



# **Micro Focus® Visual COBOL® 2.1 Update 1 for Eclipse Distributed Edition**

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A large, decorative graphic consisting of several overlapping, wavy blue lines that create a sense of motion and depth. The lines are in various shades of blue, from light to dark, and are set against a light blue gradient background.

**Release Notes**

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# Micro Focus® Visual COBOL® for Eclipse Distributed Edition Release Notes

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

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

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.



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

# Installation



**Note:** If you are installing on Solaris, please read [UNIX Installer Issues](#) first.

## Installing Visual COBOL on Windows

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

#### Hardware requirements

The disk space requirements for Windows are:

- Approximately 42MB for the Sentinel RMS license server.
- At least 680MB for Visual COBOL.



**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 UNIX/Linux are:

- Between 26 and 35 MB for the Sentinel RMS license server depending on the platform.
- Between 206 and 427 MB for Visual COBOL depending on the platform.



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

#### Operating Systems Supported



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

The supported Windows platforms are:

- Windows XP 64-bit SP2
- Windows XP 32-bit SP3
- Windows Vista SP1 32/64-bit
- Windows 7 32/64-bit
- Windows 8 32/64-bit
- Windows Server 2008 SP2 32/64-bit
- Windows Server 2008 R2 32/64-bit
- Windows Server 2012 32/64-bit

#### Software Requirements



**Note:** If you use the Micro Focus Web Installer to install this product, it checks your system and installs the missing prerequisite software.

- If you use XML Extensions, it has the same requirements as RM/COBOL version 12 for 32-bit Windows. (See the *RM/COBOL User's Guide, Second Edition* or later.) Additionally, XML Extensions may be used in conjunction with Terminal Server.



**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 Visual COBOL client and a new licensing server on the same machine.

If you have a network server, you must update the license server before installing the product as the client is not able to communicate with license servers of versions older than 10000.2.660. On Windows, you can check the version of your license server by clicking **Help > About** in the Micro Focus 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/websync/SLM.aspx>.

## Installing Visual COBOL for Eclipse (Windows)

### Installation restrictions and requirements

Before starting the installation, you should consider the following:

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

### 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

To use the Web Installer:

1. Double-click the `VisualCOBOLEclipse21_webinstaller.exe` file.
2. Click **Start** in the Installer window and follow the instructions to install the prerequisite software and the product.

Alternatively, you can use the setup file on your machine and install the product as follows:

1. Run the `VisualCOBOLEclipse21.exe` file and follow the wizard instructions to complete the installation.

A full version of Eclipse, with the Micro Focus plugins already installed, will be present in the `C:\Users\Public\Micro Focus\Product Name\eclipse` directory. On older versions of Windows, Eclipse might be installed in a different folder, such as for Windows XP, in `install_dir\eclipse`.



#### 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 Manager. By doing this you maintain the existing Sentinel RMS license files while adding the Micro Focus License Manager. 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 Windows **Add or Remove Programs** 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 the .NET Framework that are available at the [Microsoft Download](#) site.
- If you install JDK you might be prompted to install the latest update. The latest update is not required for use with Visual COBOL but you can install it if you wish.

## Installing into different Eclipse packages

Micro Focus Visual COBOL uses Eclipse 3.7. If you want to use Visual COBOL in other Eclipse packages based on version 3.7, you must also install the Visual COBOL update site, and the RSE and AspectJ plugins. Follow the procedure below to do this.



**Important:** We recommend you back up all existing Eclipse configuration files first.

1. Install Visual COBOL as directed above.
2. Copy the required Visual COBOL resources to your existing Eclipse as follows:

For Windows environments

1. Extract the contents of the following .zip files in %ProgramFiles%\Micro Focus\Visual COBOL\eclipse\installer to a temporary folder:

- ajdt\_2.1.3\_for\_eclipse\_3.7.zip
- RSE-runtime-3.3.zip

2. Copy the extracted folders to *<your existing Eclipse>\eclipse\dropins*.

3. Copy %ProgramFiles%\Micro Focus\Visual COBOLUpdateSite to *<your existing Eclipse>\eclipse\dropins*.

4. Rename each of the folders:

- From ajdt\_2.1.3\_for\_eclipse\_3.7 to AJDTUpdateSite
- From RSE-runtime-3.3 to RSEUpdateSite
- From UpdateSite to COBOLUpdateSite

5. Move the the contents of the *<your existing Eclipse>\eclipse\dropins\RSEUpdateSite\eclipse* folder up a level (that is, to *<your existing Eclipse>\eclipse\dropins\RSEUpdateSite*) and delete the empty folder.

6. Copy the eclipse.ini file in %ProgramFiles%\Micro Focus\Visual COBOL\eclipse\installer to *<your existing Eclipse>\eclipse*, overwriting the existing file.

3. Restart Eclipse.

## After Installing

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

1. Make sure you are in the COBOL perspective by clicking **Window > Open Perspective > COBOL**.
2. Click **Window > Reset Perspective**.
3. Click **OK**.
4. Reapply any customizations.

## Installing X Windows on Windows

Some features of Visual COBOL for Eclipse on Windows require an X Windows installation, hence Micro Focus ViewNowX is provided with the product. To install, run the file ViewNow\_X\_Server.exe in your



Visual COBOL installation. By default this will be in the %ProgramFiles%\Micro Focus\Visual COBOL\ViewNowX folder.

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

## Repairing

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**.

To repair your installation on older versions of Windows, such as Windows XP:

1. Click **Start Menu > Control Panel > Add/Remove Programs**.
2. Click your Micro Focus product in the list of installed programs.
3. Click **Click here for support information**.
4. Click **Repair**.

## Uninstalling

### Windows

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

1. Log in with the same user-ID as you used when you installed the product.
2. Click **Uninstall a program** under **Programs** (or **Add/Remove Programs** on older versions of Windows) in **Control Panel**.
3. On older versions of Windows such as Windows XP, ensure that **Show Updates** (at the top of the Add or Remove Programs dialog) is checked, so that any hot fixes or WrapPacks are listed.
4. Click **View installed updates** in the left-hand pane.
5. Select the product and click **Remove** or **Uninstall** as appropriate.

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



**Important:** The installer creates separate installations for Micro Focus Visual COBOL and Micro Focus License Manager. Uninstalling only Visual COBOL does not automatically uninstall the Micro Focus License Manager or any of the prerequisite software.

To completely remove the product you must uninstall the Micro Focus License Manager as well.

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

### UNIX

To uninstall this product:

1. Execute as root the `Uninstall_VisualCOBOL2.1.sh` script in the `$COBDIR/bin` directory.



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

To uninstall Micro Focus License Manager:

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

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

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

## Installing on UNIX/Linux

# System Requirements for Visual COBOL for Eclipse (UNIX)

### Hardware Requirements

The disk space requirements are:

- 33MB for the Sentinel RMS license server.
- Approximately 399MB for Visual COBOL.



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

### Operating Systems Supported



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

- x86 running Red Hat Linux 5.5/5.8 - 32/64-bit
- x86 running SuSE SLES 11/11 SP2 - 32/64-bit

### Software Requirements

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

- Before installing on Red Hat 6.x, you must have the 32-bit operating system libraries installed:

GNU Standard C++ Library - `libstdc++(i686 version)`

The object files for development using standard C libraries – `glibc-devel (i686 version)`

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

- To use the Web installer on Red Hat Enterprise Linux 6.x, you must have the following bug fix updates for Red Hat installed:

`glibc-2.12-1.25.el6_1.3.i686.rpm`

`openldap-2.4.23-15.el6.i686.rpm`

`nss-pam-ldapd-0.7.5-7.el6.i686.rpm`

`zlib-1.2.3-25.el6.i686.rpm`

`nss-3.12.9-9.el6.i686.rpm`

`nss-util-3.12.9-1.el6.i686.rpm`

`cyrus-sasl-lib-2.1.23-8.el6.i686.rpm`

You do not need these updates if you use the full product setup file to install the product.

