

Enterprise Developer

Micro Focus® Enterprise Developer® provides rapid development and modernization of z Systems applications. It enables organizations to understand, develop, verify, and deploy application change within mainframe systems or onto alternative server environments on premise or in the cloud. The Enterprise Developer environment helps organizations address mainframe skills concerns, remove deployment pipeline bottlenecks, enable DevOps practices and provide a unified environment to support improvements in quality, integration and modernization. Micro Focus has over 40 years' experience in enabling the enterprise to achieve its business goals by providing a modernization and digital transformation strategy designed for IBM z.

Business Challenge

For many organizations, the new digital economy is shaping future business and IT strategy. In order to compete and win in this digital age, where time to market is paramount, IT teams must remove cultural barriers and work together, embrace new agile approaches to software delivery that incorporate customer feedback along each step of the journey. Digitization is driving accelerated change across the business. IT teams play a pivotal role in helping the business meet this challenge and achieve their objectives.

Additionally, a shifting landscape of new technologies, compliance demands and new ways of working make IT provision a constant challenge, especially in the face of greater client expectation and continued cost pressures.

IT teams must balance the essential work of 'keeping the lights on' and enabling innovation to improve corporate performance. This often means tackling a variety of challenges.

Efficiency: Development output needs to accelerate and meet the speed of business change.

Quality: Demand to shift left and enable early detection of issues during the software development process.

Skills: Recruiting and onboarding the right skills for today's IT estate must align to future business strategy.

Resource: Managing complex application releases, across cross-functional development teams requires teams to collaborate using different tools and practices.

Process: Software delivery practices have evolved to support a more iterative, collaborative and frequent releases—yet these approaches are difficult to support on the mainframe.

Integration: Enterprise IT systems no longer consist of only mainframe components but now include composite applications that reside on the mainframe, distributed, virtual and cloud environments.

Modernization: Ensuring that core applications and data are accessible through any web or mobile device and adaptable to evolving IT trends and technologies.

Quick View

- Increase efficiency by up to 40%
- Find and fix quality issues faster
- Modernize mainframe applications
- Deliver new releases faster using Agile and DevOps practices
- Speed up developer adoption
- Reduce mainframe costs and reliance
- Address mainframe skills concerns

How Micro Focus Enterprise Developer Can Help

Enterprise Developer is a powerful integrated development environment (IDE) enabling organizations to develop both on and off the mainframe. Enterprise Developer offers both Eclipse and Microsoft Visual Studio as standard IDEs, and in addition provides the tools required to develop and test mainframe applications being deployed on alternative platforms to the mainframe. Enterprise Developer is a simple and proven approach to modernize, develop and maintain mainframe applications.

Enterprise Developer supports COBOL, PL/I, IBM Assembler, CICS, IMS-TM, JCL, DB2, IMS-DB, z/OS file formats and the common batch utilities, including SORT. As a result of this compatibility, developers have the choice from a single IDE to develop directly on the mainframe and to move analysis, edit, compile, and debug tasks, all necessary to maintain and improve core online and batch applications, to a Windows workstation on premise or in the cloud. Using a dedicated environment for development and unit testing frees the programmer from mainframe resource constraints.

Enterprise Developer is part of the Micro Focus Enterprise Suite—a comprehensive and integrated toolset designed to help IT teams through their mainframe modernization journey. It includes Enterprise Analyzer®, Enterprise Sync, Enterprise Developer, Enterprise Test Server® and Enterprise Server®. This solution enables customers to fully understand their application inventory, adopt Enterprise DevOps practices to streamline the development, configuration management and testing of mainframe applications, and enable greater choice and flexibility

for the deployment of mainframe application workload to new platforms.

Key Benefits

Increase efficiency by up to 40%: Dramatically increase the speed of development and delivery of change, by integrating all phases of the application development life-cycle, from initial design through analysis, development, compilation, unit testing and debugging.

Find and fix quality issues faster: Shift left by ensuring application quality through a full function unit test environment where developers can thoroughly validate code changes without resource conflict or reliance on the mainframe. Powerful debugging and diagnostics ensure that stubborn runtime issues can be found and resolved quickly. Advanced diagnostics tools, available for RHEL Intel platforms, include patented reversible debugging aids for fast issue discovery and resolution.

