o operations in managed code applications.

2877480 (1106928)

- Using the CBL_FILENAME_CONVERT library routine resulted in receiving an exception in managed COBOL if bit 3 was set for the function parameter and CTF tracing was then enabled.

2876179 (1106763)

- An environment variable with a value containing a leading space is no longer treated as having been deleted.

2872919 (1106405)

- A CANCEL of a dataname containing low values no longer causes a Run-Time System error in managed COBOL code.

2872140 (1106247)

- A 12-byte (32-bit) memory leak has been prevented when calling native COBOL code from JVM COBOL when using the 'C' call-convention, or the RuntimeSystem.cobcall/cobrcall library APIs, with a parameter type that is a JVM array.

SQL: COBSQL

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- A problem that caused the COBSQL preprocessor to incorrectly parse comments beyond column 72 has been fixed.
3101746 (1108980)
- A problem with COBSQL producing a duplicated cursor data item when KEEPCOMP was used has been fixed.
2874051 (1106531)
- A problem that caused the COBSQL preprocessor to incorrectly process source lines with characters in column 73 and beyond has been fixed.
2869958 (1109899)

SQL: OpenESQL

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- A problem that occurred when SQLCODE was set incorrectly and an EXECUTE IMMEDIATE statement was executed multiple times has been fixed.
2990794 (1108754)
- A problem using SQL(PROCOB) and SQL(DATE=EXTERNAL) with Oracle fully managed data access provider for .NET has been fixed.
2989291 (1108639)
- Performance when using SQL(PROCOB) with OpenESQL ADO.NET runtime and Oracle unmanaged provider has been improved by reducing occasions where Oracle's ALL_SYNONYMS table is accessed.
2913100 (1108599)
- A problem that occurred when a stored procedure that makes dynamic COBOL CALLS executes an EXEC SQL CLOSE <cursorName> WITH RETURN TO CALLER statement has been fixed. For this fix to be effective, the stored procedure must not be compiled using SQL(OPTIMIZEPCURSORS).
2887060 (1108265)
- A problem fetching from a cursor defined for a stored procedure call that doesn't return a result set has been fixed.
2885499 (1108075)
- A problem with DESCRIBE CURSOR in COBOL SQLCLR stored procedures for cursors that retrieve result sets from nested stored procedure calls has been fixed.
2883792 (1107841)
- A problem in COBOL stored procedures that occurred when a COBOL CALL followed a cursor OPEN for a TSQL procedure call has been fixed.
2881606 (1107529)
- For .NET applications accessing Oracle databases, character values used in numeric host variables caused performance degradation. This has been fixed.
2877103 (1107035)
- A problem that caused OpenESQL to incorrectly handle FETCH statements when the number of host variables did not match the number of columns in the result set has been fixed. Host variables in excess of result columns remain unchanged. If the number of host variables is fewer than the number of result columns, SQLWARN 3 is set to 'W' in the SQLCA. Note: When using PostgreSQL with ODBC, you must

adjust the DSN configuration to disable updatable cursors because OpenESQL provides its own support for updatable cursors with PostgreSQL.

2876426 (1106813)

- A COBOL stored procedure could not retrieve multiple result sets from an OpenESQL cursor via a nested stored procedure call. This has been corrected, and the retrieval of multiple result sets from a COBOL stored procedure is now supported.

2875262 (1106668)

- The OpenESQL preprocessor incorrectly expanded a group host variable used in a CURSOR SELECT statement, resulting in a run-time error. The preprocessor has been modified to generate a COBES0130 error message in this case.

3104602 (1109289)

- A problem that prevented OpenESQL applications calling SQL Server stored procedures with no parameters when using the legacy 'SQL Server' ODBC driver has been fixed. Important: We strongly discourage use of the legacy 'SQL Server' ODBC driver. Instead, we recommend that for best performance and functionality, use the ODBC driver that corresponds to the version of SQL Server used by the application.

3100550 (1109071)

- A problem with HCOSS code generation that occurred when duplicating input host variable references (for example when substr() is used with 2 rather than 3 parameters) has been fixed.

3100098 (1108819)

- A problem with the OpenESQL native routine that provides DSNTIAR emulation sometimes caused an RTS114 error. This has been fixed.