1. Java Platform Standard Edition (Java SE) 6 Update 27 or Java 7 is required to run the Eclipse IDE, to execute COBOL JVM code and for native COBOL and Java interoperability.



**Note:** On AIX 6.1 v2, the minimum required version is Java 6.0 SR10.

You can download Java SE from [www.oracle.com](http://www.oracle.com) and install it anywhere on your machine.

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



**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 Visual COBOL client and a new licensing server on the same machine.

If you have a network server, you must update the license server before installing the product as the client is not able to communicate with license servers of versions older than 10000.2.660. On Windows, you can check the version of your license server by clicking **Help > About** in the Micro Focus 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/websync/SLM.aspx>.

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

- Set the JAVA\_HOME environment variable. When installing the product, set this variable to a 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`

- Add `$JAVA_HOME/bin` to your system PATH variable. To do this, execute:

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

- Set the LANG environment variable to pick up localized messages. The LANG settings are English and Japanese only.

## Installing Visual COBOL for Eclipse (UNIX)

### 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

To use the Web Installer:

1. Give the Web installer file execute permissions:

```
chmod +x webinstaller_visualcobol_deveclipse_2.1_platform
```

2. Run the installer with superuser permissions:

```
./webinstaller_visualcobol_deveclipse_2.1_platform
```

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

Alternatively, you can use the setup file on your machine and install the product as follows:

1. Give execute permissions to the setup file:

```
chmod +x setup_visualcobol_deveclipse_2.1_platform
```

2. Run the installer with superuser permissions:

```
./setup_visualcobol_deveclipse_2.1_platform
```

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

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

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

```
./webinstaller_visualcobol_deveclipse_2.1_platform -installlocation="full path of new location"
```

or

```
./setup_visualcobol_deveclipse_2.1_platform -installlocation="full path of new location"
```

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



**Note:**

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

```
./setup_visualcobol_deveclipse_2.1_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 later licensing needs to be updated, remove the file and install Sentinel RMS server manually.

## Set up the environment

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

1. To set up your product, execute:

```
./opt/microfocus/VisualCOBOL/bin/cobsetenv
```

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

```
cob -Version
```



**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 (`etc/profile`, `etc/bashrc`, etc.)

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.

## Start the Product

To start Eclipse:

1. Double-click the product icon (automatically installed on your desktop).



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

## Installing as an Upgrade

This release works concurrently with version R4 of Visual COBOL, so you do not need to uninstall it. There are two options for installing the latest version in this case:

- Move the R4 installation to a different location and install the latest version to the default install location, `/opt/microfocus/VisualCOBOL`.

This ensures you do not need to change your environment. To move the existing older installation to a different location:

1. Execute the following command:

```
[ as root ] mv /opt/microfocus/VisualCOBOL /opt/microfocus/VisualCOBOLR4
```

2. Install the latest version as described in the section *Installing*.

- Install the latest version in a different location and set the environment to point to it. To do this, run the Visual COBOL 2.1 Update 1 installer with the `-installlocation` option:

1. Execute the following command:

```
./InstallFile -installlocation="/opt/microfocus/VisualCOBOL2.1"
```

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

```
./opt/microfocus/VisualCOBOL2.1/bin/cobsetenv
```

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.

## Installing into different Eclipse packages

Micro Focus Visual COBOL uses Eclipse 3.7. If you want to use Visual COBOL in other Eclipse packages based on version 3.7, you must also install the Visual COBOL update site, and the RSE and AspectJ plugins. Follow the procedure below to do this.



**Important:** We recommend you back up all existing Eclipse configuration files first.

1. Install Visual COBOL as directed above.
2. Copy the required Visual COBOL resources to your existing Eclipse as follows:

For UNIX environments

1. Extract the contents of the following `.zip` files in `/opt/microfocus/EnterpriseDeveloper/eclipse` to a temporary folder:

- `ajdt_2.1.3_for_eclipse_3.7.zip`
- `RSE-runtime-3.3.zip`
- `UpdateSite.zip`

2. Copy the extracted folders to `<your existing Eclipse>/eclipse/dropins`.

3. Rename each of the folders:

- From `ajdt_2.1.3_for_eclipse_3.7` to `AspectJUpdateSite`
- From `RSE-runtime-3.3` to `RSEUpdateSite`
- From `UpdateSite` to `COBOLUpdateSite`

4. Move the the contents of the `<your existing Eclipse>/eclipse/dropins/RSEUpdateSite/eclipse` folder up a level (that is, to `<your existing Eclipse>/eclipse/dropins/RSEUpdateSite`) and delete the empty folder.
  5. Copy the `eclipse.ini` file in `/opt/microfocus/EnterpriseDeveloper/eclipse/eclipse` to `<your existing Eclipse>/eclipse`, overwriting the existing file.
  6. If necessary, edit `eclipse.ini` so that the `-vm` parameter is set to the requisite Java folder.
3. Restart Eclipse.

## UNIX Installer Issues

### 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

On UNIX, 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.

## After Installing

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

1. Make sure you are in the COBOL perspective by clicking **Window > Open Perspective > COBOL**.
2. Click **Window > Reset Perspective**.
3. Click **OK**.
4. Reapply any customizations.

## Configuring the Environment for Developing RDBMS Applications on UNIX



### Note:

- If you are working with remote projects, you need to configure the environment before you start the remote server process.
  - On UNIX, if you are working with local projects, you need to configure the environment before you start Eclipse.
1. Ensure the COBOL and the third-party software environments are set.
  2. Set up the RDBMS environment.

Refer to your RDBMS vendor documentation for details.

3. Set COBCPY as required in order for the IDE to locate any copybooks that are external to your project.
4. If working with Pro\*COBOL/Cobsq1 applications you need to set COBOPT. This sets the appropriate linker options for the platform and the COBOL working mode:

To do this, execute the following at the command line:

```
$COBDIR/src/oracle/set_cobopt_oracle  
COBOPT=$PWD/cobopt.ora  
export COBOPT
```

## Repairing

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

## Uninstalling

To uninstall this product:

1. Execute as root the `Uninstall_VisualCOBOL2.1.sh` script in the `$COBDIR/bin` directory.



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

To uninstall Micro Focus License Manager:

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.

# System Requirements for Visual COBOL Development Hub

## Hardware Requirements

The disk space requirements are:

- Between 26 and 33 MB for the Sentinel RMS license server depending on the platform.
- Between 206 and 427 MB for Micro Focus Development Hub depending on the platform.



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

## Operating Systems Supported

- POWER running AIX 6.1 TL7 SP5/7.1 TL1 SP5 - 32/64-bit
- x86-64 running Red Hat Linux 5.5/5.8/6.3, Oracle Linux 6.3 with Red Hat Kernel compatibility mode, Oracle Linux 6.3 with Unbreakable Enterprise Kernel - 32/64-bit
- SPARC running Solaris 10/11 - 32/64-bit
- x86-64 running Solaris 10/11 - 32/64-bit
- x86-64 running SuSE SLES 11/11 SP2 - 32/64-bit

- System Z running SuSE SLES 11 SP2 - 32/64-bit
- System Z running Red Hat Linux 6.2/6.3- 32/64-bit
- HP IA 11.31 - 32/64-bit

## Software Requirements

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

- Before installing on Red Hat 6.x, you must have the 32-bit operating system libraries installed:

GNU Standard C++ Library - libstdc++(i686 version)

The object files for development using standard C libraries – glibc-devel (i686 version)

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

- To use the Web installer on Red Hat Enterprise Linux 6.x, you must have the following bug fix updates for Red Hat installed:

glibc-2.12-1.25.el6\_1.3.i686.rpm

openldap-2.4.23-15.el6.i686.rpm

nss-pam-ldapd-0.7.5-7.el6.i686.rpm

zlib-1.2.3-25.el6.i686.rpm

nss-3.12.9-9.el6.i686.rpm

nss-util-3.12.9-1.el6.i686.rpm

cyrus-sasl-lib-2.1.23-8.el6.i686.rpm

You do not need these updates if you use the full product setup file to install the product.

1. Java Platform Standard Edition (Java SE) 6 Update 27 or Java 7 is required to execute COBOL JVM code and for native COBOL and Java interoperability.



**Note:** On AIX 6.1 v2, the minimum required version is Java 6.0 SR10.

You can download Java SE from [www.oracle.com](http://www.oracle.com) and install it anywhere on your machine.

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



**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 Visual COBOL client and a new licensing server on the same machine.

If you have a network server, you must update the license server before installing the product as the client is not able to communicate with license servers of versions older than 10000.2.660. On Windows, you can check the version of your license server by clicking **Help > About** in the Micro Focus 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/websync/SLM.aspx>.

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

- Set the JAVA\_HOME environment variable. When installing the product, set this variable to a 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`

- Add `$JAVA_HOME/bin` to your system PATH variable. To do this, execute:

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



- Set the LANG environment variable to pick up localized messages. The LANG settings are English and Japanese only.

## Installing Visual COBOL Development Hub

### 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

To use the Web Installer:

1. Give the Web installer file execute permissions as follows:

```
chmod +x webinstaller_visualcobol_devhub_2.1_platform
```

2. Run the installer with superuser permissions:

```
./webinstaller_visualcobol_devhub_2.1_platform
```

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

Alternatively, you can use the setup file and install the product as follows:

1. Give execute permissions to the setup file:

```
chmod +x setup_visualcobol_devhub_2.1_platform
```

2. Run the installer with superuser permissions:

```
./setup_visualcobol_devhub_2.1_platform
```

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

The COBOL environment is installed by default into `/opt/microfocus/VisualCOBOL`.

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

```
./webinstaller_visualcobol_devhub_2.1_platform -installlocation="full path of new location"
```

or

```
./setup_visualcobol_devhub_2.1_platform -installlocation="full path of new location"
```

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



#### Note:

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

```
./setup_visualcobol_devhub_2.1_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 later licensing needs to be updated, remove the file and install Sentinel RMS server manually.

## Set up the environment

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

- To set up your product, execute:

```
./opt/microfocus/VisualCOBOL/bin/cobsetenv
```

- To verify that your product is installed, execute:

```
cob -Version
```



**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 (`etc/profile`, `etc/bashrc`, etc.)

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



**Note:** For information about the Visual COBOL Development Hub, check the help for Visual COBOL for Eclipse that is available online on the [Micro Focus Infocenter](#).

## Installing as an Upgrade

This release works concurrently with version R4 of Visual COBOL, so you do not need to uninstall it. There are two options for installing the latest version in this case:

- Move the R4 installation to a different location and install the latest version to the default install location, `/opt/microfocus/VisualCOBOL`.

This ensures you do not need to change your environment. To move the existing older installation to a different location:

- Execute the following command:

```
[ as root ] mv /opt/microfocus/VisualCOBOL /opt/microfocus/VisualCOBOLR4
```

- Install the latest version as described in the section *Installing*.

- Install the latest version in a different location and set the environment to point to it. To do this, run the Visual COBOL 2.1 Update 1 installer with the `-installlocation` option:

- Execute the following command:

```
./InstallFile -installlocation="/opt/microfocus/VisualCOBOL2.1"
```

- Execute `cobsetenv` to set the environment and point to the new install location:

```
./opt/microfocus/VisualCOBOL2.1/bin/cobsetenv
```

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

## 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

On UNIX, 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.

# Configuring the Remote System Explorer Support

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

## Starting the Daemon



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

- a version of Perl
- a version of Java
- the `as` (assembler) and `ld` (linking) programs on the path, as specified by the `PATH` environment variable

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

```
$(COBDIR)/remotedev/startrdodaemon
```

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

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

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

where:

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

For example,

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

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

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

For example,

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

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

## Stopping the Daemon

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

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

## Configuring the Environment

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

# Repairing

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

# Uninstalling

To uninstall this product:

1. Execute as root the `Uninstall_VisualCOBOL2.1.sh` script in the `$COBDIR/bin` directory.



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

To uninstall Micro Focus License Manager:

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:

- This release uses the license keys for the Visual COBOL R4 release.
- This release requires the latest version of SafeNet licensing software. See *Software Requirements* in this document for more details.
- If you are unsure about what your licensing policy is or what sort of license you require, consult your System Administrator or Micro Focus SupportLine to obtain a valid license.

**Windows** Use the Authorization Code, supplied with your delivery notice, to license your product. To do this:

1. Click **Start > All Programs > Micro Focus License Manager > License Management System**.

The dialog box for the Micro Focus License System Administration Tool will be displayed.

2. Click the **Authorize** tab.
3. Enter your Authorization Code and click **Authorize**.
4. Close the Micro Focus License System Administration Tool.

If you wish to install the license silently, execute the following after the product has been installed:

```
start /wait <install-dir>\bin\cesadmintool -term activate  
AuthorizationCode
```

**UNIX** The Micro Focus Licensing System is installed into the `/var/microfocuslicensing` directory.

To license your software:

1. Run the Micro Focus Licensing Administration utility:

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



## Note:

- You need permissions to write to the license file which normally means you need to log in as root.
  - Make sure Java is on the PATH before you run the utility. See *System Requirements* for more information.
2. Select an option as appropriate and press **Enter**:

### If you have access to the Internet:

Select **Online Authorization**. You will be prompted to enter the Authorization Code supplied with your delivery notice.

### If you do not have access to the Internet:

You need the license strings. In order to obtain them, you need your Authorization Code, your Machine Id and a machine with access to the Internet.

- a. Choose **Get Machine Id** and press **Enter**.
- b. Make a note of the information which is displayed.
- c. On the machine which is connected to the Internet, open <http://supportline.microfocus.com/activation/> in a browser.
- d. Follow the instructions to obtain the license strings and save them to a text file.

- e. Copy the text file to the first machine on which you are installing the product.
- f. At the command line, select **Manual License Installation** from the licensing options and enter the full name of the file containing the license strings.

# What's New

The following sections outline the new features that have been added in this release of Visual COBOL for Eclipse.

## New Features in Visual COBOL 2.1 Update 1

### Compiler Directives

You can now set SQL Compiler directives and their values more easily, using a table of tick boxes in a project's Properties dialog box.

## Features Added in Visual COBOL 2.1

### ACUCOBOL-GT Data Types in Managed Code

ACUCOBOL-GT data types and sign() variants that were previously only available in native code are now supported in managed code. Use the Compiler directives COMP1 and COMP2 to set ACUCOBOL-GT behavior for those particular data types.

### ACUCOBOL-GT Library Routines in Managed Code

ACUCOBOL-GT library routines that were previously only available in native code are now supported in managed code.

### Automatic Directives Detection and Setting

The IDE automatically determines and sets the COBOL dialect, and the CICS and SQL directives on local or remote native COBOL projects. You can also start a directives scan from within COBOL Explorer - select **Determine Directives** from the context menu for the projects or the COBOL source files. This triggers a scan to determine the COBOL dialect, the CICS and SQL settings, and sets them as Compiler directives on a file or project level respectively. At the end of the scan, you view the results and choose to apply the changes.

### Compiler Directives

The following new Compiler directives are now available:

<b>DISPLAY</b>	Defines the default behavior of standard DISPLAY statements.
<b>COMP1</b>	Specifies the behavior of a COMP-1 data item.
<b>COMP2</b>	Specifies the behavior of a COMP-2 data item.
<b>RESTRICT-GOTO</b>	Generates a syntax error for GO TO statements that transfer control to outside of the current section.

**ILSMARTRESTRICT** Limits the generation of properties in ILSMARTLINKAGE classes to non-redefining elementary items.

The following Compiler directive has changed:

- **DATAMAP** - Two new parameters allow you to display either the address or offset values for data items in your program.

## `.int`, `.gnt` and `.lbr` File Types Support

Support has been added within the IDE for compiling native COBOL applications to the Micro Focus legacy formats `.int` and `.gnt`, and to package these files as a Micro Focus library file (`.lbr`). Improvements include:

- An option to compile all native COBOL projects to `.int` and `.gnt` code. You can set this in your project's properties.
- An option to package the `.int` and `.gnt` files produced by the project as a Micro Focus `.lbr` library files.
- Improvements to the Net Express Project Import wizard that enable you to convert existing Net Express projects to Visual COBOL projects that compile to `.int` and `.gnt` code.

## Just-in-time debugging

Visual COBOL now supports "Just-in-time" debugging: when a run-time error occurs, or an application calls `CBL_DEBUGBREAK`, the IDE can start automatically with the debugger attached to the failed process.

## JVM Class Library

A new class library, `com.microfocus.cobol.runtimeservices`, has been introduced to help you integrate JVM COBOL and Java in the same application.

The library contains the following classes:

- |                        |                                                                                                       |
|------------------------|-------------------------------------------------------------------------------------------------------|
| <b>CallableProgram</b> | Provides a class and annotation that you can use to create a class that can be called from COBOL.     |
| <b>Interop</b>         | Provides a class that contains helper methods for loading, calling and cancelling a program.          |
| <b>RunUnit</b>         | Provides a container class that allows you to use COBOL programs in a multi user/session environment. |

Full information on these classes is available in Javadoc format for integration in the Eclipse IDE.

## Managed COBOL Enhancements

- |                                      |                                                                                                                                                                                                                                                                                           |
|--------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Delegates and Events</b>          | Delegates and events are now implemented on the JVM platform.<br>This release provides support for combining delegates, using the <code>METHOD</code> keyword to specify method groups, and implicit conversion from a method group or an anonymous method to the suitable delegate type. |
| <b>Handling Invalid Numeric Data</b> | The handling of invalid numeric data is controlled by a number of Compiler directives: <code>HOSTNUMMOVE</code> , <code>HOSTNUMCOMPARE</code> and <code>SIGNFIXUP</code> . These directives were previously only available in native code but are now supported in managed code.          |



## Resolving Types

In this release, the Compiler attempts to resolve types to those defined in the current compilation unit wherever possible. The Compiler will attempt to resolve such types to an external name only if no suitable type exists in the current compilation unit. For example:

```
$set ilusing"System"  
class-id MyNamespace.EventHandler.  
01 o type EventHandler.  
end class.
```

In this release, `01 o type EventHandler.` resolves to `MyNamespace.EventHandler` and not to `System.EventHandler`.

## Specifying Properties

In previous versions of the products, properties declared using the `PROPERTY` keyword on a data item were generated as final properties. Starting with this release, they are generated as virtual properties by default. In order to make the properties final, you need to specify the word `FINAL` following `PROPERTY`. This change may affect the generation of Proxy classes, for example, if you are using WCF.

## OpenESQL

### SQL Compiler Directive Options

OpenESQL has been enhanced to support the the following new SQL compiler directive options:

<b>DATE</b>	Controls the reformatting of date values in output parameters and in input parameter character host variables when <code>DETECTDATE</code> is also specified.
<b>TIME</b>	Controls the reformatting of date values in output parameters and in input parameter character host variables when <code>DETECTDATE</code> is also used.
<b>DATEDELIM</b>	Specifies a single character as the delimiter between the year, month, and day components to override the default delimiter determined by the <code>HCOSS DIALECT</code> or <code>DATE</code> directive specification.
<b>TIMDELIM</b>	Specifies a single character as the delimiter between the hour, minute, and second components to override the default delimiter determined by the <code>HCOSS DIALECT</code> or <code>TIME</code> directive specification.
<b>TSTAMPSEP</b>	Specifies a single character as the separator between the date and time parts of timestamp and date/time data.

**SQL Server** We now support Microsoft SQL Server 2012.

## UNIX Platforms Support

Support for remote development and deployment of projects has been added for the Linux/390 platform. Development Hub now supports Oracle Linux 6 Update 2 with Unbreakable Enterprise Kernel Release 2.

## Features Added in Visual COBOL 2.0

### Automatic Directives Detection and Setting

It is now possible to automatically determine and set the COBOL dialect and SQL directives on native COBOL source code. In the COBOL Explorer, select **Determine Directives** from the context menu for the projects or the COBOL source files. This triggers a scan to determine the COBOL dialect and SQL settings

and sets them as Compiler directives on a file or project level respectively. At the end of the scan, you view the results and choose to apply the changes.

This feature works with local or remote native COBOL projects only.


## COBOL Explorer View

Visual COBOL now includes the COBOL Explorer view in the Eclipse IDE. This allows you to navigate around COBOL projects in a more useful and convenient way than Eclipse's own Navigator view.

The COBOL Explorer view includes the following features to help you manage your projects:

- For COBOL Project, Remote Project, and Mainframe Project types, COBOL Explorer adds category folders that automatically group together your project's COBOL programs, copybooks, and output files. (These folders are not physical folders on the disk, but effectively headings for certain file types.)
- To simplify navigation around your project, you can hide some files that are part of the project, such as the `.cobolBuild`, `.cobolProj`, and `.project` files, and the `.settings` folder and its content in JVM projects. You do this by opening the view menu, selecting **Customize View** and choosing from the options.

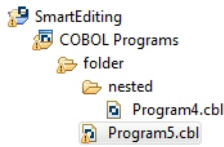
**Filters** Choose types of content to hide in COBOL Explorer.

Option	Description
.*resources	Any files of type <code>. *</code> such as <code>.cobolBuild</code> , <code>.cobolProj</code>
Closed projects	Resources in closed projects never display, but you can choose to hide all closed project icons  too
Empty folders inside COBOL categories	Folders mapped to the COBOL Programs and Copybooks that contain no COBOL program or copybook files
Non-COBOL projects	Projects of types other than those under Micro Focus COBOL - for example AspectJ, Plug-in, or Update-site projects
RSE Internal projects	Projects generated by the RSE plug-in

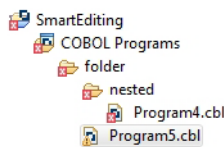
**Content** Choose types of content to show in COBOL Explorer.

Option	Description
Working Sets	Working sets are subsets of workspace resources you can choose to show or perform options on. To define a working set, click <b>Project &gt; Build Working Set &gt; Select Working Set &gt; New</b> .
COBOL Elements	Non-resource types that are COBOL-specific: <ol style="list-style-type: none"> <li>1. <code>x</code></li> <li>2. category folders, including those for COBOL programs and copybooks</li> <li>3. icons for the different types of COBOL files.</li> <li>4. overlays for build errors and warnings</li> <li>5. some context menu items</li> </ol>
Resources	COBOL projects, COBOL programs and copybooks. Has effect only if the <b>COBOL Elements</b> option is unchecked.

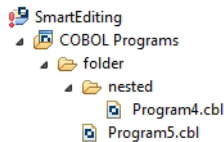
- COBOL Explorer helps you fix problems by using icons to identify files and containers that cause build errors and warnings.
- A file that generates a warning, and any containing folders and categories, is marked with a yellow warning sign. For example:



- A file that causes an error, and any containing folders and categories, is marked with a cross. In this example the icons indicate the most severe problem is the error caused by Program4.cbl, and the folders are marked with error icons despite Program5.cbl generating a warning:



- A project that suffers from a dependency error is marked with a red exclamation mark; its contents remain unmarked. In this example the project depends on another project that is closed, causing a build path problem:



Also, the context menus are reorganized and include some additional tasks such as the **Determine Directives** command.

You access COBOL Explorer in the same way as other Eclipse views, by selecting **Window > Show View**.

## COBOL File Search

Visual COBOL now includes the COBOL File Search feature in the Eclipse IDE.

There are two ways to use the COBOL File Search feature to make it easier to find certain files within your projects.

- Select **Search > COBOL File**, and type the filename search string.

You can filter results based on

- file type: choose from COBOL programs, copybooks.
- only those files that cause build errors
- only those files that cause build warnings
- Select **Search > Run Stored COBOL Search Query** and choose to find either:
  - only those files that cause build errors
  - only those files whose properties override the project's properties (for example **Language dialect** or **Compile for debugging** settings).

The results are shown in the Search view.

You can edit the properties of multiple files in the search results simultaneously if they come from the same project. Highlight the files you want to change, right-click and select **Properties**, and make sure **Enable file specific settings** is selected.



**Tip:** You can save your search criteria and give it a label, which adds it to the list of stored queries available when you select **Search > Run Stored COBOL Search Query**. When saving a search you can also assign it a keyboard shortcut by entering the required keystrokes in the **Binding** text box.

Save and edit your search either in the Search view, or the **Windows > Preferences > Micro Focus > Search** dialog box.

Make sure you don't open the **Keys** preferences page (**Windows > Preferences > General > Keys**) before or after you edit the binding in the **Search** preferences page, and before clicking **OK** to save any changes. Opening the **Keys** preferences page will prevent any changes you make to the search bindings being saved.

## Compiler Directives

The following new directives are now available:

- COPYSEARCH - enables you to specify how copybooks are located. You can choose between usual Micro Focus COBOL behavior or usual RM/COBOL behavior.
- ILSMARTNEST - enables you to nest ILSMARTLINKAGE classes inside the program class in which they are defined. This makes it possible to have multiple programs in a single compilation unit that include linkage records with the same name.

The following directives have been changed:

- DIALECT(RM) - now accepts a new parameter, RM, which enables the RM-compatible functionality that the RM directive used to enable.
- ILREF - can only specify a .class as a parameter, and not a .jar file or other file types.
- ILUSING - when set on a single file using the SET statement, `$set ilusing`, the directive only affects that file.

## Compiling Single Files

It is now possible to compile individual COBOL source files without rebuilding your entire project. **Build Automatically** on the **Project** menu must be turned off.

## Enhancements to Developing Applications on a Remote Machine

Previously, this product depended on Samba or NFS to transfer and manage the project files on a remote UNIX machine. Remote Server Explorer (RSE) was only used to build the applications on remote machines.

"Remote file system (RSE)" is now the default option in the Create Remote COBOL project wizard for managing the files of remote COBOL projects. RSE establishes a connection with the remote machine and is used to transfer and manage the project files on it.




### Important:

- You must use SSH connection and not DStore for remote COBOL projects created with Remote file system (RSE).
- You can still use Samba and NFS as file system providers. On system where SSH is not allowed, you can use SAMBA and DStore connection to transfer and manage the files on the remote system.

# Converting Net Express Projects

It is now possible to convert Net Express projects into Eclipse projects and use them with Visual COBOL. To do this, use the Net Express Project Import and Convert Wizard available from **File > Import > Convert NetExpress Projects to COBOL Projects**. The wizard analyzes the Net Express project file and its configuration settings, creates Eclipse projects based on this information, imports the existing source code into them, and sets the requisite project and file properties from the original Net Express project.

 **Note:** If you import a Net Express project that uses functionality that is not supported in Visual COBOL, the wizard will still produce an Eclipse project. In some cases you might be able to perform additional steps (such as editing source files, installing AddPacks, or reworking parts of the application) in order to successfully compile and run it. See *Converting Net Express Projects to Eclipse Projects* for more information about the limitations of the wizard.


# Copybook Context

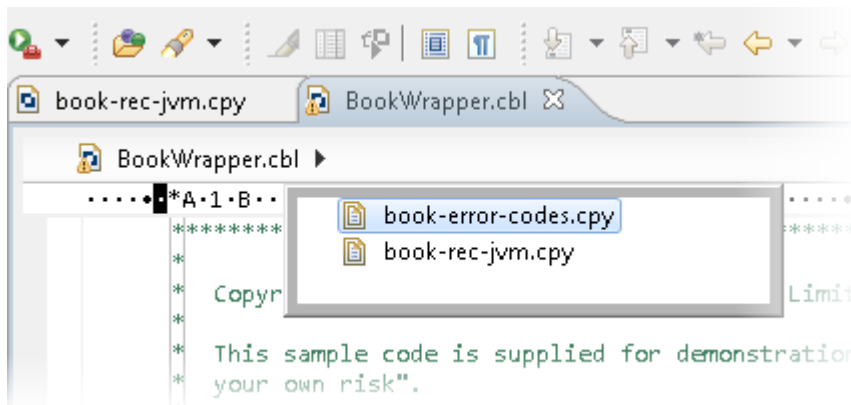
When you view or edit a copybook, you need to see it in the context of the program that references it, as its appearance and usage can change depending on the program. For example, data items that are not used in the program are struck through, and horizontal lines indicating the start and end of code lines can show depending on the source format of the program. The Program Outline view can differ between contexts too.

You can choose which context to open a copybook by right-clicking on the file in COBOL Explorer and selecting **Open In Context**. A list is displayed of all the programs that include a COPY statement referencing the copybook. You can also choose to open the copybook in no particular context.

Whichever you choose becomes the copybook's context whenever you right-click the copybook in COBOL Explorer and select **Open**. It also determines which program it is displayed within when you right-click in the copybook source and select **Open in Copy View**.

A breadcrumb trail at the top of the Editor indicates which program and copybooks are the current context -

click Toggle Context Breadcrumbs  in the Eclipse toolbar and use the drop-down list to view and open the dependent copybooks.



# Debugging Enhancements


This release provides the following enhancements to debugging:

## Program Breakpoints



**Note:** Program breakpoints are supported in native COBOL only, and are not supported with nested programs.

You can now set program breakpoints, which break into a program whenever it or one of its entry points is called.

To set or toggle a program breakpoint, double-click in the left margin, next to the Procedure Division heading. The  icon appears when the program breakpoint is set.

**Step out of OSVS perform statements** You can now step out of a perform statement when PERFORM-TYPE(OSVS) or DIALECT(OSVS) is set.

## Eclipse 3.7

This release of Visual COBOL uses Eclipse 3.7.1 Indigo.

## JVM COBOL File Handler

Use the JVM COBOL File Handler, a File Handler written in purely JVM COBOL managed code, when you are deploying to environments that do not allow the use of native code such as the default Micro Focus File Handler.

## Library Routines

The following CTF library routines are now available in COBOL for JVM:

```
CBL_CTF_COMP_PROPERTY_GET
CBL_CTF_TRACE
CBL_CTF_TRACER_LEVEL_GET
CBL_CTF_TRACER_GET
CBL_CTF_LEVEL
```

The following routine has been enhanced:

- The CBL\_SEMAPHORE\_ACQUIRE routine now accepts a `timeout` parameter.

## Managed COBOL Language Features

The following new syntax elements are now available in managed COBOL:

<b>Local Variables</b>	In managed COBOL, Data items can now be declared in the procedure division, using the DECLARE statement. In addition, they can be declared inline as the iterator in a PERFORM statement, or as an exception message in a TRY ... CATCH ... FINALLY statement block.
<b>Collections</b>	There are two new collection types in managed COBOL: LIST and DICTIONARY. For a LIST, you can add elements to a list, retrieve the nth element of the list, replace the nth element, iterate through the list and clear the list. For a DICTIONARY, you can add key value pairs, retrieve a value corresponding to a key, to replace the value corresponding to a key, iterate through the dictionary and clear the dictionary.
<b>Properties</b>	In managed COBOL, a property can now be defined using PROPERTY-ID and GETTER and SETTER phrases to access to the property. The previous technique of specifying the keyword PROPERTY on a data declaration is still available.
<b>Indexers</b>	In managed COBOL, an indexer can now be defined using INDEXER-ID and GETTER and SETTER phrases to access the indexer value. Indexers are similar to properties,

except that their accessors take parameters. Indexers allow instances of a class or valuetype to be indexed just like arrays.

- Zero-based Indexing** The managed COBOL syntax for arrays now uses zero-base indexing to access arrays when square brackets are specified. For backward compatibility, one-base indexing is used when round parentheses are specified.

The Help now contains code examples comparing managed COBOL and Java.

## Data Access

This release provides the following enhancements:

- Improved IDE integration with SQL directives - now supports handling of deprecated and removed directives. Also supports filtering of the choices offered to the user by product type, project type, and platform.
- OpenESQL has been enhanced and it now:
  - defaults to optimal performance
  - supports 64bit ODBC across all platforms
  - OpenESQL now supports JDBC across all platforms

## Remote COBOL JVM Projects - Early Release

You can use Eclipse to develop COBOL JVM projects on a remote UNIX/Linux machine. The source code resides and is being compiled and debugged on the remote machine.

## Run-Time Tunables

This release provides the following new tunable:

- `subsystem_cancel_mode` - use this to override the default cancel mode when you use the `CBL_SUBSYSTEM` library routine to cancel a subsystem.

## Samples

The following new samples are now available:

- `Collections` - demonstrates the managed COBOL collections syntax
- `Local Variables` - shows how to declare data items in the procedure division in the `DECLARE`, `PERFORM` and `TRY` statements
- The code in the `Properties` sample has been enhanced to use the new `PROPERTY-ID` syntax. The sample also includes a sample program for Indexers which illustrates the new `INDEXER-ID` syntax.

## Vision Data File Searching

This release provides the following new ACUCOBOL-GT compatible environment variables to help search for Vision data files at run time:

```
APPLY_FILE_PATH  
FILE_CASE  
FILE_PREFIX  
FILE_SUFFIX
```

# Features Added in Visual COBOL 2010 R4 Update 2

## New Platforms Support

Support for Visual COBOL for Eclipse has been added for the following platforms:

- x86-64 running Red Hat Enterprise Linux 5.7/6.1
- x86-64 running SuSE SLES 11 SP1

Support for Visual COBOL Development Hub has been added for the following platforms:

- x86-64 running Red Hat Enterprise Linux 5.7/6.1
- x86-64 running SuSE SLES 11 SP1

Support for COBOL for JVM has been added for the following platforms:

HP IA 11.31 - 32/64-bit  
x86-64 running Red Hat Linux 5.6/6.1 - 32/64-bit  
SPARC running Solaris 10 - 32/64-bit

## OO COBOL Class Library Reference

On Windows, Help for the following OO COBOL class libraries is available:

Base class library  
GUI class library  
OLE class library  
OLE Automation class library

The Help is available in the file `nrxclr.chm`, which is installed in the Help folder of your installation. The default location is `%ProgramFiles%\Micro Focus\Visual COBOL\Help`.

To open the help, double-click `nrxclr.chm` in Windows Explorer.

Help for the OO COBOL class libraries are available from the Micro Focus SupportLine Web site, as follows:

1. Go to the Server Express documentation, at <http://supportline.microfocus.com/documentation/books/sx51ws02/sx51indx.htm>.
2. Click *Reference > OO COBOL*.
3. Expand *OO COBOL Class Library Reference*.

## OpenESQL

OpenESQL now includes the JDBC preprocessor option that you can use to access databases for applications running under the Java Virtual Machine (JVM).

# Features Added in Visual COBOL 2010 R4

## ACUCOBOL-GT Compatibility

The Compiler and run-time continue to provide support for ACUCOBOL-GT. The directive `ACU` is the main switch for turning on ACUCOBOL-GT compatibility. The `ACU` directive enables various ACUCOBOL-GT



syntax extensions and other language elements. Additional ACUCOBOL-GT compatibility features include the following:

- When using a CALL statement, the USING and GIVING/RETURNING phrases can now appear in either order.
- The following ACUCOBOL-GT standard library routines can now be used with Visual COBOL in native code:
  - C\$CALLED BY
  - C\$CALLERR
  - C\$CHDIR
  - C\$MAKEDIR
  - C\$MEMCPY
  - C\$MYFILE
  - C\$PARAMSIZE
  - C\$RERR
  - M\$ALLOC
  - M\$FREE
  - M\$COPY
  - M\$FILL
  - M\$GET
  - M\$PUT
  - WIN\$VERSION
- The following ACUCOBOL-GT 'ccbl' compiler options can now be used with Visual COBOL:
  - -E, -V
  - -Cv
  - -Da, -Db, -Dd31, -DL1/2/4/8, -Dq, -FpRounding
  - -La, -Li, -Lc, -Lf, -Ll, -Lo, -Ls, -Lw

Note: The output that these list options provide differs in Visual COBOL.

  - -Qm
  - -Rc, -Rn, -Rw
  - -Sa, -St, -Sd, -Sp, -S1...-S9
  - -noTRUNC, -truncANSI, -Dz
  - -Td, -Te
  - -Vc
  - -Za, -Zc, -Zl, -Zn, -Zs, -Zi, -Zr1, -Zy, -arithmeticVSC2

Full ACUCOBOL-GT compatibility is documented under the *Programming* section in the product help.

## COBOL for Java Virtual Machine (JVM) Support

In this release you can compile COBOL applications to JVM byte code (.class files) so that they can be run on a JVM. There is support in the IDE to edit, compile and debug JVM COBOL applications. This release includes Managed COBOL - COBOL with extensions to support the JVM framework plus OO syntax support.

Features include support for

- New managed COBOL syntax:
  - The SYNC statement, which marks a statement block as a critical section by obtaining the mutual-exclusion lock for a given object, executing a block of statements, and then releasing the lock.
  - Extension methods, enabling you to extend an existing class with new methods without the need to recompile the existing class

- Java style inner classes, which define a nested class within another class. These follow all the methods belonging to the containing class.
- The STATIC keyword, enabling you to mark methods and data as static.
- Enumerators, which represent a list of constant values. You can declare an enum type that defines the values and symbolic names for them, and refer to the values by name in your code.
- Seamless interoperability between JVM COBOL and native COBOL
- The ability to add Java projects to the classpath for COBOL JVM projects, and COBOL JVM projects to the classpath for Java projects
- Red Hat, AIX and SUSE platforms

## Embedded HTML

We now support the use of Embedded HTML (EHTML) in COBOL CGI programs, which enables you to output HTML directly from your applications.

## Improved Usability

The following improvements to COBOL development in Eclipse have been made:

**Dialog box improvements**      The dialog boxes governing build configuration, debug configuration, and launch configuration are redesigned to make them easier to use.

**Autocompletion and Content Assist**      The IDE now includes autocompletion and content assist editing features.

## Language Improvements

The following improvements have been made to managed COBOL:

**Extension methods and extending operators**      Managed COBOL now supports extension methods. This feature enables you to add methods to existing types without the need to edit or recompile the code. You can also extend operators.

**The SYNC modifier for methods**      The SYNC modifier locks the values of the arguments sent to the method, so that they do not change while the method is processing.

**Nested classes**      In managed COBOL, a nested class can now be defined so that it can access the instance fields, properties and methods in its containing class. To allow this, you add the optional SHARING PARENT phrase to the nested class definition.

## Renamed Color Preferences

The COBOL Editor syntax-coloring scheme called "Micro Focus Net Express" is now called "Micro Focus Traditional".

The syntax-coloring element called "Identifiers" is now called "Identification Division Names".

Any existing settings for these options will not change.

## Reporting of Linker Errors

Errors relating to linking, such as undefined entry points and libraries not being found, are now logged in Eclipse's Problems view.

# RM/COBOL Compatibility

The Compiler and run-time continue to provide support for RM/COBOL. Additional RM/COBOL compatibility features include the following:

- The following RM/COBOL standard library routines can now be used with Visual COBOL in native code:
  - C\$Century
  - C\$ConvertAnsiToOem
  - C\$ConvertOemToAnsi
  - C\$DARG
  - C\$Delay
  - C\$GetEnv
  - C\$GetNativeCharset
  - C\$LogicalAnd
  - C\$LogicalComplement
  - C\$LogicalOr
  - C\$LogicalShiftLeft
  - C\$LogicalShiftRight
  - C\$LogicalXor
  - C\$NARG
  - C\$SetEnv
  - C\$RERR
  - DELETE
  - RENAME
- The RM/COBOL file handler can now be used with Visual COBOL, enabled by using the CALLFH(ACUFH) Compiler directive, and then configuring an add-on to the Vision file handler.

Full RM/COBOL compatibility is documented under the *Programming* section in the product help.

## XML Extensions



**Note:** This functionality is supported in native COBOL only.

You can now use XML Extensions, the system that enables your COBOL applications to interact with XML documents, with Visual COBOL.

XML Extensions has many capabilities. The major features support the ability to import and export XML documents to and from COBOL working storage. Specifically, XML Extensions allows data to be imported from an XML document by converting data elements (as necessary) and storing the results into a matching COBOL data structure. Similarly, data is exported from a COBOL data structure by converting the COBOL data elements (as necessary) and storing the results in an XML document.

For more information about XML Extensions, refer to the *XML Extensions User's Guide*, available from the RM/COBOL product documentation set, in the SupportLine section of the Micro Focus Web site.

# Known Issues

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

In addition, please note the following:

## 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.

## Co-existing with Earlier Micro Focus Products

**Run-time system error due to COBCONFIG** A run-time system error occurs if either the COBCONFIG or COBCONFIG\_ environment variable is set when you run a Visual COBOL application or when you use Visual COBOL to edit or create projects and the configuration file it refers to contains entries that are not valid for Visual COBOL.

For example, this might happen if you have Net Express or Studio Enterprise Edition installed and either COBCONFIG or COBCONFIG\_ is set for it.

To work around this issue, ensure that Visual COBOL is not running and then modify the configuration file by doing one of the following:

- If the invalid tunable is not needed by another application, remove it from the run-time configuration file.
- Add the following as the first line in the configuration file:

```
set cobconfig_error_report=false
```
- Unset COBCONFIG (or COBCONFIG\_) or set it to another configuration file that does not contain the invalid tunable for the particular session you are running in.

## Debugging

There is an issue with "Wait for attachment" when you use Visual COBOL for Eclipse to debug applications that run on some Linux/Unix platforms. Eclipse connects to the debugger on the remote machine, but might not attach to the process to debug the code.

To work around this issue, ensure that on the remote machine the TMPDIR environment variable is unset or has the same value for both Micro Focus Visual COBOL Development Hub server and for the running process you wish to debug. The Micro Focus Visual COBOL Development Hub server is the server which you started either directly with the \$COBDIR/remotedev/startrdoserver script or indirectly using the daemon which is started with the \$COBDIR/remotedev/startrdodaemon script.

To check the variable used by the Micro Focus Visual COBOL Development Hub server:

1. Open Remote Systems view in Eclipse on the Windows machine.
2. Right-click the **Shells** element of the server connection to be tested and click **Launch Shell**.
3. In the **Remote Shell** view, type `echo $TMPDIR` in the **Command** field, and press **Enter**.

The value of the TMPDIR environment variable is shown - ensure it is the same as the one used by the process to be debugged.



**Note:** The value of TMPDIR used by the Development Hub server cannot be changed in the remote shell and must be set before you start the daemon or server.

## File Handling

- When using a CGI/ISAPI application developed with the Net Express HTML Forms Designer in Visual COBOL, you may receive an error “unresolved external symbol \_NMCNVRTI” or “unresolved external symbol \_NMCNVRTO”.

To work around this issue, add the corresponding .obj file to the **Additional Directives** in the project properties, or use them from the command line to link the application: `cbllink filename.cbl NMCNVRTI.OBJ` (or `cbllink filename.cbl NMCNVRTO.OBJ`, respectively).

- If you are accessing Vision files through the Vision file handler (as opposed to the default Micro Focus File Handler) and you are upgrading from Visual COBOL version 2.0 to version 2.1, you must first uninstall version 2.0, otherwise the Vision file handler may not function correctly.

## Fileshare

A write of a record with an alternate key where the alternate key is the first value for that key may now return a 0/2 file status rather than a 0/0 status if a record with that alternate key value has been deleted by uncommitted transaction (possibly the same transaction as that performing the write).

# Resolved Issues

The resolved issues that customers have reported are listed in this section. The numbers that follow each issue are the Reported Problem Incident number followed by the Customer Incident Numbers (in parentheses). RPIs that have numbers only (and no text) are included to confirm that the RPIs have been fixed, since no further information is required.

- [BIS Service Engine](#)
- [Compiler](#)
- [Data Tools Converter](#)
- [Data Tools Vrecgen \(Character\)](#)
- [Documentation](#)
- [Eclipse IDE](#)
- [File Handling - External File Handler](#)
- [File Handling - Sort](#)
- [JVM - Debugger](#)
- [MF Communications Server](#)
- [MF Directory Server](#)
- [MVS REXX Emulation](#)
- [NCG](#)
- [Request Handler](#)
- [RTS](#)
- [Setup Issues \(UNIX\)](#)
- [SQL: COBSQL](#)
- [SQL: OpenESQL](#)
- [XML syntax support runtime](#)

## **BIS Service Engine**

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- Visual COBOL BIS supports and can operate with either one of the following products - Visual COBOL for Visual Studio 2010, Visual COBOL for Visual Studio 2012, or COBOL Server. If you have installed both Visual COBOL for Visual Studio 2010 and Visual COBOL for Visual Studio 2012 on the same machine, BIS uses Visual COBOL for Visual Studio 2010, by default. To use the version for Visual Studio 2012, you need to edit the following registry entries and set the "vcob\_key" value to "Visual COBOL 2012":
  - 1) HKEY\_LOCAL\_MACHINE\SOFTWARE\Micro Focus\Xcentrisity BIS\2.1\Visual COBOL\Config
  - 2) On 64-bit versions of Windows, HKEY\_LOCAL\_MACHINE\SOFTWARE\Wow6432Node\Micro Focus\Xcentrisity BIS\2.1\Visual COBOL\Config
- A problem with running BIS programs that open files on AIX which was caused by a stack size that was too small has been resolved. Set COBMAINSTACK in /etc/sysconfig/xbis to set the desired size.  
594902 ( )
- The BIS interface functions called by COBOL programs under Xcentrisity BIS now begin with "B\_" instead of "B\$". This change is required to make Xcentrisity BIS for Windows source-compatible with Xcentrisity BIS for Linux and AIX.  
594736 ( )

## Compiler

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- Specify an environment variable with the USE and DIRECTIVES Compiler directives (e.g. USE"\$myDirs") to locate a directives file.

1086063 (2592063)

## Data Tools Converter

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- The dfconv replacement input and output filenames are no longer truncated to the filename lengths used within the profile file.

1086569 (2599741)

## Data Tools Vrecgen (Character)

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- The source files for the VRECGEN and VRECGEN2 utilities are now stored in the .\src folder in the product installation.

1087209 (2603963)

## Documentation

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- The SSRANGE Compiler directive is provided for emulation of the IBM mainframe compiler of the same name; because of this, its scope is limited to the syntax permissible in a mainframe dialect.

1087083 (2605408)

- To ensure no loss of functionality when accessing Vision and RM/COBOL data files, you should use the appropriate IDXFORMAT Compiler directive setting or file handling option, and not use the CALLFH(ACUFH) Compiler directive. See 'Configuring Access to Vision Files' and 'Configuring Access to RM/COBOL Data Files' for more information.

593437 ( )

- All COBOL CICS programs that call user exits need to be compiled with the NOAMODE directive.

593780 ( )

- The documentation now clarifies the EZACICM.MOD location.

1086693 (2599949)

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

1087060 (2605136)

- The documentation has been updated to provide more information about the MFJAMS LISTCAT command.

594069 ( )

- The documentation has been updated to remove references to ERRORLEVEL in Unix environments.

1087575 (2610423)

- The casrdtex documentation has been updated to include several more supported parameters.

594324 ( )

## Eclipse IDE

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- You can now set program breakpoints as follows - click "Add Program Breakpoint" in the Run menu or on the Breakpoints view toolbar, and enter the program name in the dialog that is displayed.  
1087239 (2606838)
- When you download from a mainframe files that use DBCS characters, any shift-out and shift-in control characters should be kept in the downloaded source code. When entering new DBCS characters in the COBOL Editor, shift-out and shift-in control characters must be added manually using the following key combinations: for shift-out press Alt+S, release them and then press O; for shift-in press Alt+S, release them and then press I. These key combinations can be altered using the Eclipse Preferences dialog box.  
594093 ( )
- When building within Eclipse, the COBCPY environment variable value set before launching Eclipse was truncated to a maximum of 1024 characters.  
1087408 (2608978)
- Eclipse could stop responding or use excessive amounts of memory when large COBOL JVM projects were opened.  
1087777 (2610488)
- Eclipse could stop responding or use excessive amounts of memory when building large projects.  
1087748 (2610469)
- A problem with Variables view not allowing you to modify the values of string variables in EBCDIC projects has been resolved. In addition, the Change Value dialog now displays correctly the values of the variables in HEX mode.  
593497 ( )
- Variables which were only used in preprocessed source lines were marked as not referenced.  
1087030 (2603385)
- Remote ports that were previously set are preserved when a launch configuration is reopened.  
1086008 (2594159)

### **File Handling - External File Handler**

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- EXTFFH 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.  
1086089 (2594733)
- RMFM record lock timeouts now work correctly on UNIX.  
1087015 (2602108)

### **File Handling - Sort**

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- A SORT RETURN statement now returns a 9/230 error for the return past EOF.  
1087358 (2606867)
- SORT now terminates with return code 16 and throws a 9/013 error when the catalogued input file is not physically present.  
1087529 (2607690)
- SORT now terminates with return code 16 and displays error message "SORT103E Invalid operator .JOINKEYS." when the JCL contains the JOINKEYS parameter.  
1087311 (2607369)



## **JVM - Debugger**

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- The JVM COBOL Debugger could only locate copybooks that were located in the same directory as the COBOL program.  
1086348 (2597430)

## **MVS REXX Emulation**

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- Execs residing in temporary datasets allocated to SYSEXEC or SYSPROC no longer sometimes fail to load.  
1086478 (2579785)
- The bpxwunix() function is now supported by the REXX engine.  
1085190 (2584045)

## **NCG**

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- An error when linking on Solaris Intel 64 bit with the latest versions of Solaris 10 has been fixed.  
1086852 (2602536)
- Display statements of the type "display a(1:i\*c) at 0101" could cause the generator to fail when in debug mode.  
1088048 (2607368)

## **Request Handler**

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- A problem where the BIS Request Handler would not load on AIX has been resolved.  
595001 ( )

## **Setup Issues (UNIX)**

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- During installation, the CheckDiskSpace function no longer relies on English text strings from the UNIX df command.  
1086610 (2600117)

## **SQL: COBSQL**

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- The COBSQL preprocessor could not process options longer than 65 characters.  
1085597 (2589416)

## **SQL: OpenESQL**

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- The SQL JVM Run-Time .jar library file is now supplied as part of the Micro Focus COBOL deployment products for UNIX.  
1087595 (2610662)

- The OpenESQL preprocessor sometimes generated incorrect query lengths for EXEC SQL PREPARE INTO FROM statements, resulting in the SQL queries being truncated.  
1087324 (2607761)
- The ODBC pre-compiler now allows you to define host variables after the DECLARE CURSOR SQL statement if they are not defined in the PROCEDURE DIVISION.  
1086501 (2599123)
- When using the SQL Server Native Client ODBC driver, the OpenESQL Run-Time System now correctly processes SQL Server data defined as VARCHAR(MAX).  
1086665 (2601192)

### **XML syntax support runtime**

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- The XML preprocessor now generates correct output for the COUNT IN clause.  
1086285 (2596137)

# 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 `SCOBDIR/bin`.

To run `mfsupport`:

1. Start a UNIX shell.

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

This creates a log file, `mfpoll.txt`, in that directory.

4. When the script finishes, send the `mfpoll.txt` file to your Micro Focus SupportLine representative.



**Note:**

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

## Creating Debug Files

If you encounter an error when compiling a program that requires you to contact Micro Focus technical support, 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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