



# **Micro Focus Enterprise Developer 2.2 for Visual Studio**

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A decorative graphic consisting of a thick, blue, glossy ribbon that loops and swirls across the lower half of the page. The ribbon has a gradient from dark blue to light blue, giving it a three-dimensional appearance.

**Release Notes**

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**2014-01-27**

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# Micro Focus Enterprise Developer 2.2 for Visual Studio 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.

Enterprise Developer is a contemporary development suite for Microsoft Visual Studio or Eclipse that allows mainframe developers to maintain, develop and modernize mainframe applications environments regardless of whether these are to be deployed back on the mainframe or onto an alternative platform.

Enterprise Developer supports IBM COBOL, IBM PL/I, IBM Assembler, IBM CICS, IBM IMS, IBM JCL, IBM DB2, IBM z/OS file formats and common batch utilities including SORT. This means that the core mainframe online and batch applications can be developed and maintained under Enterprise Developer. These applications can then be deployed back on the mainframe or migrated onto one of the Micro Focus Linux, UNIX or Windows based production platforms.

Micro Focus offers Enterprise Developer with the following licensing options that unlock different functionality:

## **Enterprise Developer Personal Edition**

Enterprise Developer Personal Edition is a free product, available for download. It is suitable for anyone who wants to become familiar with the Eclipse or Visual Studio means of editing and compiling mainframe applications under Windows.

## **Enterprise Developer**

Enterprise Developer is for customers looking to modernize mainframe applications and move to an alternative platform. This option again uses either the Visual Studio or Eclipse-based IDE and includes development and test tools for all platforms currently supported by Micro Focus.

## **Enterprise Developer Connect**

Enterprise Developer Connect is for customers looking to use modern and productive Eclipse-based tooling to develop mainframe applications directly on the mainframe. Close integration to mainframe configuration management systems and the ability to easily customize the Eclipse-based IDE to include mainframe based tools and processes means developers can take full advantage of modern development tools without having to learn new development processes.

## **Enterprise Developer for IBM zEnterprise**

Enterprise Developer for IBM zEnterprise targets customers who look at developing and maintaining their mainframe applications as well as modernizing them for deployment back on the mainframe or any of the z/Enterprise partitions. This option uses the Visual Studio or Eclipse-based IDE and includes mainframe integration to support development on and off the mainframe and the Application Workflow Manager for configuring the IDE. It also includes tools to support development and test on z/Linux and AIX and x86 environments. Enterprise Developer for IBM zEnterprise combines all the capabilities of Enterprise Developer Connect and Enterprise Developer.

Full mainframe integration and the Application Workflow Manager are only available in the Eclipse-based IDE.



**Note:**

- The Enterprise Developer Personal Edition option is not available with this release.

You can use the Personal Edition option if you install the previous release, Enterprise Developer Personal Edition 2.1 Update 1. When you start the product, follow the links in the Micro Focus Enterprise Developer Product Licensing dialog box to activate the free product.

- If you are currently using the Personal Edition variant and you want to use the full functionality of Enterprise Developer or upgrade to Enterprise Developer for IBM zEnterprise, please contact your Micro Focus representative and ask for a free evaluation license.



**Note:**

- Micro Focus Enterprise Developer Unix Components is only available with an Enterprise Developer or Enterprise Developer for IBM zEnterprise license and is not available with an Enterprise Developer Personal Edition license.
- Mainframe Access Server is only available with an Enterprise Developer or with an Enterprise Developer for IBM zEnterprise license and is not available with an Enterprise Developer Personal Edition license.



**Important:** Application executables that were compiled using earlier Micro Focus products must be recompiled from the sources using Enterprise Developer. For more information, read the section *Upgrading to Enterprise Developer for Visual Studio 2010* in the product Help.

# Installation

## System Requirements for Enterprise Developer for Visual Studio

### Hardware Requirements

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

In general, most modern machines will have the required processor and available RAM to run the Micro Focus products under Windows effectively. For planning purposes, it is recommended to have a minimum of 2GB of RAM.

The disk space requirements are:

Platform	Enterprise Developer	Sentinel RMS License Manager
x86 Windows platforms	600MB	35MB
x64 Windows platforms	750MB	35MB

 **Note:** 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 for Micro Focus Enterprise Developer Unix Components are approximately:

Platform	Enterprise Developer (MB)	Sentinel RMS license server (MB)
POWER running AIX	396	26
HP IA	806	54
System Z running Red Hat Linux	332	28
x86-64 running Red Hat Linux	358	33
SPARC running Solaris	431	31
System Z running SuSE SLES	337	28
x86-64 running SuSE SLES	363	33

 **Note:** The installation requires extra disk space that equals the size of the product you install.

### Operating Systems Supported

 **Note:** If you are using Enterprise Developer on a 64-bit operating system, you can produce either 32-bit or 64-bit applications.

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:**

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

## Software Requirements

**Windows:**

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

**Visual Studio IDE**

This product requires any of the following versions of Visual Studio:

- A full version of Microsoft Visual Studio 2010 or Microsoft Visual Studio 2012 (Premium, Professional, or Ultimate), or the respective version of the Microsoft Visual Studio Integrated Shell.

**Note:**

- Microsoft Visual Studio Express Edition is not supported.
- You can download the Visual Studio Integrated Shell from the [Microsoft Download Center](#). 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.
- If you do not have any of these versions of Visual Studio installed, the setup file will install the Visual Studio Integrated Shell.
- 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 4.0. This is included with the above versions of Visual Studio.
- Microsoft .NET Framework 4.5. This is included with Visual Studio 2012.

**Note:**

- Visual Studio 2010 Service Pack 1 is required if you are using Enterprise Developer for Visual Studio 2010 and Enterprise Developer for Visual Studio 2012 on the same machine. If you are connected to the Internet, the setup file downloads and installs Visual Studio 2010 Service Pack 1 automatically. If you do not have Internet access, you need to download Visual Studio 2010 Service Pack 1 on a machine that has Internet connection, and then copy the installer to your machine.
- In addition, when building a native COBOL project that contains resources you must replace the `cvtres.exe` in the `bin` and `bin64` directories of your Enterprise Developer installation with the version of the file which gets installed with Visual Studio 2010 SP1. You can download Service Pack 1 for Visual Studio 2010 from the [Microsoft Download Center](#).

**UNIX/Linux:**

- The Korn shell is required for the licensing daemon. After the installation, if the licensing daemon does not start, check and ensure the Korn shell is installed and then run the `/var/microfocuslicensing/bin/startmfcesd.sh` script to start the daemon.
- The pax archiving utility is required by the setup file. Pax is distributed with most UNIX/Linux systems but, if it is missing, you must install it separately. To verify pax is installed, run `pax --help` or `pax --version` at the command line.
- On Red Hat 6.x, you must have the following operating system libraries installed:

**All Enterprise Developer products**

`glibc-*.x86_64`  
`glibc-*.i686`

libgcc-\*.x86\_64  
libgcc-\*.i686

### Additional libraries for Micro Focus Enterprise Developer Unix Components

glibc-devel-\*.x86\_64  
glibc-devel-\*.i686

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.
- You need to set the JAVA\_HOME environment variable. When installing the product, set this variable to a 32-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.

### Other Requirements



**Important:** This release requires version 10000.2.990 or later of the Micro Focus licensing software. For local servers, you do not need to install it separately, as the setup file installs a new Enterprise Developer 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 Licensing System 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>.

## Additional Software Requirements

To ensure full functionality for some Enterprise Developer features, you might be required to obtain and install additional third-party software in addition to the prerequisite software installed automatically by the Enterprise Developer setup file. The following information specifies the third-party software required for each feature.

### COBOL on Windows Azure

Windows Azure requires additional software. See the Microsoft Windows Azure web site for a full list of the required software, but the following is a summary of the main prerequisites:

- Windows 7, Windows Vista® SP1 or higher, or Windows Server® 2008
- Visual Studio's Visual Web Developer feature
- Windows Azure Tools version 1.8 for Visual Studio - this includes the Windows Azure SDK
- Internet Information Services (IIS) 7.0 - this must be installed and enabled, with ASP.NET, which is not enabled by default

## Enterprise Server for .NET

- Microsoft .NET Framework 4.0
- Microsoft SQL Server 2008 R2. For beta or development installations, SQL Server Express 2008 R2 is sufficient.

You can download Microsoft's SQL Server from <http://www.microsoft.com/sqlserver/en/us/get-sql-server/try-it.aspx>.

- A TN3270 terminal emulator. Micro Focus Rumba is supplied with this product.

 **Note:** You also need to enable IIS and some additional Windows features. Read the *Quick Start* section in your Enterprise Server for .NET help for further instructions on how to set up your operating environment.

## Java Compilation

- Either the IBM or the Oracle Java Development Kit (JDK), version 1.5 or later, is required for compiling Java. The JDK is downloadable from the Oracle and IBM Web sites. After installing the JDK, you must put the `tools.jar` file for the JDK on your classpath, using a command similar to:

```
set classpath=jdk-install-directory\lib\tools.jar
```

## Micro Focus Rumba

- On Windows 8, in order to install Micro Focus Rumba you must have the Microsoft .NET Framework 3.5 Service Pack 1 installed.

## Windows Forms

- Microsoft Visual Studio is required for using the Service Interfaces feature to generate Windows Forms and ASP.NET Web site test clients.
- Microsoft Internet Information Service (IIS) is also required for generating Windows Forms test clients.

## Application server support for JVM COBOL

The following application servers are supported using the following JDKs:

Application Servers	JDK version	Containers support version
Tomcat 7.0.39	1.6.027	Servlets 2.5
JBoss 6.1	1.6.027	Servlets 2.5
WebLogic 12.1.1	1.6.027	Servlets 2.5
WebLogic 12.1.1 on AIX 6.1	1.6.0 SR10 FP1	Servlets 2.5
WebSphere 8.5	1.6.027	Servlets 2.5
WebSphere 8.5 on AIX 6.1	1.6.0 SR10 FP1	Servlets 2.5

The availability of resource adapters for these application servers differs between UNIX platforms. The following table indicates where support is available for each platform:

Platform	Tomcat 7.0.39	JBoss 6.1	WebLogic 12.1.1	WebSphere 8.5
Red Hat EL 5	32-bit and 64-bit	32-bit and 64-bit	32-bit and 64-bit	32-bit and 64-bit
Solaris on SPARC	32 bit	32-bit	32-bit	32-bit
HP/UX 11.31 on Intel IA64			64 bit	64 bit
AIX 6.1			32-bit and 64-bit	32-bit and 64-bit

Platform	Tomcat 7.0.39	JBoss 6.1	WebLogic 12.1.1	WebSphere 8.5
SUSE 11				32-bit and 64-bit

Eclipse IDE development is supported for Red Hat and Windows platforms only.

## Installing Enterprise Developer for Visual Studio

### Downloading the Product

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

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

You can download Enterprise Developer for Visual Studio 2012 from the Micro Focus SupportLine Web site and from the *Product Updates* section.

### Product Co-Existence

- Enterprise Developer and Enterprise Server (or Enterprise Test 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.
- Enterprise Server comes in the following versions:
  - Enterprise Server, which is the deployment server for applications built using Enterprise Developer for Visual Studio 2010 and Enterprise Developer for Eclipse.
  - Enterprise Server 2012, which is the deployment server for applications built using Enterprise Developer for Visual Studio 2012.

You can only deploy applications to the version of Enterprise Server from the associated development product you used to build the applications. For example, if you built your application using Enterprise Developer for Visual Studio 2012 you must deploy the target files to Enterprise Server 2012.

### Installation restrictions and requirements

Before starting the installation you should consider the following:

- If, when you install Enterprise Developer for Visual Studio 2010, the machine does not have Microsoft Visual C++ 2010 Redistributable Runtime already installed, it is installed as required by Enterprise Developer. The installation of Microsoft Visual C++ 2010 Redistributable Runtime adds a number of .dll files, without digital signatures, into the `winsxs` directory.
- If, when you install Enterprise Developer for Visual Studio 2012, the machine does not have Microsoft Visual C++ 2012 Redistributable Runtime already installed, it is installed as required by Enterprise Developer. The installation of Microsoft Visual C++ 2012 Redistributable Runtime adds a number of .dll files, without digital signatures, into the `winsxs` directory.
- If you are installing this as an upgrade, make sure that none of the product files are in use when you start the installation. Also, the Visual Studio Help Viewer must not be opened.
- You need to be logged in with a user-ID that has write access to the registry structure under `HKEY_LOCAL_MACHINE`, `HKEY_CLASSES_ROOT`, and `HKEY_CURRENT_USER` so the installation software can set the environment appropriately. You also need to be logged on with Administrator privileges.

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

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

```
net stop mf_ccitcp2
```

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

2. Uninstall the MFDS or CCITCP2 service.

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

For CCITCP2: `ccitcp2 -u`

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

1. Stop and uninstall the MFDS service, as described above.
2. Reinstall the earlier version, as follows:
  - a. Open an Enterprise Developer command prompt.
  - b. Install the service. Enter the following command: `mfdss -i`
  - c. Start the service. Enter the following command: `net start mf_ccitcp2`



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

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

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

## Installing and Licensing Micro Focus Rumba

The Enterprise Developer installer includes Micro Focus Rumba 9.0 which you can optionally install. The license for Enterprise Developer enables you to use the mainframe components of Rumba (Rumba for Mainframe).

Before using the Enterprise Developer installer to install or update Rumba, please note the following:

- If you have the full, standalone version of Rumba installed on your machine, it is recommended that you use the standard ways to upgrade this version to Rumba version 9.0 or later.

It is not recommended to use the Enterprise Developer 2.2 setup file to update Rumba as you may lose your license for the full Rumba version.

- If you are installing Enterprise Developer 2.2 onto a machine that does not have Rumba installed, it is recommended that you select the Rumba option and install this with Enterprise Developer.

This installs the components you need to establish a mainframe 3270 connection (Rumba for Mainframe) and a 30-day trial license for the full Rumba product. After the 30-day trial period completes you will still access Rumba for Mainframe components as part of your Enterprise Developer license.

- If you are installing Enterprise Developer 2.2 as an upgrade to an existing licensed installation of Enterprise Developer that is using an authorization code issued before Enterprise Developer 2.1 Update 1 (released in April 2013), it is recommended that you do not update the Rumba components previously installed with the earlier version of Enterprise Developer.

If you do want to update Rumba, then select this during the 2.2 installation and then contact Micro Focus SupportLine and ask for the Enterprise Developer 2.2 authorization code. This will replace your existing 2.1 authorization code and will enable the updated version of Rumba.

# Installing



## Note:

- Before installing, check *Installation Restrictions and Requirements*.
- This version of the product is a full install.

To install this product:

1. Run the `edvs2010_22.exe` (or `edvs2012_22.exe` when installing the product for Visual Studio 2012) file and follow the wizard instructions to install the prerequisite software and the product.

The installer installs Enterprise Developer, Enterprise Server for .NET, and offers to install Micro Focus Rumba.



## Note:

- If you are installing onto a machine that has an existing Micro Focus product that uses an older Sentinel RMS License Manager, you might be prompted to remove it and install the Micro Focus License Administration. By doing this you maintain the existing Sentinel RMS license files while adding the Micro Focus License Administration. If you are unsure about existing licenses on your computer or removing the Sentinel RMS License Manager, consult your System Administrator. If you want to proceed, remove Sentinel RMS License Manager by using **Program and Features** (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 Enterprise Developer but you can install it if you wish.

## Installing as an Upgrade

This release will update existing installations of Enterprise Developer for Visual Studio, versions 2.1 and 2.1 Update 1.

## Enterprise Developer Installation Options

To install Enterprise Developer you run `edvs2010_22.exe` which contains a number of product `.msi` files (Windows Installer packages). When run, `edvs2010_22.exe` performs some initial system checks then sequentially installs the `.msi` files.



**Note:** The following applies to `edvs2012_22.exe` when installing the product for Visual Studio 2012.

`edvs2010_22.exe` can take a number of parameters, enabling you to specify a number of different types of installation:

- Standard Installation

### Format:

`edvs2010_22.exe`

### Summary:

Full installation including License Manager and Enterprise Developer. During installation you can specify options including the location to which the components are installed.

- Non-interactive Installation

### Format:

```
edvs2010_22.exe /passive
```

**Summary:**

Full installation, but the components are installed non-interactively using default options and directories.

- Silent Installation

**Format:**

```
edvs2010_22.exe /q
```

**Summary:**

Full installation, but the components are installed non-interactively with no user interface, using default options and directories.

- Modified Silent Installation

**Format:**

```
edvs2010_22.exe /q InstallFolder=d:\otherdirectory
```

**Summary:**

Full installation, but the components are installed non-interactively with no user interface, and Enterprise Developer is installed to d:\otherdirectory.

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

```
edvs2010_22.exe /?.
```



**Note:**

- Log files that are created during installation are saved in the folder specified by the TEMP environment variable. To change the location or name of the files, use the /log parameter on your setup command line and specify the path and file name, for example: `filename /log d:\temp\log.txt`. This creates a log file, named `log.txt`, in the `d:\temp` directory.

## Microsoft Terminal Server

You can use this product with Microsoft Terminal Server but note that a separate end-user license is required for each user who accesses it, even if the product is running on a single machine. See your *End User License Agreement*.

Microsoft Terminal Server is an environment for running multiple instances of a single-user product. It is not a platform where a single-user product can be made to perform as a multi-user product.

To install onto a terminal server:

- Log on to the physical terminal server with a user ID that has administrator privileges.
- Use **Control Panel > Programs** and follow the instructions on the screen.

When you install the product on Microsoft Terminal Server or similar terminal software, do not execute more than one installation at the same time.

When you install Microsoft Terminal server, you must assign a unique port address to each user. Then the very first time that each user logs into Enterprise Developer and starts the terminal server, they should:

1. Select **Options > Project > Port address for Web Server**.
2. Type in the assigned port address.

This is necessary because the default port address for the Web server is 80. Once this has been allocated to the first user, when the next user attempts to start the Web server, the software recognizes that this port is in use and rejects the attempt. Consequently each user requires an individual port address.

## Installing from a Server

There are two methods for installing this product on users' machines using a server. You can:

- Copy the product onto the server and then use Setup under control of a third-party software distribution package, such as Microsoft's Systems Management Server (SMS), to install the product onto multiple users' machines.

This method of installation and the associated file are not supported by Micro Focus. They are provided on an "as is" basis and have not been tested in any form. You can use them at your own discretion.

- Install onto the server. Then users run Setup to install from the server onto their own machines.

Both methods give you control of what options the user can install and mean you do not have to send the installation media to every user, as they install from the server instead.

## Windows Compatibility Mode

In Windows Vista and Windows Server 2008, if you have problems starting Enterprise Server instances using the Micro Focus Enterprise Server Administration HTML GUI, ensure that none of the Enterprise Server program files are configured to use a Windows compatibility mode. You can check for compatibility modes by examining the file properties for the program file using Windows Explorer:

1. Open the **Properties** dialog box for the file.
2. Click the **Compatibility** tab.
3. Ensure that **Run this program in compatibility mode for** is not checked.
4. Click **Show settings for all users** and ensure that **Run this program in compatibility mode for** is not checked.
5. Click **OK** on both dialogs to update the file properties.

Verify that `<install-dir>\base\bin\mfds.exe` is not set to run in a compatibility mode.

- For 32-bit Enterprise Server, check `bin\cas*.exe` and `bin\mfcs.exe`
- For 64-bit Enterprise Server, check `bin\win64\cas*.exe` and `bin\win64\mfcs.exe`.

## After Installing

You are now ready to run Enterprise Developer. From the Windows taskbar click **Start > All Programs > Micro Focus Enterprise Developer > Enterprise Developer for Visual Studio *nnnn***.



**Note:** The Start menu is not available on Windows 8 and Windows Server 2012. You use the Start screen to invoke programs.



**Note:** For applications created with earlier Micro Focus products or earlier versions of Enterprise Developer, note the following:

**Database Access** Managed applications using SQL(DBMAN=ODBC) that were compiled in Enterprise Developer 2.1 Update 1 must be recompiled in Enterprise Developer 2.2.

**Existing Applications** Application executables that were compiled using earlier Micro Focus products must be recompiled from the sources using Enterprise Developer. For more information, read the section *Upgrading to Enterprise Developer for Visual Studio 2010* in the product Help.

Please refer to the *Start Here* and *Product Information* sections in your product Help. Here, you will find information on getting started including tutorials and demonstration programs.



**Note:**

- The first release of Visual Studio 2010 has a browser-based help system, Microsoft Help Viewer 1.0, which does not include an index for the locally-installed help. Navigation of the content is only available using the table of contents and Search and the help contents for the Help system does not expand and collapse in the same way as previous Help systems.

- If you have problems trying to view the Micro Focus help, ensure that the Visual Studio Help Library is pointing to local help. From the Visual Studio menu click **Help > Manage Help Systems > Choose online or local help** and check the **I want to use local help** button.
- Visual Studio 2010 SP1 provides an upgrade of the help system, Microsoft Help Viewer 1.1, which provides a stand-alone help viewer with an index and a fully expandable table of contents.
- If you do not want to install Visual Studio 2010 SP1, you can install some third-party tools that enable the index or the fully expanding table of contents. For more information, see the topic *Help on Help*.
- To view the help in Visual Studio 2012, ensure that the Visual Studio Help Library is pointing to local help. From the Visual Studio menu click **Help > Set Help Preferences > Launch in Help Browser**.
- For full details of the Visual Studio 2012 Help system, see the locally installed Microsoft Help Viewer 2.0 Help, which is available from Help menu in the IDE.
- On Windows 8 and Windows Server 2012, an issue with Microsoft Help Viewer 2.0 and Internet Explorer's security being turned on can cause the Help content to be displayed as raw HTML code. To resolve the issue, you need to turn off the Internet Explorer Enhanced Security Configuration (IE ESC) for both administrators and users. Check the Microsoft Windows help for more information on how to do this.

## Repairing

### Windows

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

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

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

### UNIX

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

## Installing Micro Focus Enterprise Developer Unix Components



### Note:

- Micro Focus Enterprise Developer Unix Components is only available with an Enterprise Developer or Enterprise Developer for IBM zEnterprise license and is not available with an Enterprise Developer Personal Edition license.
- If you are installing on Solaris, please read [UNIX Installer Issues](#) first.

## Downloading the Product

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

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

## Installing



### 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`.

These are the steps to install this product:

1. Give execute permissions to the setup file:

```
chmod +x setup_entdev_2.2_platform
```

2. Run the installer from the Process User ID login:

```
./setup_entdev_2.2_platform
```

When the installer starts it will prompt you to enter the superuser password so it can perform operations that require root permissions.

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

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

```
./setup_entdev_2.2_platform -installlocation="full path of new location"
```



**Note:** You can use variables or the tilde syntax for the path for `-installlocation`. For example, the following examples are equivalent:

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

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

```
-installlocation="~/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.

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

- ESSysLog** Specifies a location in which the build will create the Enterprise Server System log file - for example, `-ESSysLog="/home/esuser/logs"`. The default location is `/var/mfcobol/logs`.
- ESadminID** Sets the Enterprise Server System Administrator Process User ID from the command line - for example, `-EDadminID="esadm"`. The default user ID is the one that runs the installer.
- CASrtDir** Specifies the location where the Enterprise Server run-time system files are placed - for example, `-CASrtDir="/home/esuser/casrt/es"`. The default location is `/var/mfcobol/es`.

**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_entdev_2.2_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.

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

1. To set up your product, execute:

```
./opt/microfocus/EnterpriseDeveloper/bin/cobsetenv
```

2. To verify that your product is installed, execute:

```
cob -V
```



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

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

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

## UNIX Installer Issues

### Licensing Daemon

If the Korn shell is not installed on your machine when you run the installer, the licensing daemon will not be started. To resolve this after you install the product, install the Korn shell and then run the `/var/microfocuslicensing/bin/startmfcesd.sh` script to start the daemon.

### License Infrastructure Installer

On some Solaris platforms, you can receive the following error message when SafeNet license server needs to be installed or upgraded on your machine:

```
tar: /safenet.tar: No such file or directory
```

To resolve this issue, wait for the installation to complete and then perform the following:

1. Navigate to the `safenet` directory in the `COBDIR` location.
2. With superuser permissions execute: `./MFLicenseServerInstall.sh`

### 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.

## Preserving Configuration Settings When Upgrading Product Versions

The Micro Focus Product Settings Backup and Restore tool allows you to backup and restore the COBOL product configuration files and settings from one product install to another. You can also use the script to take a snapshot of a product's settings before testing changes, and then restore the product.

The backup `.tar` files that the tool generates are stored in `/opt/microfocus/Archive`.

The following files are backed up by default:

### MFDS and Enterprise Server files

```
bin/mfds/  
etc/mfds/  
etc/mfdsacfg.dat  
etc/mf-client.dat  
etc/mf-server.dat  
deploy/.mfdeploy  
etc/cas/cas.cfg
```

### COBOL product configuration files

```
etc/cob.cfg  
etc/cob64.cfg  
etc/coboops.cfg  
etc/coboops64.cfg  
etc/coboops64_t.cfg  
etc/coboops_t.cfg  
etc/cobopt  
etc/cobopt64  
etc/liblist  
etc/liblist64  
etc/cobjvm.cfg  
etc/cobisym  
etc/ecm.cfg
```

### Other files

```
etc/default.tcf  
DemoCA/
```



**Note:** Products before Visual COBOL 2.2 and Enterprise Developer 2.2 do not contain the tool.

## Syntax

The tool has the following command line arguments:

```
Backup_Restore.sh [-help|-h|-?|-readme ]  
                  [ -backup -archive="location" ]  
                  [ -restore -archive="location" ]  
                  [ -installlocation="location" ]
```

### -help

Display usage message.

### -readme

Display step-by-step guide.

### -backup

Create a backup `.tar` file of product configuration.

**-archive="location"**

Full path to location of where to store or get backup file from.

**-restore**

Restore product configuration from given backup .tar file.

**-archive="location"**

Full path to location of where to store or get backup file from.

**-installlocation="location"**

Full path to location of COBDIR to be processed. If you do not know this path you can find it using the command `mfds -m`.

## Backing up your settings

The backup option of the tool preserves the MFDS, Enterprise Server and COBOL product settings. It does this by creating a .tar archive of the files and places them in `/opt/microfocus/Archive/` on your machine.

You can run the tool interactively and following the on screen instructions or you can use it from the command line as part of an automated process.

The archive file name is made up of the following parts: `[ProductName][Release]_snapshot.[MachineName].YYYY-MM-DD.HH:MM:SS.tar` and you can also specify the destination of the archive file using the `-archive` command line option. For example, running

```
Backup_Restore.sh -archive="/tmp"
```

on a machine call RedHatBLD against Visual COBOL 2.2 will give you a file name of `VisualCOBOLDevelopmentHub2.2_snapshot.RedHatBLD.date.time.tar`.

Before performing the backup, the tool checks to see if the files exist. If they are present then in the `/opt/microfocus/Archive` folder, they are added to the backup list. If they are missing, a warning is given telling you which files are not found.

The backups can be used to take generational backups of the product setting to make sure you have the latest settings backed up. You can also use the tool to take snapshots of the product's settings before making changes. You can then use the backup to restore the product to a known configuration if needed.

Perform the following steps to create a backup:

1. Log on as root.
2. Set COBDIR to the product you want to backup.
3. Run the tool and select **Backup** from the menu.

The tool then generates the backup file and places it in `/opt/microfocus/Archive/`.

You can also run the tool from the command line, so the process can be automated:

1. Log on as root.
2. Run the command

```
Backup_Restore.sh -backup
```

This creates a backup in the default area. To create a backup in a different location, log on as root and run the following command:

```
Backup_Restore.sh -backup -archive="/tmp"
```

## Restoring your settings

The tool can be used to restore backed up files for a given product. Set COBDIR to the product you want to update the settings of and run the tool. You can then select a file to use and the script will overlay the files in the backup archive over the top of the product.

During the restore process a copy of the files that are to be overwritten is made so that if the files from the backup you are overlaying are not what you want or cause an issue, you can revert to the previous state.

By default all the archive files are stored under `/opt/microfocus/Archive/`.

To restore files in a product, perform the following steps:

1. Log on as root.
2. Set COBDIR to the product you want to update.
3. Run the tool and select **Restore** from the menu.
4. Select the archive file you want to use.
5. Confirm the files listed are those you want to overlay onto the product.

The product is then updated. If needed you can perform the restore process using the tool's command line option `-restore`.

### Migrating settings between machines

The tool can be used to transfer settings from one product to another on the same machine or on another machine, so that once you have the required settings in place you can roll them out to a number of installations. To do this perform the following steps:

1. Log on as root.
2. Set COBDIR to the product containing the tool.
3. Run the tool and select **Change COBDIR setting** from the menu.
4. Enter the COBDIR location for the product you want to migrate the settings from, for example an earlier version of Enterprise Developer such as version 2.1.
5. Select the **Backup settings** option from the menu.
6. If you want to update a product on the same machine, set COBDIR to this product using the **Change COBDIR setting** menu option.

If you are updating a product on a different machine, you need to copy the `.tar` file created to that new machine. The tar files can be found under `/opt/microfocus/Archive`. Copy the `.tar` file from this location to the new machine and put it in the same directory structure on the new machine.

7. From the menu select **Restore**.
8. Select the archive file you want to use. It will list the files that will be restored.

The tool will then take a backup of the existing files in the product so they can be restored if required.

## Repairing on UNIX

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

## Installing Mainframe Access Server



**Note:** Mainframe Access Server is only available with an Enterprise Developer or with an Enterprise Developer for IBM zEnterprise license and is not available with an Enterprise Developer Personal Edition license.

### Introduction

The installation process for Mainframe Access Server (MFA) uses a single FTP operation to transfer all of the mainframe software into a partitioned data set that you pre-allocate. When this transfer is complete, the remaining installation activities are all done on the mainframe. You customize and submit the pre-built FRESTORE job to restore the product data sets from the uploaded files and then continue with customization steps to create an operational Mainframe Access Server.

## Requirements

- IBM TCP/IP 4.0, or Interlink TCP/IP 3.1 or higher
- Two APPLIDs, two TCP/IP ports
- Availability of APF security authorization support personnel
- Access to a network share with acceptable space for source and data, as well as the ability to access the IP address and ports used to access MFA
- The following installation-specific variable information:

Variable	Description
<i>drive</i>	
<i>userid</i>	TSO user-ID for FTP to your mainframe
<i>pswd</i>	TSO password for the FTP user-ID
<i>your.mainframe.name</i>	TCP/IP host name or IP address of your mainframe
<i>prodhq</i>	A NEW high level qualifier that will be assigned for all Host Connectivity data sets when the new Mainframe Access product is installed. These are NOT existing product data sets, but rather brand new files that you will be creating for this base version.



**Important:** The installation of a new version of MFA creates new product run-time data sets before the upgrade is applied. Any existing Host Connectivity 3.01 libraries remain intact, and can be used for fallback. If you prefer to retain your former production library names and re-use your existing *prodhq*, rename your old libraries beforehand.

Make a note of the maintenance level of your current Mainframe Access Server. Messages MFM0001I and MFM0014I on the syslog and XDBOUT sysout data set show the maintenance level at startup. You may need to know what level you are upgrading from when you complete post-installation customizations for this upgrade.

## Install Mainframe Access Server

In the instructions that follow, the information that you must provide is shown as one of the variable names from the table of information in the previous section. For example, if your high-level qualifier (*prodhq*) value is MY.MFA, then substitute MY.MFA for *prodhq*.

Follow these steps to load Mainframe Access Server:

1. Download the installation file from the link in your Electronic Product Delivery email and extract its contents to a directory on the PC.
2. On the mainframe, allocate a new partitioned data set named *prodhq.UPLOAD* to receive the uploaded files. Use the following data set characteristics for this upload library:

```
DSORG=PO          <=== PDS (partitioned data set)
RECFM=FB          <=== record format fixed and blocked
LRECL=80          <=== 80 character record size
BLKSIZE=3120      <=== 3120 character block size
SPACE=(3120,(3500,500,50)) <=== allocate blocks (BLKS) size 3120
                                     3500 primary blocks
                                     500 secondary blocks
                                     50 directory blocks
```

3. On the PC, issue the following FTP commands. The actual text of the FTP prompts and responses that you see may differ slightly from those shown in this example.

### a. Start FTP:

```
C:\>ftp your.mainframe.name
Connected to your.mainframe.name.
220-FTPD1 IBM FTP CS/390 VxRy at YOUR.MAINFRAME.NAME, hh:mm:ss
```

```
220 Connection will close if idle for more than 5 minutes.
User (your.mainframe.name:(none)): userid
331 Send password please.
Password: pswd
230 userid is logged on. Working directory is "userid."
```

- b. Change the working directory on the mainframe to be the upload library that you allocated:

```
ftp> cd 'prodhlq.UPLOAD'
250 The working directory "hlq.UPLOAD" is a partitioned data set.
```

- c. Set file transfer type to binary:

```
ftp> binary
200 Representation type is Image
```

- d. Set FTP prompting off to transfer all files without interruption:

```
ftp> prompt
Interactive mode Off.
```

- e. Transfer all files from the extracted \Upload directory to members in the *prodhlq.UPLOAD* library:

```
ftp> mputdrive:\upload\f*
200 Port request OK.
125 Storing data set prodhlq.UPLOAD(Fxxxxxxx)
250 Transfer completed successfully.
ftp: xxxx bytes sent in x.xx seconds (xxx.xx Kbytes/sec)
.
.
.
```

- f. When `mput` has transferred all files the `ftp>` prompt appears. End the FTP connection:

```
ftp> quit
221 Quit command received. Goodbye.
```

- g. On the mainframe, verify that all files transferred successfully and that for each `Fxxxxxxx` file in the `\Upload` directory there is a corresponding member in the *prodhlq.UPLOAD* data set. There should be 10 members, F1 through to F9 and FRESTORE.

4. On the mainframe, edit member FRESTORE in the upload library, *prodhlq.UPLOAD*. Follow the instructions in that member to customize the JCL and then submit that job to restore the product libraries from the uploaded files and populate your new product runtime libraries.
5. Start Mainframe Access Server.

### After installation

Since the program libraries can change between versions, it is necessary to either create new procedures, or back up the old procedures, and at least modify the `DSNQUAL=prodhlq` within your MFA sample started task procedures as provided by Micro Focus. The *prodhlq.LOADLIB* and *prodhlq.SASC.LINKLIB* must both be authorized.

Verify successful maintenance application by checking the Mainframe Access Server startup message:

```
MFM0001I: Mainframe Access V4.00 (BASE ) is active
```

The "(BASE )" indicates the product maintenance level. Also check for "V4.00" in the Mainframe Access Data Connect server startup message:

```
MFA303I MFA/DATACONNECT V4.00 - BASE COPYRIGHT (C) 1987-2012 MICRO FOCUS...
```

When you are satisfied with the new version installation you may delete the `UPLOAD` data set from your system.

### New parameters and members in the CNTL samples data set

The following updated members are found in the CNTL data set.

MFA	sample MFA started task
MFAS	*new* sample MFAS started task for Data Connect

MFAAS	sample MFAAS application server started task
MFAVTAM	sample MFA VTAM definitions
PARMS	sample PARMS for MFA started task
PARMSAS	sample PARMSAS for MFAAS started task
SERVERS	sample SERVERS configuration for MFA
UPQUICK	configuration notes

If you are migrating from Host Connectivity 3.01 WebSync 10 or earlier, you may want to retain your existing CNTL members from your current version as an installation test. You can simply copy the existing MFA started task JCL and change the STEPLIB to reference the new product libraries. You will however need to modify the MFAS started task JCL since the module names for Data Connect have been changed to allow co-residence within the same authorized library as MFA.

Review the Change Log in each of the new members. Read the documentation for any new parameters in the Readme and in the updated Mainframe Access Administrator's Guide. Add these new parameters and other changes to your working copies. If necessary, customize the new parameters for your installation.

Once you are satisfied with the operation of Mainframe Access, you can consolidate the configuration settings into the new high-level qualified CNTL members.

## Uninstalling

### Windows

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

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

When you uninstall, the only files deleted are those that the installation software installed. If the product directory has not been removed, delete any unwanted files and subdirectories within it using Windows Explorer.



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

Enterprise Server for .NET must be uninstalled before you remove Enterprise Developer. To completely remove the product you must uninstall the Micro Focus License Administration as well.

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

Some registry entries are not removed by the uninstallation process and you need to manually delete them.

The following folders might not be removed:

- The *Micro Focus Product Name* folder in the Start menu - you can delete it manually.
- %systemdrive%\Users\Public\Documents\Micro Focus - includes the binaries and the log files of the samples which you have built.
- %ProgramData%\Micro Focus - includes some data files used by the Micro Focus licensing system.
- %Program Files%\Micro Focus - you can delete it manually.

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

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

In addition, the following registry entries are not removed. These are created the first time that an Enterprise Server that has been enabled for performance monitoring starts up:

- Micro Focus Server\Performance\Active Servers
- Micro Focus Server\Performance\PerfIniFile

## UNIX



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

To uninstall this product:

1. Execute as root the `Uninstall_EnterpriseDeveloper2.2.sh` script in the `$COBDIR/bin` directory.



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

To uninstall Micro Focus License Administration:

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

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

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

# Licensing Information



## Note:

- If you have purchased licenses for a previous release of this product, those licenses will also enable you to use this release.
- The Enterprise Developer Personal Edition option is not available with this release. In order to use this product, you need purchase the full unlimited license for it.

You can use the Personal Edition option if you install the previous release, Enterprise Developer Personal Edition 2.1 Update 1. When you start the product, follow the links in the **Micro Focus Enterprise Developer Product Licensing** dialog box to activate the free product.

- Your entitlement for using this product is governed by the Micro Focus End User License Agreement and by your product order. 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

1. In the IDE, click **Help > Micro Focus Product Help > Product Licensing**.

This opens the **Micro Focus Buy Now** dialog box.

2. Ensure that the email address you used to register the product is in the **Email address** text entry field.
3. Click **Send email**.

This opens your default mail client and creates a new email filled in with the details to contact Micro Focus. Send the email.

If there is no mail client installed on your machine, you will be presented with a template that includes the email address and subject line for an email to send to Micro Focus using a mail client of your choice.

You will be contacted by a Micro Focus Sales representative.

## To start Micro Focus License Administration

From the Windows Taskbar click **Start > All Programs > Micro Focus License Manager > License Administration**.



**Note:** On Windows 8 and Windows Server 2012, you use the Start screen to invoke programs.

Log on as root, and from a command prompt type:

```
/var/microfocuslicensing/bin/cesadmintool.sh
```

# Installing licenses

## If you have a license file

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 Enterprise Developer.
2. Click **Help > Micro Focus Product Help > Product Licensing** to open the **Product Licensing** dialog box.
3. Ensure **I have a full Enterprise Developer Team Edition 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 **Authorize** to install the license.

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

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:** This topic only applies if you have an authorization code.

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.

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.

1. Start Micro Focus License Administration.
2. Select the **Online Authorization** option by entering 1 and pressing **Enter**.
3. Enter your authorization code at the **Authorization Code** prompt and then press **Enter**

## Authorizing your product when you don't have an Internet connection



**Note:** This topic only applies if you have an authorization code.

This method of authorization is required if your machine does not have an Internet connection or if normal (automatic) authorization fails.

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**.

In order to authorize your product you must have the following:

- 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 Enterprise Developer, contact your sales representative or Micro Focus SupportLine.

# New Features in Enterprise Developer 2.2



**Note:** There are differences between the variants of Enterprise Developer you might have installed. Enterprise Developer Personal Edition provides a development environment that supports analysis, editing and syntax checking of COBOL and mainframe programs outside of the mainframe environment. It does not, however, support off-mainframe debugging, unit testing, or building of projects. To build, debug, and execute the demonstration application, you need Enterprise Developer.

## Application configuration

You can now set environment variables for when you run native projects from within the IDE from the project's properties - click **Environment** on the **Application** tab in the project properties.

## COBOL editor enhancements

Navigating in the editor is now more similar to the editor navigation in Net Express. You can configure things like word wrap and indentation, the movement of the cursor using the **Home** and **End** keys, the style of the ruler and the colors of the text and the margins:

### Smart editing mode

The default mode in the editor is now Smart edit mode. It controls the word wrapping and the indentation in the different COBOL areas. You can configure the Smart edit mode from the **Tools > Options > Text Editor > Micro Focus COBOL > Margins** page. To toggle the mode, click  or  (in Visual Studio 2012) in the COBOL toolbar.

### Home and End keys navigation

You can configure how the **Home** and **End** keys move the cursor in the editor on the **Tools > Options > Text Editor > Micro Focus COBOL > Margins** page. To toggle the mode, click  or  (in Visual Studio 2012) in the COBOL toolbar.

### Configuring the ruler

You can specify whether to display the horizontal ruler in the editor and also choose its style, a default style or a mainframe style for which the ruler indicates COBOL area A/B, from **Tools > Options > Text Editor > Micro Focus COBOL > Margins** and check **Show ruler**.

## COBOL Source Information (CSI)

COBOL Source Information (CSI) provides a quick and easy way of providing you with information about your program when you are working on it. You enter a query in the **Quick Browse** dialog box and CSI returns the results of the query in the Output window's COBOL Source Information tab.

## Compiler directives

The following Compiler directives are new:

### ACU-UNDERSCORE

This directive treats underscores in COBOL words as hyphens.

### ILSHOWPERFORMOVERLAP

This managed COBOL-only directive generates a warning when an overlapping PERFORM range is detected in the program.

### ILEXPONENTIATION

This managed COBOL-only directive enables you to optimize exponential arithmetic operations by specifying the calculation method used.

### EXITPROGRAM

This directive determines how the EXIT PROGRAM statement is executed.

The following Compiler directives have changed:

**CHANGE-MESSAGE** The scope of this directive has been widened to allow you to change the severity of different types of error messages, not just syntax checking messages.

**DIALECT"RM"** DIALECT"RM" now sets PERFORM-TYPE"RM". If you recompile an application that uses DIALECT"RM", the behavior may change for nested PERFORM statements. If that is the case, explicitly set PERFORM-TYPE"MF" after DIALECT"RM" to continue with the previous behavior.

**HIDE-MESSAGE** The scope of this directive has been widened to allow you to hide different types of error messages, not just syntax checking messages.

**PRESERVECASE** This directive now defaults to PRESERVECASE when compiling native COBOL; managed COBOL compilation already defaults to PRESERVECASE. This results in externally visible identifiers preserving their case instead of being converted to uppercase.

### Consolidated Tracing Facility

The following changes have been made to the Consolidated Tracing Facility (CTF):

#### Emitter properties and variables

The following support has been added to existing emitters.

#### Properties

The following property has been added to the BINFILE emitter:

Property	Description
RunUnitID	Controls whether the RunUnit information is included in the trace.

#### Variables

Four new pseudo-variables for the FILE property have been added to the BINFILE and TEXTFILE emitters:

pseudo-variable	Description
\$(PLATFORM)	A platform specific constant, useful when two run-time systems are in the same process, and you require separate trace files
\$(RUNUNIT)	A unique number that represents the managed RunUnit ID
\$(RUNUNIT_SESSIONNAME)	The session name passed to the managed RunUnit
\$(RUNUNIT_GUID)	The globally unique identifier associated with the managed RunUnit

### Converting Net Express projects

Conversion of Net Express projects has been enhanced. You now use the Visual Studio Conversion Wizard to import and convert Net Express projects (.app files) to Visual Studio solutions.

## Debugging

### Displaying debug information

You can set the DEBUG constant for managed COBOL projects on the **COBOL** tab in the project properties. This enables you to use the System.Diagnostics.Debug class in your applications to ensure they write diagnostic information in the Output window for projects compiled for Debug but not for projects compiled for Release.

### Display format in the Watch window

You can now change the display format between hexadecimal (hex) and decimal for individual items in COBOL projects in the Watch window. To do this, click a row, press **F2**, and type: *Variable,h* or *Variable,x* to always display the values in hexadecimal format; *Variable,d* to always display the values of variables in decimal format, and of strings - as text.

## Documentation

The following guides are now available, among other updates to the product help for this release:

### Object-Oriented Programming

A guide that provides a basic introduction to Object-Oriented Programming (OOP) for COBOL developers, *An Introduction to Object-Oriented Programming for COBOL Developers*, is now available from the *Product Documentation* section on the Micro Focus SupportLine Web site - [click here to download it](#).

### Upgrading to Enterprise Developer

A new section in the product help, *Upgrading from Net Express to Enterprise Developer for Visual Studio 2010*, provides guidance on how to move existing applications created with Net Express into Enterprise Developer and the Visual Studio IDE .

## Enhanced Enterprise Server integration with the IDE

This release provides the following enhancements:

- Creating a server from a template directly from the Server Explorer window.
- Automatically starting the associated server and enabling dynamic debugging for it when you start debugging.
- Showing the spool and the catalog of the associated server from the context menu for the project in Solution Explorer.
- Debugging applications using a temporary server when the project has no association with any of the existing enterprise servers.

## File Handling

New features include:

- The DATEDIFF function as part of the DFSORT emulation. There are some limitations of its use in Enterprise Developer.
- Converting and editing Vision and RM/COBOL indexed data files using the Data File tools.
- Access to data files (either sequential or indexed) through AcuServer.
- Access to Vision and RM/COBOL indexed data files through Enterprise Server.

## Grouping files in virtual folders in Solution Explorer

Enterprise Developer now provides a Virtual View of a project within Solution Explorer. In the Virtual View you use virtual folders to improve navigation by logically grouping the files that make up the project. You can also create your own virtual folders to group files of your choice (a file can only belong to one virtual folder). The files can be of different file types.

## HCO for SQL Server (HCOSS)

Several updates have been made to the HCOSS tool set:

**DB2 database batch migration** This set of batch utilities provides an alternative to the standard HCOSS database migration tools.



**Note:** This feature is in early adopter release status. We intend to provide the finalized feature in a future release. Please contact Micro Focus SupportLine if you require further clarification.

**Schema Extract tool** This tool now provides:

- Updated security that enables users to study extracted schemas without accessing the catalog
- Extracted schema modification
- Export and import capabilities

**Application Assessment tool**

This tool now enables you to perform data analysis on schema extract files and identify structures that are not supported by SQL Server, or that could require manual modification before HCOSS can accurately transfer the data to SQL Server.

**OPTION SQL compiler directive option**

New parameters have been added to handle additional host variable types.

## IMTK

**BMS and MFS maps for PL/I applications**

Enterprise Developer now supports the creation of service interfaces for CICS and IMS screen (BMS/MFS) PL/I applications.

**EJB transactions**

Enterprise Developer now supports EJB services that execute as a transaction.

## IMS

**Database recovery** IMS database recovery using the new IMS Database Forward Recovery and Rollback Recovery features is available. These consist of a set of backup and restore utilities that enable you to restore your IMS database complete with the most recent updates.

**Locking improvements**

Internal Resource Lock Manager (IRLM) support has been added to provide more granular locking capabilities, allowing for increased sharing and decreased contention and deadlock risk.

## Mainframe Access Drag and Drop

This release provides the integrated Drag and Drop utility - based on the traditional standalone version of Drag and Drop, you can now transfer files to and from the mainframe from within the IDE using the Micro Focus Mainframe Explorer. This version also enables you to view and edit mainframe files.

## Mainframe snippets

A number of code snippets for inserting EXEC CICS and EXEC DLI statements in the code are now available for Mainframe Subsystem applications. You can insert code snippets from the context menu in the editor or by typing a shortcut and pressing **TAB**.

## Mainframe Subsystem Support

<b>JCL System Catalog</b>	You can now use in-stream data for DDs within JCL procedures. This change is to maintain compatibility with mainframe JCL processing which recently introduced the same change.
<b>JCL Public Catalog API</b>	You can now access and update JES Catalog information.
<b>IMS database utilities</b>	The database utilities commands Zeroload, Load, Unload and Add are now available from the context help menu for .dbd files in Solution Explorer.
<b>CICS External Call Interface (ECI)</b>	Micro Focus proprietary support for the CICS External Call Interface (ECI) has been enhanced. ECI uses the Micro Focus BINP protocol, thus eliminating the need for third-party middleware. Additional features include support for extended LUW (logical unit of work) and new support for Java clients. For more information, see <i>IBM External Call Interface (ECI) and External Presentation Interface (EPI)</i> .

## Managed COBOL

<b>Procedural Multi-Output Project type</b>	A new .NET managed project template, Procedural Multi-Output Project, is now available. The project compiles procedural programs to individual managed assemblies or executables as opposed to the standard managed project templates that produce a single assembly. This project type is useful when you are moving existing procedural applications that consist of multiple programs to Enterprise Developer and to managed code. When calling a subprogram, the COBOL run-time system can locate the assembly using the name of the called program which will match the assembly file name. In this case, the assembly does not have to be preloaded. See <i>Types of COBOL Project Templates</i> in the product help for more details and for a list of the limitations of this project type.
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### Named and optional parameters

Two new types of parameter have been introduced for use during method invocation:

#### Named parameters

As part of the invocation expression, you can define a value for a parameter named in the method definition. The named argument must be specified after any positional arguments, and must not correspond to any of those preceding arguments.

#### Optional parameters

Optional parameters are parameters defined with a default value in the procedure division header of the invoked method. If none of the arguments passed in during invocation correspond to this parameter, the default value is used in the method; if an argument does correspond, the value that was passed in is used.

### Delegates and events

A number of new features have been added that relate to delegates and events:



**Note:** Some of these features were also available in previous versions of Enterprise Developer.

#### The ATTACH and DETACH statements

Use these statements to attach or detach a delegate, method group or an anonymous method to or from an event.

#### The RUN statement

Use this statement to invoke a delegate once it has been created.

#### Combining delegates

Use the '+' operator to add a method group, anonymous method or another delegate to a delegate, and use the '-' operator to remove a method or another delegate from a delegate.

## Method groups conversions

Use the METHOD keyword to specify a compatible method from a method group, and convert it to a delegate.

## PL/I support

This release provides enhanced support for developing PL/I applications within the Visual Studio IDE. The project templates have been updated, and a new Mainframe Subsystem Applications project template is available. It also includes:

- EBCDIC support
- Support for XML (using XMLCHAR, PLISAXA, PLISAXB, and PLISAXC)
- Preprocessor support for programs written using EXEC DLI
- Support for PL/I programs running MQ Series
- Support for the creation of service interfaces for CICS and IMS screen (BMS/MFS) PL/I applications.
- Support for Open PL/I programs running as DB2 stored procedures

## Rumba - embedded mainframe display

This release provides integration with the Micro Focus Rumba application for debugging Mainframe Subsystem applications that require a TN3270 emulator to run. When debugging, you can run Mainframe Subsystem applications that need an emulator that supports TN3270 in either a Rumba mainframe display embedded in the IDE, or in the Rumba desktop.

## Searching in copybooks

The search in copybook files has been enhanced. Visual Studio's **Find in Files** now enables you to perform a search in all copybooks - the ones that are part of the project, and in the ones that are found in the paths defined on the **Dependency Paths** tab in the project's properties. To do so, set the search scope in the **Find and Replace** dialog to **COBOL Project Copybook Paths**.

## SQL

### EXEC SQL GET DIAGNOSTICS Statement

Enables you to get diagnostic information for the last OpenESQL statement executed.

### OPTION compiler directive option

New parameters have been added to handle additional host variable types.

### XA switch modules

This release includes support for XA switch modules that enable CICS- and JES-initiated transactions to run under Microsoft SQL Server using different user credentials than those specified within the XA open string.

## Visual Studio 2012 Integration

Enterprise Developer provides support for the new features of Visual Studio 2012 and the Visual Studio 2012 Integrated Shell, including:

### Compatibility (Project Round-Tripping)

The project round-tripping features enables you to use Visual Studio 2012 to open and edit a project created with Visual Studio 2010 without upgrading or changing anything. After closing the project, you can still open it in Visual Studio 2010 to make further changes.

These are the requirements and the restrictions for using project round-tripping with COBOL projects:



### Note:

- The version of Visual Studio 2010 being used to create and edit projects must be Service Pack 1.
- For managed COBOL, the feature only works for applications that target versions of the .NET Framework 2 to 4.
- There is a new format in Visual Studio 2012 for the COBOL SQL CLR projects. Such projects created with Visual Studio 2010 will be upgraded when you open them in Visual Studio 2012.

<b>.NET Framework 4.5 Compatibility</b>	Provides support for creating managed COBOL applications that target version 4.5 of the .NET Framework.
<b>Reference Manager</b>	Supports the new Add Reference dialog box which provides a faster way for adding references to your projects.
<b>Browse Code in Solution Explorer Hub</b>	Supports the enhanced Solution Explorer Hub without the built-in class/object browser features.
<b>Previewing Files in the Code Editor</b>	Supports code preview for COBOL files which enables you to explore the files in your project without opening them in the editor.
<b>Loading Projects Asynchronously</b>	Enables you to load your source code in the IDE and start working on it faster even when you have large applications.
<b>Search</b>	Supports the enhanced search features across the IDE for COBOL projects.
<b>Visual Studio 2012 Themes</b>	Enterprise Developer conforms to the new look and feel of Visual Studio 2012.
<b>Microsoft Help Viewer 2.0</b>	Provides support for the Micro Focus Help in Microsoft Help Viewer 2.0.

### Expanded Copybook View - Technical Preview

The COBOL editor in Visual Studio 2012 supports showing the contents of copybooks inline at the place where they are referenced in a program or a copybook. Features include:

- You can edit the code of copybooks in the expanded copybook view (except for copybooks shown with replaced values).
- For copybooks referenced using a COPY... REPLACING statement, you can show either the original contents of the copybook file or show its contents with replaced values. The expanded copybook view with replaced values is read-only which is indicated by a yellow background color.



**Note:** You can configure the background color of the read-only view from **Tools > Options > Environment > Fonts and Colors**, and changing the background color for the **COBOL Read-Only Background** item.

- Go To Definition, Find All References, navigation using the drop-down types and members, and navigating to an error from the Error List window all find results or locate information in the expanded copybook view.



**Note:** The following limitations apply:

- IntelliSense and code snippets are not supported when editing a copybook in expanded copybook view.
- In expanded copybook view, it is not possible to edit copybooks referenced through a COPY... REPLACING statement when the expanded copybook view shows the replaced values. In this case, the expanded copybook view is read-only.
- Outlining is not supported in the expanded copybook view.
- Navigating to items in the expanded copybook view is not supported from the Class View or using the Navigate To option.

- References to file locations in the output windows such as pointing to the build output, or in the results received by Find in Files, Quick Browse (COBOL Source Information), do not point to items in expanded copybook view.
- It is not possible to step in the expanded copybook view while debugging.
- The expanded copybook view supports breakpoints setting but the Breakpoint icon does not appear in it but only in the original copybook file.

### **Running different versions of Visual Studio to edit your Enterprise Developer projects**

Enterprise Developer 2.2 for Visual Studio 2012 and Enterprise Developer 2.2 for Visual Studio 2010 can coexist on the same machine. You can use either one of these versions to edit COBOL projects that are supported by the project round-tripping feature in Visual Studio 2012.

### **Copybook Dependencies**

Solution Explorer shows a tree view of the dependencies of the COBOL programs and copybooks on copybooks in a project to help you navigate easily around the source code.

### **SQL CLR Project Templates**

The COBOL SQL CLR project template has a new format. COBOL SQL CLR projects created with Visual Studio 2010 will be upgraded when you open them in Visual Studio 2012.

### **Windows 8**

Enterprise Developer supports Windows 8.

### **WCF REST Service Application projects**

Enterprise Developer now provides a project template for creating COBOL WCF REST Application services. The requirements are - Visual Studio Professional, Premium, or Ultimate (Visual Studio Shell does not support WCF applications), and versions of the .NET Framework 4.0 and later. For more information about WCF and REST, check Microsoft's MSDN.

### **Windows Azure**

Enterprise Developer for Visual Studio now enables you to create, build, debug, run, and package COBOL applications for use with Windows Azure. It provides:

- Project template for a COBOL cloud service. This creates a solution containing a project for the cloud service and projects for the web and worker roles you specify.
- Demonstration projects, showing a web and worker role in COBOL, with the business logic remaining in unchanged COBOL programs.
- Help. This includes a tutorial that shows how to create a simple cloud service for COBOL and how to deploy and run the service as an off-premises Windows Azure instance.

This functionality was previously available as an AddPack but is now integrated into Enterprise Developer.

### **XML Extensions**

You can now use XML Extensions in your managed COBOL projects.

# Known Issues

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

In addition, note the following:

- AcuCOBOL File Handler** When using an interface of ACUFH other than MSSQL, you may experience a file operation delay when the interface fails to connect to a database. This failed connection also results in a memory leak. Set the environment variable MSSQL\_DETACH to 1 to avoid both issues.
- ASP.NET** It is not possible to run ASP.NET Web Sites or Web Services on a production machine (one that has Micro Focus Enterprise Server installed) without an additional setup. This is because the production machine does not contain development tools such as the COBOL Compiler. To work around this, you need to do the following steps:
1. Precompile the site before you deploy it using the **Publish Web Site** command in Visual Studio.
  2. Edit the .asmx file of the Web service project or the .aspx file of the Web site and delete the `Language="COBOL"` statement.
  3. Edit the web.config file with a text editor and delete the line which contains:  
`<compiler language="COBOL" . . .`
  4. Ensure that a .NET Server license is installed using Aptrack.
- CICS**
- An EXEC CICS DELAY statement may sometimes produce a difference of one second.
  - When Enterprise Developer for Visual Studio is initially installed, no CICSECM directives will be set on assembler files that are added to a project even when the IDE is configured to do so. To work around this problem, click **Tools > Options > Micro Focus > Directives**. Disable and then enable the check boxes under COBOL CICS and Assembler CICS.
- COBOL Watchpoints** The debugger ignores a COBOL watchpoint that is hit if there is no statement following the statement that modifies the data on which that watchpoint is set.
- Compiler** When running with Java 1.7, if your class contains a static method called 'main' with a single string array parameter, in order for this class to be executable from the command line that main method should not have a returning item.
- Documentation**
- In Visual Studio 2012, clicking **Help > Micro Focus Product Help > Product Documentation** results in the message "Cannot find requested topic on your computer". If you see this message, click Micro Focus Enterprise Developer 2.2 for Visual Studio 2012 in the **Contents** tab to display the documentation as expected.
  - If you install Enterprise Developer for Visual Studio 2012 and its documentation is not available in the Microsoft Help Viewer, perform the following steps:
    1. In Visual Studio 2012, click **Help > Add and Remove Help Content**.
    2. Choose the **Manage Content** tab.
    3. Check the **Disk** radio button, then navigate to the folder containing the Enterprise Developer for Visual Studio 2012 documentation. By default, this is `C:\Program Files (x86)\Micro Focus\<product name>\help`.
    4. Select `helpcontentsetup.msha` and click **Open**.
    5. In the content list, click **Add** next to the Enterprise Developer entry.

6. Click **Update**.

7. Click **Yes** on the User Account Control and Microsoft Help Viewer 2.0 dialog boxes to enable the update to continue.

The documentation for Enterprise Developer for Visual Studio 2012 is added to the Microsoft Help Viewer.



**Note:**

This problem only occurs if you install Enterprise Developer for Visual Studio 2012 while documentation for Visual Studio 2012 is being downloaded or updated, which typically happens when you install Visual Studio 2012 or run it for the first time.

**Enterprise Server**

- The Historical Statistics Facility may generate incorrect records for SSTM-enabled enterprise servers.
- In Visual Studio, using **Submit JCL** from within the IDE does provide the option to create a temporary enterprise server when your project is not associated with an enterprise server.

**Expanded Copybook View (in Visual Studio 2012)**

- When you add a COPY statement in a COBOL program and then show it in Expanded Copybook View, the line for the copybook statement is read-only. If you then perform an Undo in the COBOL program, the COPY statement is removed while the contents of the copybook is still shown in the program.
- **Replace All** does not work inside the Expanded Copybook View
- Trying to paste a block selection inside the Expanded Copybook View does not work and deletes all lines of code which the block selection overlaps.
- For copybooks with file extensions that are not traditionally associated with COBOL you must first add the file extension to the list of known copybooks extensions in **Tools > Options > Text Editor > File Extensions** before you can show them in Expanded Copybook View.

**ICETOOL Emulation**

ICETOOL emulation for managed code is not available in this release.

**Installation**

- When installing this product for Visual Studio 2010, if you already have Visual Studio 2010 Isolated Shell with Service Pack 1 (SP1) installed, you might experience problems with starting Visual Studio after the installation. This is a Microsoft issue relating to the Integrated Shell (installed as part of the Micro Focus product installer) overwriting some Visual Studio SP1 components. To resolve the issue you need to repair Visual Studio 2010 SP1.
- On UNIX, check [UNIX Installer Issues](#) before you start the installation.
- If you are using the latest version of Java 1.7 on Linux, you might receive some warnings when you start this product. To resolve the issue, it is recommended that you install an earlier version of Java 1.7 and set JAVA\_HOME to that.

**JCL VSE**

When running Enterprise Server applications on HP Itanium in 32-bit mode, if you receive an error such as "CASCD1057S JES Initiator for Server ... abended by signal 00004", you need to set the environment value COBMAINSTACK to a value greater than 500000 to increase the default stack size.

**Micro Focus Rumba**

On versions of Windows Vista and later, Enterprise Server listens only on the IPv4 loopback address (127.0.0.1). As a result, an attempt to connect to localhost with a TN3270 emulator such as Micro Focus Rumba may fail. To work around this issue, in your emulator's configuration use 127.0.0.1 in preference to localhost or your host machine's name.

<b>Native COBOL</b>	On Windows XP, when building a native COBOL application in Visual Studio, a dialog may pop up with error "Unhandled exception at 0xc0006866 in cobol.exe: 0xC0000005: Access violation reading location 0xc0006866)". This is caused by Symantec antivirus runtime protection. To resolve this, you need to apply the following fix from Symantec: <a href="http://www.symantec.com/business/support/index?page=content&amp;id=TECH97280&amp;locale=en_US">http://www.symantec.com/business/support/index?page=content&amp;id=TECH97280&amp;locale=en_US</a> .
<b>Open PL/I</b>	Currently, the Open PL/I Codewatch debugger does not run on 64-bit Windows 8.
<b>Resource Adapters</b>	Trying to deploy the local resource adaptor <code>mfcobol-localtx.rar</code> to WebLogic may fail with a <code>ClassCastException</code> . To work around this issue, you need to deploy <code>mfcobol-xa.rar</code> first, then need to undeploy this file and deploy the local one, <code>mfcobol-localtx.rar</code> . 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).
<b>Visual Studio IDE</b>	<ul style="list-style-type: none"> <li>• In your project properties, the Application page currently allows you to select any of the static methods in the application as a Startup object. This is incorrect. You should always set only the first static method or the program name as a Startup object in order for the project to build.</li> <li>• In Visual Studio, the controls on the COBOL page in the project properties are not displayed for a WPF project. To workaround this issue, open the Application page in the project properties and from the drop-down list under Output type choose the same output type that was already selected. Close the project property pages and save the project. The next time you open the project properties, the COBOL page is properly displayed.</li> </ul>

# Significant Changes in Behavior or Usage

This section describes significant changes in behavior or usage. These changes could potentially affect the behavior of existing applications or impact the way the tools are used.

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

- [.NET Compiler](#)
- [ASM Compiler: HLL Macro Assembler](#)
- [CAS \(COBOL App Server\) General](#)
- [CCI Session Layer Code](#)
- [Compiler](#)
- [File Handling - Sort / JCL Sort](#)
- [JCL System Catalog - Dataset Allocation](#)
- [MF Directory Server](#)
- [MF Server Administrator \(GUI\)](#)
- [MFBSI](#)
- [MTO - IMS Other](#)
- [MTO - JCL MVS](#)
- [MTO - JCL System Catalog](#)
- [Open PL/I Compiler](#)
- [Open PL/I Debugger](#)
- [Open PL/I RTS](#)
- [Request Handler](#)
- [Samples Browser](#)
- [Visual Studio IDE](#)

## **.NET Compiler**

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- The use of ILSMARTLINKAGE in sub-programs is now working correctly. In previous versions, if it was specified in a sub-program, a dynamic call of that program from another program could cause execution failure.  
2608825 (1087435)
- In managed code, the statement DISPLAY UPON SYSERR now behaves as expected. Previously, it was behaving the same as DISPLAY UPON CONSOLE.  
2589053 (1085576)
- When the PROPERTY keyword is used on a numeric edited field, the SET method now works correctly when the program specifies DECIMAL POINT IS COMMA.  
2588508 (1085560)

## **ASM Compiler: HLL Macro Assembler**

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- A "." (dot) specification is no longer ignored in the SYSIN environment variable or in the mf370ctl.cfg file when used to specify an output directory, and indicates the current directory. This is a change in behavior from Mainframe Express, where the "." (dot) character in the SYSIN environment variable or in the mf370ctl.cfg file is still ignored and assembler output files are placed in the directory specified by the SYSIN environment variable.

- Assembler Build Output will now be sent to the location specified in the COBOL output path project setting. Previously, all Assembler build output went to the project directory.

## CAS (COBOL App Server) General

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- Previously, on cancelling an active JCL job on UNIX (after you have used STOP on the ESMAC > SEPs page to stop the INITIATOR that it is running in), the INITIATOR was terminated and a new one was restarted in its place. Now, the new INITIATOR will not be started, as the STOP request was received before the CANCEL.

2559087 (1084226)

## CCI Session Layer Code

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- A new option, use\_global\_namespace, is available for the cci.ini file in the Windows %SystemRoot% folder. If use\_global\_namespace is set, all the ccishared memory objects are created in a system-wide address space, and the applications hosted by different users, including system services, can communicate. To use this facility, edit the cci.ini file and ensure use\_global\_namespace is set to "yes". [ccismem-base] # Allow interaction between users on a # single system. Using this option reduces security as # all users will have access to the same name space. use\_global\_namespace=yes If the value of this option is anything other than "yes", or if the option is missing, no change is made to the existing behavior.

2195519 (1062800)

## Compiler

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- The default for the NSYMBOL directive under DIALECT(ENTCOBOL) has been changed to NSYMBOL(NATIONAL) to emulate the equivalent IBM default.

2657471 (1090355)

- To improve RM/COBOL and ACUCOBOL compatibility, the SIGN clause at a group level is no longer applied to non-DISPLAY usage signed numeric data items within the group, just as it is not applied to unsigned numeric data items and non-numeric data items within the group.

2549904 (1082171)

- Previously, even though no code was generated, the Compiler allowed the ON EXCEPTION and NOT ON EXCEPTION phrases in the DISPLAY statement in formats that do not allow these phrases. As a result, if the DISPLAY statement was in the ON EXCEPTION phrase of another statement, the NOT ON EXCEPTION phrase would bind incorrectly with the DISPLAY statement instead of with the intended containing statement - for example, ACCEPT or CALL.

## File Handling - Sort / JCL Sort

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- When used with MFJSSTRICTSORT=ON, MFJSORT now errors (return code 16) if the input RECFM is different to a SORTOUT RECFM. It also errors if the input RECFM is different to an OUTFIL RECFM when FTOV or VTOF/CONVERT has not been specified.

2643384 (1088993)

## JCL System Catalog - Dataset Allocation

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- The default for previous releases was to create a catalog entry with no physical file until data was actually written to the catalog. Now, a PC file is allocated for non-VSAM files by default. You can emulate the previous behavior if you set the environment variable MFALLOC\_PCFILE to N.

## MF Directory Server

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- The mfd command line option for exporting registered Enterprise Server definitions to an XML file now supports the "\*" option. This exports all registered servers rather than a specified server. Multiple server definitions are now exported into the target directory and saved into a file with the default name ALLSERVERS.xml. The import option now also supports the import of multiple server definitions from a single XML file.

2641890 (1088838)

- mdump now supports a new option, -e, to help you query the Security Manager configuration details. The possible values of the option are: "1" - shows security configuration that applies to any returned enterprise servers; "2" - shows security configuration for MFDS and the default Enterprise Server security configuration. This requires MFDS version 1.15.00 or higher; "3" - returns the properties of all configured external Security Managers.

2487164 (1081693)

## MF Server Administrator (GUI)

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- When adding a user to an external security manager, you can now include a password expiry time in the Advanced Configuration section of the Add New User wizard in Enterprise Server Administration. The field value is specified using generalized time format (YYYYMMDDHHMMSS.0Z), and can be used by the MLDAP ESM for calculating whether a user's password has expired and requires updating. This value may only be specified using this page when adding a user. You need to use an external directory services configuration tool to edit it.

2562118 (1083203)

## MFBSI

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- casout now correctly sets return-code to the job status for the sysout retrieval when the file is less than 65K. Also, MFBSI now considers return codes of 0, 7 or 8 to be successful for JESYSMSG retrieval where, previously, it only considered 0 as successful.

2655482 (1090444)

## MTO - IMS Other

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- The DBDCPY, MFSCPY, and PSBCPY environment variables are no longer required and have been deprecated. Use the IMSCPY environment variable to specify copybook locations.

## MTO - JCL MVS

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- Empty values for the USER or NOTIFY parameters on the JCL JOB card no longer cause an error when parsing the JCL.

2646770 (1089380)

- The disposition processing of PASSED datasets has been revised to be consistent with mainframe processing. Particularly, received datasets are removed at the end-of-step processing, unless they are

to be passed on to another step in the job. Any passed datasets that were not received at the end of the job may be removed if they conform to the mainframe conditions for this.

2610362 (1087601)

## **MTO - JCL System Catalog**

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- The value for the JCL DD UNIT=device parameter is now stored in the system catalog entry for the dataset.

2619050 (1089095)

## **Open PL/I Compiler**

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- If using the -cics, -ims, or -mvs options when compiling on a little endian platform, the possibility for errors existed. Starting with this release, using the -cics, -ims, or -mvs options automatically uses -bigendian, thereby eliminating the possibility for these errors. Evaluate any applications that were built with a prior release to determine any impact on any data files being used, or where programs compiled with the -mvs option pass data to sub-programs compiled without it. The -bigendian option can be suppressed by adding the -native option after the -cics, -ims, or -mvs options.

## **Open PL/I Debugger**

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- CodeWatch no longer attempts to use an incorrect directory when starting. Also, CodeWatch is now the default debugger when no other debugger is specified, and is the only debugger available when using -optexec plitest.

2655906 (1090193)

- Support for the evaluation of X, NX, Z, A, and E constants has been added to CodeWatch.

## **Open PL/I RTS**

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- A problem with possible truncation or trailing zeroes within PICTURE assignments has been fixed. As the fix depends on changes to both the Compiler and the run-time, you must perform a complete rebuild of all your source code (recompile and relink) in order to apply it.

2662261 (1090768)

- Previously, when taking a PLIDUMP, if the .PDB file needed for a PLIDUMP was not in the same directory as the .DLL and the .STB files, and they were not in the first CAS\_BATCH\_PATH subdirectory, then the PLIDUMP was not successfully generated and an S0C4 abend could occur.

2615412 (1090483)

- The Open PL/I debugger no longer loses its place and behaves erratically when debugging code containing the same PL/I macro multiple times within the same source routine, even if the -nodebuginfo and -pp options are not specified.

2612530 (1087809)

## **Request Handler**

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- A problem that caused BIS to create log files in a directory named C:\ProgramData\AcuCorp\BIS\LogFiles was fixed. BIS no longer creates log files unless specified and the BIS logging service is now

disabled by default. To enable it, you need to use the following global environment variable:  
BIS\_LOG=[ OFF | ON | <directory> ] Where the values are:

- OFF - disables logging (the same as if BIS\_LOG is not specified or is left blank)
- ON - enables logging and directs the log files into the default location, which must not be read-only.
- <directory> - enables logging and directs the log files into the specified directory. The user must ensure that the BIS request handler has write rights for this directory. The directory must be an absolute path or network path. If the specified directory does not exist, BIS will attempt to create it. The containing directory must exist.

The BIS\_LOG variable is only examined when the BIS application pool is started or recycled. After setting or changing BIS\_LOG, IIS must be restarted in order for the variable to take effect.

## Samples Browser

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- If you have installed the version of this product for both Visual Studio 2010 and Visual Studio 2012, the Samples Browser now provides links for you to open the samples in either one of them.

## Visual Studio IDE

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- Performance when loading and building COBOL projects that consist of a large number of files has been improved.  
2657121 (1090316)
- When building a project outside of the IDE, adding a new file to a project no longer results in a full rebuild of the project.  
2617003 (1089623)
- You can now change the display format of values on individual rows in the Watch window using modifiers after the names of variables and expressions. To do this, click a row, press F2, and type a modifier after the name of the variable or the expression as follows - type VariableName,h or VariableName,x to always display the variable or the expression in hexadecimal format; type VariableName,d to always display numeric variables in decimal format and strings - as text.  
2614182 (1087959)
- When you perform a search in the IDE for copybooks that your programs depend upon, the COPYEXT directive you set from the Additional directives field on the COBOL tab in your project's properties is now used in preference to the list of copybook extensions specified in Tools > Options > Text Editor > Micro Focus COBOL > Advanced, and in Copybook extensions. This change does not affect the project build and background parsing that already use COPYEXT.  
2612053 (1087773)
- Attempting to restart an enterprise server failed if the process took longer than fifteen seconds.  
2607051 (1087259)
- When you debug native code and query a data item which contains null bytes, the value displayed in the Watch window is no longer truncated at the first null byte.  
2604749 (1087235)
- A new setting, "Define DEBUG constant", is now available on the COBOL page in the project properties of managed projects for the Debug configuration. You can select it to add "constant"DEBUG(1)"" to the build directives.  
2600567 (1086629)
- The Output window now displays a notification when the compilation of the IMS files has been successful.  
2600137 (1086667)

- A problem with the value of "Link with objs" setting being duplicated after you reload the COBOL Link properties page has been resolved.  
2595408 (1086091)
- IntelliSense now displays data names longer than 32 characters correctly.  
2594901 (1086053)
- Previously, when you upgraded COBOL projects with signed assemblies from Visual Studio 2003 format to Visual Studio 2010 format, the signed assembly property was lost.  
2585458 (1085258)
- There is an improvement in the performance of the cursor in the text editor when working with larger files and projects.  
2585450 (1085255)
- Using linked files in projects has been improved as follows:
  - Folders that only contain linked files no longer disappear from the project when you reload it.
  - The location of linked files is preserved in the project structure when you reload the project.
  - Moving a linked file within a project no longer moves the actual file on the disk but only moves the link inside the project structure.
  - It is no longer possible to copy a linked file into the same project where, previously, this created a copy of the actual file on the disk.
- 2574102 (1084208)
- When you convert Net Express projects that compile to .int or .gnt files to Enterprise Developer for Visual Studio, the application environment variables are now imported successfully.  
2569777 (1083953)
- It is now possible to convert Net Express projects that do not contain any COBOL source files to Visual Studio projects.  
2568638 (1083900)
- You can now set environment variables used by the native COBOL Run-Time system during initialization from the project properties - click Environment on the Application tab.  
2539447 (1081251)
- Pressing Enter to create a new line now preserves the indent in the COBOL editor in Smart edit mode.  
2496411 (1077769)
- The "Edit IMS Database" command was disabled for DBD files in your project if the ACB file was not in the project directory. You can now optionally define a location for the ACB files different than the project directory by setting the ES\_ACBLIB environment variable.  
2496391 (1077864)
- Pressing End inside the writing area of the COBOL editor now positions the cursor on the first non-blank character, if columns 12-72 contain any text. If the line is blank, the cursor is positioned on column 73.  
2496351 (1077767)
- The COBOL editor now supports a "Smart edit mode" (see Tools > Options > Text Editor > Micro Focus COBOL > Margins) which is enabled by default. In Smart edit mode, when you press ENTER in the code (A/B) area the comments move to the next line and stay in the right-hand area.  
2496350 (1077768)
- You now receive a suitable error message when you try to use "Start Without Debugging" with Mainframe Subsystem Application projects.  
2495298 (1078343)
- You can now use Solution folders to group projects in your solution.  
2259310 (1065760)

- If, when you start debugging, the debug target does not exist you now receive an error message that correctly states the missing filename.
- Any leading or trailing spaces you added to the name specified in the "Output name" field on the Application tab in the properties of a native project are now ignored.
- Class view no longer contains outdated information from previous background syntax checking after classes have been renamed.
- Class view no longer contains outdated information from previous background syntax checking when the files defining types have been removed.
- A problem with navigating to member definitions from the Class View has been resolved.
- A problem with navigating to member definitions from the Class View has been resolved.
- An issue where canceling some of the dialogs in Tools > Options resulted in the changes being saved anyway, or the pages not reverting when next loaded, has been resolved.
- You can now start and stop servers from the Server Explorer when using the local machine's IP address or DNS name.
- It is now possible to debug a project that has its "Compile for debugging" setting enabled in the project properties for the Release configuration.
- Selecting a project in Class View now triggers background syntax checking, if it has not been performed for that project yet.
- If you have .NET Framework v. 4.5 installed, creating a COBOL Web application with Visual Studio 2010 Shell was failing with a Signal 114 error and was causing the IDE to crash. This issue has been resolved for the IDE. To work around the issue when you compile COBOL Web Applications from the command line, you need to manually set the environment variable VisualStudioVersion to 10.0 before compiling.
- Using the tab character in comments no longer causes issues with the colorization of the code.
- The Visual Studio IDE no longer crashes if you try to close it while directives scan is in progress.
- Adding files to a project when directives scan is disabled was taking a long time to complete.
- Friend assemblies (as identified by the InternalsVisibleToAttribute) are now correctly handled during syntax checking, and types are correctly found within friend assemblies when they are present.
- An issue with adding new platforms or configurations to a project or solution when the project contains pre- or post-build events has been resolved.
- A problem with navigating to member definitions from the Class View, when the definitions occurred within copybooks used within partial classes, has been resolved.
- A problem where trying to navigate to the source of an item from the Class View positioned you on the wrong line, has been resolved.
- An issue where the Implements smart tag was present for interfaces that were fully implemented (when some of the methods from that interface were implemented explicitly; and in addition to another interface which was not fully implemented) has been fixed.
- An issue where method signatures were rendered incorrectly if the member had a 78 level item in its local storage has been resolved.

# Resolved Issues

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

- *.NET Compiler*
- *.NET CICS (General)*
- *.NET ESQL Support*
- *.NET JCL (General)*
- *.NET Native Debug*
- *.NET RTS*
- *Adis*
- *Animator (Character version)*
- *ASM Compiler: HLL Macro Assembler*
- *CAS (COBOL App Server) General*
- *CAS Security*
- *CAS XA Switch modules*
- *CCI TCP/IP*
- *Compiler*
- *CICS: Problems not classed above*
- *Cob/Cblink/Cblnames (32-bit PC)*
- *Data Tools Converter*
- *Data Tools Editor*
- *Data Tools Layouts*
- *Debugger*
- *Documentation*
- *File Handling - External File Handler*
- *File Handling - Fileshare*
- *File Handling - Sort / JCL Sort*
- *IDE Debugging*
- *IDE Mainframe Explorer*
- *Macro Preprocessor*
- *MF Common Client*
- *MF Communications Server*
- *MF Directory Server*
- *MF Server Administrator (GUI)*
- *MFA: GUI components*
- *MFA: Mainframe*
- *MFBSI*
- *MTO - CICS BMS Screen painter*
- *MTO - CICS ECM/Preprocessor/Translator*
- *MTO - CICS Emulation*
- *MTO - CICS ESMAC*
- *MTO - CICS Utilities*
- *MTO - IMS DB*
- *MTO - IMS ESMAC*
- *MTO - IMS TM*

- [MTO - IMS Utils](#)
- [MTO - JCL ESMAC](#)
- [MTO - JCL MVS](#)
- [MTO - JCL System Catalog](#)
- [MTO - JCL TSO](#)
- [MTO - JCL Utils](#)
- [MTO - JCL Utils - IDCAMS](#)
- [MVS REXX Emulation](#)
- [NCG](#)
- [Open PL/I CICS Preprocessor](#)
- [Open PL/I Compiler](#)
- [Open PL/I Compiler Back-End](#)
- [Open PL/I Debugger](#)
- [Open PL/I Macro Preprocessor](#)
- [Open PL/I RTS](#)
- [Open PL/I SQL Preprocessor](#)
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- [Samples Browser](#)
- [Setup Issues](#)
- [Setup Issues \(UNIX\)](#)
- [SQL: DB2 ECM](#)
- [SQL: HCO for SQL Server](#)
- [SQL: OpenESQL](#)
- [Vision File System](#)
- [Visual Studio IDE](#)
- [XML Extensions](#)
- [XML syntax support runtime](#)

## **.NET Compiler**

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- It is now possible to query data items during debugging for programs containing multiple entry points, compiled with the directive `PERFORMTYPE"OSVS"`.  
2663738 (1090935)
- The correct calling conventions are now used for programs that have multiple platform invokes with different calling conventions.  
2660948 (1090751)
- Accessing an `ILSMARTLINKAGE` class built for a group containing an `OCCURS DEPENDING ON` item no longer causes unexpected results, as it now uses the maximum length for the `OCCURS DEPENDING ON` item within the property access methods for the group.  
2654127 (1090119)
- A `SEARCH` statement where the table name contains DBCS characters now compiles to managed code successfully.  
2652827 (1089896)
- When compiling managed COBOL, a move from an alphanumeric field to a numeric property no longer causes an error. (This was an error that was introduced in Enterprise Developer 2.1 update 1.)  
2651658 (1089833)
- Incorrect code is no longer produced when creating WCF services.  
2649616 (1089641)

- 'Illegal format: literal' errors are no longer generated when building and running a website.  
2645733 (1089290)
- Incorrect control flow no longer occurs when an EXIT PROGRAM statement is in a paragraph by itself, and that paragraph is performed from elsewhere in the program. Previously, this could result in the EXIT PROGRAM being ignored.  
2642765 (1089164)
- When debugging .NET COBOL on a 64-bit system, the result field is now updated correctly when you step over a divide operation.  
2642169 (1088841)
- Previously, if a .NET managed program called a C++ method, where one of the parameters was marked with the IsLong modifier, the code failed at run time with a "method not found" error.  
2615417 (1088095)
- The Form Designer is now working correctly when PIC 1 data items containing boolean literal values are inserted into a working-storage section associated with a Windows form.  
2612621 (1087910)
- Previously, when a callfh directive targeted a method expecting more than the normal two parameters, you received a system error at compile time.  
2611093 (1087662)
- Stepping over an IF statement while debugging now works as expected. Previously, it could leave the cursor pointing at the first statement following the IF, even though the associated conditional expression evaluated to false.  
2610824 (1087679)
- A new directive, ILSHOWPERFORMOVERLAP, which identifies those procedures that form part of an overlapping perform range is now available.  
2607319 (1087299)
- The ATTACH and DETACH statements no longer produce compiler errors when referencing an event declared in a different class.  
2604429 (1086973)
- A SORT statement used in an object method, where the program did not have OBJECT/END OBJECT markers, could result in an "index out-of-range" exception at run time.  
2596409 (1086418)
- In managed code, some COBOL numeric fields are now optimised to 32-bit or to 64-bit binary fields, regardless of their definition in the COBOL source. This means that fields defined as DISPLAY or COMP-3, for instance, which do not form a part of a group, may be stored as binary fields. The Compiler inserts the required code to make the behavior of these fields the same as if they had not been optimised.  
2595775 (1086432)
- In .NET COBOL, when HOSTNUMCOMPARE is specified, a numeric item containing a level 88 with multiple values no longer produces invalid code.  
2595331 (1086088)
- The use of EXTERNAL files in class programs compiled for managed code no longer leads to invalid code generation.  
2595177 (1086071)
- When defining a field using the syntax: 01 s1 type String. an EVALUATE statement using the field as the subject now executes the correct control flow.  
2594906 (1086055)
- The use of host variables defined as type DateTime no longer produce spurious compiler errors.  
2594156 (1085997)

- An error that could cause a `MissingMethodException` for managed programs compiled with `charset(ebcdic)` has been fixed.
- When a `COMPUTE` target had more than 18 significant digits and the `COMPUTE` expression included division, the decimal scaling could be lost, producing incorrect results.
- The error reporting for forward references and ambiguous references has been enhanced.
- In managed COBOL, a statement of the form "set string-type to interface-type", where string-type is an item of type string and interface-type is an item of some interface type, was producing invalid code.
- Spurious errors relating to indexed file keys are no longer produced as a result of using implicit local declaration.

## **.NET CICS (General)**

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- An Enterprise Server for .NET event monitor consumed most of a machine's CPU and created a large number of Windows events if a cross-region database it was monitoring became unavailable (for example, when the database server was stopped).  
2659289 (1090517)
- The Enterprise Server for .NET Get-SEERegions PowerShell cmdlet failed to retrieve remote enterprise servers if SQL Server was not installed on the local machine.  
2655529 (1090245)
- The Enterprise Server for .NET PowerShell cmdlet Stop-SEERegion and the `seestop` command line utility were not picking up the database server instance from the start-up file of the enterprise server when the `-usedb` option was not specified. This prevented the region from shutting down.  
2655529 (1090246)
- The `commarea` for an XCTLed program was not set up if it was in the LINKAGE SECTION of the program performing the XCTL.  
2640630 (1089197)
- Receiving a map in which the last modified field has had its entire contents deleted now works properly.  
2640509 (1088708)
- The UCTRAN setting is now taken into account for CICS TYPETERM and PCT configurations.  
2614821 (1088035)
- CICS programs running under Enterprise Server for .NET which call a mixture of CICS and non-CICS subprograms no longer fail with an Abend 4038 error.  
2605204 (1087116)
- A task was sometimes incorrectly terminated with an ATNI abend if the terminal associated with the previous task run by the SEP disconnected.
- Sometimes, when setting extended attributes for BMS maps, CICS in Enterprise Server for .NET CICS could generate invalid TN3270 data streams that contain unescaped `x'ff'` bytes.
- The error message displayed after an attempt to start an Enterprise Server for .NET region using a version of SQL Server earlier than 2008 now includes relevant information.
- Errors encountered during the parsing of the start-up file of an Enterprise Server for .NET region were not being output to the UI.
- Enterprise Server for .NET now prevents the applications from deploying binaries (program .dll files and map modules) to a database table under two or more names, where the names only differ by the letter case. This helps avoid a situation where multiple versions of a binary exist in the table and the wrong one is retrieved during execution.

## **.NET ESQ L Support**

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- Previously, OpenESQL incorrectly handles Oracle NOWAIT, WAIT n and SKIP LOCKED cursor options when SQL(TARGETDB) was set to ORACLE.  
2649989 (1089640)
- The OpenESQL preprocessor now accepts SQL(DATE=ODBC) and SQL(TIME=ODBC).  
2641087 (1088749)
- The behavior of various cursor types in different usage scenarios is now documented, showing how the product behavior is now more consistent across different database types for error detection and reporting.  
2614802 (1088009)
- Previously, a nullable host variable in a stored procedure call might have generated an invalid call statement.

## **.NET JCL (General)**

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- Previously, you received a Stack Overflow exception when trying to perform an SVC 99 operation.  
2591805 (1085797)
- Running multiple jobs at the same time under Enterprise Server for .NET which required the use of the same dataset resources resulted in internal JCL engine errors being reported, and the resources being permanently locked until the region was restarted.
- An intermittent RTS 114 error was occurring in MVS\_JOB\_STEP\_RESOURCE\_MGR during JCL execution under Enterprise Server for .NET.
- An intermittent IndexOutOfRangeException was occurring in Enterprise Server for .NET when using the casout utility to query a job's sysout datasets.
- Specifying an empty or blank "host" or "url" attribute value in a listener's configuration file, resulted in a UriFormatException produced at run-time when the listener process attempted to contact the dispatcher process.

## **.NET Native Debug**

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- Stepping a program that contains a screen section and compiles to .int code no longer causes the IDE to hang when an error occurs in the screen section.  
2613594 (1087908)

## **.NET RTS**

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- Using binary floating-point items on a machine with a non-English locale no longer produces errors.  
2657599 (1090407)
- The RuntimeServices Add() method for .NET COBOL no longer gives an exception for some instances of COBOL classes.  
2642836 (1088926)
- Using "DIVIDE ... GIVING quotient ROUNDED" where "quotient" evaluates to zero no longer causes an exception.  
2641108 (1088761)
- An error in JVM COBOL converting the result of a floating point expression to a fixed point expression has been fixed.  
2610381 (1087558)

- Computation of fractional exponents in .NET managed COBOL has been improved and is now much faster.

2594740 (1086047)

### **Adis**

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- Statements of type "DISPLAY SPACES AT LINE... POSITION... SIZE..." now only clear the screen at the specified coordinates and for the specified size.

2644054 (1089103)

- The Compiler and ADIS now support RM/COBOL ACCEPT and DISPLAY behavior, including when the Compiler DIALECT(RM) directive and the RM2VCOB configuration in ADISCTRL are both used.

2616898 (1088510)

### **Animator (Character version)**

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- Animator now displays the correct program name on the status bar.

2475333 (1076125)

- An error message is now displayed if there is a problem accessing the terminal when animating using Character Animator.

2050690 (1050314)

### **ASM Compiler: HLL Macro Assembler**

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- Assembler macro IEFZB4D0 now compiles cleanly.

2192729 (1062581)

- MF370CHK now accepts spacey filenames if they are enclosed in double quotes. When assembling programs from the command line, you need to enclose spacey paths and filenames in double quotes - for example: RUN MF370CHK "C:\DIR\DIR\TEST.MLC" NOANIM

### **CAS (COBOL App Server) General**

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- casgate no longer crashes when it receives a shutdown request from MFCS.

2657261 (1090327)

- When an MFCS process terminated while it was processing an EZASOKET function for an application, the SEP remained in a waiting state indefinitely. Recovery processing now dispatches the SEP with a TERMAPI.

2653313 (1090061)

- EZASOKET applications are now tied to a single comms process for the life of a task. Previously, in the event of termination of a comms process (if the process was not being used by an active EZASOKET application), recovery would cause any active EZASOKET applications to dispatch the new comms process on the next EZASOKET call (which would then fail) rather than the one it was already using.

2653313 (1090060)

- When an enterprise server was processing a very large number of JCL jobs for the same class, a job could be locked for dispatch in SYSZJOB forever.

2617413 (1088420)

- The EZ sockets SELECT and SELECTEX APIs now duplicate mainframe behavior in ignoring mask bits that do not correspond to allocated descriptors. This means, for example, that SELECT can be passed as a mask set to -1 (all bits set) to refer to any sockets the application has open.  
2609555 (1087715)
- A problem with submitting jobs when "Local ES Security enabled" is checked for mfuser on the Users page in ESMAC has been resolved.  
2605873 (1087287)
- Jobs active during shutdown are moved back to the input queue when the server restarts.  
2588701 (1085584)
- Previously, when retrieving the spool information, the text of some error messages has been truncated.  
2582713 (1085017)
- Logging has been added for the resource managers to facilitate recovery from failures that leave the resource managers such as DB2 and MQ with in-doubt transactions. You only need to log if the resource manager switch modules are configured to respond to xa\_recover() calls. Logging may affect the performance so you can disable it as follows - edit the server from the Enterprise Server Administration, click the General tab and type the following in the Configuration Information text box:  
[ES-Environment] ES\_XA\_LOG\_SUPPRESS=Y  
2582570 (1085539)
- If you define an XA resource definition in MFDS for MQSeries, you must deselect IBM MQ in the SIT definition in ESMAC, otherwise you will get a -5 error when the XA Switch is used.

## CAS Security

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- 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  
2646298 (1089343)
- Previously, when using IMS with LDAP-based security, the system could sometimes stop processing requests for four minutes, and then issue a series of messages in the console log to indicate that threads had timed out waiting for a thread lock. The system would then generally recover and start processing again.  
2640581 (1089108)
- The fix for this RPI addresses the following specific situations:
  1. Installation with an ESM that is not case sensitive for user IDs (for example - when sysad, SYSAD, SysAd and other case combinations are all recognized by the ESM as the same user).
  2. Installations where all user IDs are of a the same case - either uppercase or lowercase.
  3. Installations where the user IDs are of mixed case and you would like to suppress any additional ESM authorization attempts for keying errors.
  4. Only ESM-backed security is affected.

You can now use the environment variable "ES\_ESM\_IDPW\_CASE=xy" where "x" = user; ID case and "y" = Password case. The values for "x" and "y" are:

- U = Always uppercase
- L = Always lowercase
- M = Mixed case and case sensitive

When this environment variable is set, Enterprise Server will only make one attempt to identify a user presenting the user ID and password as is (M), folded to uppercase (U) or folded to lowercase(L). If this

environment variable is not set, the legacy Enterprise Server behavior will be used. For the legacy behavior for CICS, the User ID and the password are used as supplied possibly filtered by the uppercase translation configuration of the sign-on transaction. For the legacy behavior for ESMAC and IMS you have the following sequence - first, the user ID and password are used as supplied. If the authentication fails, the User ID is folded to uppercase and used again. If this fails as well, both the user ID and the password are folded to uppercase and the used.

2640427 (1088819)

- For Enterprise Server External Security, the MLDAP ESM Module now supports retrying the connection to the LDAP server if it fails to connect. This provides some fault tolerance if the server is not immediately reachable. See the MLDAP ESM Module documentation for more information.

2619088 (1088485)

- When using an External Security Manager (ESM), an IMS printer no longer passes authorization incorrectly when it is unknown to the ESM.

2617526 (1088978)

- When the LDAP-based security has a long timeout (over four minutes) configured for LDAP operations, the ESF Manager now increases the timeout for thread locks accordingly so thread locks do not expire prematurely while the MLDAP ESM Module is waiting for a slow LDAP server.
- In Enterprise Server's External Security Facility, the MLDAP ESM Module normally attempts to set a user's failed-login count and last-login-time if the user class includes the associated LDAP attributes (microfocus-MFDS-User-LoginAttempts and -LastLoginTime). You can now disable this from the Security Manager configuration. See the documentation for the MLDAP ESM Module for more information.
- The cas-to-ad utility, which is used when initially configuring LDAP-based security for Enterprise Server, now picks up the correct path for the default location of the CICS resource definition file (dfhdrdat).

## CAS XA Switch modules

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- If a ROLLBACK is already in operation when an XA ROLLBACK is requested, Enterprise Server sees the rollback as being successful.

2653121 (1089931)

- The XDB XA switch module was updated to add a missing variable definition which prevented compilation.

2638370 (1088599)

## CCI TCP/IP

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- CCITCP now supports more than 4000 clients per server process on UNIX systems. CCITCP's memory consumption with large numbers of clients should also be reduced, compared with previous releases.

2589460 (1089134)

- CCI has been extended to allow the user to tune the content and location of first failure error messages produced by CCI. This is controlled by the errlog\_path option in the cci.ini configuration file.

2083845 (1053206)

## Compiler

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- Programs with data names containing certain DBCS characters now compile as expected. Previously, they would incorrectly report error message "COBCH0005 User-name not unique".

2663436 (1090882)

- VALUE clauses on THREAD-LOCAL data items are now always correctly initialized on a per thread basis.  
2659874 (1090647)
- Debugging with Expression view expanded to show many qualification levels of a data record no longer causes the IDE to crash.  
2659532 (1090682)
- A MOVE of a numeric literal to a JUSTIFIED RIGHT data item now executes as expected.  
2658757 (1090641)
- The MOVELENGTH directive now also includes checking when the source item is an alphanumeric literal.  
2656595 (1090311)
- When compiling with DIALECT"ACU", a comparison between a numeric item and the figurative constant NULL now works as expected.  
2653033 (1089923)
- Comp-1 data items are now processed correctly under DIALECT"RM". Previously, they were treated as binary floating point items.  
2652327 (1089892)
- Preprocessors now work as expected with the DIALECT"ACU" compiler option.  
2649324 (1089577)
- The DIALECT(RM) directive now sets PERFORM-TYPE(RM).  
2647147 (1089366)
- Large EXEC statements containing DBCS characters now compile without error.  
2645584 (1089204)
- List file output with the DATAMAP directive is now shown correctly for SJIS data names.  
2643308 (1088962)
- The DBCS hyphen character x"817C" is now treated as occupying the correct number of column positions, and so prevents spurious compile errors for comments in Area C.  
2642431 (1088863)
- Programs using ACUCOBOL-GT index names now execute as expected.  
2641124 (1088755)
- A VALUE clause on a national data item that specifies a figurative constant now works as expected.  
2640826 (1088820)
- An "out of memory" error when compiling ACUCOBOL-GT programs with both COPY REPLACING and REPLACE statements has been fixed.  
2640304 (1088671)
- \$DISPLAY of SJIS characters now works as expected.  
2640050 (1088644)
- Tab characters on the same line as DBCS characters no longer cause margin issues.  
2638792 (1088607)
- The maximum number of extensions supported by the COPYEXT directive has been increased to 25.  
2618274 (1088353)
- Literals assigned to DBCS data items are now checked for valid content.  
2618240 (1088339)
- When running under RM/COBOL or ACUCOBOL-GT emulation, appropriate declaratives are now executed for an unsuccessful DELETE FILE operation.

- 2616717 (1088313)
- The emulation of RM/COBOL has been improved regarding the default encoding of numerics types.
- 2607368 (1088045)
- The error message for when special register names are used as data-names has been improved.
- 2599694 (1086646)
- A qualified reference to a paragraph in another section followed by an unqualified reference to the same paragraph now compiles without error.
- 2598461 (1086498)
- Display statements are now displayed correctly when using the window1 preprocessor.
- 2591903 (1085826)
- A syntax error is now produced if you attempt to use a data item with more than 18 numeric positions in extended ACCEPT/DISPLAY syntax.
- 2590649 (1085688)
- The COPY statement no longer requires Katakana characters in a copybook's name to be enclosed in quotation marks in order for the copybook to be found.
- 2582689 (1085009)
- With regards to file handling, the DIALECT(RM) compiler directive now better emulates the default behavior of the latest RM/COBOL product.
- 2582096 (1084955)
- An error with EXTERNAL files where the fd name is the same as the name of an OS function (e.g. sin or strcpy), which caused an rts error 114, has been fixed.
- 2492339 (1077479)
- An error in ADD statements with multiple targets, where one of the targets has a subscripted subscript, has been fixed.
- 2189318 (1062255)
- Error messages 'RTS226 External file definition inconsistent' and 'RTS227 External data definition inconsistent (Fatal)' have been enhanced to give additional information.
- 2188868 (1062214)
- Parsing and consistency checking of the FOREGROUND-COLOR attribute in DISPLAY statements has been improved.
- The Compiler no longer crashes when processing the USE Compiler directive and the specified directive file does not exist.
- Under a Shift-JIS locale, you can now successfully compile a program containing tilde characters.
- EXEC statements are now subject to the action of REPLACE statements (INCLUDE names excepted).
- An INSPECT statement with both 'TALLYING .. FOR TRAILING ..' and 'REPLACING TRAILING ..' syntax now compiles successfully and executes as expected.
- The CHANGE-MESSAGE and HIDE-MESSAGE directives have been enhanced to allow non-severe SQL and CICS errors to be configured (their severity changed or completely suppressed). This can be achieved using the error message's 2-character sub-component prefix; for example, CHANGE-MESSAGE(ES1000 N). If no prefix is specified, CH is assumed.
- You now receive a warning when you use a TYPEDEF-NAME as a parameter for the PROCEDURE DIVISION header of an ENTRY statement, except for external programs or program prototypes where this syntax is legal.
- The Compiler no longer crashes with an RTS114 error after finding multiple Report Writer syntax errors.
- A error processing a bitwise logical expression that has a subscripted operand where the subscript is an arithmetic expression has been fixed.

**CICS: Problems not classed above**

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- The BMS Compiler message "BMSCH1064S Missing comma after operand with continuation, continuation cards ignored" has been changed from a warning to a serious error and the return code is set to indicate the error condition.

2639889 (1088636)

### **Cob/Cblink/Cblnames (32-bit PC)**

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- CBLLINK no longer gives an error when an object file is specified in a fully qualified path containing a dot.

2605052 (1087384)

### **Data Tools Converter**

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- DFCONV no longer fails on non-Intel byte order processors when the conversion uses an STR file.

2658596 (1090476)

- Converting a Mainframe-Report-ANSI file to a PC-Print file where the file begins with a form feed no longer results in a line feed being inserted in the PC-Print file before the form feed.

2652812 (1089911)

- The Data File Converter no longer fails with DFC661 Error during conversion when executed in 64-bit mode.

2649118 (1089569)

- dfconv no longer fails with "DFC161 Error during conversion" if the profile file extension (.PRO) is not in upper case on UNIX and Linux platforms.

2642112 (1088846)

### **Data Tools Editor**

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- The Data File Tools editor no longer crashes when inserting a record after the last record of the file.

2655432 (1090160)

- The Data File Tools editor no longer corrupts a PIC 9 data item when the field is edited from within the record layout view.

2655011 (1090143)

### **Data Tools Layouts**

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- Setting a condition value for a PIC 9 data item no longer displays a corrupt value.

2612439 (1087833)

- Setting a condition value for a PIC 9 data item no longer displays a corrupt value.

2612152 (1087782)

### **Debugger**

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- Stepping over the last statement of a paragraph of a program compiled with a mainframe dialect now works correctly.

2647563 (1089428)

## Documentation

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- The documentation was not clear about the range of acceptable values of EX\_XA\_????\_NB\_RETRIES or the consequent system behaviours. This has been corrected.

2593300 (1085893)

- The documentation has been amended to alert users that under certain conditions, a dynamic binding error is possible

2553077 (1082557)

- You no longer need a 64-bit enterprise server in order to communicate with Microsoft BizTalk Host Integration Server on a 64-bit machine.

2614060 (1087978)

- The MFA installation process references a missing card image PDS file that can cause the MFAAS task to fail the first time it runs. You should define this file, by creating it under TSO or by submitting JCL. For example: `//DEFVCTL JOB (MFA),MSGCLASS=A,CLASS=A,MSGLEVEL=1 /* /* Define Data Connect VSAM mapping control /* /* EXEC PGM=IEFBR14 // MFAVCTL DD DSN=<hlq>.MFAVCTL, // UNIT=3390, // VOL=SER=volser, // DCB=(RECFM=FB,LRECL=80,BLKSIZE=6160), // SPACE=(CYL,(1,1,25),RLSE),DISP=(,CATLG,DELETE) You must assign an appropriate high-level qualifier and select the unit and volume names for where this file will reside. In addition, each site may assign storage class options which comply with their data centre's standards.`

2260128 (1065835)

- The casrdtex documentation has been updated to include several more supported parameters.
- The documentation has been updated to explicitly state that the "3270 Print" field must be defined as "Y" if CICS printing is to be enabled.

2613401 (1087890)

- The documentation has been updated so that the help page more accurately reflects the ESMAC screen.

2611733 (1087753)

- The documentation now includes information about the -stcpssl cassub option.

2605136 (1087060)

- The product documentation now includes information about the ES\_JESYSMSG\_OUTPUT environment variable.

2604533 (1087004)

- The documentation has been updated to clarify the effect of escape characters on path names.

2594224 (1086013)

- The CPMT transaction no longer supports the CEDF or NOCEDF functions.

2527592 (1089531)

- The documentation has been updated to clarify the background information relating to JCL User Exits.
- The documentation has been updated to clarify background information related to JCL User Exits.
- The documentation has been updated to remove references to ERRORLEVEL in UNIX environments.

2610423 (1087575)

- The documentation has been updated to provide more information about the MFJAMS LISTCAT command.
- When invoking MFSORT from the command line, the maximum length of the command is 1024 characters. Characters after this limit are ignored, and if this truncation causes an invalid/incomplete command, an error is produced.

## File Handling - External File Handler

### [Back to the list](#)

- For SORTIN, all data sets in a concatenation must use the same RECFM - either all fixed-length or all variable-length. Also, if using fixed-length records, LRECL must be set the same for all data sets.  
2654517 (1090095)
- A COMMITFLUSH no longer causes file corruption. Previously, corruption was possible with COMMITFLUSH on when a process, having done only a rewrite that changes non-key data, is committed after another process has altered the files size.  
2652378 (1090281)
- The RM RECOVER1 utility is now distributed with Enterprise Developer in case RM indexed files need to be recovered or rebuilt.  
2650917 (1090175)
- Support has been added for the ASSIGN TO PRINT syntax when accessing RM/COBOL data files. Specifically, BEFORE ADVANCING <count>, AFTER ADVANCING <count>, BEFORE ADVANCING PAGE, and AFTER ADVANCING PAGE now work correctly and produce the same print file contents as they do in RM/COBOL.  
2649809 (1089792)
- The RM/COBOL configuration option RMFM\_RUN\_INDEX\_FILES\_DEFAULT\_FILE\_VERSION\_NUMBER 2 now correctly creates a version 2 RM/COBOL indexed file.  
2649414 (1089679)
- A SORT action no longer fails due to an illegal filename when the SORTTEMP file is specified to be an RM file using EXTFH.CFG.  
2648865 (1090292)
- File names containing embedded spaces now work correctly in XML Extensions.  
2648306 (1089486)
- The correct file status "23" is now stored in the file status data item, which will cause the proper INVALID KEY condition action for REWRITE RANDOM or DELETE RANDOM I/O operations on an RM/COBOL data file.  
2648182 (1089461)
- A WRITE or REWRITE operation on a fixed record length RM/COBOL or ACUCOBOL-GT file no longer generates an erroneous 44 error after a READ of a short record.  
2647143 (1089369)
- DELETE and REWRITE operations on an RM/COBOL indexed file with DYNAMIC access and where the prime key allows duplicates now work correctly, meaning that the behavior matches RM/COBOL, where the operation behaves like sequential access and deletes or rewrites the current record.  
2646274 (1089289)
- When opening an RM/COBOL data file for input, a READ WITH LOCK after a READ WITH NO LOCK no longer returns an erroneous 99 (record locked) error. This matches RM/COBOL behavior for a file opened in the input mode.  
2644830 (1089726)
- When accessing RM/COBOL data files, a file status of 04 is correctly returned where appropriate.  
2616717 (1088310)
- When accessing RM/COBOL data files or calling C\$RERR, file statuses '44,03', '44,04', and '44,07' are correctly returned where appropriate.  
2616717 (1088465)
- When accessing RM/COBOL data files or calling C\$RERR, file status '47,01' is correctly returned where appropriate.

2616717 (1088467)

- When accessing RM/COBOL data files or calling C\$RERR, file status '48,01' is correctly returned where appropriate.

2616717 (1088468)

- When accessing RM/COBOL data files or calling C\$RERR, file statuses '93,02' and '90,05' are correctly returned where appropriate.

2616717 (1088469)

- A file status of 90,05 is now correctly displayed as 90.

2616717 (1088449)

- C\$RERR now reports a meaningful 30,22,nnnnn error, where nnnnn is the Micro Focus extended status, when the File Handler diagnoses an operation error on an RM/COBOL data file.

2616717 (1088470)

- File Handler now converts the charset of all instream data in a concatenated dataset to that of the calling program.

2606382 (1087212)

- The file locking for VB files with DISP=SHR has been removed. It is now the user's responsibility to ensure that other users do not update the file at the same time.

2605857 (1087302)

- EXTFH configuration options specified under the FOLDER tag now work correctly with UNIX files when they are specified with an absolute path in the SELECT statement of a COBOL program.

2594733 (1086089)

- Concatenating multiple SYSIN DD statements now works correctly.

2590465 (1085905)

- File corruption no longer occurs when you make two rewrites of a record in the same transaction, where the first rewrite changes an alternate key and the second rewrite changes it back again.

2576793 (1084780)

- CTF tracing no longer defaults to showing CTF handles as errors. CTF tracing for handles now only appears for DEBUG and ERROR levels.

2566161 (1083551)

- If the DDname is missing from JCL, the value of COBDATA is not used to search for a file.

2559292 (1084935)

- The rebuild help message file has been updated to correct a typo.
- Fileshare now supports the ACU and RM file formats.

## **File Handling - Fileshare**

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- SORT no longer abends if the SORTIN file is a Fileshare file.

2653753 (1090002)

- A commit-prepare now returns non-zero error code if the Fileshare server is not running.

2637773 (1088492)

- If the Fileshare server crashes before a commit or a rollback in the two-phase commit, the transactions before a commit-prepare are now committed while recovering the file.

2637773 (1088493)

- Byte-stream routines called from Fileshare clients now work correctly with a 64-bit Fileshare server.

2607314 (1088601)

## File Handling - Sort / JCL Sort

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- When a previous SORT operation had a larger SORTOUT, the next SORT now works correctly.  
2661456 (1091272)
- A SORT with OUTFIL SECTIONS no longer abends with an SOC4 error code.  
2654272 (1090066)
- Errors no longer occur when sorting large records with SORTCOMPRESS set to 5.  
2654143 (1090038)
- If the SORTSPACE or SORTTEMPSPACE environment variables are set outside of their documented limits, a message is emitted in SYSOUT.  
2651650 (1089880)
- When SKIP=P is specified for a SECTION in an OUTFIL control statement, HEADER2 records are correctly printed when the page breaks for the SECTION break.  
2651125 (1089958)
- Masking with III now correctly displays a space instead of a zero when the input is PD 000.  
2650644 (1090020)
- MFJSORT no longer abends if a physical file is missing when SORTIN is directed to DUMMY.  
2647785 (1089487)
- MFJSORT now support the use of FORMAT where some field types were already specified; for example: SORT FIELDS=(1,3,A,5,3,CH,A),FORMAT=CH  
2646265 (1089410)
- The maximum number of SUM FIELDS allowed in a sort has increased to 600.  
2646246 (1089405)
- The length of the TOTAL field is now calculated correctly, using the value specified in the LENGTH parameter.  
2643037 (1088960)
- Under ICETOOL emulation, the maximum size of an ON field for ZD data types has been increased from 15 to 31 bytes to emulate mainframe behavior.  
2641631 (1088811)
- Support has been added for the SPLICE operator when using the DFSORT ICETOOL emulation.  
2641128 (1088775)
- DFSORT emulation now supports the DATEDIFF functionality.  
2640737 (1088843)
- Under ICETOOL emulation, the maximum size of an ON field for data type CH has been increased from 80 to 4000 bytes to emulate mainframe behavior.  
2617590 (1088345)
- SORT now correctly validates the file attributes of SORTOUT and any OUTFILs that are used with FTOV.  
2615463 (1088131)
- MFJSORT now supports the format code FS when it is used as an input format in INREC and OUTREC statements in JCL sort.  
2612188 (1088012)
- SORT now terminates with return code 16 and throws a 9/013 error when the catalogued input file is not physically present.  
2607690 (1087529)

- SORT now terminates with return code 16 and displays error message "SORT103E Invalid operator .JOINKEYS." when the JCL contains the JOINKEYS parameter.  
2607369 (1087311)
- A SORT RETURN statement now returns a 9/230 error for the return past EOF.  
2606867 (1087358)
- Support has been added for processing negative FI summary fields.  
2604402 (1086996)
- When running a mainframe SORT under certain circumstances, the LRECL for mainframe print files no longer gets set incorrectly.  
2600541 (1086632)
- SORT now correctly abends when MFJSERET is set to ABEND.  
2597115 (1086370)
- SORT now terminates with an error RC=16 when the SORTOUT DD is missing from the JCL.  
2594119 (1086423)
- SORT no longer adds extra bytes to the output file when the SORT card includes either CHANGE or NOMATCH options.  
2589359 (1085677)
- The ALLDUPS option of the ICETOOL emulation now correctly separates records with duplicates and without duplicates.  
2582219 (1085463)
- Performing a check of the SORT FIELDS length against SORTIN record length is no longer needed if the SORTIN physical file is missing.
- The SECTIONS parameter now works correctly when using multiple OUTFILs in a SORT.
- SORTOUT is no longer confined to OUTFIL processing.

## IDE Debugging

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- If you set the debug\_on\_error tunable to 1, then the debugger will now attach for all RTS errors.

## IDE Mainframe Explorer

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- When starting a network connection test, the output pane now automatically gets in focus.

## Macro Preprocessor

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- SYSVERSION is supported by the macro preprocessor.  
2549363 (1082124)

## MF Common Client

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- A problem with the Micro Focus Common Client not supporting 64-bit COBOL programs on UNIX and Linux has been fixed. This enables ECI functionality for 64-bit COBOL programs, and may correct issues with certain other features such as Web Services clients.  
2642116 (1088854)

- When there are multiple directories configured in mf-client.dat, the service deployment tools (such as imtkmake) and the IDE features now correctly scan all directories for deployment destinations and not only the first one.

## MF Communications Server

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- In EZASOKET/EZACICAL applications, the "reserved" portion of the socket-address information returned by API calls (such as GETSOCKADDR and GETPEERADDR) is now set to low-values, for improved mainframe compatibility.  
2659699 (1090549)
- You no longer receive a run-time system error when an invalid IMS Connect message is received with a missing end-of-message indicator.  
2649746 (1089727)
- A problem causing IMS Connect conversations to an enterprise server to hang has been resolved.  
2645771 (1089247)
- For SSL-enabled listeners in Enterprise Server, MFCS now offers the option of setting SSL keyfile passphrases using a user exit module. For instructions and a sample module, contact Micro Focus SupportLine.  
2641670 (1088950)
- Intermittent failures in the CICS Web Interface servers that send chunked responses have been fixed.
- The SO\_LINGER socket option in CICS sockets (EZASOKET / EZACICAL) now works correctly.

## MF Directory Server

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- In the Enterprise Server Administration HTML GUI, clicking "Update All" on the Security Manager List page while an enterprise server instance using external security was started would cause the MFDS process to terminate.  
2654069 (1090069)
- The MFDS XML import command line option correctly sets the value of the listener's SSL client authentication option on import.  
2653699 (1090115)
- The MFDS command line options to export or import server configuration data when using an external Security Manager now work correctly.  
2652779 (1089981)
- If the custom configuration text for an Enterprise Server instance was larger than 4K and the "Create XML repository copy" repository option was selected or, if the server configuration was exported in XML format, the MFDS process could terminate.  
2650330 (1089683)
- The MFDS -x and -g command line options for creating and importing Enterprise Server instance configuration in XML format can now be run against an MFDS process running on a specific TCP address and port by using the CCITCP2 and CCITCP2\_PORT environment variables.  
2646427 (1089303)
- The correct details for Enterprise Server "MSS Inter-System Communication" conversation type listeners can now be exported and imported using the MFDS XML export/import feature.  
2644237 (1089091)
- The "Directories" link in the Enterprise Server Administration GUI did not function correctly based on the configured Security Manager permissions for a logged on user.  
2583624 (1085073)

- When you use `casstart` from the command line to start an enterprise server instance that appears as "Not Responding" in the Enterprise Server Administration, the status log for that server is now cleared when the server reaches "Started" state.

2570318 (1086170)

## MF Server Administrator (GUI)

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- When viewing Enterprise Server Administration from within the Visual Studio IDE, you no longer receive a script error when clicking Renew in the left-hand side panel.

## MFA: GUI components

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- MFAVCTL is now supplied with the MFA installation.  
2591556 (1085784)
- Issuing `MFDAS DIR PAN dsn FILTER * ALL` no longer results in a compressed output.
- Changing your password or phrase using the ME logon dialog now works.
- The MFA server will no longer abend if a user tries to change a password to a passphrase and vice versa.
- MFDAS exports of files with spaces in their names to VB format QSAM data sets no longer produces an empty file.
- MFDAS `STATUS FILTER *` will now work correctly with the latest MFA servers.
- The data set context menu now has a Properties item.
- MFA CATDCB displays now correctly list DA data sets.
- MFA clients will now be able to determine if Changeman is installed on the mainframe and will modify dialogs appropriately.

## MFA: Mainframe

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- The MFA GUI components have been updated to support 20-byte pass phrases which are now validated by the server. The following new server configuration option that enables passphrase support is now available: `MFA_GUI_ACCEPT_PASSPHRASES=YES`

2524253 (1080571)

- You can now select a particular SYSOUT dataset by specifying the dataset name. The output from DIR JESDD displays has been enhanced and jobname filters may be used with the STATUS option.
- Large binary uploads sometimes resulted in some data corruption.

## MFBSI

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- If a huge number of jobs are submitted by the scheduler in a short period of time, some MFBSIJCL instances may end with an error RC 244. To work around this issue, use the new MFBSI.CFG parameter `"EMX-Timeout=nn"` to increase the default timeout interval of 5 minutes to a longer interval (10 or 15 minutes). This allows all job conclusion tasks to complete.

2608309 (1089075)

## MTO - CICS BMS Screen painter

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- Compiling a BMS map now generates a COBOL copybook with PIC G data items if DBCS is defined using PS=8 or PS=X'F8' for the field macro.  
2614393 (1087970)
- Compiling a BMS map now generates a COBOL copybook with PIC G data items if DBCS is defined using PS=8 or PS=X'F8' for the field macro.  
2605849 (1087131)
- You no longer receive an error message when compiling COBOL language BMS files if a PICOUT string in them contains the character "0" (zero).  
2591902 (1085804)

## **MTO - CICS ECM/Preprocessor/Translator**

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- The figurative constant ZERO together with its variants is now recognized as a parameter in a CICS command.  
2663191 (1090846)

## **MTO - CICS Emulation**

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- Using CALL and LINK statements to the same CICS program multiple times within the same task no longer causes an RTS 200 error. Note that mixing CALL and LINK statements to the same program can cause an incorrect RESCOUNT.  
2642963 (1089521)
- EIBRCODE is now returned correctly following an EXEC CICS START command.  
2616152 (1088292)
- The documentation now clarifies the usage of DDnames in the SSTM context.  
2593338 (1085948)
- EXEC CICS ASSIGN USERNAME will now return spaces, as the username information is not held anywhere in either the resource definition files or the ESM.  
2583351 (1085968)

## **MTO - CICS ESMAC**

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- In the Spool display, the number of lines displayed is now kept in sync with the current selection even if the page is refreshed using the browser refresh button.  
2608719 (1087732)
- The "Home" link in the ESMAC HTML page now correctly links back to the Enterprise Server Administration HTML GUI page if SSL is being used for the browser connection to both GUIs.  
2526354 (1085186)
- The Refresh button at the bottom of the ESMAC page now works correctly.  
(595265)

## **MTO - CICS Utilities**

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- A BMS field name is no longer replaced with a default unique name when BMS GT options are enabled and the BMS field name is shorter than 3 characters.

2615161 (1088123)

- The size of the variable used to parse the commands you enter at the command line has been increased to more than 255 characters.

2572053 (1084087)

### **MTO - IMS DB**

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- Previously, the casout command was unable to display output from /DIS DB commands when the output contained one or more blank lines.

(586190)

- An ISRT call that results in a DEADLOCK and is subsequently chosen as the DEADLOCK loser failed to return an FD status code.

(598691)

### **MTO - IMS ESMAC**

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- Using the ESMAC /DIS TRAN ALL and /DIS USER ALL buttons no longer fails unexpectedly with an RC=24 message.

2644785 (1089181)

### **MTO - IMS TM**

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- An MPR running a Wait-for-Input transaction no longer sporadically gets stuck and incorrectly marked as busy.

2651114 (1089764)

### **MTO - IMS Utils**

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- The IMS DB editor no longer fails with a run-time system error 173 on the "mFHTSRtr" file.

(593399)

- Previously, a /STOP DB command might have been causing an infinite loop in the JES initiator that invoked it.

(595100)

### **MTO - JCL ESMAC**

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- A problem where Japanese letter appeared corrupted in SPOOL view has been resolved.

2664435 (1090962)

- Dynamic PDS member names starting with "\$\$" were not displayed in the catalog view.

2652384 (1089877)

- You no longer receive a Script Errors window, with Enterprise Server in Internet Explorer (with "Display a notification about every script error" turned on in Advanced Options) or from within Enterprise Developer for Visual Studio 2010, when you navigate to ESMAC and select JES/Catalog.

2598615 (1086461)

- The errors in the EBCDIC characters displayed in the ESMAC Spool and Catalog page have now been corrected. If a character is not displayable, it will be displayed as a '.' in ESMAC. Viewing the file in a DATA VIEWER should display the characters as expected. However, it should be remembered that ESMAC should not be used as a DATA VIEWER tool.

2551170 (1085713)

### **MTO - JCL MVS**

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- A PC file is now created when allocating empty datasets with DISP=(NEW,PASS) set.
- The JCL lexical files, produced when parsing a JCL Job stream, are not compatible with previous versions of this product. This only affects jobs that may be restarted. Such jobs may not be restarted if originally run in an earlier version of the product. Trying to restart them produces JCL errors.

2647864 (1089720)

2644393 (1090222)

### **MTO - JCL System Catalog**

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- In certain circumstances a job could complete normally without the return code displaying in the ESMAC output spool view. This has been fixed.
- The referenced data in the catalog entry for a pds model is now updated whenever the catalog entry for any of its members is updated.

2607769 (1087362)

2581611 (1084905)

### **MTO - JCL TSO**

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- The documentation has been updated to clarify the IDCAMS commands available within TSO batch jobs.

2573281 (1084163)

### **MTO - JCL Utils**

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- A header is now created for an empty VB file when the environment variable MFALLOC\_PCFILE is set to Y.

2648281 (1089537)

### **MTO - JCL Utils - IDCAMS**

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- The IDCAMS REPRO of records into an RRDS file that already contained data was generating a file write error. This has been corrected. If the RRDS file contains records and REPLACE has been specified in the REPRO command then the records will be overwritten. If REPLACE has not been specified then a DUPLICATE RECORD (JCLAM0236E) error will be generated.

2601984 (1086780)

- If the pc file associated with an empty unopened VSAM dataset was populated outside of JCL, the flag on the catalog remained set to empty. The record count is now checked, and if this is not 0, the empty flag is switched off.

2561933 (1083277)

## **MVS REXX Emulation**

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- The REXX engine previously assumed that all hexadecimal strings represented EBCDIC characters. This resulted in the X2C built-in function producing an incorrect result when a hexadecimal string representing ANSI data was used. The MFREXX\_CHARSET environment variable can now be used to indicate whether the REXX engine should use EBCDIC or ANSI when working with hexadecimal strings or performing string comparisons.

2647920 (1089596)

- Trace options set in a parent procedure are now propagated to a CALLED internal procedure.

2612317 (1087818)

- Execs residing in temporary datasets allocated to SYSEXEC or SYSPROC no longer sometimes fail to load.

2579785 (1086478)

- The LASTPOS function no longer returns an incorrect result if the 'start' parameter value exceeds the length of the 'haystack' parameter.

## **NCG**

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- You no longer receive an RTS 114 error when stepping EXEC SQL statements in debug mode.

2611568 (1088003)

- A bug in "display ... upon environment-name" with the [NOT] ON EXCEPTION clause has been fixed.
- A bug that affected querying linkage items in a program that has parameters in working-storage has been fixed.

## **Open PL/I CICS Preprocessor**

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- Accented characters with a code of 'ef'x are now supported.

2653232 (1091079)

- This RPI resulted in new feature documentation for the new PLICNV utility, rather than a readme entry.

2581884 (1085022)

- When a nested %INCLUDE is preprocessed by the macro preprocessor, the corresponding %ENDFILE is now injected into the preprocessor output in the correct column (column 1).

2546061 (1082294)

## **Open PL/I Compiler**

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- A problem no longer occurs when assigning Picture to Fixed Decimal with zero scale and differing precisions.

2665723 (1091114)

- When a CHAR data item uses the POSITION attribute as part of an illegal DEFINE, the Open PL/I Compiler now uses BYTE units to calculate the POS offset rather than the base variable's size units.

2661472 (1090693)

- Declaring a named constant as type CHAR VARYING now correctly raises an error. The VALUE attribute is ignored in this case.

- 2659096 (1090511)
- The Open PL/I Compiler no longer produces erroneous diagnostics due to the loss of fractional digits in fixed decimal arithmetic.
- 2658646 (1090473)
- Using the SUM, ALL, ANY, or PROD built-in in an initial clause no longer causes a compiler abort.
- 2658113 (1090424)
- The COPY built-in no longer encounters a performance issue when the specified string and number of times to copy is greater than or equal to 32765.
- 2657699 (1090387)
- A compiler issue no longer occurs when processing AREA of storage class BASED.
- 2655714 (1090180)
- Multi-edit PUT STRINGs now work correctly on all platforms.
- 2654555 (1090113)
- Using FETCH on a function declared without OPTIONS(FETCHABLE) no longer raises compiler error message MFPLI02000A.
- 2654320 (1090071)
- The Open PL/I Compiler no longer raises an error when converting a type PIC to BIT(1).
- 2653666 (1089989)
- The Open PL/I Compiler no longer abends with an error when named constants of type PICTURED are used.
- 2653250 (1089963)
- The Open PL/I Macro Preprocessor now correctly generates lines greater than 256 characters.
- 2653116 (1089932)
- A problem with producing extra trailing zeroes when moving PIC items no longer occurs in the Open PL/I run time.
- 2651507 (1089939)
- Passing a function name with an empty parameter list as an argument to a subroutine or function call is now treated like a function invocation (unless type ENTRY is specified in the parameter descriptor).
- 2651414 (1089761)
- A problem no longer occurs when converting a fixed point binary constant to type BIT.
- 2650756 (1089721)
- A run time SIGSEV error when using a conditional AND and OR with structure member references no longer occurs.
- 2649990 (1089644)
- Using TRIM(TRIM()) no longer produces incorrect results.
- 2649021 (1089553)
- Combining the VERIFY() and TRIM() built-in functions no longer gives an incorrect result.
- 2647769 (1089432)
- AREA sizes greater than 32K are now allowed. The implementation limit of the compiler and runtime is 2 Gigabytes. Note that very large AREA sizes may be impacted by system resources.
- 2646608 (1089309)
- Using a function invocation without parentheses returning pointer no longer causes a compiler error.
- 2646126 (1089263)
- mfpli no longer generates illegal instructions for some complex PUT statements.
- 2644311 (1089089)

- A PLIDUMP and Codewatch issue displaying char varying data items no longer occurs when using the -bigendian compiler option.  
2643377 (1089259)
- Severe error MFPLI00092S no longer occurs when using the STG or SIZE built-in on a based variable without a locator.  
2642953 (1088914)
- Decimal rounding now generates the correct code.  
2642571 (1089083)
- Comparison operators for named constants now function as expected.  
2641149 (1088758)
- A problem passing a CHAR VAR parameter no longer occurs when using the -zp1 compiler option.  
2641060 (1088916)
- A problem with relational comparisons between OFFSET variables and the NULL built-in no longer occurs when the compiler option -setnull 0 is not used.  
2618457 (1088544)
- A problem with the POINTER built-in returning -1 no longer occurs when the first argument is a NULL() offset reference and the compiler option -setnull 0 is used.  
2618457 (1088527)
- The built-in functions OFFSETADD, OFFSETSUBTRACT, OFFSETDIFF, and OFFSETVALUE are now supported.  
2616735 (1088217)
- When initializing fixed decimal static arrays, an erroneous 343E diagnostic message with regard to precision and scale was being issued.  
2609295 (1087452)
- Named constants of type BIT with static initializers no longer has a regression issue.  
2607316 (1087296)
- An issue which resulted in a SIGSEGV during the code generator phase of the Compiler has been resolved.  
2607092 (1087283)
- The Open PL/I Compiler no longer encounters a problem using a CHAR(\*) VAR parameter as the argument to the MAXLENGTH built-in.  
2606704 (1087241)
- Any variable declaration with conflicting storage attributes now produces an E-level diagnostic. The Open PL/I compiler accepts the first storage attribute and ignores any additional storage attributes.  
2605852 (1087130)
- Parameter declarations with a CHAR length given by the CSTG, STG or LENGTH builtins is now supported.  
2605672 (1087148)
- A problem with a function call in the RETURN statement has been fixed.  
2605508 (1087098)
- The Open PL/I Compiler now evaluates restricted expressions on RETURNS descriptors in entry declarations.  
2605506 (1087097)
- An issue with using SUBSTR of a character pictured variable as a pseudo-variable has been resolved.  
2603607 (1086979)

- For the Open PL/I Compiler, the implementation limit of 64 for the number of data and format list pairs in an edit-directed specification has been increased to 256.  
2600690 (1086769)
- An erroneous diagnostic for fixed decimal variables accepting the specified number of digits has been fixed.  
2600689 (1086830)
- The Open PL/I Compiler now correctly handles bit variables with DEFINED storage and the POSITION attribute.  
2600658 (1086738)
- An issue with using the NULL and SYSNULL built-ins in a named constant VALUE expression no longer occurs.  
2599747 (1086545)
- Using the DIM builtin as part of a restricted expression evaluation in declarations has been fixed.  
2599097 (1086516)
- Using INITIAL clauses that contain concatenation of string constants were generating compiler errors.  
2598242 (1086434)
- The string concatenation of the HIGH/LOW built-ins with a repeat factor no longer returns incorrect results.  
2597746 (1086379)
- A problem when using the STRING function as a pseudo-variable and the Compiler switch -range has been fixed.  
2597682 (1086550)
- When the Regional Language setting for the decimal point was a comma (for example 3,141592), a possible floating point conversion error from ASCII to float binary occurred.  
2593986 (1085970)
- The TINY and HUGE Open PL/I built-ins are now supported.  
2592830 (1085870)
- An incorrect padding of trailing blanks occurred for a string returned by the expression HEX(SUBSTR(...)).  
2590174 (1085658)
- A possible memory leak in -opt mode no longer occurs when using character strings in a relational comparison.  
2587143 (1085402)
- Beginning with Enterprise Developer 2.2, short-circuiting of IF statements occur independent of the optimizer at all -opt levels including -noopt, which means you should not encounter optimization warning diagnostics.  
2553574 (1086481)
- Previously PL/I Programs which contained FIXED DECIMAL variables that required a precision > 18 would not compile and execute successfully in Enterprise Developer. Open PL/I Programs can now support a FIXED DECIMAL precision of 31 or less.  
2549420 (1082138)
- A FIXED BINARY named constant with a value clause that uses the BX format no longer produces a compiler error.  
2521502 (1079751)
- The VALIDDATE built-in is now supported.  
2467971 (1075530)

- An Open PL/I Program that previously could not be preprocessed by the macro and SQL preprocessors no longer compiler incorrectly or with errors.

2467964 (1075506)

- The VALUE clause in named constants has been enhanced to support the POINTVALUE built-in.
- An erroneous result no longer occurs when assigning a PICTURE, FIXED DECIMAL, where the fixed decimal item scale is equal to 0, the FIXED DECIMAL item precision is equal to the PICTURE item scale and the PIC item has no significant digits.
- The -nodebuginfo option is now available when using mfplx to invoke the macro preprocessor.
- A problem with passing an unaligned variable to the HEX built-in has been fixed.
- The Open PL/I Compiler now supports the PARAMETER attribute.
- The Open PL/I compiler now supports hexadecimal (XN) fixed binary constants.
- The Open PL/I Compiler now supports the NOINIT attribute.
- The Open PL/I Compiler now diagnoses CLOSE FILE(\*) as not yet supported.
- The CLOSE FILE (\*) statement is now supported.
- The -map compiler option now shows pad bytes inserted for alignment between structure members. This applies only to pad bytes inserted between structure members which have a constant offset from the beginning of the structure.

### Open PL/I Compiler Back-End

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- You no longer receive an error 211, "Assignment of arrays or structures is only valid if both sides of the assignment have identical size, shape, and component data types".

2355413 (1069925)

### Open PL/I Debugger

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- A problem with PLIDUMP abending that was caused by variable-sized structure arguments on the stack frame no longer occurs.

2650211 (1089995)

- The warning message "stb is newer than executable file" in CodeWatch no longer triggers inaccurately.

2611268 (1087655)

- Codewatch correctly starts a debugging session on the application program's PROC statement rather than the CICS "start-up" code.

2609009 (1087685)

- A problem evaluating CONTROLLED variables in the Open PL/I Debugger has been fixed.

2578290 (1085303)

- CodeWatch now correctly debugs into procedures included using a %INCLUDE statement which is nested inside of another procedure.

2572827 (1084459)

### Open PL/I Macro Preprocessor

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- Variable values are no longer incorrectly passed to the macro preprocessor when the macro preprocessor uses variable as a parameter and the closing parenthesis immediately follows the preprocessor variable name.

2655735 (1090181)

- The macro preprocessor no longer terminates abnormally or loses code if certain NLS are embedded in literals or comments.  
2653232 (1089946)
- Previously, if a %ENDFILE; was embedded within an EXEC SQL statement, the EXEC SQL preprocessor, mfexecpp, would not precompile the application successfully.  
2641151 (1088759)
- When compiling complex PL/I programs with multiple %INCLUDE files at multiple levels which utilize macro logic, an abend no longer occurs when passing -nodebuginfo to the macro preprocessor.  
2640069 (1088712)
- A warning no longer generates when REORDER is used a parameter to a macro, and REORDER; appears in the same place as a keyword parameter to a macro as it appears for the OPTIONS macro as used by a customer.  
2609133 (1087701)
- The Open PL/I Macro Preprocessor's NOTE function now handles all valid built-in functions suitable for macro usage.  
2607126 (1087285)
- When the macro preprocessor was making multiple passes on the same portion of code, %ENDFILE and %FILE were not always generated in Column 1. This was causing issues for the CICS and SQL preprocessors.  
2605895 (1087132)
- The output from "NOTE" in PL/I was being incorrectly written to STDERR instead of STDOUT. STDERR was then causing a loop when you ran it from within the Visual Studio IDE.  
2603654 (1086977)
- An unterminated quote caused the Open PL/I Macro Preprocessor to loop.  
2591348 (1085759)
- The Open PL/I Macro Preprocessor would split compound operators when one of the shorthand operators (+=, \*=, -=, or \=) straddled the 255-byte boundary used to word wrap in the macro text. The macro preprocessor did not recognize them as shorthand operators.  
2587494 (1085437)
- The Open PL/I Macro Preprocessor now supports ||= statements.  
2549371 (1082126)
- When you used the PL/I Macro Language PARMSET() built-in, it would sometimes incorrectly report PARMSET() as true for an argument that had not been passed in. The problem was most prevalent when a combination of KEYWORD invocation and positional parameter invocations were intermixed multiple levels deep.
- The Open PL/I Macro Preprocessor supports the %OPTION statement.

## Open PL/I RTS

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- The attributes of FBA 121 are no longer forced into the catalog if no DCB is specified on the file DCL and no DCB is provided in the JCL DD declaration. Incorrect results occurred when LINESIZE() was specified on the open. The correct behavior is the LINESIZE value +1 for the CTLASA character.  
2662614 (1090784)
- A HANG no longer occurs at End of Step when running with full CTF enabled and with SYSPRINT opened multiple times with one of them using a file VARIABLE. Note that enabling COBOL RTS #SYSPGM and an undetermined amount of other tracing appeared to bypass this issue in Enterprise Developer 2.1 Update 1, as did limiting the amount of PL/I tracing.  
2662383 (1090814)

- Previously, the maximum LRECL for VSAM Entry Sequenced datasets was calculated incorrectly to be four bytes less than the real maximum length.  
2662147 (1090749)
- Previously, when using a DISPLAY(xxx) REPLY(mystr); syntax, the contents of the DISPLAY statement were not seen on the console or in the JOBLIST until AFTER the REPLY was satisfied.  
2661958 (1090744)
- Declaring an ON ENDPAGE for a file in a procedure that drives procedures which attempt to execute a SIGNAL ENDPAGE (xxx) for the ON ENDPAGE no longer creates a mismatch of the file to the ON UNIT.  
2659472 (1090624)
- DSNTIAR now returns an error message if the buffer size is larger than 1000 bytes.  
2657101 (1090406)
- Previously, if using a COBOL "Main" program to drive PL/I subroutines, the application abended the second time the COBOL program was executed within the same Batch Initiator.  
2649712 (1089898)
- Using PUT DATA to a VBA file no longer occasionally results in an incorrect record length creation or an IO\_ERROR\_105 occurring. A boundary violation caused by the internally held logical maximum record length for a STREAM PRINT SYSOUT with DCB overridden to VBA being incorrectly set to the LRECL rather than physical LRECL was causing the issue.  
2649238 (1089582)
- Extra blank lines no longer generate erroneously page breaks.  
2644985 (1089212)
- When executing an application that streams IO to a print file using a LINESIZE > 121, an error would intermittently occur after ENDPAGE logic triggered within the application and multiple lines of output were driven as part of a single PUT EDIT statement.  
2641134 (1088772)
- A problem with using the TRIM built-in with a char(\*) parameter of length 0 has been fixed.  
2638161 (1088552)
- Errors no longer trigger when a PUT DATA() or a PUT LIST() is attempted on a variable of type AREA, or on a structure containing an element of type AREA, and <...> now signifies the AREA variable contents.  
2618457 (1088918)
- Using PUT EDIT statements with a control-format item that specifies a SKIP that triggers an ENDPAGE condition no longer results in memory corruption if an additional control-format item specified COLUMN(s) when returning from ENDPAGE and continuing to generate output.  
2614479 (1088196)
- Writing or rewriting to a record contained in an Open PL/I "Regional(1)" file no longer triggers the ONKEY condition if a key of 0 was used.  
2612112 (1087762)
- Accessing PL/I Regional(1) files from an Open PL/I Program no longer triggers an ONKEY condition when attempting to read KEY(0) from an OPEN PL/I Program. This behavior should have returned 'FF'x if the record was not present or the actual record if present.  
2611584 (1087690)
- Reading from a PL/I "Regional(1)" dataset into a "CHAR VARYING" field no longer results in garbled data being returned from a successful read.  
2611386 (1087674)
- When using a VSAM RRDS to emulate PL/I Regional(1) file, a trap no longer occurs if the RECSZ() parameters for AVG, MAX used to define the VSAM RRDS are identical.

2611383 (1087675)

- A compiler issue causing RTS Error 198 during Finalization no longer occurs.

2607689 (1087322)

- The error message CASSI1745E Error loading MFPLI support (cannot find MPLICPPM) no longer appears in Console.log when Enterprise Server starts.

2605091 (1087696)

- If more than 65,535 Open/Close cycles occurred in a long running standalone (.exe) PL/I application, then an RTS 13 error occurred.

2591161 (1085752)

- Input/Output speed has increased for PL/I sequential file access.

2589081 (1085599)

- Open PL/I now provides support for the generation of ASA Print control characters when writing to files declared with the STREAM/PRINT Attributes. See the documentation for the rules describing how the characters are generated.

2527865 (1080288)

- An ASRA abend no longer occurs on subsequent access attempts when trying to utilize PLIDUMP in a CICS Trancode driven in a given SEP.
- Previously, when running a PL/I batch program under the control of JCL, if the program generated a call to PLIDUMP() on Windows, the .dll files were held by the Batch Initiator until it was recycled.
- Previously, if using an Open PL/I stream IO within a CICS trancode to drive output to SYSPRINT or SYSOUT, an abend or memory corruption occurred on the second invocation of the trancode.
- RTS Condition 142 is no longer raised when attempting a PUT DATA(); on a variable or structure containing an OFFSET variable.

## Open PL/I SQL Preprocessor

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- Previously, "mfexecpp -sql odbc" included the SQLCA definition twice.

2648060 (1089443)

- The DB2 preprocessor did not generate database code when an EXEC SQL INCLUDE sqlca was not defined in application.

2641212 (1088770)

- A problem with a sporadic incorrect occurrence of Error 2000A has been fixed.

2606039 (1087150)

- The mfdb2 pre-compiler did not tolerate the "BUFFERED" attribute when it was used on a file declaration.

2603472 (1086978)

- An ECM for Open PL/I to translate EXEC DLI statements into the necessary calls to the DLI interface is now provided.

2578517 (1084612)

## RTS

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- Using the CBL\_EXEC\_RUN\_UNIT library routine to repeatedly execute non-COBOL processes no longer causes a 'COBRT105 Memory Allocation Error' error to be produced.

2651531 (1090239)

- The library routine C\$OSLockInfo now works correctly when used in a program compiled with the DIALECT(RM) directive.

2643661 (1089044)

- The RANDOM intrinsic function, when compiled in a program using the HOSTNUMMOVE directive, no longer produces a runtime error if the argument is a literal or a numeric expression.

2596268 (1086174)

- Dynamic memory allocations using the CBL\_ALLOC\_MEM call are no longer limited to 2Gb on 64-bit processes.

2513886 (1079960)

- On Windows, if an error occurs when creating a core dump file, then a message box is no longer displayed for core\_on\_error settings greater than 127.

2509666 (1079870)

- Reading from STDIN has been enhanced when STDIN is being redirected from a file or from a pipe line on UNIX. It now automatically reflects the file type without the need for you to use any runtime tunables. The record size line sequential files return is now the size of the data that is actually read. The full record size is now read for record sequential files or when you use CBL\_READ\_FILE.

2468412 (1075670)

- When using the kterm terminal emulator, any new terminal Windows created by COBOL will now be kterm, in preference to xterm. By default, it will use ShiftJis kanji mode and 16 point fonts but these can be overridden by setting the COBTERM\_OPTS environment variable. For example, to use EUC kanji mode and 14 point fonts, use: export COBTERM\_OPTS="-fn a14 -fk k14 -km euc"

## Samples Browser

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- Enterprise Developer now includes samples for the ACU/RM conversion utility and for XML Extensions and Xcentricity.

2600450 (1086612)

## Setup Issues

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- The Start and Stop scripts for mfcsd and lserv have been improved for handling the possible states that services and system files may be in.

2657001 (1090384)

- Previously, when PLIDUMP was created under Enterprise Server, some of the information was missing because of a missing message file in \$COBDIR/lib. This message file is now also available in \$COBDIR/lang/default so that it can be found and used when creating PLIDUMP files on deployment platforms.

2615412 (1088915)

## Setup Issues (UNIX)

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- startmfcsd.sh has been updated and no longer includes /tmp/mfcsclient\* which it starts up. for i in `ls /tmp/mfcsclient\* 2>/dev/null` do rm -rf \$i done If no files are present, remove command is skipped.

2657021 (1090386)

## SQL: DB2 ECM

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- A required file for the DB2(GEN-SQLCA)directive was missing, causing the directive to work improperly.

2659056 (1090501)

- The DB2 pre-compiler now saves or restores the RETURN-CODE special register so executing EXEC SQL statements no longer affects that register.

2655173 (1090353)

- Previously, the DB2 preprocessor sometimes incorrectly defined the number of host variables to use for a singleton SELECT when a group host variable was redefined using FILLER.

2613602 (1088069)

- Previously, the DB2 preprocessor would not generate calls to a system program unless it was linked in.

2611937 (1087736)

- Previously, the DB2 preprocessor might incorrectly flag indicator arrays as invalid.

2546456 (1088155)

### **SQL: HCO for SQL Server**

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- Previously, the SPD Generator tool could generate invalid COBOL parameter names if no parameter name was specified and the parameter type was DECIMAL.

2664672 (1091009)

- Some thread safety issues that occurred in SQL run-time allocation under load have been resolved.

2658581 (1090459)

- The performance of forward-only, read-only cursors in SQL CLR stored procedures has been improved and a new Compiler directive, SQL(OPTION=OPTIMIZEPCURSORS), has been added to provide additional control.

2644905 (1089182)

- When SQL(DETECTDATE) is used with SQL(DIALECT=MAINFRAME), and the mainframe time format is ISO, the second component of the time value must be present. This is to avoid ambiguity and unwanted conversion of simple numeric character strings.

2641203 (1090111)

- Under HCOSS, SQL error messages returned from calls to DSNTIAR did not always get translated to EBCDIC when executing the application in that mode.

2615782 (1088148)

- There are new directives, SQL(OPTION=SQLRTRANS) and SQL(OPTION=SPCOMMITONRETURN), that resolve some issues with stored procedures that expect COMMIT and ROLLBACK to behave the same as mainframe DB2.

2611786 (1087718)

- You can now use DISPLAY statements with COBOL stored procedures for diagnostics in the same way as with applications, when you set the SQL(OPTION=SPDISPLAY) directive.

2598617 (1086941)

- Previously, after a FETCH NEXT ROWSET statement, the number of rows returned was incorrectly reported in SQLERRD(3).
- Dynamic SQL statements executed by EXEC SQL EXECUTE IMMEDIATE are now correctly converted to T-SQL when the SQL(DIALECT=MAINFRAME) directive is set.

### **SQL: OpenESQL**

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- Previously, the OpenESQL runtime did not work correctly with the unixODBC 2.3.1 and later ODBC Driver Managers on AIX platforms.

2658290 (1090583)

- Using a java.math.BigDecimal host variable as an input parameter to SQL statements caused an ORA-17041 error.  
2652362 (1089847)
- Previously, when using OpenESQL for ADO.NET, an SQL-CODE error occurred when a query timeout was set from a host variable.  
2650030 (1089675)
- Previously, OpenESQL threw an exception while attempting to set a default JDBC login timeout at connect time.  
2647801 (1089421)
- When using the Progress Oracle ODBC driver, the OpenESQL runtime incorrectly reported a failure for a successful INSERT when a successful INSERT was followed by a failing INSERT.  
2646958 (1089336)
- OpenESQL now accepts EXEC SQL DECLARE x STATEMENT END-EXEC statements, where x is a dynamic SQL statement name. This statement has no effect but is accepted for compatibility with other ESQL SQL dialects.  
2643884 (1089076)
- When using SQL Native Client or SQL Server Native Client ODBC drivers, the PIC N(xx) USAGE NATIONAL host variable caused an error when used with the NVARCHAR(MAX) SQL Server data type.  
2601192 (1087619)
- When executing code compiled for the JVM, if the run-time system encounters a duplicate symbol, it now reports an RTS119 error, "the symbol is not unique".  
2598694 (1086469)
- Previously, the precompiler incorrectly reset run time information in large Object-Oriented applications that had SQL statements across multiple methods which resulted in incorrect SQL runtime errors.  
2597319 (1086681)
- When compiling Oracle applications and using SQL(CHECK), errors were reported for SELECT statements only. This has been corrected to report errors for all statements.  
2566933 (1083631)
- You no longer receive an internal buffer error message when compiling OpenESQL applications under an MBCS UTF8 locale.
- EXEC SQL DESCRIBE or PREPARE INTO now return the correct sqltype for VARCHAR columns when the SQL(OPTION=DESCRIBEVARCHAR) directive is used. The SQL(DATE) and SQL(TIME) directives now apply to date and time host variables that are declared with SQL TYPE as well as with PIC X.

### **Vision File System**

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- RMFM now correctly generates 04,05 (and 04,06) statuses and the file status variable contains 04.

### **Visual Studio IDE**

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- Compiler directives files containing & comment entries are now processed correctly during a background syntax check.  
2643547 (1089039)
- Using unsupported directives such as "\$CONTROL DYNAMIC" no longer causes a message "The IDE has encountered an unexpected error and is no longer stable. You should save your work and exit."  
2615891 (1088262)

- Projects under source control in Team Foundation Server were not opened correctly in Enterprise Developer for Visual Studio 2012.  
2611808 (1087801)
- A BMS setting in the project and file properties had an incorrect label, "High level assembler features". The label now correctly states - "Allow Long Macro Label Names (HLL)".  
2586254 (1085346)
- You can now specify in the IMS project and file properties different folders to store the listing files for the DBD, MFS and PSB files.  
2582644 (1085100)
- A new setting, IMS Config, in the IMS project properties enables you to specify a folder to contain the IMS System Configuration data indexed file, imskonfig.dat.  
2582610 (1085541)
- Background syntax checking performance has been improved.  
2574012 (1084232)
- It is now possible to define the location of the IMS copybook files that are used by IMS files (PSB, DBD, MFS) from within the IDE. You do this from the project's properties, on the Dependency Paths tab, when Type is set to IMS Copy Paths.  
2573432 (1085238)
- It is now possible to modify the fonts and colors for items in the BMS, IMS, JCL, and PL/I files in Tools > Options > Environment > Fonts and Colors.  
2573015 (1084522)
- Find in Files now includes an option for searching in the copybook paths - COBOL Project Copybook Paths.  
2495750 (1077749)
- You can now successfully rename and change the case of filenames from Solution Explorer.
- Previously, when opening a solution that references a missing or inaccessible COBOL project file, Visual Studio offered to upgrade the missing project file.

## XML Extensions

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- A compiler error when processing XML extensions with dialect(rm) set has been fixed.  
2589841 (1085641)
- Previously, in native code, XML Extensions treated negative literals (such as in the value of a name/value pair for XML SET XSL-PARAMETERS) specified as parameters in native code as a large positive literal. It now correctly treats them as negative literals.

## XML syntax support runtime

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- Block comments in XML instance documents no longer cause a 201 parsing error.  
2618943 (1088554)
- The XML preprocessor now generates correct output for the COUNT IN clause.  
2596137 (1086285)

# 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 WebSync service, where you can download fixes and documentation updates.
- The Knowledge Base, a large collection of product tips and workarounds.
- Examples and Utilities, including demos and additional product documentation.

To connect, enter <http://www.microfocus.com> in your browser to go to the Micro Focus home page.



**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](http://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.

## 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 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.

If COBDIR is set to a location that does not contain `etc/cobver` or COBDIR is not set, `mfsupport` gives you the option to search your machine for possible product locations. Note that the search can take some time if you have a large amount of disc storage and files.

## Data Manager

When using Data Manager, please be ready to provide the following in addition:

- The version number for the z/OS component, found on the **Main Menu** panel.
- Whether you are using the Standard or Client/Server configuration.
- The data stores you are working with, including client-side and server-side versions where appropriate.
- Details of the data store contents, for example:

```
DDL, DCLGEN, or SYSPUNCH (for SQL data stores)
Copybooks (SEQ, VSAM, GDG, DL/I)
FDT (ADABAS)
DBD (DL/I)
```

## 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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