2989595 (1108699)

- A new OpenESQL directive, GEN-SQLCA, has been added to generate the SQLCA copybook in a program when it has not been explicitly included. This directive provides additional support when migrating applications compiled with STDSQL(YES) on the mainframe.

2887858 (1108368)

- A problem with the MSSQL XA switch module sometimes causing a CICS transaction to abort if it ended without closing all FORWARD and READ ONLY cursors has been fixed.

2887074 (1108340)

- An inconsistency in reporting data truncation warnings when using PostgreSQL has been fixed.

2886648 (1108201)

- OpenESQL and OCI have been updated to prevent RTS198 errors when using DSNTIAR with ODBC. To take advantage of this new functionality, specify the cob -d command flag to resolve DSNTIAR with the correct callable shared object. For example, to compile a COBOL program into an executable on a 64-bit platform with OESQL DSNTIAR: `cob -x program.cbl -d DSNTIAR@cobmfsntiar64.so -L$COBDIR/lib -lmfpliz -lplidump -llmgr -lm` Or, to compile a PL/I program into an executable on a 32-bit platform with OESQL DSNTIAR, execute the following two commands: `mfplx -c PROGRAM.pli -sql odbc -optsql "behavior=mainframe nosmftrace" cob -x PROGRAM.o -d DSNTIAR@cobmfsntiar.so -L$COBDIR/lib -lmfpliz -lplidump -llmgr -lm`

2884651 (1107997)

- A problem when using OpenESQL for JDBC with the "Use Dynamic Calls" project option has been fixed.

2883500 (1107955)

- A problem with SQL(AUTOFETCH) that affected SQL Server FORWARD READ ONLY WITH HOLD cursors performance has been fixed.

2880840 (1107580)

- The ADO.NET Run-Time System for OpenESQL now returns the correct value in SQLERRD(3) after a cursor fetch when other statements are executed between any fetches on the cursor.

2880814 (1107386)

- OpenESQL now allows FREE to be used as an SQL identifier. It is server dependent if this is supported at compile time when using SQL(CHECK) and at run time.

2880673 (1107368)

- A new OpenESQL directive, CLOSE_ON_COMMIT, has been added to provide greater control over cursor behavior on COMMIT for cursors that are not explicitly declared using WITH HOLD.

2879558 (1107305)

- A problem with HCOSS handling of nested table references in DB2 statements has been fixed and error messages when using SQL(STRICTPARSE) have been improved.

2879503 (1107286)

- The SQLBGP COBSQL compiler directive option has been added to ensure successful background parsing of EXEC SQL statements when the Pro*COBOL installation resides on a remote machine and not on the local machine.

2877618 (1107292)

- A problem that prevented SQL(CHECK) from working correctly on some databases has been fixed.

2877284 (1107021)

- When used with the SQL(USER-SQLDA=MAINFRAME) directive, the OpenESQL preprocessor could incorrectly generate ES0100 errors if a group variable was used in an EXEC SQL FETCH statement. This has been fixed.

2876420 (1106803)

- The OpenESQL preprocessor sometimes failed to return comp data items correctly if compiled with SQL(DIALECT=MAINFRAME). This has been fixed.

2874931 (1106606)

- The OpenESQL preprocessor has been updated to generate a more meaningful message, COBES0129, when it encounters an undefined host variable.

2874408 (1106624)

- A problem with SQL(NORSLOCATORS) leaking SQL Server server cursors has been fixed.

2872613 (1106294)

- HCOSS handling of the DB2 CHAR() function did not always properly apply the compile-time settings of DATE and TIME as the default formats when CHAR was called with a date or time value but no date or time format parameter was supplied. This has been fixed.

2872518 (1106404)

- A new SQL compiler directive option, OPTIMIZECURSORS, has been added to optimize memory consumption when using OpenESQL for ADO.NET with Oracle, DB2, or PostgreSQL. The default setting is SQL(OPTIMIZECURSORS=YES). See the OPTIMIZECURSORS reference topic in the documentation for complete information.

2871132 (1106056)

- Decimal and host variables with the same length are now converted to EBCDIC correctly when CHARSET(EBCDIC) is enabled; however, if you link native COBOL applications that use display numeric variables in SQL statements using CHARSET(EBCDIC), you might get a link error. To resolve this issue, see the OpenESQL topic under Known Issues and Restrictions.

2857755 (1104091)

- A problem with the ODBC switch module not reporting broken connections to Enterprise Server when xa_start() is called has been fixed.

2843672 (1108847)

- A problem that caused the OpenESQL preprocessor to incorrectly interpret UNICODE(PORTABLE) has been fixed.
- The SQL xa_open string has been updated to include the PACKAGEPATH option, which enables the use of substitution markers to customize the package path based on the current JCL or CICS user

name, XA resource name, enterprise server region name, or a combination. In addition, when used with the UserP option, the PACKAGEPATH option value changes when the user for the connection changes.

- A problem using SQL(DATEDELIM) with SQL(DATE=JIS) has been fixed.
- OpenESQL has been updated to enable execution of selected SQL statements at compile time. You can use this functionality to create temporary tables during compilation and to enable the use of SQL(CHECK) with temporary as well as permanent tables.
- The encoding of the sqltype fields in SQLDA has changed and any applications that use dynamic SQL with SQLDAs might require application code change. The new sqltype encoding scheme adds 0x2000 to sqltype when an integer, a small integer or a big integer host variable is COMP and 0x1000 and when any indicator host variable is COMP. Otherwise, COMP-5 is assumed for indicators and for integer, small integer and big integer host variables.

SQL Option for DB2

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- A problem with the Declaration Generator that prevented COBOL copybooks from being generated correctly for tables with timestamps and XML columns has been fixed.
2875742 (1106868)
- The XDB preprocessor has been updated to support source connect files that previously generated a "File not found" error for EXEC SQL INCLUDE statements located on the source connect drive.
2912819 (1108471)
- The XDB ECM has been enhanced to handle temporal table query syntax.
2876438 (1106807)
- Implemented the JDBC ResultSet Interface getBigDecimal methods that do not require a scale argument: getBigDecimal(int columnIndex) and getBigDecimal(String columnLabel).
2877817 (1106963)
- A problem that caused an X020 syntax error on SELECT DISTINCT (TRIM)has been fixed.
3105393 (1109324)
- A problem that prevented the XDB engines to successfully process a COUNT(DISTINCT expression) scalar function when the expression was a concatenated expression enclosed in parentheses has been fixed.
2884227 (1107903)
- A problem that caused a thread stack overflow on scalar function recursions that use CONCAT has been fixed.
2884046 (1107882)
- A problem with the XUTLB LOAD grammar prevented the reserved word DATE from being used as a table name. This has been fixed.
2882727 (1107652)
- An problem when correlating a subquery produced a PDMP242 error. This has been resolved.
2880672 (1107367)
- A problem that caused a FETCH FIRST clause in a scalar subquery to be ignored has been fixed.
2880671 (1107366)
- A problem using the reserved word DOCUMENT as an identifier in the first argument of a scalar function has been fixed.
2874154 (1106483)
- CAST AS TIMESTAMP using the special character 'T' as the date/time delimiter was not allowed. This is now allowed.
2874153 (1106484)

- An issue with the ordering of a result set caused the incorrect row to be returned on a FETCH FIRST ONLY clause. This has been fixed.
2873390 (1106435)
- An issue with index optimization of LIKE predicate processing has been resolved.
2873389 (1106391)
- A problem that sometimes caused the XDB Server to shut down before completing location checkpoint operations by maintenance threads has been resolved.
2847090 (1102750)
- An problem with LIKE predicate index query optimization that caused missing result set rows has been fixed.
2841168 (1101910)
- A problem that prevented the restoration of LOB data from a record with an LOB column after deleting the record and then rolling back from a Save Point has been fixed.
- XDBMONN has been updated to issue the correct error message when it is started, but the server is not running.
- The server Name be displayed in the status bar of the XDB SQL Wizard.
2865763 (1105197)
- Using ALLOW EDITING on an SQLWizard result set could result in the query being corrupted. This has now been fixed.
2865336 (1105171)
- The restriction that prevented the editing of result sets generated from alias tables has been removed.
2857585 (1104067)
- When the SQLWizard is invoked by MFA Drag & Drop to import unload data to a table it no longer returns an X352/X95 error.
- A problem that sometimes occurred when using the DB2(NOHCO) compiler directive option caused the return of incorrect codes at completion of program execution. This has been fixed.
3100172 (1108872)
- The DB2 preprocessor has been updated with a new DB2 compiler directive option, QUALIFY-CALL, that works with the QUALIFIER compiler directive option to qualify DB2 EXEC SQL CALL statements with the schema name specified by the DB2 QUALIFIER directive.
2884948 (1108032)
- The DB2 ECM has been updated to prevent an undefined ECM error when indicator variable arrays are used in SELECT SQL statements.
2884605 (1107947)
- The DB2 ECM preprocessor has been updated to support host variables defined as SQL TYPE IS XML AS BLOB-FILE/CLOB-FILE/DBCLOB-FILE.
2839654 (1101707)

XML Support

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- XMLPARSE no longer returns -19 in XMLSS mode.
2913116 (1108661)
- Opened XML files are now closed when the COBOL program called by JCL is terminated.
2885450 (1108132)
- A new directive "OUTENC(INPUT)" is created to ensure encoding of the output text will be the same as the input encoding specified in the XML declaration.

2870879 (1106332)

- XMLIO now handles REDEFINE data items correctly.

2795744 (1096302)

Other Issues Resolved in This Release

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

- 2884374 (1107928)
- 2875256 (1106645)
- 2871954 (1106649)
- 3103304 (1109198)
- 2857117 (1106716)
- 3106240 (1109462)
- 2989573 (1108689)
- 2874306 (1106666)
- 2848671 (1102872)
- 2878662 (1107084)
- 2864100 (1104959)
- 3101450 (1108990)
- 2884755 (1107973)
- 2884754 (1108098)
- 2883962 (1108118)
- 2883962 (1108119)
- 2878826 (1107101)
- 2878227 (1107012)
- 2877589 (1106938)
- 2875248 (1106679)
- 2874812 (1106627)
- 2874077 (1106516)
- 2872027 (1106210)
- 2869739 (1105894)
- 2868086 (1105954)
- 2864170 (1105040)
- 2864164 (1105035)
- 2990780 (1108760)
- 2884757 (1108096)
- 2883769 (1107830)
- 2851153 (1103313)
- 3101883 (1108971)
- 3101148 (1108902)
- 2885725 (1108103)
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- 3101467 (1109005)
- 2879947 (1107389)
- 2879908 (1107247)
- 2878412 (1107371)
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- 2875245 (1106642)
- 2858289 (1104218)
- 2839585 (1102006)
- 2869862 (1105851)
- 2857086 (1104025)
- 2831639 (1100766)
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- 3103824 (1109284)
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- 2879876 (1107263)
- 2880593 (1107378)
- 3105620 (1109342)
- 2991280 (1108799)
- 2882386 (1107606)
- 2881902 (1107890)
- 2879176 (1107150)
- 2885859 (1108130)
- 2885529 (1108083)
- 2884236 (1108000)
- 2883551 (1107800)
- 2881659 (1107500)
- 2881243 (1107455)
- 2881040 (1107414)
- 2881038 (1107416)
- 2881037 (1107419)
- 2881036 (1107423)
- 2880647 (1107399)
- 2879819 (1107333)
- 2883907 (1107872)
- 2874406 (1106565)
- 2873249 (1106552)
- 2871661 (1106145)
- 2863482 (1104862)
- 2848848 (1102895)
- 2866216 (1105926)
- 2883667 (1107815)
- 2880475 (1107343)
- 2871842 (1106178)
- 3102432 (1109463)
- 2887808 (1108624)
- 2873158 (1106378)
- 2873035 (1106735)
- 2871178 (1106125)
- 2870557 (1106194)
- 2865051 (1105317)
- 2859144 (1104286)
- 2146936 (1059549)
- 2876653 (1106832)
- 2865001 (1105155)

Unsupported Functionality

The following features or functionality 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.

Installation

Before Installing

Downloading the Product

You can download Visual COBOL from the *Product Updates* section of the [Micro Focus SupportLine](#) Web site.

System Requirements

System Requirements for Visual COBOL for Visual Studio

Hardware Requirements

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

The maximum disk space requirements are, approximately:

Visual COBOL	Sentinel RMS License Manager
1.2Gb	75MB

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

Operating Systems Supported

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

Note:

- You can produce both 32-bit or 64-bit applications with Visual COBOL installed on a 64-bit operating system.
- Visual COBOL for Visual Studio is not supported on versions of Windows earlier than Windows 7.
- The Enterprise Server feature is not supported on Windows XP.

Software Requirements

The setup file will check your machine for whether the prerequisite software is installed and will install any missing prerequisites and the product components. A supported version of Microsoft's Visual Studio 2015 or 2017 must, however, be installed in advance.

Note:

- Besides the software listed below, the setup file also installs the 64-bit Java 8 Update 102.

- This product includes OpenSSL version 1.0.2j.

Visual Studio IDE

You must have Microsoft's Visual Studio installed in advance.

You need one of the advanced versions of Visual Studio listed below or the Visual Studio Integrated Shell (only supported by Visual COBOL for Visual Studio 2012 or 2013):

Professional, Premium, or Ultimate (for Visual Studio 2012)

Professional, Premium, Ultimate or Community Edition (for Visual Studio 2013)

Professional, Enterprise or Community Edition (for Visual Studio 2015)

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

Microsoft's Visual Studio Express Edition is not supported.

If there is no Visual Studio installed on your machine, the setup file for Visual COBOL for Visual Studio 2012 or 2013 will install the Visual Studio Integrated Shell. Alternatively, you can download the Visual Studio Integrated Shell from the [Microsoft Download Center](#) and install it before you install Visual COBOL. If you choose to install the Shell, ensure you run the installer to complete the installation - run `vsintshell.enu.exe` from the location where you installed the download.

Note that some Visual Studio features might not be available with the Shell. This includes WCF or the Visual Studio 2013 Connected IDE experience in the Visual Studio 2013 Shell - the help for more details.



Important:

- A problem with Microsoft's Windows 10 prevents installing the Visual Studio 2013 Shell on that version of the OS. You must install an advanced edition of Visual Studio 2013 on Windows 10 before you start the installation of Visual COBOL for Visual Studio 2013.
- Visual COBOL for Visual Studio 2015 does not support Visual Studio 2015 Shell as the Shell has a number of restrictions to COBOL development. The Visual Studio 2015 Shell is not included in the setup for Visual COBOL for Visual Studio 2015 and before you start the installation, ensure that there is an advanced edition of Visual Studio 2015 installed on your machine.
- On Windows 8.1 RT, Windows 8.1 or Windows Server 2012 R2, you must have the Windows update KB 2919355 before you install Visual Studio 2015. Download KB 2919355 from the [Microsoft Download Center](#).
- When installing Visual Studio 2017, ensure you select the Help Viewer component for installing to ensure you can view the Visual COBOL product help inside Visual Studio. When you select components to install in the Visual Studio installer, click **Individual components** and check **Help Viewer** in the **Code tools** section.
- Code generation issues in Microsoft's 64-bit JIT (just-in-time) compiler delivered as part of .NET Framework version 4.6 can result in incorrect execution of some COBOL code compiled to .NET. Version 4.6 of the .NET Framework is currently shipped as default with Visual Studio 2015 and Microsoft's Windows 10. The problems include incorrect execution of MOVE and STRING statements applied to alphanumeric operands, and incorrect execution of the ROUNDED phrase for arithmetic statements.

Some of these issues only seem to be reproducible in COBOL language applications compiled to .NET and some can be reproduced in other languages (C# or Visual Basic).

These problems have been reported and acknowledged by Microsoft and it is our belief that they either have resolutions or are working on fixes for all of them. For further information about these issues and guidelines on how to disable the latest version of the 64-bit JIT compiler, see [RyuJIT Bug Advisory](#) and [Troubleshooting RyuJIT](#).

As of October 2015, Microsoft have released the following updates that address these issues with the .NET Framework 4.6:

- Hotfix rollup 3088955 for the .NET Framework 4.6 on Windows Server 2012 and Windows 8 - see: <http://www.microfocus.com/docs/links.asp?vc=mskb3088955>.
- Hotfix rollup 3088956 for the .NET Framework 4.6 on Windows Server 2012 R2 and Windows 8.1 - see: <http://www.microfocus.com/docs/links.asp?vc=mskb3088956>
- Hotfix rollup 3088957 for the .NET Framework 4.6 on Windows 7 SP1, Windows Server 2008 SP2, Windows Server 2008 R2 SP1, and Windows Vista SP2 - see: <http://www.microfocus.com/docs/links.asp?vc=mskb3088957>.
- Cumulative update 3093266 for Windows 10: September 30, 2015 (available through Windows Update) - see: <http://www.microfocus.com/docs/links.asp?vc=mskb3093266>.

The following software is also required:

- Microsoft Windows SDK is required if you are using the Visual Studio Shell. See the [Microsoft Download Center](#) and search for Windows SDK.
- Microsoft .NET Framework 4.5. This is included with Visual Studio 2012.
- Microsoft .NET Framework 4.5.1. This is included with Visual Studio 2013.
- Microsoft .NET Framework 4.6. This is included with Visual Studio 2015.
- Microsoft .NET Framework 4.6.2. This is included with Visual Studio 2017.

Selecting the Visual Studio 2017 components to install

The Visual Studio 2017 installer enables you to customize and only install the workloads and components that are most suitable for your area of development. For example, you can select the components that are required for .NET desktop development, ASP.NET Web or C++ development.

The Help Viewer component is not installed by default and must be selected before you start the Visual Studio installation to ensure you can view the Visual COBOL product help.

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

- .NET Framework version 4.6.2
- Debugger
- Visual Studio's Help Viewer
- Data services

A number of workloads and components are optional - for example, Azure, WCF, Web, WPF or SQL CLR application development. If you require any of these, you can select them when you start the Visual Studio 2017 installer or, enable them after completing the installation - see the next section.

Installing Visual Studio 2017 features that are not currently installed

If a feature of Visual Studio 2017 was not installed during the Visual Studio installation, the respective functionality or the project templates for it are not available. You can install a missing feature in one of the following ways:

Rerun the Visual Studio installer:

1. Start the Visual Studio 2017 installer and choose to modify an existing Visual Studio instance.
2. Select the workloads and the components that are missing (for example, **ASP.NET and web development** or **Help Viewer**).
3. Start the Visual Studio installation.

Use the **Quick Launch** control in Visual Studio 2017:

1. Start Visual Studio 2017.
2. Type the name of the feature in the **Quick Launch** control - for example, type `ASP.NET` or `Help Viewer`.

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

Use the `Install Missing Feature(s)` command in Visual Studio 2017:

1. Start Visual Studio 2017.
2. Click **Help > Micro Focus Product Help > Install Missing Feature(s) > Feature Name**.

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

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


Internet Explorer 10

Internet Explorer 10 (IE 10) is required by the installation of Visual Studio 2013. If you are installing Visual COBOL on a machine that has no Visual Studio 2013 installed, the setup file installs Visual Studio 2013 Shell provided that IE 10 is installed beforehand. You can download IE 10 from [Microsoft's Web site](#).

IIS Express

IIS Express is required if you want to use the Web development tools. You can download IIS Express from the [Microsoft Download Center](#).

Other Requirements

 **Important:** This release requires version 10000.2.990 or later of the Micro Focus License Administration tool. For local servers, you do not need to install it 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`.

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


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:**

- 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.
- The Enterprise Server feature is not supported on Windows XP.

Software requirements

Note: This product includes OpenSSL version 1.0.2j.

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 4.6.0.

Some earlier versions of Eclipse are also supported. See *Installing Visual COBOL into other instances of Eclipse* in the *Advanced Installation Tasks*.



Note: If you are installing Visual COBOL into Eclipse 4.5, or 4.6, you must install the Eclipse Target Management plugins into the Eclipse IDE for Java EE Developers package (32-bit):

1. Click **Help > Install New Software** in Eclipse and add a new repository for the location <http://download.eclipse.org/tm/updates/4.0>.
 2. Expand **RSE 3.8 Main Features**, check **RSE Terminals UI (Deprecated)** and complete the installation of the plugin.
- 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

- Oracle's Java Platform (64-bit) version 1.8.92 or above is required to run the Eclipse IDE. Java 7 and 8 (32 or 64-bit versions) are supported for executing JVM COBOL code and for native COBOL and Java interoperability. You can download Oracle's Java EE from [Oracle's web site](#) and install it anywhere on your machine.



Note: If Java 7 is installed on your machine, you can skip installing Java 8. Run the setup file with the `skipjre=1` command line option to do this.

- 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 .NET Framework v4.6.2 and the Microsoft's Visual C++ 2010 and 2012 Redistributables.

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



Important: This release requires version 10000.2.990 or later of the Micro Focus License Administration tool. For local servers, you do not need to install it 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`.

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

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	1.02 GB	4.06 GB	2.03 GB	44 MB
x86-64 running SUSE SLES	Micro Focus	1.02 GB	4.08 GB	2.04 GB	44 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

- The setup file installs Visual COBOL and the 64-bit Eclipse 4.6.0. 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 4.4, and 4.5 for both the 32-bit and the 64-bit Eclipse. See *Installing Visual COBOL into other instances of Eclipse*.
- Visual COBOL supports the 64-bit Eclipse IDE as default and requires a 64-bit Java installation.
- 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.

 **Note:** If you are installing Visual COBOL into Eclipse 4.5, or 4.6, you must install the Eclipse Target Management plugins into the Eclipse IDE for Java EE Developers package (32-bit):

1. Click **Help > Install New Software** in Eclipse and add a new repository for the location `http://download.eclipse.org/tm/updates/4.0`.
2. Expand **RSE 3.8 Main Features**, check **RSE Terminals UI (Deprecated)** and complete the installation of the plugin.

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 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 11 ¹	SUSE 12	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-	N/A				X	

Library	32-bit Library Name	64-bit Library Name	Platform					
			s390	SUSE 11 ¹	SUSE 12	Red Hat 6.x	Red Hat 7	
PackageKit-gtk3	N/A	module-*.x86_64 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
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		X
unzip	Any version	Any version	Any version	X	X	X		X
libgnome	N/A	libgnome.x86_64	N/A			X		X


 **Note:** ¹ To install Eclipse on SUSE 11 you must have installed SuSe 11 Service Pack 3 or later.

* 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.

** Operating system libraries required for PL/I support on both SUSE and Red Hat.

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.
- Oracle's Java Platform (64-bit) version 1.8.92 or above is required to run the Eclipse IDE. Java 7 and 8 (32 or 64-bit versions) are supported for executing JVM COBOL code and for native COBOL and Java interoperability. You can download Oracle's Java EE from [Oracle's Web site](#) and install it anywhere on your machine.

 **Note:** 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.

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:

```
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: This release requires version 10000.2.990 or later of the Micro Focus License Administration tool. For local servers, you do not need to install it 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.

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

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	442 MB	1.77 GB	884 MB	35 MB
HP IA	Micro Focus	800 MB	3.20 GB	1.60 GB	66 MB
System Z running Red Hat Linux	Micro Focus	362 MB	1.45 GB	724 MB	34 MB
x86-64 running Red Hat Linux	Micro Focus	431 MB	1.72 GB	862 MB	44 MB
ppc64le running Red Hat Linux	Micro Focus	262 MB	1.05 GB	524 MB	1 MB
SPARC running Solaris	Micro Focus	423 MB	1.70 GB	846 MB	38 MB

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 Solaris	Micro Focus	396 MB	1.58 GB	792 MB	30 MB
System Z running SUSE SLES	Micro Focus	243 MB	972 MB	486 MB	1 MB
x86-64 running SUSE SLES	Micro Focus	436 MB	1.74 GB	872 MB	44 MB
ppc64le running SUSE SLES	Micro Focus	243 MB	972 MB	486 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 1.0.2j.

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 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 11	SUSE 12	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

Library	32-bit Library Name	64-bit Library Name	s390 Library Name	Platform			
				SUSE 11	SUSE 12	Red Hat 6.x	Red Hat 7
libstdc++	libstdc++- *.i686	libstdc++- *.x86_64	libstdc++-*.s390			X	X
glibc- devel	glibc- devel- *.i686	glibc- devel- *.x86_64	glibc-devel-*.s390			X	X
glibc- locale	glibc- locale-32 bit	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	libXcomp osite1-0	N/A		X		
gtk2	N/A	libgdk_pix buf-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
PackageK it-gtk	N/A	PackageK it-gtk- module- *.x86_64	N/A			X	
PackageK it-gtk3	N/A	PackageK it-gtk3- module- *.x86_64	N/A				X
gtk2- engines	N/A	gtk2- engines.*. x86_64	N/A			X	

Library	32-bit Library Name	64-bit Library Name	s390 Library Name	Platform			
				SUSE 11	SUSE 12	Red Hat 6.x	Red Hat 7
libcanberra-gtk2	N/A	libcanberra-gtk2-x86_64	N/A			X	X
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	X
unzip	Any version	Any version	Any version	X	X	X	X
libgnome	N/A	libgnome-x86_64	N/A			X	X

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

- Oracle's Java Platform (64-bit) version 1.8.92 or above is required to run the Eclipse IDE. Java 7 and 8 (32 or 64-bit versions) are supported for executing JVM COBOL code and for native COBOL and Java interoperability. You can download Oracle's Java EE from [Oracle's web site](#) and install it anywhere on your machine.



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. 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](#).

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:

```
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: This release requires version 10000.2.990 or later of the Micro Focus License Administration tool. For local servers, you do not need to install it 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`.

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

UNIX and Linux Installer Issues

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 `-EDadminID=[User ID]` on the command line so it is used by the installer.

License Server

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

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

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

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

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

Product Co-Existence



Note: The following applies to Windows only.

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

Basic Installation

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

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

Installing Visual COBOL for Visual Studio

To install this product:

1. Run the `vcvsnnnn_30.exe` file (where *nnnn* is the version of Visual Studio you're installing for) and follow the wizard instructions to install the prerequisite software and the product.



Note:

- When the installation has completed, on some editions of Windows you might receive a notification that Visual Studio 2012 has compatibility issues. This is a known Microsoft issue. To resolve it, follow the instructions in the notification for obtaining help online, or download the KB2781514 update for Visual Studio 2012 from the [Microsoft Download Center](#).
- If you are installing onto a machine that has an existing Micro Focus product that uses an older Sentinel RMS License Manager, you might be prompted to remove it and install the Micro Focus License Administration. By doing this you maintain the existing Sentinel RMS license files while adding the Micro Focus License Administration. If you are unsure about existing licenses on your computer or removing the Sentinel RMS License Manager, consult your System Administrator. If you want to proceed, remove Sentinel RMS License Manager by using **Program and Features** (Windows Vista or later), and rerun the installation file.
- Trial licenses cannot be used with remote desktop services. If you want to use your product in this way, please contact Micro Focus SupportLine to obtain a relevant license.
- We recommend that you install any updates for Visual Studio and the .NET Framework that are available at the [Microsoft Download](#) site.
- If you install JDK you might be prompted to install the latest update. The latest update is not required for use with Visual COBOL but you can install it if you wish.

Installing Visual COBOL for Eclipse (Windows)



Note:

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

These are the steps to install Visual COBOL:

1. Run the `vce_30.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 4.6 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. For example, if you have a more recent Java 8 update version installed on your machine and you want to skip installing Java 8 update 102, run the setup file from the command line with the `skipjre=1` command line option.

Installing Visual COBOL for Eclipse (UNIX)



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_3.0_platform
```

2. Run the setup file with superuser permissions:

```
./setup_visualcobol_deveclipse_3.0_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_3.0_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_3.0_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.

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_3.0_platform
```

2. Run the installer with superuser permissions:

```
./setup_visualcobol_devhub_3.0_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_3.0_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 affect 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`.

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](#) and the [Micro Focus Infocenter](#) for any updates to the documentation which might have been uploaded.

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.
- This package provides eight licenses for using Micro Focus Development Hub on all platforms.
- If you have purchased licenses for a previous release of this product, those licenses will also enable you to use this release.
- Personal Edition licensing is only available with Visual COBOL for Visual Studio 2017 and Visual COBOL for Eclipse
- 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 7 and Earlier

- From your desktop, click **Start > All Programs > Micro Focus License Manager > License Administration**

Windows 8, 8.1, and Windows Server 2012

- From the **Start** screen, click the **License Administration** tile

Windows 10 and Later

- 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 16-digit string of letters and numbers.

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

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

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.
- The *Examples and Utilities* section of the Micro Focus SupportLine Web site, including demos and additional product documentation.
- The *Support Resources* section of the Micro Focus SupportLine Web site, that includes troubleshooting guides and information about how to raise an incident.

To connect, enter <http://www.microfocus.com> in your browser to go to the Micro Focus home page, then click **Support & Services > Product Support**. In the **Browse by Product** field, click the product you require support for. 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, www.microfocus.com. 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 <http://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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