Modernize mainframe applications: Enterprise Developer provides a unified development environment regardless of where that application may be deployed. Enterprise Developer includes all the tools needed to easily adapt these applications to run in .NET, on the JVM, web, virtual or cloud based environments depending on your business needs either now or in the future.

Deliver new releases faster using Agile and DevOps practices: Teams looking to adopt modern software delivery practices such as Agile or Scrum as part of a DevOps initiative can integrate Enterprise Developer into existing toolchains and processes to foster a culture of collaboration between development and testing teams across the business.

Reduce mainframe costs and reliance: The Windows based Enterprise Developer toolset enables developers to spend as much as 90% of their time away from the mainframe, realizing significant cost savings with no wait times or resource contention.

Speed up developer adoption: Through easy customization, integrating modern development tooling directly into mainframe source management systems and familiar processes eases the transition to a new development environment.

Address mainframe skills concerns: Instantly reduce the skills gap between mainframe COBOL and Java or C# developers by offering a collaborative and modern development environment built around Eclipse or Visual Studio. Recent graduates or developers new to working with COBOL can quickly and easily adapt to the language and get up to speed in no time.

Flexibility: Enterprise Developer provides a flexible development environment to efficiently develop and maintain mainframe applications and gives you the choice of where you deploy your development platform: directly on the mainframe, on a distributed environment or in the cloud.

Key Features

Powerful integrated development environment: A complete mainframe application modernization, development, and maintenance environment available for leading industry standard Microsoft Visual Studio or Eclipse based IDEs.

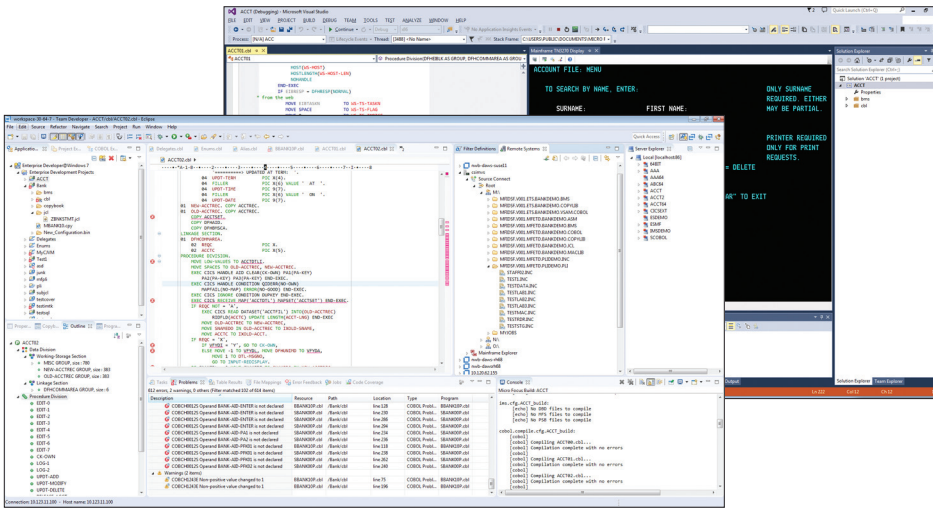


Figure 1. Industry standard IDEs

Full application development life-cycle support on the desktop: From initial application design through analysis, development, compilation, unit testing and debugging. Support includes:

- Advanced editor capabilities such as instant feedback on syntax errors, content assist, syntax colorization and outline view, for faster source navigation to enable developers to quickly and securely execute changes in mainframe applications.

- Instantaneous code compilation offers considerable time savings, as compiles happen on the local workstation. Close integration with the editor means faster error resolution.
- Improved testing through sophisticated COBOL and PL/I visual debugging capabilities for full control on test execution scenarios.
- Unit test capabilities with a local execution engine that supports a unit test framework and provides code coverage and performance statistics.

Code analysis and standards checking: Integration directly into the IDE at point of change means developers can:

- Make changes to existing programs with more confidence.
- Run standard checking rules to easily verify that the developed code meets site specific standards before check-in.
- Identify code that can be optimized to improve application performance.

Enterprise Developer provides a number of pre-defined queries which can be easily modified and extended. These can also be run as part of a Continuous Integration (CI) process.

Code Analysis			
Available code analysis rules:			
Name	Shown on Menu	Location	
64 bit readiness	Yes	built-in	
Constant Indexing		built-in	
Constant Reference Modification		built-in	
Explicit Definitions of Pointers in C		built-in	
Implicit Definitions of Pointers in C		built-in	
Modification of Pointers by Implicit		built-in	
Possible Pointer Modification Via		built-in	
Variable Indexing		built-in	
Variable Reference Modification		built-in	
COBOL Performance	Yes	built-in	
Coding Standards	Yes	built-in	
Explicit Scope Terminators	Yes	built-in	
IF statements deeper than 3 levels	Yes	built-in	
MOVE statements with loss of sign	Yes	built-in	
General Queries	Yes	built-in	
Possible Data Truncation	Yes	C:\xml\movetr...	
Within Entire Program	Yes	built-in	
Dead Statements	Yes	built-in	
Unused Data	Yes	built-in	

Figure 3. Code analysis and standard checking directly from the IDE

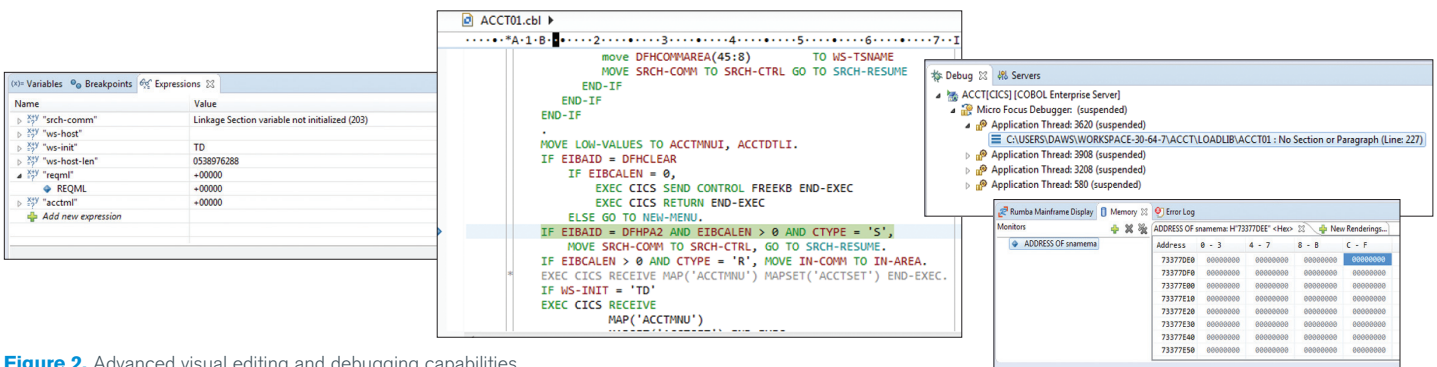


Figure 2. Advanced visual editing and debugging capabilities

Mainframe integration and remote development: Directly on the mainframe from a single Eclipse based IDE enables developers to:

- Browse MVS mainframe datasets, submit jobs and view the system output.
- Navigate through the UNIX sub-system (USS) accessing functions like edit, browse, rename, delete and copy/paste across systems.
- Take advantage of analysis and smart COBOL, PL/I and JCL edit tooling for fast syntax error detection and content assist when editing source modules on the host. This includes those that use mainframe pre-compilers.
- Submit jobs for mainframe compilation with integrated error output to quickly view and resolve issues.
- Start debug and unit test sessions directly on the mainframe.

Easy Eclipse customization: Typical development processes involve a wide range of tools such as source control, test management, third-party tools and databases. Ready and easy access from a single IDE is a must for fast acceptance and adoption. Enterprise Developer provides a simple and highly customizable approach to:

- Automatically integrate and display Interactive System Productivity Facility (ISPF) panels graphically in Eclipse, without changing mainframe ISPF programs or procedures.
- Quickly integrate mainframe and Windows based tools and processes directly into Eclipse without developing or maintaining Eclipse JAVA plug-ins.

* Integration to CA Endevor, Micro Focus ChangeMan and IBM SCLM provided through add-on Enterprise Developer models.

- Create predefined customizations to support different development processes that can be managed and deployed centrally.
- Improve developer acceptance and realize productivity gains.

Mainframe source control integration*: Including Micro Focus ChangeMan ZMF, CA Endevor and IBM Software Configuration and Library Manager (SCLM). Developers have full access to tools and projects on and off the mainframe, from a single development environment. This enables them to:

- Navigate Source libraries and packages with a graphical tree view.
- Review software components, and version and dependencies lists.
- Get access to all available versions of a source member.
- Edit members directly, or checkout to a partitioned data set or local Enterprise Developer project off the mainframe.

With the addition of Enterprise Sync developers have access to full function distributed SCCM environment that is synchronized seamlessly with their mainframe SCCM repository. This allows them to take advantage of modern tools for parallel development, including visualizing application change and efficient code merging tools directly integrated into Enterprise Developer, without compromising their tried and trusted processes for managing applications releases on the mainframe.

Effective team-working and collaboration: Application work-grouping enables developers to share source files, data and program executables. This ensures secure, centralized team and application management, and greatly simplifies the task of setting up a shared multi-user development environment.

Comprehensive mainframe compatibility: To enable mainframe applications to be developed and tested on Windows without reliance on the mainframe. Support is provided for:

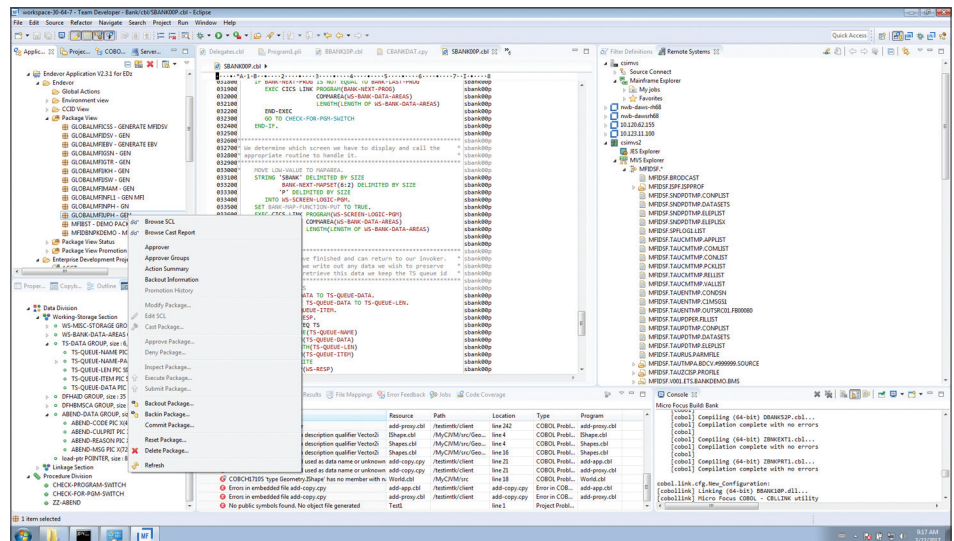


Figure 4. Integration into CA Endevor

- Multiple IBM mainframe COBOL dialects.
- ANSI PL/I and commonly used IBM PL/I extensions.
- IBM HL Assembler edit, compile, debug and runtime execution.
- Online CICS or IMS TM application development including GUI BMS screen painter plus BMS and MFS macro compilers.
- Development of IBM CICS Web Services which enables developers to expose CICS transactions as either a service provider or requester.
- Batch application and JCL support including remote job submission on the mainframe.

Extensive mainframe data support: For editing, accessing and transforming different mainframe data formats. Developers can access:

- Local or remote mainframe QSAM and VSAM datasets, Generation Data Groups (GDGs), IMS-DB and DB2 databases.
- Powerful graphical data record editors that enables field-level display, edit, and search and filter criteria, making it easy to identify and edit specific data records.
- Tools to simplify moving mainframe data to alternative databases such as Microsoft SQL Server, