Getting Started

extend® 8 with ACUCOBOL-GT®

Version 8.1

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Nothing in this document is intended to amend the terms and conditions of the applicable license agreement between you and Micro Focus (IP) Ltd. Rather, this document is meant to summarize the various aspects of Micro Focus's licensing technology which are required to operate the ***extend*** Software. The terms and conditions of your licensing of ***extend*** Software shall continue to be governed by the applicable license agreement between you and Micro Focus.

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1 Let’s Get Started!

Key Topics

1.1 Overview

Welcome to ACUCOBOL-GT! We are pleased to have you as a customer. This *Getting Started* guide contains the information you need to begin using your products. If you need assistance, refer to **section 8.1, "Technical Services."**

- Chapter 1 (this chapter) contains general installation information, such as disk space requirements and terminal configuration.
- Chapters 2 through 5 contain detailed information about installing and licensing your software on the various operating systems available.
- **Chapter 6** provides information on License management and what to do in some special circumstances, such as when you have multiple versions of a product on the same machine, or when you are ready to deploy an application built using the ACUCOBOL-GT® development system.
- **Chapter 7** contains troubleshooting advice on installation and license files.
- **Chapter 8** introduces some of the support services that Micro Focus has to offer.

Refer to the *Quick Start* cards included with your products for a quick installation reference. For more detailed information about the ACUCOBOL-GT development system and other products, such as AcuServer® and Acu4GL®, refer to your online help files.

Now, let's get started!

1.2 Requirements

extend software has the following requirements:

For Windows:

- The amount of disk space needed to install the ACUCOBOL-GT development system is typically less than 35 MB. The HTML files for the user documentation require an additional 50 MB.
- AcuBench® requires at least 20 MB for installation.
- You need an additional 40 MB to install all of the other ***extend*** products.

Unless otherwise indicated, the references to “Windows” in this manual denote the following 32-bit versions of the Windows operating systems: Windows Vista, Windows XP, Windows NT 4.0 or later, Windows 2000, Windows 2003; and the following 64-bit versions of the Windows operating system: Windows Server 2003 and 2008 x64, Vista x64. In those instances where it is necessary to make a distinction among the individual versions of those operating systems, we refer to them by their specific version numbers (“Windows 2000,” “Windows NT 4.0,” etc.).

Refer to section 1.4 in Book 1, and Appendix B in Book 4, of the ACUCOBOL-GT documentation set for more information about the specifications and requirements of ACUCOBOL-GT.

For all other platforms:

- The amount of disk space needed to install all ***extend*** products is typically less than 35 MB.
- The HTML files for the user documentation typically require 50 MB.

Refer to section 1.4 in Book 1, and Appendix B in Book 4, of the ACUCOBOL-GT documentation set for more information about the specifications and requirements of ACUCOBOL-GT.

1.3 Installation Basics

While the rest of this chapter contains detailed instructions for installing your software, the process is really quite simple. The following steps must be performed to install your products on any platform:

1. Choose a directory for your products. (You may select the defaults.)
2. Insert the media containing your products into the appropriate drive.
3. Run the **setup** or **install** program or unload the media. (This process varies depending on your operating system. Refer to the appropriate chapter in this book for specific instructions.)
4. Create your software license file using the Activator utility described in **Chapter 2**. The **setup** or **install** program will prompt you automatically.
5. Configure the product for use according to the directions given in the product’s online help file.)

1.3.1 License Files for *extend* Products

All ***extend*** products require a license file in order to operate. You may request a license file for a single user, or one that allows a number of users to execute a particular product concurrently.

When you receive your product(s) the package includes one or more letters containing *product codes* and *product keys* for every product you ordered. (These are alphanumeric strings containing information about your product, such as the version number, serial number and user count.) The letter is titled “Important Licensing Information.” If you do not receive this letter, contact your Micro Focus ***extend*** representative. You must have the product code(s) and product key(s) to install your software. A utility called the *Activator* converts the pair of strings into a license file.

Note: Use the version of the Activator that corresponds with the version of the product you are installing.

The product code and product key make it easy to update or change your license file. If you order a new product or add users, you simply enter a new product code and key into the Activator utility. The resulting license file is required. If the license file is missing or damaged, your access to the software may be interrupted.

Chapter 6 provides detailed information on license management, and **Chapter 7** includes information on debugging license host errors.

1.3.1.1 License file names

The name of each license file is based on the name of the product's executable file, with a special extension. For example, if your runtime executable is named "runcbl," the runtime license file is named "runcbl.alc," and the Acu4GL for Sybase license file is named "runcbl.ylc." Each product has its own license file. The following chart lists the UNIX and Windows license file name for each ***extend*** product.

Product	**License ext.**	**UNIX**	**Windows**
Acu4GL DB2	.klc	runcbl.klc	wrun32.klc
Acu4GL Informix	.ilc	runcbl.ilc	N/A
Acu4GL MSSQL	.mlc	N/A	wrun32.mlc
Acu4GL ODBC	.dlc	N/A	wrun32.dlc
Acu4GL Oracle	.olc	runcbl.olc	wrun32.olc
Acu4GL Sybase	.ylc	runcbl.ylc	wrun32.ylc
AcuBench	.alc	N/A	acubench.alc
ACUCOBOL-GT compiler	.alc	ccbl.alc	ccbl32.alc
ACUCOBOL-GT runtime	.alc	runcbl.alc	wrun32.alc
ACUCOBOL-GT runtime CGI	.clc	runcbl.clc	wrun32.clc
AcuConnect distributed processing	.clc	acurcl.clc	acurcl.clc
AcuConnect Thin Client	.alc	acurcl.alc	acurcl.alc

Product	License ext.	UNIX	Windows
AcuServer	.alc	acuserve.alc	acuserve.alc
AcuSQL precompiler	.alc	acusql.alc	acusql.alc
AcuSQL runtime	.2lc	runcbl.2lc	wrun32.2lc
AcuXDBC	.alc	xvision.alc	xvision.alc
AcuXDBC Server	.slc	xvision.slc	xvision.slc
AcuXDBC Enterprise	.elc	xvision.elc	xvision.elc
AcuXUI	.jlc	runcbl.jlc	wrun32.jlc
Transaction Server	.1lc	runcbl.1lc	wrun32.1lc

Note: If you rename the product's executable file, you must change the *base name* of the license file to match it, and leave the license file *extension* unchanged. For example, if you rename your compiler from "ccbl" to "mycomp," you must rename the license file from "ccbl.alc" to "mycomp.alc."

License files with an extension ending in an exclamation point (!), are back-up copies of old license files. See **section 2.1** for more information.

1.3.1.2 License file directory

Each product searches for its license file in the same directory in which its executable resides. The product expects the license file to have the same base name as the product's executable, with a special extension assigned by Micro Focus. If you move the product's executable to a new directory, be sure to move its license file as well. If no license file is found, or if the information in the license file does not permit execution, the product exits with an error message.

1.3.2 Protect Your Software Investment

Store all of your original software media in a safe place. Keep copies of your serial numbers, product codes and keys, and any other product registration information. Contact your Micro Focus ***extend*** representative if you have questions about your software license file.

1.4 Sample, Definition, and DLL Files

This section describes some of the sample programs included with the release materials, and introduces the standard definition (".def") and *dynamic link library* (".dll") files that are included in ACUCOBOL-GT compiler and runtime system in the release materials.

1.4.1 Sample Programs

ACUCOBOL-GT includes many sample programs in the standard release materials. These programs demonstrate general and specific features of the system and measure some aspects of system performance. Many of these programs can serve as *generic* templates for developing similar functionality in your programs.

Some of the sample programs provided with ACUCOBOL-GT are stand-alone programs, designed to be run at the command line. Examples include:

- TOUR.CBL (demonstrates features of the Development System)
- GENMENU.CBL (creates COBOL code for menu bars)

Some of the sample programs can either be called from another program or run from the command line:

- CALC3.CBL (provides a pop-up calculator)
- NOTEPAD.CBL (offers a pop-up notepad for notes and reminders)

Many of the sample programs are subroutines that must be called from another program. You can call them from "tour.cbl" or from your own application:

- MESSAGE.CBL (shows how to send up to three lines of text to the user and receive a standard numeric response code)
- MENUBAR.CBL (demonstrates pop-up and static menu bars)
- MENUBAR2.CBL (demonstrates pop-up and static menu bars for graphical environments)
- PRNTSCRN.CBL (for character-based applications, shows how to print screens using the ACCEPT FROM SCREEN verb)

Many other valuable sample programs are available in the Examples and Utilities area of the Micro Focus Web site. Copy and paste the following link into your web browser:

http://supportline.microfocus.com/xmlloader.asp?type=home.

1.4.2 Definition Files

ACUCOBOL-GT includes a number of *definition* files. These files make it easier to use some of ACUCOBOL-GT's special features, such as graphical controls, color configuration, and Windows HELP. Many of the definition files contain predefined data structures for use with ACUCOBOL-GT runtime routines. You can include these structures easily in your program by COPYing the definition file into your program. All of the definition files have the three character ".def" extension in their name. Most reside in the "sample/def" subdirectory of your ACUCOBOL-GT directory. How and when to use these files is documented with the feature or function that the file supports (such as with a runtime library routine or in the Special Names reference documentation).

Note: Always use the same .def file version with the corresponding version of the Development System. For example, do NOT use a version 7.2 .def file with a version 8.0 Development System.

1.4.3 DLL Files

On Windows systems, ACUCOBOL-GT includes a number of *dynamic link library* files (extension ".DLL"). Those files are part of the product and contain various utility functions used by the executable files. They may also contain data. The .DLL files that are part of the ACUCOBOL-GT compiler and runtime are installed automatically in the same directories as the main executable files for those programs, CCBL32.EXE and WRUN32.EXE, respectively.

One of the main components of the Windows versions of ACUCOBOL-GT is a *utility* file called ACME.DLL. All of the .EXE and .DLL components of ACUCOBOL-GT link to this file, including their initialization and shutdown functions. ACME.DLL offers the benefit of providing a common set of utility functions for all executables to share, as well as allowing you easy and consistent access to all our libraries through a single DLL. ACME.DLL is installed automatically in the same default subdirectory on your machine as the executable files.

Note: Those users who change directories after the installation of the product, or those who ship the compiler or runtime separately as part of their own product, should make sure that all the .DLL files are placed in the same directory as the .EXE files. Therefore, if you move CCBL32.EXE or WRUN32.EXE, you must move all of the .DLLs along with them. If you delete any .DLL files that have been installed, your products will not run.

1.5 Configuring Your Terminals

For ACUCOBOL-GT to run, it needs to know about the video environment it is running in. On Windows machines, it directly examines the hardware and configures itself appropriately. On UNIX, MPE/iX, and VMS machines, you must provide to ACUCOBOL-GT a description of the terminal you are using. This section describes briefly how to do that. Additional details are provided in Chapter 4, "Terminal Manager" in the *ACUCOBOL-GT User's Guide.*

On systems that do not configure themselves automatically, describing the terminal to ACUCOBOL-GT involves two steps:

1. First, identify the terminal by setting the "TERM" variable.
2. Second, ensure that the terminal's characteristics are accurately described in the *terminal database file*.

1.5.1 TERM Variable

ACUCOBOL-GT determines the type of terminal you are using by looking at the setting of the "TERM" variable. On UNIX and Linux machines, TERM is an *environment variable;* on VMS machines, it's a *symbol*. Samples for both UNIX and VMS are presented below.

TERM should be set to the name of one of the entries in the terminal database (described in **section 1.5.2**). You can examine the database file for valid names. The first field of each entry consists of a list of accepted names. Some common names are "vt100", "tv925", and "wy50" for VT100, Televideo 925, and Wyse 50 terminals, respectively.

Note that on most UNIX systems, the TERM environment variable is initialized as part of the login procedure. You will need to change this only if the name used is not one listed in the terminal database. On VMS systems, the TERM symbol defaults to "vt100" if it is not defined. Thus, you need to define the TERM symbol only if you want to use a terminal that is not VT100 compatible or if you want to use some advanced features of your terminal.

As an example, suppose you want to use a VT220 terminal. In the database, "vt220" is one of the accepted names for this type of terminal. On a VMS system, you would use the following command

```
TERM == "vt220"
```

On UNIX systems with the Bourne or Korn shell, the command would be:

```
TERM=vt200; export TERM
```

Using the C shell, the equivalent command is:

```
setenv TERM vt220
```

You may want to leave the TERM variable at its current setting in order to maintain compatibility with other software. If the setting is not correct for ACUCOBOL-GT, you can set the "A_TERM" variable instead. If both the A_TERM and TERM variables are set, ACUCOBOL-GT uses the definition of A_TERM. This allows you to have different settings for ACUCOBOL-GT and your other software.

1.5.2 Terminal Database

ACUCOBOL-GT comes with a database of terminal descriptions. On UNIX machines, this is called "a_termcap". On VMS machines it is called "A_TERMS.DAT". This database contains encoded descriptions of many types of terminals. You need to select the terminal type in the database that most closely matches the terminal you are using. If you need to, you can add your own entries in the database. This process is described in detail in Chapter 4, "Terminal Manager," in the *ACUCOBOL-GT User's Guide*.

By default, the terminal database should reside in a pre-selected directory on your machine. On UNIX machines, this is the "/etc" directory; on VMS machines, it is the "SYS$LIBRARY" directory. If you want to place your terminal database somewhere else, then you must define the variable "A_TERMCAP" to be the full name of the database file. For example, on a VMS system, you could place the database in the "SYS$LOCAL" directory with the following command:

```
A_TERMCAP == SYS$LOCAL:A_TERMS.DAT
```

On UNIX systems (using the Bourne shell), you might use the command:

```
A_TERMCAP=/usr/local/etc/a_termcap; export A_TERMCAP
```

Chapter 4, "Terminal Manager," in the *ACUCOBOL-GT User's Guide* contains more information about setting up terminals and making full use of their capabilities.

2 Windows Installation

Key Topics

2.1 License Files for Windows

You may request a license file for one or more users. The number of users (user limit) is set in your license agreement with Micro Focus.

When you receive your products the package includes product codes and product keys for every product you ordered. You must have the product codes and product keys to create the license file.

When you install or update your license file, place it in the same directory as the product executable. When you have multiple users or products, you may copy the license file onto each machine containing the corresponding product or place the products and license file on a shared drive. Each product must be able to locate its license file in order to function. The product expects the license file to be in the same directory as the product executable.

Note: The ACUCOBOL-GT Transaction Server runtime license file is named “wrun32.1lc”. If you are using other ***extend*** products, the license files must be concatenated into a special file.

The Activator Utility

When you install your products, “setup.exe” installs the Activator utility (“activator.exe”) for you. It is installed in the “C:\Program Files\Acucorp\Acucbl8*xx*\AcuGT\bin” directory by default. In some cases, you may receive the Activator executable on a floppy disk. Copy the file onto your computer and run it as you would any other executable.

Note: Use the version of the Activator that corresponds with the version of the product you are installing.

The Activator utility automates the process of creating a license file. Just launch the Activator to add a new or updated product code and product key.

Once installation is complete, the Activator utility can be launched from the Acucorp 8*x* program group on the Start menu. You may also launch the Activator by double-clicking on the “activator.exe” icon.

During installation, if the Activator utility detects the presence of an existing license file, the extension of the existing file is changed before a new license file is created. For example, "runcbl.alc" is renamed "runcbl.al!". On Windows platforms, file attributes such as Read Only are also preserved. If the Activator is unable to rename the existing license file, it quits with an error message, and no new license file is created. If a license file with the back-up extension already exists, the Activator attempts to overwrite it. If that fails, the Activator quits with an error message and no new license file is created.

Changing or Updating the Windows License File

If you need to alter your license file information, contact your Micro Focus ***extend*** representative for updated product code(s) and product key(s). When you receive them, launch the Activator and enter the new information as prompted.

Note: If you have copied the license file to a non-default directory, remember to replace that file with a copy of the updated license file.

2.2 Installation on Windows Platforms

Windows installation requires little interaction; the setup program from copies the files into a directory you designate, or "C:\Program Files\Acucorp\Acucbl8*xx*" by default.

After the installation is complete, if you have installed both the compiler and runtime, you can begin to compile and execute your COBOL programs. Basic compilation and execution techniques are described in **section 2.3** and **section 2.4**.

Note: If you move or delete any ".dll" files that have been installed, your products may not run.

You will need to have your product codes and product keys and the product media available to perform this operation. Refer to the appropriate installation instructions below.

AcuBench and AcuXDBC™ must be installed locally (on the client). Server-side products such as AcuServer™, AcuXDBC™ Server and AcuConnect® are installed only on server machines.

Installation Steps

Follow these steps to install your products. See **Section 2.2.2** for information on uninstalling and reinstalling.

1. Insert the disk containing your products.

2. The setup program should start automatically. If it does not, click on **Start** and select **Run**. Type ***x*:setup** in the entry box (where "*x*" is the letter of the drive containing your disk). Select **Install Products**.

3. At the License Agreement screen, you must accept the terms in order to activate the Next button and continue the install.

4. Enter the information on the Customer Information screen if desired. Note that you can also choose whether to install the applications for any user of the computer, or just for you.

5. At the Destination Folder screen, you are prompted to specify an installation directory or to accept the default location. If you are a previous user of ***extend*** products, take special note of several changes related to selecting an installation directory:

   Default directory path

   Starting with version 8.0, the default directory path includes "program files". The full default path is: "C:\Program Files\Acucorp\Acucbl8*xx*". This is consistent with Microsoft standards related to software installation.

   Installing in a non-default directory

   When specifying a path other than the default, a subdirectory named with the release version numbers (e.g., Acucbl800) is not created, as was the case in versions before 8.0. The software is installed in the directory you specify, not in an automatically created subdirectory that specifies the version.

When installing into an existing directory, there is no warning message if the directory already exists. This means that if you attempt to install version 8.x into an existing directory containing a previous version of ***extend*** products, that version will be overwritten by the current version you are installing. If you want to maintain several versions of ***extend*** products, be sure to specify a different directory for each version.

Directory names containing spaces

You can specify a directory name that has embedded spaces. In previous versions, embedded spaces prevented the PATH variable from being properly set, which could cause other problems.

6. At the Select Products screen, select the products you wish to install. You must have product codes and keys to activate each product; however, you can install all products now, and activate those products for which you do not have a license at a later date. (Be aware if you attempt to use products for which you do not have a license you may receive error messages indicating that no license file is available). In cases where you are installing to a non-default directory, this approach makes installing additional products easier (see **Section 2.2.2** for details). Deselect any products you do not want to install. When your products are selected, click **Next**.

   Note: Be sure to select **Online Documentation** on this screen to install and access HTML versions of the product user guides.

7. At the Installation Settings screen, select whether or not to add your products to your machine's path, and whether to install and launch the License Activator.

   Note: Only one version of ***extend*** products should be specified in the path variable. Having more than one version specified may cause unexpected results.

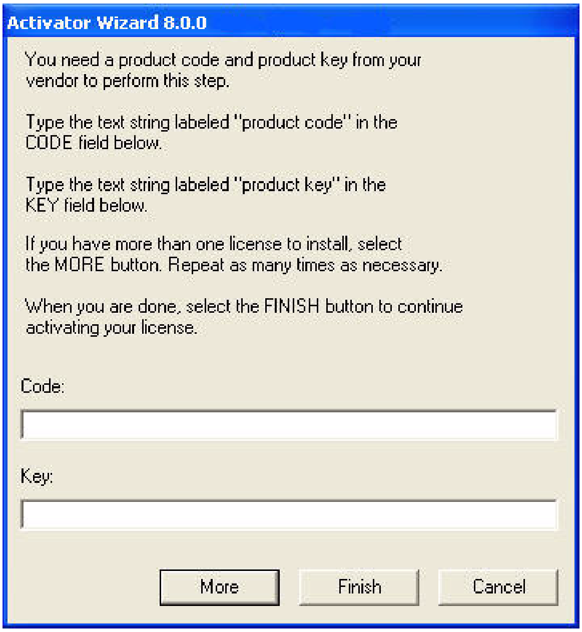
8. If you chose to launch the Activator, the setup program opens the Activator utility after the install process completes. You then enter into the appropriate entry fields the product codes and keys that came in your package. Note that the Activator is case insensitive and displays

only uppercase characters. The Activator also ignores embedded spaces and separating characters. Product codes and keys do *not* contain the letters “O” or “I”.

Note: If you are installing a Windows runtime (“wrun32.exe”) and an Alternate Terminal Manager (ATM) runtime (“run32.exe”) on the same machine, be aware that the Activator utility creates a license file named “wrun32.alc” for each of them. You must use one of the following precautions:

- Install the ATM runtime and rename the license file to match the executable (change “wrun32.alc” to “run32.alc”) *before* installing the Windows runtime.
- Or make a back-up copy of the Windows runtime license file prior to installing (and renaming) the ATM runtime.

This will avoid a situation where the Activator overwrites the license file for the second runtime.



Activator Wizard 8.0.0

You need a product code and product key from your vendor to perform this step.

Type the text string labeled "product code" in the CODE field below.

Type the text string labeled "product key" in the KEY field below.

If you have more than one license to install, select the MORE button. Repeat as many times as necessary.

When you are done, select the FINISH button to continue activating your license.

Code:

Key:

If you have more than one code and key pair to enter, select the **More** button to continue entering code/key pairs. Each time you press **More**, the Activator creates the license file for the product code and key you entered and returns you to the code and key entry screen. You may select **More** as many times as you have product code and key pairs. Select the **Finish** button to create your license file. The Activator creates a separate license file for each product.

9. When the above steps are complete, the Activator displays a dialog box that confirms whether license file activation was successful. You can now begin using your products.

Note: If license activation was successful, but you get a message during product startup indicating that the license file cannot be found, the license file may not be in the proper directory. The Activator determines where to place the license file based on entries in the Windows registry. If no registry entry is found, the license file is placed in the same directory as the Activator executable. (The default location for the Activator is the "bin" directory of "AcuGT". If this is not the location of the product's executable file, move the license file to the directory containing the corresponding executable file. For example, move "wrun32.alc" to the folder containing "wrun32.exe".

When installation is complete, you will find an icon named "tour.acu" in your "\Program Files\Acucorp\Acucbl8*xx*\AcuGT\sample\samplprj\object" folder. Double-click this icon to execute a sample program that displays a window with a graphical interface containing a variety of controls and demonstrates how they work.

Please read the "RELEASE" file. The "RELEASE" file (if present) describes changes to the product that are not covered in the documentation.

2.2.1 Windows 64-bit Installations

There are 64-bit versions of most products. These 64-bit product versions install from a CD that is separate and unique from the standard 32-bit Windows version of ***extend*** software. The installation process follows the same steps as described in **section 2.2**. Note that the 64-bit CD also installs 32-bit versions of those products that do not have 64-bit equivalents. This includes certain program executables such as AcuBench as well as non-executables such as sample programs and tools.

When selecting products to install on Windows x64 platforms the 32-bit products will be installed into a special Windows folder reserved for 32-bit programs called “Program Files (x86)”. The Windows Start menu items will use these 32-bit versions. Some of the 32-bit products have 64-bit equivalents and are automatically installed into the Windows “Program Files” directory if the 32-bit product was selected to be installed. The 64-bit “Program Files” directory only contains the executables and does not contain all of the support files. The support files are found in the “Program Files (x86)” directory along with all the 32-bit executables.

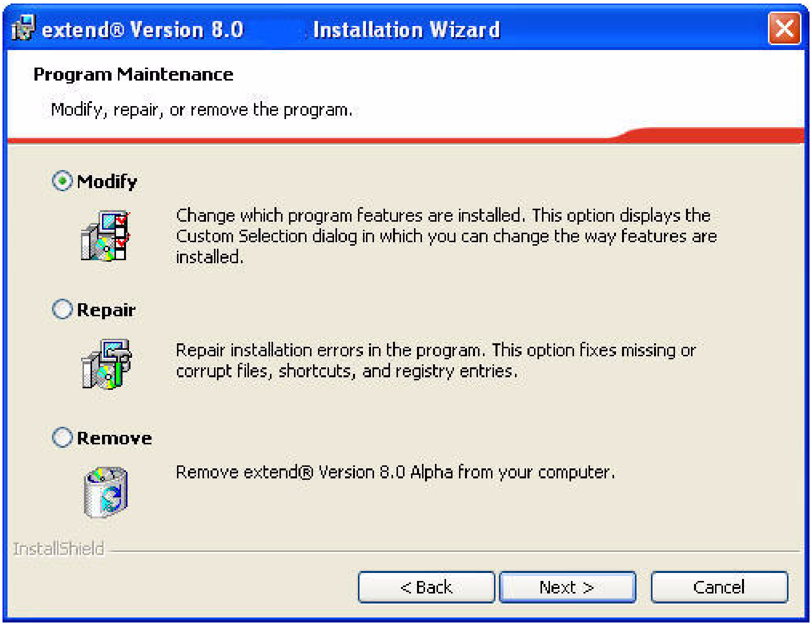
An example of a 32-bit product that does not have a 64-bit equivalent is AcuBench. When you compile and run programs from AcuBench the 32-bit versions of the compiler and runtime are used. AcuBench does not require any path changes for this to occur. All the 32-bit versions are fully supported and functional in the 64-bit environments.

When running the license activator the installer runs the 64-bit version of the activator so that it can install the license files into both the 32-bit and 64-bit directories. If you run the license activator from the command prompt make sure you are using the 64-bit version in the “Program Files” directory because the 32-bit license activator will generate license files only for the 32-bit products.

2.2.2 Uninstalling and Reinstalling

The installer can be used to uninstall and reinstall newer versions of the same product or, completely new products that you may now wish to utilize. When reinstalling existing products or adding new products, the installation occurs in the default directory (C:\Program Files\Acucorp\Acucbl8*xx)*. There is not an option to change to a non-default location, as is the case when you initially installed your products. To overcome this, copy the installed files from the default location to your preferred location. Note that this method will not work for AcuXDBC, AcuBench, and any server products that are registered as “services”.

After you have initially installed your product, and you reinsert the product CD and run the installer again, you will be presented with the following screen for managing your installations:



extend® Version 8.0 Installation Wizard

Program Maintenance

Modify, repair, or remove the program.

● **Modify**

Change which program features are installed. This option displays the Custom Selection dialog in which you can change the way features are installed.

○ **Repair**

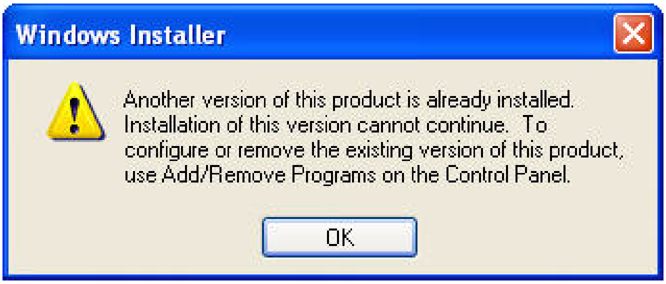
Repair installation errors in the program. This option fixes missing or corrupt files, shortcuts, and registry entries.

○ **Remove**

Remove extend® Version 8.0 Alpha from your computer.

Selecting the **Modify** option takes you to the product selection screen from which you can choose products you want uninstalled or installed. Products currently installed will be checked. You can uncheck those items you want removed, and check those items you want installed. Use the **Repair** option if you want to reinstall a product and the **Remove** option if you want to uninstall all version 8.x software.

If you run the installer a second time from media that was created at a time that is different from the media you originally installed from, you will get the following message:



Windows Installer

Another version of this product is already installed. Installation of this version cannot continue. To configure or remove the existing version of this product, use Add/Remove Programs on the Control Panel.

Go to Add/Remove Programs on the Windows Control Panel and select Change or Remove. Remove will uninstall all products previously installed.

2.3 Compiling Your Programs

The ACUCOBOL-GT compiler is most easily used via AcuBench. It is also possible to compile from the command prompt, to use the Run dialog to compile, to establish an *association* between your source files and the compiler executable, or to set up one or more icons to compile individual files. For information regarding creating file associations and setting up icons, see your Windows documentation.

When you compile, if the system returns “Bad command or file name,” you didn’t add the location of the compiler to your PATH, or you haven’t rebooted since installing the software. You can check the current definition of PATH by typing **path** and pressing the **Enter** key at the command prompt. The path is “C:\Program Files\Acucorp\Acucbl8*xx*\AcuGT\bin\ccbl32.exe”, by default. You may choose to type the full path and program name each time you compile or create a .bat file.

Once you have verified that the compiler is in your PATH (or you have decided that you will specify the full path every time you compile), you are ready to compile your programs. A complete list of compile options is located in section 2.1 of the *ACUCOBOL-GT User's Guide*. You can also display a complete list of options by running the compiler command:

```
ccbl32  -help
```

One commonly used option is "-o". This option is used to specify the name of the output object file. Note that ACUCOBOL-GT uses the naming convention ".acu" to indicate an ACUCOBOL-GT object file. If "-o" is not used, the compiler will name the file "*source-name*.acu". If your source includes COPY files, you can copy the COPY files to your current working directory, specify their location with the "-Sp" option followed by the complete path of one or more directories, or set the COPYPATH environment variable. A typical compilation command might look like:

```
    ccbl32 -Sp c:\work\lib -o sample.cbx sample.cbl
```

2.4 Running Your Programs

After a successful compilation, the resultant object file is ready for immediate execution (there is no link step). To run your program, make a note of the full path to your object file and return to the Windows desktop or Program Manager.

There are a variety of ways to run your program under Windows. The basic methods are:

- selecting **Run** from the Start menu.
- placing an icon for each program in a Program Group or folder, and then starting the program by double-clicking its icon.
- giving your COBOL object files a common file extension and associating the extension with the runtime. After the association is established, you can run a program by double-clicking on the name of the file as it appears in the File Manager or Windows Explorer, or most Windows file system navigation utilities.
- typing **wrun32** (or **crun32** if you are using the console runtime) at the command prompt.

This document describes only the first option. The advantage of using the Run dialog is that it requires no special setup. However, it is a time-consuming method because you must type the command line options every time you execute the program. For the greatest convenience to the end user, it is best to set up a program icon. To set up an icon, or to create a file *association* to the runtime, please refer to your Windows documentation.

To start the Run dialog, select **Run** from the Start menu.

In the entry box, type the name of your ACUCOBOL-GT Windows runtime. The default name is **wrun32.exe**. If you changed the name of the runtime executable, enter that name. Follow the name of the runtime with any desired runtime options and the path and name of the COBOL program you want to run. After you have entered the complete command line, click OK to execute the program.

Note: If you didn't add ACUCOBOL-GT to your path, you will need to specify the full path to the runtime (for example: "c:\Program Files\Acucorp\Acucbl8*xx*\bin\wrun32.exe").

You can use the COBOL configuration variable DEFAULT_PROGRAM to specify the name of the program to execute when no program is specified on the command line. See Appendix H in Book 4 of the ACUCOBOL-GT documentation set for more configuration information.

2.5 Printing and Spooler Issues

ACUCOBOL-GT includes extended support for printing under Windows. In addition to the basic print spooler access procedures described below, the WIN$PRINTER runtime library routine provides easy access to extended Windows print spooler capabilities. See the entry for "WIN$PRINTER" in Appendix I, "Library Routines" in your online documentation. Rules for printer handling are illustrated in the *ACUCOBOL-GT User's Guide*, section 2.8.3.

Under Windows, you may print *directly to the printer* by defining PRINTER in the configuration file as "-D PRN". Be aware that this does not prevent other programs from printing at the same time and as a result you my get intermixed pages.

You may also print using the *Windows spooler*, even if your reports have embedded control codes. The spooler allows many programs to create print files at the same time, and also allows the user to do other tasks while the report is being printed.

Note: The configuration variable WIN_SPOOLER_PORT allows you to divert printer output to a file or port through the Windows print spooler. For more information, see Appendix H of the ACUCOBOL-GT manual set.

Before you assign your print file to the Windows spooler, you must decide whether you want to control the format of each page directly (with embedded control codes) or whether you want the print spooler to format the pages.

2.5.1 Spooler Formatting

There are two ways to use the Windows spooler to format your print file: "-P SPOOLER" and "-Q <*printername*>". (If you wish to control formatting yourself, refer to **section 2.5.2, "Direct Control"** below.)

2.5.1.1 -P SPOOLER

If you want to use the default printer and font, simply assign your print file to "-P SPOOLER". For example, to assign "PRINTER1" to the spooler, enter the following line in your COBOL configuration file ("CBLCONFI"):

```
PRINTER1  -P  SPOOLER
```

By default, the runtime system assigns the "PRINTER" device to the spooler. You may change this in the configuration file by assigning "PRINTER" to some other name.

When the runtime opens a file assigned to "-P SPOOLER", it automatically initiates a job with the Windows spooler and constructs print pages in accordance with your program. The runtime uses the default printer and font. If the user looks for the job in the spooler, it is named with the current title of the ACUCOBOL-GT window.

Note: The Windows spooler operates by *drawing* your report on each page. It constructs its own control codes to handle formatting. If you assign your print file to "-P SPOOLER" and your file contains device-dependent control sequences (such as those used to shift to a condensed font, or to print a form and then fill it in), *the codes will be passed to the spooler as data* and thus will not be interpreted correctly. If you have reports that depend on embedded control codes, you should print those directly to the device, or assign the print file to "-P SPOOLER-DIRECT," as described below.

2.5.1.2 -Q <*printername*>

If you want the Windows spooler to format the pages of your report, but you want to use a particular printer, assign your print file to:

```
PRINTER1 -Q \\printername
```

in the configuration file ("CBLCONFI"). *Printername* is the printer designation as given in the Printers folder under Settings in the Start menu. The name may be up to 80 characters long and contain embedded spaces. The name may not include the semicolon character (;) or be surrounded by single or double quotes. The pages are printed in the manner described in "-P SPOOLER" above. The sample programs "graphprn.cbl" and "prndemox.cbl" contain examples of these functions.

To determine a valid *printername*, use the WIN$PRINTER library routine to obtain the name of the desired printer. (This is described in Appendix I under the WINPRINT-SET-PRINTER operation code in "Specifying a Printer.") Then add the following line to your code:

```
MOVE "-Q \\printername" TO WS-PRINTER-NAME.
```

When the runtime opens a file assigned to "-Q <*printername*>" it sets the Windows print spooler to use this printer. The printer driver must be installed on the computer from which you print. If *printername* is not recognized by the runtime, a dialog box allows you to choose a printer manually.

Note: If you want to access a printer using a UNC path, you have to print directly to the printer by defining PRINTER as "-D PRN". If you use the UNC path, Windows formatting is not supported.

Setting Options

You may also use "-Q <*printername*>" to set several other printing options in the configuration file using the following syntax:

```
<-Q printername>[;option1=x][;option2=x][;option3=x]...
```

The following options may appear in any order. Options not supported by the printer driver are ignored. *Printername* should appear as shown in WINPRINT-NAME, but the options are case insensitive.

Note: The options PITCH, COLS, LINES, and FONT are all mutually dependent. Omitting one or more of these options may cause the resulting printout to look wrong.

DIRECT	Setting DIRECT to "ON" will cause the job to print as if the configuration file was set to "-P SPOOLER-DIRECT" (described in **section 2.5.2** below). This will also disable any use of additional options. Setting DIRECT to the default of "OFF" causes the job to print to the selected printer as if the configuration file was set to "-P SPOOLER".
FONT	Use FONT to specify a single font name. The font name may have embedded spaces, but may not contain double or single quotes. If the font does not exist, the closest matching font is chosen. The runtime does not align columns. If you are printing a report containing columns, you should use a fixed-width font.

PITCH	This value specifies the point size of the font. Pitch does not determine the number of characters per line. If you use a larger pitch, the characters simply appear more crowded. For example, when printing 132 columns, a pitch of 10 will produce better character spacing than a pitch of 12.
COLS	Specifies the number of columns (width) on the page. This number is not validated by the runtime or the spooler. Choose a number of columns that coordinate with the selected font and pitch when designing the report layout.
LINES	Specifies the lines (rows of characters) on the page. This number is not validated by the runtime or the spooler. Choose a number of lines that is compatible with the selected font and pitch when designing the report layout.
ORIENTATION	If your printer supports this feature, ORIENTATION allows you to specify LANDSCAPE or PORTRAIT orientation for the report. The default value of ORIENTATION is driver specific.
COPY	If your printer supports this feature, COPY allows you to specify the number of copies to print.

Examples

To use the Windows spooler with an HP Laserjet printer driver located on SERVER1, and specify the font, font size, width and number of lines in the report, enter the following into CBLCONFI:

```
PRINTER1 -Q \\SERVER1\HP Laserjet IV;FONT=Times New Roman;PITCH=12;COLS=132;LINES=65.
```

To print three copies directly to the printer on a server named GUTENBERG in Landscape orientation, enter the following into CBLCONFI:

```
PRINTER1 -Q \\GUTENBERG\HP Laserjet IV;DIRECT=ON;ORIENTATION=LANDSCAPE;COPY=3
```

2.5.2 Direct Control

If you want to control the format of the printout yourself using embedded control codes, simply assign your print file to "-P SPOOLER-DIRECT" or to "-Q <*printername*>" using the "DIRECT=ON" option. For example, to assign the print job "PRINTER1" to the spooler and retain direct control over formatting, enter the following line in your COBOL configuration file ("CBLCONFI"):

```
PRINTER1  -P  SPOOLER-DIRECT
```

Or, use the following command to assign PRINTER1 to the spooler for printing to a specific printer while retaining direct formatting control:

```
PRINTER1 -Q printername;DIRECT=ON
```

Both of these methods cause the print job to be sent to the printer via the Windows spooler, but the program does not use the spooler to format the pages. You must use embedded control codes to handle formatting (much as you would under UNIX if you used the UNIX spooler).

When using the "-P SPOOLER-DIRECT" option, you may use the WIN$PRINTER library routine to choose a printer. But because you completely control the printer, the various options provided by WIN$PRINTER are ignored. For example, WIN$PRINTER does not set the page size, page orientation, or font. Information returned from WIN$PRINTER, such as number of lines and columns on the page, may not be accurate and should not be used. This subject is discussed in detail in Appendix I "Library Routines" of the ACUCOBOL-GT manual set.

Because some print drivers do not flush the last page, be sure to end your last page with a form-feed (for example, WRITE … BEFORE ADVANCING PAGE). This ensures that all pages are printed. The ACUCOBOL-GT runtime ensures that no extra blank pages are printed at the end.

If you code WRITE…AFTER ADVANCING PAGE instead of WRITE…BEFORE ADVANCING PAGE, you might receive a blank last page. This is because a blank line written on the new page causes the

Windows subsystem to flush the page for some print drivers. ACUCOBOL-GT ensures that entirely empty lines are not sent to the device (only the form-feed will be sent). But it is essential that:

1. you have specified trailing space removal in your COBOL code (the default for print files).
2. you have set the configuration option MIN-REC-SIZE to “0”.

Your other option is to specify WRITE… BEFORE ADVANCING PAGE to avoid this potential problem.

If the user looks for the job in the spooler, it is named with the current title of the ACUCOBOL-GT window.

2.5.3 Printing Multiple Jobs Simultaneously

If you need to print multiple jobs at the same time, you must open multiple File Descriptors that point to “-P SPOOLER” or “-P SPOOLER-DIRECT” simultaneously. For example, you may have two simultaneous print jobs:

```
SELECT FIRST-FILE
       ASSIGN TO PRINTER "-P SPOOLER".

SELECT SECOND-FILE
       ASSIGN TO PRINTER "-P SPOOLER".

..PROCEDURE DIVISION.

..

       OPEN OUTPUT FIRST-FILE.
       OPEN OUTPUT SECOND-FILE.
```

and both will print to the default Windows printer without interfering with each other. You can call WIN$PRINTER USING WINPRINT-SETUP before one or both of the OPEN statements. Each file may have individual file status variables, or may refer to a common file status variable.

This does not mean that you can open a single File Descriptor multiple times. For example, the following will return file status indicating that the file is already opened:

```
SELECT FIRST-FILE
       ASSIGN TO PRINTER "-P SPOOLER".

..

PROCEDURE DIVISION.

..

       OPEN OUTPUT FIRST-FILE.
       OPEN OUTPUT FIRST-FILE.
```

This is normal behavior and is consistent with the way file handling is implemented in COBOL and in other programming languages.

If you are using only the verbs OPEN, CLOSE and WRITE, no further changes to your code are needed. If you are using WIN$PRINTER functionality (other than WINPRINT-SETUP) you will need to specify which print job is affected. This can be done in two ways:

1. The simplest way is to execute the WIN$PRINT operation immediately after an OPEN or WRITE statement on the intended job. Every execution of OPEN and WRITE sets the current job as the default so that subsequent activity using WIN$PRINTER is automatically directed to the job that was last accessed with an OPEN or WRITE statement.

   In this situation, if you have multiple jobs running, and you close one of them, the runtime switches to the next job in the list. For example, if you are printing jobs 1, 2 and 3, and you close job 2, the close command sets the current job to 3. If there is no job 3, the runtime attempts to set to the job that preceded the closed job (which in this case is job 1). If there are no jobs, the current job is initialized.

2. The other method is to use the WINPRINT-SET-JOB operation of the WIN$PRINTER library routine. This operation is described in Appendix I of the ACUCOBOL-GT manual set.

3 UNIX Installation

Key Topics

3.1 License Files for UNIX

UNIX customers may request a license file for one or more users.

When you receive your product(s) the package includes product codes and product keys for every product you ordered. You must have the product codes and product keys to create the license file.

The Activator utility

The Activator utility automates the process of creating a license file. On UNIX platforms the Activator operates through a command line interface.

The Activator program (**activator**) is placed in the same directory as the runtime and other binary executable files by default.

If for some reason you did not install the Activator with your other products, simply copy the file onto your computer and run it as you would any other executable.

Changing or updating your UNIX license file

If you need to alter your license file, contact your Micro Focus ***extend*** representative for updated product codes and product keys. When you receive them, launch the Activator and enter the new product codes and product keys as prompted.

3.2 Installation Under UNIX

To install ***extend*** products on UNIX or Linux systems, you must have the product media and product codes and product keys for the products you licensed. Your products may be delivered via FTP, CD-ROM, or tape. Refer to the appropriate installation instructions below. FTP installs follow the same instructions as CD-ROM (except for the mounting steps).

3.2.1 Installation from CD-ROM or FTP

1. Insert the CD-ROM containing your products into the appropriate drive and mount it using the appropriate "mount" command for your operating system.

Note: If you are mounting a CD-ROM on HP/UX 11.0, use the following mount command:

```
    mount -F cdfs -o cdcase,nosuid /dev/dev mountpoint
```

where *dev* is the CD-ROM device assignment.

- If using FTP, download the product from the Micro Focus supportline site. Using a tar command, extract the files in the archive to your installation directory. For example:

```
tar-xvf archive-name.tar
```

2. Change to the mount directory and type:

```
    ./install
```

Follow the instructions on the screen to select the specific platform, installation directory, and products to be installed. If you select a directory that contains a previous version of ***extend*** products you are prompted and asked if you want to view a list of files that will be overwritten, and if you want to proceed with the overwrite. If you then select not to proceed the installation is stopped, which enables you to go back and select a different directory.

Note: For AIX version 5.1 and later, HP-UX version 11 and later, and Solaris version 7.0 and later, ACUCOBOL-GT products may be distributed as shared object libraries. If you install ACUCOBOL-GT as a shared object library and you don't install to the default location, you need to set an appropriate library path variable specifying the location of the shared objects. For example, on an AIX system, you would need to set the LIBPATH environment variable. Note that if you log in as root or superuser, this variable must also be set in root's environment in order for ACUCOBOL-GT to start. Additionally, see **Section 3.2.3** for information on the SHARED_LIBRARY_PREFIX variable.

Tip: If you choose the default installation directory (/opt/acucorp/8*xx*), you may want to create a symbolic link to a version-independent directory such as "/opt/acu". This allows you to use "opt/acu/bin" in your PATH setting and "/opt/acu/lib" in your shared library path setting.

3. After your products are installed, the Activator starts automatically. At the prompt, type the product code and product key that came with your product package. When you press **Enter** after typing in each code and key pair, the license file is updated. Repeat this cycle until the code/key pairs for each product you have ordered are entered.

Note: Each product searches for its license file in the same directory where its executable resides. If you move the product's executable to a new directory, you must move its license file to the same location.

4. Start the **acushare** license manager service by entering "**acushare -start"** at the command line.

5. Go to the "sample" subdirectory and try compiling and running the "tour" program with the following commands:

```
ccbl   tour.cbl
runcbl tour.acu
```

6. If you get the message "Can't find entry for '*terminal*' in '*term-lib*'", you need to configure your terminal for ACUCOBOL-GT. See **section 1.5, "Configuring Your Terminals."**

7. Once you have the sample program running, you may want to edit the "cblconfig" file supplied with ACUCOBOL-GT to meet the needs of your site. In particular, you should configure it to support the printers you have attached to your system. The chapter called "Compiler and Runtime" in the *ACUCOBOL-GT User's Guide* contains details about the configuration file.

8. If you are using shared memory, see the instructions for configuring **acushare** that are located in section 2.11 of the *ACUCOBOL-GT User's Guide*.

Please read the “RELEASE” file. The “RELEASE” file (if present) describes changes to the product that are not covered in the documentation.

3.2.2 Installation from Tape

Your products are shipped on tape using either TAR or CPIO format, depending on the target machine. The media label shows which format is used, along with any other pertinent information.

1. Insert the tape into the appropriate drive.
2. Create a new directory for the product.
3. Move to this directory on your machine and then type one of the following commands depending on the archive type indicated on the label:

   ```
   tar xfv device
   ```

   or

   ```
   cpio -icvBd < device
   ```

   where *device* is the appropriate hardware device name (for example, “/dev/rfd0” or “/dev/rmt0”). This extracts your product files and install them on your machine.
4. After the products are installed, start the Activator from the “/bin” subdirectory.

   Note: Each product searches for its license file in the same directory where its executable resides. If you move the product’s executable to a new directory, you must move its license file to the same location.

5. At the prompt, type the product code and product key that came with your product package. When you press **Enter** after typing in each code and key pair, the license file is created. Repeat this cycle until the code/key pairs for each product you have ordered are entered.
6. Start the **acushare** license manager service by entering **“acushare -start”** in the command line.

7. Move to the directory that contains the sample programs and try compiling and running the **tour** program with the following commands:

   ```
   ccbl   tour.cbl
   runcbl tour.acu
   ```

   Note: If you get the message "Can't find entry for '*terminal*' in '*term-lib*'", you need to configure your terminal for ACUCOBOL-GT. See **section 1.5, "Configuring Your Terminals."**

8. Once you have the sample program running, you may want to edit the "cblconfig" file supplied with ACUCOBOL-GT to meet the needs of your site. In particular, you should configure it to support the printers you have attached to your system. The chapter called "Compiler and Runtime" in the *ACUCOBOL-GT User's Guide* contains details about the configuration file.

9. If you are using shared memory, see the instructions for configuring **acushare** that are located in section 2.11 of the *ACUCOBOL-GT User's Guide*.

Please read the "RELEASE" file. The "RELEASE" file (if present) describes changes to the product that are not covered in the documentation.

3.2.3 SHARED_LIBRARY_PREFIX Configuration Variable

If you install ACUCOBOL-GT as a shared object library and you don't install to the default location, you need to set an appropriate library path variable (LIBPATH or LD_LIBRARY_PATH) specifying the location of the shared objects. The SHARED_LIBRARY_PREFIX variable helps the runtime find libclnt.so (or libclnt.sl) in case the LIBPATH (or LD_LIBRARY_PATH, etc) variable is not set. libclnt.so (or .sl) is needed for AcuServer and AcuConnect support.

If a shared library name is specified without any directory information and the system call fails to load the shared library, the runtime will try to load the shared library from each of the directories specified in the SHARED_LIBRARY_PREFIX configuration variable.

The default value for SHARED_LIBRARY_PREFIX is "/opt/acucorp/*8xx*/lib /opt/acu/lib". The format of the value of SHARED_LIBRARY_PREFIX is the same as FILE_PREFIX. You can set SHARED_LIBRARY_PREFIX in the configuration file, environment or programatically with the SET verb. Note that the runtime searches for and loads libclnt.so (or libclnt.sl) using the default value of SHARED_LIBRARY_PREFIX. This happens before reading the configuration file, environment, or running any COBOL code.

You can set SHARED_LIBRARY_PREFIX to an empty value if you do not want to use it.

Also, if the license is for AcuTSL, in a transactional server environment such as CICS, then the runtime will add /opt/acucorp/*8xx*/bin/runcbl.1lc and /opt/acu/bin/runcbl.1lc to its list of license files to check. First the runtime checks $ACUCOBOL/etc/license.acu, then /etc/license.acu. If neithe exists, then the runtime will check /opt/acucorp/8xx/bin/runcbl.1lc and finally /opt/acu/bin/runcbl.1lc.

In cases where users install ACUCOBOL-GT in the default location, /opt/acucorp/*8xx* or /opt/acu, and they have a license file, runcbl.1lc in their bin directory, they will not need to copy the license to /etc/license.acu.

4 VMS and OpenVMS Installation

Key Topics

4.1 Before You Begin

This chapter contains instructions for installing ***extend*** products on VAX, AXP, and IA64 systems running OpenVMS. Unless otherwise indicated, “OpenVMS” refers to both VMS and OpenVMS operating systems.

Products are shipped for OpenVMS on VAX machines in Saveset format (*.BCK). The software does not have to be installed on the system disk. However, to use it within an OpenVMS-Cluster, it is advisable to install it on a disk that is accessible from all nodes in the cluster.

We recommend creating a separate directory for each version similar to the structure shown below:

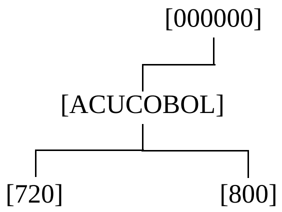


Table 1: Recommended directory structure

4.2 License Files for VMS

You may request a license file for one or more users. Note that this is different from an OpenVMS License-PAK.

When you receive your products the package includes product codes and product keys for every product you have ordered. You must have the product codes and product keys to create the license file using the Activator utility.

The Activator utility

The Activator utility operates as a command-line interface for adding new or updated product codes and product keys.

On VMS platforms, the Activator (**activator.exe**) is installed in the same directory as the runtime and other binary executable files by default.

Changing or updating your VMS license file

If you need to alter your license file information, contact your Micro Focus ***extend*** representative for updated product codes and product keys. When you receive them, launch the Activator and enter the new information as prompted.

4.3 Installation Steps

You need product codes, product keys, and the product media available to perform the installation. The installation process involves three main steps: create directories, extract the files from the Saveset onto your machine, then copy certain files to specific directories.

Perform these installation steps using the SYSTEM account:

1. Create the directories where you want your files to reside. These instructions use the directory structure depicted in Section 4.1, **table 1** and is referred to as "path".

2. If the product files reside on a CD-ROM or tape, first make the media accessible for the system. For example, to extract the files from a CD-ROM in device DQA0:, insert the CD-ROM into drive DQA0:, then type the following commands:

   ```
   ALLOCATE DQA0:
   MOUNT/NOASSIST/OVERRIDE=IDENTIFICATION DQA0:
   ```

   These commands reserve the device so that no other process can access it. If you misspelled the device specification, or the device is already in use, you will get a corresponding message after a short while.

3. Identify the directory in which the Saveset resides by entering the following command. You will need this information to extract the product files in the next step.

   ```
   DIRECTORY DQA0:[000000…]*.BCK
   ```

The Saveset is called “COBOL.BCK” and typically resides in a directory called “[ACUCOBOL]”. If you find more than one Saveset and you do not know which one to use, contact Micro Focus.

4. Extract the files from the Saveset to the directory where the files should be installed. For example:

   ```
   SET DEFAULT DKA100:[ACUCOBOL.800]
   ```

   Then enter the command:

   ```
   BACKUP/LOG DQA0:[ACUCOBOL]COBOL.BCK/SAVE_SET
   DKA100:[ACUCOBOL.800…]*
   ```

   Note that the two lines above are one command, and that the qualifier “/SAVE_SET” is always required when accessing Savesets on disks.

   After extracting the release files from the product media, read the “RELEASE” file if present. The RELEASE file contains changes to the compiler not covered in the documentation.

   If you copied the Saveset via FTP to your system, use the BACKUP command above, replacing the source specification with the name and path of your Saveset.

5. Define symbols so that users can access the executables. Define one symbol each for the compiler, the runtime system, the object file utility and the Vision file utility for every user who will use ACUCOBOL-GT. You also need to define a symbol for the Activator utility for the system administrator. If you are installing AcuConnect, define a symbol for that product as well. If you want to allow everyone to have access to an executable, you can place the command in the “SYS$MANAGER:SYLOGIN.COM”. Otherwise, place it in the “LOGIN.COM” file for each user who requires access.

   Use the following commands to define these symbols:

   ```
   CCBL == “$disk:[directory]CCBL.EXE”
   RUNCBL == “$disk:[directory]RUNCBL.EXE”
   CBLUTIL == “$disk:[directory]CBLUTIL.EXE”
   VIO == “$disk:[directory]VIO.EXE”
   ACTIVATOR == “$disk:[directory]ACTIVATOR.EXE”
   ACURCL == “$disk:[directory]ACURCL.EXE”
   ```

Using the directory structure depicted in **Section 4.1**, table 1, the first command would look like this:

```
CCBL == "$DKA100:[ACUCOBOL.800.ACUROOT.BIN]CCBL.EXE"
```

Log out and back in to get the ACUCOBOL symbols defined for you.

Note: The use of the dollar sign indicates to VMS that these symbols represent executable programs.

6. Copy the file "A_TERMS.DAT" to the SYS$LIBRARY directory. Make sure it has read and execute permission for everyone by using the following command:

   ```
   SET SECURITY/PROTECTION=(W:RE) SYS$LIBRARY:A_TERMS.DAT
   ```

7. Copy the file "CBLHELP.DAT" to the SYS$HELP directory. Make sure it too has read and execute permission for everyone by using the following command:

   ```
   SET SECURITY/PROTECTION=(W:RE) SYS$HELP:CBLHELP.DAT
   ```

8. Copy the file "A_CONFIG.DAT" to the SYS$LIBRARY directory. You may need to edit this file. In particular, you should configure it to support the printers you have attached to your system. The *ACUCOBOL-GT User's Guide* Chapter 2, Compiler and Runtime, contains details about the configuration file.

9. Change to the directory where your executables reside and start the License Activator by issuing the command:

   ```
   ACTIVATOR
   ```

10. At the prompt, type the product code and product key that came with your product package. When you press **Enter** after typing in each code and key pair, the license file is created. Repeat this cycle until the code/key pairs for each product you have ordered are entered.

11. Change your DEFAULT to the directory that contains the ACUCOBOL-GT sample programs. (For example: SET DEFAULT DKA100:[ACUCOBOL.800.ACUROOT.SAMPLE]). Then try compiling and running the "tour" demonstration program with the following commands:

    ```
    CCBL TOUR.CBL
    RUNCBL TOUR
    ```

Note: The compiler and runtime make use of the VAX shared library “vaxcrtl.exe”. This file must be in the SYS$SHARE directory. Install this file as a shared image for multi-user performance.

If you have a VT100-compatible terminal, you should be able to run this program. To make use of some of the more advanced features of your particular terminal (or if you do not have a VT100 compatible), configure your terminal as outlined in the *ACUCOBOL-GT User’s Guide* Chapter 4, Terminal Manager.

12. For AcuConnect, create a server access file and set user account quotas to define each user's capabilities. Refer to section 6.2.2.4, Installing AcuConnect on an OpenVMS server in the *AcuConnect User's Guide* for information about these settings.

5 HP e3000 Installation

Key Topics

5.1 Introduction

This chapter contains instructions for installing ***extend*** products on HP e3000 machines running the MPE/iX operating system. Your system must run MPE/iX Release 5.0, or later. Products are shipped in MPE/iX STORE or POSIX TAR format.

Compatibility between ACUCOBOL-GT and HP e3000 COBOL is described in detail in Chapter 4 of *Transitioning to ACUCOBOL-GT.*

5.2 File System Syntax

There are some differences between the file organization system used by MPE/iX and the system used by ACUCOBOL-GT. This can affect your installation.

MPE/iX vs. HFS

The MPE/iX environment typically uses FILE.GROUP.ACCOUNT syntax for specifying files and directories. With ACUCOBOL-GT, you can also use Hierarchical File System (HFS) syntax. This system arranges the account, group, and file in a different order. It also uses slashes instead of dots to separate accounts, groups, and files. Files specified using HFS are case sensitive, can have file extensions, names longer than eight characters, and allow multiple levels of directories. For example, the following path:

```
/ACUCOBOL/sample/def/acucobol.def
```

refers to a file called “acucobol.def” in a subdirectory called “def” which is in a subdirectory called “sample” in a directory (or account) called “ACUCOBOL”.

If you use standard MPE/iX syntax, you can only reference MPE files. If you use HFS syntax, you can reference both HFS and MPE files.

Note: Most ACUCOBOL-GT files and directories must be specified using the HFS syntax. This means that, in some cases, you will not be able to use MPE syntax.

LISTF vs. LISTFILE

The LISTF command in MPE/iX does not display HFS files. You must use the LISTFILE command instead. Hewlett-Packard made this decision to minimize the chances of conflicts between files using HFS syntax and existing uses of LISTF.

Even with MPE/iX commands like LISTFILE, you will not be able to see all of the ACUCOBOL-GT files unless you give the commands to look for HFS files. For example:

```
:LISTFILE @
```

shows only files that conform to standard MPE notation. Instead, use the following command:

```
:LISTFILE ./@
```

to show MPE files and HFS files. The prefix of "./" allows MPE/iX to use HFS notation so the program looks for MPE and HFS files in the current directory.

You may also use a wildcard (such as "@", "?", or "#") to reference HFS files, or a leading slash ("/") character to look for MPE and HFS files in a location that starts from the root. For example, if you are in the PUB.ACUCOBOL group and want to move to the ACUCOBOL-GT "bin" directory and list a file called "ccbl", you would type:

```
:CHDIR /ACUCOBOL/bin
:LISTFILE /ACUCOBOL/bin/ccbl
```

or

```
:CHDIR ../bin
:LISTFILE ./ccbl
```

The ".." prefix specifies the directory above the current working directory (the parent directory of the current working directory). For example, if you are in the PUB.ACUCOBOL group:

```
:LISTFILE ..
```

is equivalent to:

```
:LISTFILE /ACUCOBOL
```

Note: When purging or manipulating files it is important that you do not confuse HFS file extensions with MPE/iX groups or accounts. For example:

```
program.acu
```

is an HFS filename with a file extension of ".acu". This should not be confused with:

```
PROGRAM.ACU
```

which could be an MPE/iX group called "PROGRAM" in an account called "ACU".

5.3 License Files for HP e3000

When you receive your products the package includes product codes and product keys for every product you ordered. You must have the product codes and product keys to create the license file using the Activator utility.

You may request a license file for one or more users.

Note: If you change the location of a program executable, you must also move the corresponding license file.

The Activator utility

The Activator utility creates new or updated license files from the product codes and product keys.

On HP e3000 platforms, the Activator (activator) is installed in the same directory as the ACUCOBOL-GT runtime and other binary executable files.

Changing or updating your HP e3000 license file

If you need to alter your license file information, contact your Micro Focus ***extend*** representative for updated product codes and product keys. When you receive them, launch the Activator and enter the new information as prompted.

5.4 Installation on HP e3000 Machines

You will need to have your product codes and product keys and the product media available to perform this operation. The following sections use HFS file syntax to specify files and directories. Refer to **section 5.2** for more information.

Note: In the following sections, we assume you are installing products into an account named “ACUCOBOL” using the installation defaults. You can install your products in a different account, but make sure to edit the permissions for that existing account as described below.

5.4.1 Before Installing ***extend*** Products

Before installing your products, log in as MANAGER.SYS and check to see if the ACUCOBOL account exists:

```
:HELLO MANAGER.SYS
:LISTACCT ACUCOBOL
```

If the ACUCOBOL account already exists, use the following command to make sure the ACUCOBOL-GT User Defined Command (ACUUDC) file is *not* cataloged:

```
:SHOWCATALOG
```

The ACUUDC file sets the environment variables needed to run ACUCOBOL-GT. If ACUUDC.PUB.ACUCOBOL is cataloged, it must be removed (uncataloged) or renamed and all users and jobs that have ACUUDC cataloged must log out before installation is performed. Otherwise, you will get an error saying the file is already in use. If ACUUDC was cataloged at the account level, you can remove it by typing:

```
:SETCATALOG ACUUDC.PUB.ACUCOBOL;ACCOUNT;DELETE
```

Another method (that does not require all users and jobs that have ACUUDC cataloged to log out) is to overwrite the version of ACUUDC that is currently cataloged with the following command:

```
:MV.HPBIN.SYS “-f /ACUCOBOL/PUB/ACUUDC /ACUCOBOL/PUB/ACUUDC.inuse”
```

The MV.HPBIN.SYS command allows you to move a file even though it is in use. The “-f” option does the move without asking for confirmation. This renames the ACUUDC currently in use so that the RESTORE can create and catalog a new file with the same name.

If you get a message saying that the ACUCOBOL account is a “Non-existent account” when performing the LISTACCT command, then create the account with the following commands:

```
:NEWACCT ACUCOBOL,MGR
:ALTACCT ACUCOBOL;CAP=+PH;ACCESS=(R,X:ANY;W,A,L:AC)
:ALTUSER MGR.ACUCOBOL;CAP=+PH
:ALTGROUP PUB.ACUCOBOL;CAP=+PH
```

The “CAP=+PH” capability must be included because some ACUCOBOL-GT programs require the Process Handling (PH) capability. If a program resides in the HFS system, the user executing it must have PH capability. If a program resides in the MPE/iX group and has an MPE/iX name, the user does not have to have PH capability, but the MPE/iX group does. For example:

```
/ACUCOBOL/bin/ccbl
```

requires the user to have PH capability but:

```
CCBL.PUB.ACUCOBOL
```

does not, as long as the PUB.ACUCOBOL group has the PH capability added to it. If you do not want the user to have to have PH capability, then move the programs you want to run from the /ACUCOBOL/bin directory to a valid MPE/iX group and change the name to uppercase. For example:

```
:COPY /ACUCOBOL/bin/ccbl CCBL.PUB.ACUCOBOL
```

If your products are on a DAT tape in MPE/iX STORE format, follow the directions in **section 5.4.2** to install them within the MPE/iX shell.

If your products are on a DAT tape in POSIX TAR format, follow the directions in **section 5.4.4** to install them within the POSIX shell.

If your products are delivered on a CD-ROM, mount the CD-ROM, FTP the archived file to your HP e3000 machine and follow the directions in the appropriate section for the file format.

5.4.2 Installing Products Within the MPE/iX Shell

Note: You must have system manager (SM) or system supervisor (OP) capability to perform the following procedures.

1. Extract the contents of the MPE/iX STORE archive with the following command:

   ```
   :FILE T;DEV=TAPE
   :RESTORE *T;@.@.@;SHOW;TREE;ACCOUNT=ACUCOBOL;CREATE;CREATOR=MGR
   ```

   The "TREE" option is required because most files are in HFS format. The "TREE" option tells RESTORE to recursively scan and include all files below the specified wildcards or directories. The "ACCOUNT=ACUCOBOL" option is required to switch the file's account as you install (RESTORE) it from tape because a different account was used in the creation of the installation archive. The "CREATE" option recreates account, group, creator, or HFS directories if needed. The "CREATOR=MGR" option changes the creator of the files to MGR.

   If you get the following error message:

   ```
   EXCLUSIVE VIOLATION: FILE ACCESSED EXCLUSIVELY
   (FSERR 91) /ACUCOBOL/PUB/ACUUDC NOT RESTORED:
   DISC FILE IN USE, CANNOT PURGE
   ```

   then you did not remove or rename ACUUDC before doing the RESTORE. Remove or rename ACUUDC as described **section 5.4.1**, and perform the RESTORE again.

   If you get the following error message:

   ```
   SPECIFIED ACCOUNT DOES NOT EXIST
   ```

   then you did not create an account for ACUCOBOL prior to installation. Create the account as described in **section 5.4.1**, and perform the RESTORE again.

2. Change the access permissions for the "/ACUCOBOL/bin" and "/ACUCOBOL/etc" directories so that you can access ACUCOBOL-GT commands from other accounts:

```
:CHMOD.HPBIN.SYS "755 /ACUCOBOL/etc"
:CHMOD.HPBIN.SYS "755 /ACUCOBOL/bin"
```

These commands allow read, write, and execute ability for the owner (7--), read and execute ability for the group (-5-), and read and execute ability for everyone else (--5). The CHMOD.HPBIN.SYS and MKDIR.HPBIN.SYS commands are used because these are HFS format directories.

Note: If you are using ***extend's*** Thin Client technology, you must also create the "/etc" directory that is used by the AcuAccess file using the following command:

```
    :MKDIR.HPBIN.SYS "/etc"
```

For more information about thin client and the AcuAccess file, refer to the *AcuConnect User's Guide*.

---

3. Make sure the UDC for ACUCOBOL-GT, "ACUUDC.PUB.ACUCOBOL", is cataloged with the following command:

   ```
   :SHOWCATALOG
   ```

   This UDC sets the environment variables needed to run ACUCOBOL-GT. If you want to make this a logon UDC, add the "OPTION LOGON" line to ACUUDC. This can only be done if you do not already have a logon UDC for the specified level. *MPE/iX only recognizes one logon UDC for each level*. If a logon UDC exists, you can add ACUUDC to the existing logon UDC at that level. If ACUUDC is not cataloged, catalog it at the desired level. For example, use the following command to catalog and activate the UDC at the account level:

   ```
   :SETCATALOG ACUUDC.PUB.ACUCOBOL;APPEND;ACCOUNT
   :ACUUDC
   ```

   Start the Activator utility to create the product license files.

   ```
   :/ACUCOBOL/bin/activator
   ```

4. At the prompt, type the product code and product key that came with your product package. When you press **Return** after typing in each code and key pair, the license file is created. For example:

```
:/ACUCOBOL/bin/activator
Enter the product code []: 2EKAAAKNNVDA6KJBSWAA
Enter the product key []: 9XFKJGKNNU7Z
```

If you have another set of product codes and keys to enter, run the Activator again. (Repeat this step until all code and key pairs are entered.) You can use the REDO command to recall the Activator utility.

5.4.3 Verifying Your MPE/iX Installation

Once your products are installed, you can verify that the installation was successful by compiling and running the "TOURHP" program. (Refer to Chapter 4 in *Transitioning to ACUCOBOL-GT* for detailed information about compiling and running programs in the HP e3000 environment.)

To test your installation, log into your own account. Make sure the account has the PH capabilities described in **section 5.4.1** (if needed), and that "ACUUDC.PUB.ACUCOBOL" has been cataloged. Then compile and run the "TOURHP" program. TOURHP is a special sample program for HP e3000 users that demonstrates how to use the ACUCOBOL-GT compiler and runtime and creates a small KSAM file:

1. Go to the ACUCOBOL-GT "sample" directory that contains sample COBOL source files:

   ```
   :CHDIR /ACUCOBOL/sample
   ```

2. Compile the sample program named TOURHP:

   ```
   :ccbl "-cp -gd -v TOURHP"
   ```

   Most of the ACUCOBOL-GT files are case sensitive. Be sure that **ccbl** is lowercase. In the command shown above, the "-cp" option places the ACUCOBOL-GT compiler in HP COBOL compatibility mode. The compiler will automatically select a file with the ".cbl" extension. The "-gd" option includes source code information in the compiled object for use with the interactive debugger. Finally, the "-v" option places the compiler in "verbose" mode so that you will see messages displaying the compiler's status. When you press ENTER after typing this command, you should see the following messages:

```
Start TOURHP
   Data Division
   Procedure Division
   Including Debugging Info
   Writing Code Addresses
Compilation complete
```

If you get an error similar to the following:

```
Unknown command name. (CIERR 975)
```

It is probably because the path for **ccbl** was not added to your HPPATH environment variable. You can check this by typing:

```
:SHOWVAR HPPATH
```

If the HPPATH is incorrect, you might see the following:

```
HPPATH = !HPGROUP,PUB,PUB.SYS,ARPA.SYS
```

Normally when ACUUDC is cataloged it will add "/ACUCOBOL/bin" to your path. Verify that ACUUDC is cataloged. If you do not want to add "/ACUCOBOL/bin" to HPPATH, you will have to specify the full or relative pathname as follows:

```
:/ACUCOBOL/bin/ccbl "-cp -gd -v TOURHP"
```

If you don't want to use ACUUDC, and prefer to type commands that are in the "/ACUCOBOL/bin" directory without having to enter the full or relative pathname, you can type:

```
:SETVAR HPPATH “!HPPATH,/ACUCOBOL/bin”
```

to set the HPPATH variable.

3. Compiling the "TOURHP" program creates an object file in the same directory with the same prefix, "TOURHP", but with an extension of ".acu". (For more examples of how to compile your programs and what options are available, refer to Chapter 4 in *Transitioning to ACUCOBOL-GT*.) Use the LISTFILE command to display the compiled object:

```
:LISTFILE ./TOURHP@
```

If you use the wildcard as shown, this should display “TOURHP” (the source COBOL program) and “TOURHP.acu” (the compiled object). The compiled object is ready to run using the ACUCOBOL-GT runtime system. No linking is required. If you use the following LISTFILE command:

```
:LISTFILE NEWKFILE,2
```

you should get a message indicating that the file “NEWKFILE” does not exist. This is the expected behavior. It simply means that the KSAM file that will be created by running the TOURHP program does not yet exist.

4. Now run the compiled program with the following command:

```
:runcbl "-c CNFGVAR TOURHP"
```

In this case, the “-c” option tells the runtime to look for the configuration file named “CNFGVAR”. This file sets the variable “DEFAULT_HOST” to “KSAM”, causing the runtime to create KSAM files instead of Vision files. The runtime automatically selects a file with the “.acu” extension. If you run the same LISTFILE command indicated in step 3, you will see that a KSAM file named “NEWKFILE” has been created.

If you get the message “Can’t find entry for *terminal* in /ACUCOBOL/etc/a_termcap”, you need to configure your terminal for ACUCOBOL-GT. This is set in the ACUUDC with the following command:

```
:SETVAR A_TERM "hp"
```

You can verify this by typing:

```
:SHOWVAR A_TERM
```

For more information on configuring your terminal for ACUCOBOL-GT, see Chapter 4 of the *ACUCOBOL-GT User’s Guide*.

5. When you have the “TOURHP” program running, you may want to set a configuration file to support the printers you have attached to your system. You may edit the “CNFGVAR” file supplied with the “TOURHP” program or the “/ACUCOBOL/etc/cblconfi” file supplied with ACUCOBOL-GT. (The “cblconfi” file is used by default, unless

you specify a different file with the “-c” runtime option.) For more information about working with the configuration file, see section 2.7 of the *ACUCOBOL-GT User’s Guide*.

Note: EDITOR/iX cannot edit HFS files, so you need to use an editor that can, or move the file to a valid MPE/iX group using an MPE/iX name in uppercase.

---

6. Read the “RELEASE” file (if present). It describes changes to the products not covered in the documentation. You can see if this file exists by typing:

```
:LISTFILE /ACUCOBOL/RE@
```

You can display it on the screen using the PRINT command. For example:

```
:PRINT /ACUCOBOL/RELEASE
```

5.4.4 Installing Products Within the POSIX Shell

1. Begin by invoking the POSIX shell with the following command:

```
:SH
```

2. Extract the contents of the TAR archive with the following commands:

```
shell/iX> cd /ACUCOBOL
shell/iX> tar xovf name
```

where *name* is the tape device name (for example, “/dev/rmt0”) or the name of the TAR file (“mpeix_7*x*.tar”).

Note: TAR format creates byte stream files that may conflict with existing file formats. If you have an existing installation of ACUCOBOL-GT and you get errors when extracting the archive, you should remove any existing files from the destination directory before installing your products.

---

3. Set your PATH environment variable so the ACUCOBOL-GT commands can be found:

   ```
   shell/iX> export PATH="$PATH:.:/ACUCOBOL/bin"
   ```

4. After the files are installed, run the **mpinst** command. For example:

   ```
   shell/iX> mpinst
   ```

   If you get the following error:

   ```
   mpinst: not found
   ```

   your PATH environment variable is not set correctly. Make sure you are in the correct directory (as described in step 2 above) and use the full pathname for the **mpinst** command, for example:

   ```
   shell/iX> cd /ACUCOBOL
   shell/iX> /ACUCOBOL/mpinst
   ```

   The mpinst install script:

   - Alters the capabilities and access for the ACUCOBOL account. Other accounts that use ACUCOBOL-GT should have, at least, the following capabilities:

Account:	ND,SF,BA,IA,PH
User:	ND,SF,BA,IA,PH
Group:	BA,IA,PH

   - If necessary, converts the files read from the TAR archive to what MPE/iX expects. It converts the files because files read from archives in TAR format are created as byte stream files on MPE/iX.
   - Sets up a link needed for printing from the POSIX shell. For more information on printing, see **section 5.5, "Printing from the MPE/iX POSIX Shell."**
   - Sets file permissions and ownership to the ACUCOBOL account.
   - Copies a library needed for relinking the runtime to the "/lib" directory.

5. Once your products have been installed, start the Activator from the "/bin" subdirectory.

   ```
   shell/iX> /ACUCOBOL/bin/activator
   ```

6. At the prompt, type the product code and product key that came with your product package. When you press **Return** after typing in each code and key pair, the license file is created. Repeat this cycle until the code/key pairs for each product you have ordered are entered.

5.4.5 Verifying Your POSIX Installation

Once your products are installed, you can verify that the installation was successful by compiling and running the "TOURHP" program. (Refer to Chapter 4 in *Transitioning to ACUCOBOL-GT* for detailed information about compiling and running programs in the HP e3000 environment.)

To test your installation, log into your account. Then make sure the account has the PH capabilities for "Account," "User," and "Group" established in **section 5.4.1** (if needed). Then compile and run the "TOURHP" program. TOURHP is a special sample program for HP e3000 users that demonstrates how to use the ACUCOBOL-GT compiler and runtime. It also creates a small KSAM file.

1. Invoke the POSIX shell with the following command (cataloged in step 3 of **section 5.4.2**):

   ```
   :SH
   ```

2. Type the following environment variables at the shell prompt (on the third line below, "hp" is just an example; substitute the correct name of the terminal you are using):

   ```
   shell/iX> export PATH="$PATH:/ACUCOBOL/bin"
   shell/iX> export A_TERMCAP="/ACUCOBOL/etc/a_termcap"
   shell/iX> export A_TERM="hp"
   ```

   Note: If you do not want to type these variables each time you invoke the POSIX shell, set them in your ".profile" file.

3. Go to the sample directory and compile the "TOURHP" program:

   ```
   shell/iX> cd /ACUCOBOL/sample
   shell/iX> ccbl -cp -gd -v TOURHP
   ```

   In the command shown above, the "-cp" option places the ACUCOBOL-GT compiler in HP COBOL compatibility mode. The compiler will automatically select a file with the ".cbl" extension. The "-gd" option includes source code information in the object file for use with the interactive debugger. Finally, the "-v" option places the compiler in "verbose" mode so that you will see messages displaying the compiler's status. When you press ENTER after typing this command, you should see the following messages:

   ```
   Start TOURHP
      Data Division
      Procedure Division
      Including Debugging Info
      Writing Code Addresses
   Compilation complete
   ```

   Compiling the "TOURHP" program creates an object file in the same directory with the same prefix, "TOURHP", but with an extension of ".acu".

4. Now run the compiled program with the following command:

   ```
   shell/iX> runcbl -c CNFGVAR TOURHP
   ```

   In this case, the "-c" option tells the runtime to look for the configuration file named "CNFGVAR". This file sets the variable "DEFAULT_HOST" to "KSAM", causing the runtime to create KSAM files instead of Vision files. The runtime automatically selects a file with the ".acu" extension. The "TOURHP" application creates a small KSAM file.

Note: If you get the message "Can't find entry for terminal in /ACUCOBOL/etc/a_termcap ", then you need to configure your terminal for ACUCOBOL-GT. For more information, see Chapter 4 of the *ACUCOBOL-GT User's Guide*.

5. When you have the “TOURHP” program running, you may want to set a configuration file to support the printers you have attached to your system. You may edit the “CNFGVAR” file supplied with the “TOURHP” program or the “/ACUCOBOL/etc/cblconfi” file supplied with ACUCOBOL-GT. (The “cblconfi” file is used by default, unless you specify a different file with the “-c” runtime option.) For more information about working with the configuration file, see section 2.7 of the *ACUCOBOL-GT User’s Guide*.

   Note: EDITOR/iX cannot edit HFS files, so you need to use an editor that can, or move the file to a valid MPE/iX group using an MPE/iX name in uppercase.

6. Read the “RELEASE” file (if present). It contains changes to the products not covered in the documentation.

7. You can display the “RELEASE” file using the **more** command from the shell. For example:

   ```
   shell/iX> more /ACUCOBOL/RELEASE
   ```

5.5 Printing from the MPE/iX POSIX Shell

The MPE/iX POSIX shell provides a way to print files using the “LP” shell command script. This program is located in the “/SYS/HPBIN” directory. If you do not specify the full pathname then this directory should be located somewhere in your MPE/iX shell PATH. For example:

```
shell/iX> export PATH="$PATH:/SYS/HPBIN"
```

The usage for the “LP” command is:

```
LP [-d dest] [-n number] [-p priority] [-s] [-t title] [file...]
```

where:

-d *dest*	Destination or output device. The default is LP.
-n *number*	Number of copies to print. The default is 1 on MPE.
-p *priority*	Print priority. The default is 8 on MPE.

-s	Suppress messages
-t *title*	Print title on the banner page of the output.
file	name of file(s) to print.

To help print files using ACUCOBOL-GT, we have provided a sample configuration file called “cblconfig”. This file contains sample settings for assigning the PRINTER device name to the MPE/iX system spooler. For example:

```
PRINTER   -P /SYS/HPBIN/LP -s
```

If your COBOL application writes to a file assigned to “PRINTER”, the first and following words after the “-P” are treated as the program to run.

The above example runs the “LP” command on the print file. If desired, you may also specify any of the arguments to “LP”. For more information, see the *ACUCOBOL-GT User's Guide*, section 2.8, “File Name Interpretation.”

6 License Management

Key Topics

6.1 Using Multiple Versions of ACUCOBOL-GT

Version 8.*x* license files work only with the Version 8.*x* series of products. You may easily run Version 6.*x* or earlier versions of ***extend*** products alongside Version 8.*x*products. To do this, simply install the products and license files in a separate directory for each version.

For example, if you place the Version 6.2.0 compiler and license file in the "C:\Program Files\Acucorp\Acucbl600\AcuGT" directory, and place the Version 8.x compiler and license file in the "C:\Program Files\Acucorp\Acucbl8*xx*\AcuGT" directory, either version of the compiler will execute properly.

6.2 Evaluation License Files

Evaluation license files are time-limited. The steps performed to install ***extend*** products with a product code and key for an evaluation license file are the same as for installing a permanent license file. If you have an evaluation product code and key, follow the directions provided for your platform in this book.

6.3 License Management for ISVs

This section is intended for Independent Software Vendors (ISVs) who have used ***extend*** products to develop applications and are ready to distribute them to end-user customers. The following information outlines what you must include in your product distribution so that the licensing mechanism will work properly for your customers.

6.3.1 Licensing Requirements

Your customers will require the appropriate license file (single-use vs. multiple-use). A license file is created from the product code and product key by the Activator utility. In order to obtain the product code and product key pair for your end user, you need to provide Micro Focus with the following information:

1. **Host operating system:**

   We need information about the target machine, such as the name of the operating system (OS), the release version of the OS, and the type of processor (such as Intel or Sparc). For example:

   - Windows XP Professional (Intel)
   - IBM AIX 5L 5.2 32-bit
   - HP-UX 11.0 RISC 64-bit
   - SCO UNIX Open Server 5.0.6
   - DG/UX SVR4 R4.11 (Intel)
   - Linux (glibc 2.2) (Intel)
   - Solaris 8.0 (SPARC) 64-bit

2. **Number of users:**

   You also need to specify how many users will be accessing the application at the same time (concurrent users). For example, if a site needs access to an application from a number of machines, but only by one user at a time, this would require a different license file than a site where multiple users access the same application concurrently.

3. ***extend* products:**

   You need to specify which products will be run with your application. Remember to specify the version number of the product using three digits, such as 8.1.0.

Once your we have this information, the product code and product key pair(s) will be shipped in accordance with your License Agreement.

6.3.1.1 The Activator Utility

In addition to the product code and product key, you will be given the following files, based on the target platform for the license file:

Target Platform	**Required Files**
Windows	activator.exe
UNIX/Linux	activator acushare*
VMS	activator.exe
HP e3000 with MPE/iX	activator

*After all necessary license files are installed and the applications are ready to run, UNIX and Linux platforms use a utility called **acushare** to act as the license manager. The **acushare** utility must be distributed with all UNIX/ Linux products. For more information on **acushare**, see **Section 6.6**.

6.3.2 Distributing License Files to your Customers

There are two methods of providing the license file with your application:

1. Create the license file and package it with your application in the same directory as the corresponding ***extend*** executable.

2. Distribute the ***extend*** executable files, the product code and product key pair, and the Activator utility to your customers and allow them to create the license file on site.

6.3.2.1 Including the license file in your distribution

If you choose to create the license file using your customer's product code and key and incorporate it into your product installation before sending it to the customer, simply create the license file as described in the chapter of this manual related to your operating systems and place the resulting file in the same folder as the runtime (or other corresponding executable).

6.3.2.2 Distributing ***extend*** products and license files

If you choose to allow your end-user customer to create the license file directly on the target machine, your application must be accompanied by all of the files necessary to install ***extend*** products on the end user's machine. This includes the ACUCOBOL-GT product executable(s), DLLs, other relevant files, and the licensing files described above. Your customers will also need to receive their product codes and keys. The installation instructions for all major host systems are given in **Chapter 1**.

Note: If you will be using the ACUCOBOL-GT Web Runtime, refer to section 5.7 of *A Programmer's Guide to the Internet* for special licensing considerations that may affect your product distribution.

The Activator utility should be launched at the end of your product installation.

You can distribute the product code and product key via fax, e-mail, or as a text file on your distribution media. When you send the product codes and keys to your customers, use a font that clearly distinguishes the different letters from each other. Product codes and keys *do not* contain the letters "o O" or "i I." In the Activator, all product codes and keys display in upper case. Also, the Activator removes spaces and hyphens.

6.4 License Management with CGI on the Internet

If you order a *CGI license file*, you will receive a product code and key that will cause the Activator utility to create this type of license file. However, in order for the runtime to recognize this special license file, your COBOL application should be compiled with the “-Ca” compiler switch. You must also use “-f” as a runtime parameter, or set the A_CGI environment variable to a non-zero value. (The A_CGI variable is described in section 4.7 of *A Programmer’s Guide to the Internet*.)

When these conditions are detected by the runtime, it will run exclusively in *CGI mode*. In CGI mode, the runtime looks for a CGI license file. If a CGI license file is not found, the runtime looks for a standard runtime license file which, if found, causes the runtime to execute in its normal mode. End users should not detect any difference in runtime operation between CGI mode and normal mode.

6.5 Multiple-User License File Management

Micro Focus offers multiple-user license files for extend products. This enables end-user sites to plan for network growth and make arrangements to accommodate peaks in application use.

The first step in creating a multiple-user license file is to determine how many end users might need to execute the product simultaneously.

To determine this maximum on UNIX machines, you count the number of unique terminal names that might need to execute the product at the same time. On Windows systems, each connected machine is counted. Request a license file for the maximum number of simultaneous users. This number is the user limit. The user limit is encoded in the product code and key that create the license file. The product is also assigned a unique serial number in its license file.

Note: On systems using Alternate Terminal Manager (ATM), the system cannot recognize which user is running a particular process. In that environment, one process equals one user.

For example, suppose the Adams Corporation has 50 end users, not all of whom use the system at the same time. Adams' managers predict that, with planned expansion, up to 30 of these users may need to execute the runtime at the same time.

Adams Corporation arranges for a 30-user license file, which gives all 50 of their end users access to the runtime system, with up to 30 having simultaneous access.

If Adams has a Windows network, up to 30 connected machines may execute the runtime system at the same time. The number of processes is not monitored.

If Adams has a UNIX network, the 30-user license file allows up to 30 terminals to execute at the same time. Because users often run background processes, each terminal is allowed to run more than one runtime process at a time. This ensures that background processes such as reports can be processed while interactive work continues. This is managed by the acushare utility, described below.

To establish a multiple-user license file on other operating systems, such as VMS, please contact your local Micro Focus ***extend*** representative.

6.5.1 Updating the user limit

If you need to change the user limit, you update the license file. Contact your Micro Focus extend representative for new product codes and product keys. These should be entered with the Activator utility as described in the chapter of this guide that is applicable to your operating system.

6.6 Acushare License File Management for UNIX and Linux

License file management in UNIX and Linux environments is handled by the acushare utility program. Acushare provides three key services to ***extend*** products:

- AcuServer license management
- ACUCOBOL-GT runtime license management
- ACUCOBOL-GT runtime shared memory management

The acushare utility program is described in detail in section 2.11 of the ACUCOBOL-GT User's Guide. Acushare's role in extend license management is described in this section as well as basic instructions for starting and stopping acushare.

Note: acushare versions 6.x and earlier cannot be used with ***extend7*** or ***extend8*** products. Conversely, acushare versions 7.x and 8.x cannot be used with pre-***extend7*** products. Multiple versions of acushare can run concurrently on the same system.

6.6.1 AcuServer license management

The acushare utility is required with the AcuServer product. AcuServer enables remote access of Vision indexed files. AcuServer can be requested for single-server situations (one instance of AcuServer per server machine) and for multiple-server situations (multiple instances of the product executing simultaneously on the same server machine). The acushare utility is required for both configurations.

6.6.2 How Acushare License Management Works

The acushare utility program is an important component of any UNIX or Linux system running AcuServer or the ACUCOBOL-GT runtime. Acushare monitors the number of simultaneous users of extend products, where a "user" is defined as a unique terminal name.

Note: For programs called via AcuConnect and CGI processes started by a Web server, each process on the server is counted as a separate user. Likewise, if a terminal allows users to log in with more than one telnet (tty) session under a single user name, each telnet session is counted as a separate user by the license manager.

Acushare keeps a list of active users (terminals) and ensures that the number of users executing the runtime simultaneously does not exceed the limits of the site's license.

Acushare keeps track of users for each product's distinct serial number. For example, if you have a runtime for 10 users, and a second runtime for 20 users, then a total of 30 users could be executing applications on the system simultaneously, if both runtimes are executing.This ensures that distinct software applications are monitored separately.

When the ACUCOBOL-GT runtime or AcuServer run, they perform the following actions related to license management:

Check acushare

When the ACUCOBOL-GT runtime or AcuServer starts up, each checks to make sure that acushare is running on the system. If it's not running, the product attempts to start it. In order for this automatic startup to be successful, acushare must be located in the product's search path.

If the product cannot start acushare, it exits with the following message:

Shared memory and license manager (acushare) is not running

For details regarding separately starting acushare, see the section Starting and Stopping Acushare below.

Register each terminal name

If acushare is running on the system, the ACUCOBOL-GT runtime or AcuServer attempts to register itself with acushare. If the user limit has not already been reached, the registration occurs. Acushare places the user's (terminal) name on the list of active product users (unless it's already there).

If the user limit specified in the site’s license file would be exceeded by the addition of this user, the product checks the product’s configuration file (and then checks the environment), to determine if it should retry the registration process in a few seconds.

A runtime configuration variable can be used to specify the number of retries allowed when you are executing the runtime. If this variable is set to a positive integer value, the runtime waits n seconds and tries again to register itself. The value n (the number of seconds to wait between retries) is set in the variable A_RETRY_DELAY. If no retries are desired, or all retries have been performed and the limit is still exceeded, the product exits with a message.

Recheck acushare

Each active product checks periodically to determine if acushare is still running. If the product detects that acushare has stopped and has not been restarted, it tries to restart it itself. If unsuccessful, it issues the following warning message:

License manager (acushare) is not running

This warning message appears at the line specified in the runtime configuration variable SCREEN ERROR-LINE. Or, if that’s not set, at the bottom of the screen.

If acushare has not been restarted by the time the product makes another periodic check, the product exits.

Ending a session

When the user ends a session on the terminal, the product receives a signal to terminate. If the product was executed with -h or -sb it ignores the signal and continues to run. When a product is executing without a controlling terminal, acushare displays the terminal name as (none). The terminal is removed from acushare's list of active users only when the product terminates.

6.6.3 Starting and Stopping acushare

Acushare manages both the license file and any shared code segments used by the ACUCOBOL-GT runtime system. On UNIX and Linux systems, acushare runs as a background server process that responds to requests from various client products (a “daemon” in UNIX terminology).

Acushare has several command line formats. They include:

```
acushare -start [-f] [ -p portnumber ] [ -e errorfile [ -g ] ]
acushare –kill
acushare –clean
acushare –version
acushare
```

All of acushare’s command line formats are fully described in section 2.11 in the *ACUCOBOL-GT User’s Guide*. General information on starting and stopping acushare is given below.

-start

To start acushare, you simply enter the following on the command line:

```
acushare -start
```

A successful start creates a background process that handles license management and shared code. You can specify:

```
acushare -start -f
```

to have acushare run in the foreground.

If you want acushare to start automatically each time your system boots, you can add a small amount of code to the system boot file. The name of the boot file varies from system to system. Typical names are /etc/rc.local, /etc/brc or /etc/rc. Identify the proper startup file and add lines similar to the following:

```
if [ -f /usr/etc/acushare ]; then
   echo Starting ACUCOBOL-GT shared-code and license daemon> \
        /dev/console
   /usr/etc/acushare -start > /dev/console
fi
```

The above example assumes that you’ve placed acushare in /usr/etc. You may need to adjust the sample code to match the conventions used in your environment.

For more information about starting acushare, see section 2.11 in the *ACUCOBOL-GT User’s Guide.*

-kill

To stop acushare, you simply enter the following on the command line:

```
acushare -kill
```

For complete information on all of acushare’s options, and information on licensing and memory sharing error messages, see section 2.11 in the *ACUCOBOL-GT User’s Guide.*

7 Troubleshooting

Key Topics

7.1 Debugging an Invalid License Host Error

If you receive an “Invalid License For This Host” error the likely cause is that the wrong port for your operating system was selected during installation. This can result in a mismatch between the runtime and the runtime license file. You can determine which port was actually installed and whether it matches your operating system by comparing the machine key numbers that appear in the Makefile to the runtime license file (runcbl.alc).   mismatch numbers between these two places indicates that the incorrect port for your machine is installed and can can lead to other errors or unexpecteed behaviors.

Note: The machine key corresponds to a specific port and is embedded within the runtime.   This same machine key must be in the license file runcbl.alc. The runtime searches for the runcbl.alc file attempting to match the machine keys. If no match is found, an “Invalid License Host” error is displayed. The runtime does not check to verify if the port you installed matches the operating sysem.

7.1.1 Identifying a Machine Key Mismatch

Check for a machine key mismatch by opening the Makefile (located in the “lib” directory) and locating the line containing “PMK”. Make note of the machine key number that appears here. The Makefile content looks like this:

```
# Makefile to create new version of "runcbl" or "acusql"
# based on changes to "sub.c"
# To relink the runtime, run: make runcbl
# To relink the ESQL pre-compiler, run: make acusql
# Distributed with ACUCOBOL-GT version 8.0.0
# PMK: 120
```

Now, open the runtime license file, and check the machine key number. This number should be the same number that appears in the PMK number of the Makefile. The license file content looks like this:

```
# ACUCOBOL license file
# BLOCK_START_runtime_120_7.0.0
# Product code: LQASC3ABANS6S7XX7A2S
# Product key.: HTY9SVJBAMX3
# Product........: runtime
# Version........: 8.0.0
# Machine-key....: 120
```

If the numbers do not match, refer to the packing slip and the product code and key labels that were sent with the distribution. Note that the UNIX CD contains several choices, but only one port will match the generated license files. After reviewing these documents, delete the installed files and reinstall choosing the port from the UNIX CD that matches the description on the license labels including whether it is 32- or 64-bit.

7.1.2 Tracing a License File

You can also perform the following file tracing steps to determine where the runtime is searching for a license file, and if found, which directory it is in. the trace output also displays information abou the license file itself, including the machine key number.

1. In the OS environment, set the following environment variable:

   ```
   A_TRACE_LICENSE=1
   ```

2. From the "bin" directory of acucobol*xx*, execute the following command:

   ```
   runcbl -vv
   ```

3. Examine the output from the trace to determine if the two entries that follow "Testing port key" match. The following example shows what the trace output would look like in the event of a mismatch:

   ```
   ACUCOBOL license: Trace 'runtime 8.0.0'
   ACUCOBOL license: Trace './runcbl.alc'
   ACUCOBOL license: Trace 'Comment'
   ACUCOBOL license: Trace 'Blank line'
   ACUCOBOL license: Trace 'Blank line'
   ACUCOBOL license: Trace 'Comment'
   ACUCOBOL license: Trace 'Comment'
   ACUCOBOL license: Trace 'Comment'
   ACUCOBOL license: Trace 'Blank line'
   ACUCOBOL license: Trace 'Testing port key'
   ACUCOBOL license: Trace '120'
   ACUCOBOL license: Trace '135'
   ```

If you still are unable to resolve the error, contact Micro Focus Technical Services and include the trace output.

7.2 Questions & Answers

Question: I have two servers on my network. One server contains ACUCOBOL-GT for two users, and the other has ACUCOBOL-GT for three users. If the server with a two-user license file fails, can all five users use the license file on the other server?

Answer: No. The license manager does not add up users from multiple servers. In order to have five users on either server, you would need to request the full user limit for each server.

Question: I am experiencing an error when I try to read the media on UNIX. For example, CPIO, generates the error, "not in cpio format" and TAR formatted archives generate the error, "I/O error on *device name*." What should I do?

Answer: In either case, use the following command to do an ASCII dump of the first part of the data:

```
od -c device | more
```

If you see the word "AMEK" in the dump, this indicates that some bytes may be swapped. You may be able to correct the problem with the "dd" utility.

For CPIO archives, use the following command:

```
dd if=device bs=10b conv=swab | cpio -icvBd
```

For TAR formatted archives, use the following command:

```
dd if=device bs=20b conv=swab | tar -xvf -
```

These commands cause each pair of incoming bytes to be swapped big-endian to little-endian conversion or vice versa). This may solve the problem.

8 Micro Focus Services and Solutions

Key Topics

8.1 Technical Services

If you have a question about how to install your products, Micro Focus's ***extend*** Technical Services staff is ready to assist you by phone, fax, or e-mail.

If possible, please have the following information available when you contact Technical Services:

- The type of operating system you are using.
- The version number of the product being installed.
- A screen shot of the error message.

You can reach Technical Services in the United States Monday through Friday from 6:00 a.m. to 5:00 p.m. Pacific time, excluding holidays. You can also raise and manage product issues online and follow the progress of the issue or post additional information directly through the website. Following is our contact information:

Phone:	+1 858.795.1902
Phone:	800.399.7220 (in the USA and Canada)
Fax:	+1 858.795.1965
E-mail:	**support@microfocus.com**
Online:	**http://supportline.microfocus.com**

For worldwide technical support information, please visit **http://supportline.microfocus.com**.

8.2 Training

Micro Focus's Training Department offers hands-on training classes that teach COBOL programmers how to use the business solutions provided by the ***extend*** product line. Classes cover nearly all products including the ACUCOBOL-GT Development System and related deployment and data access products. These classes are offered in an instructor-led environment or as online training units. They are designed to give guided practice using ***extend*** solutions. Contact your Micro Focus ***extend*** representative to register for any of our training opportunities.

Instructor-led training

Training courses are held at Micro Focus's locations around the world. We also conduct classes at customer sites throughout the world. New classes are developed as needed to cover new solutions and features. Visit the training section of the Micro Focus website at www.microfocus.com/services/training/ for the latest training news and schedules.

Online training

Micro Focus's Training Department provides hands-on training to students who prefer a self-paced method of learning. Online courses use the same materials found in our instructor-led courses. Visit the training section of the Micro Focus website at www.microfocus.com/services/training/ for the latest training news and schedules.

Students enroll for a specific amount of time (i.e., 30, 60, or 90 days). Students may choose to work through each lesson sequentially or use the materials randomly as a "just-in-time" training resource. They are allowed access to all online materials for the duration of their enrollment.

Micro Focus regularly holds online seminars, or Webinars that provide detailed information on our ***extend*** solutions as well as tips and tricks for using our software development tools.

8.3 Consulting Services

Micro Focus offers consulting services led by experienced professionals at Micro Focus's worldwide offices. These professionals provide a wide variety of consulting and training assistance as part of our business solutions. COBOL specialists with expertise in analysis, development, and project management are available to provide any level of support your business requires. We can help you:

- Add a Graphical User Interface (GUI) to your character-based COBOL programs.
- Deploy your COBOL applications on the Internet.
- Migrate your COBOL application to a client/server and distributed processing environment.
- Partner with your IT department for joint application development.
- Migrate COBOL applications written for older platforms to an open systems environment.
- Interface your COBOL application to a Relational Database Management System (RDBMS).
- And more...

For more information contact your Micro Focus ***extend*** representative.

Glossary of Terms

Activator

A utility that converts product codes and product keys into license files.

acushare

A utility for UNIX platforms that manages product licenses and supports shared memory.

evaluation license file

A time-limited license file. You may use an evaluation license file to run the full version of ***extend*** products for evaluation and testing.

license file

A text file that contains license software for one or more products.

product code

An alphanumeric string used during product installation to create the license file for a particular product. Each product requires two strings, the product code and product key.

product key

An alphanumeric string used during product installation to create the license file for a particular product. Each product requires two strings, the product key and product code.

user limit

The total number of users/processes allowed for a particular product in the license file.

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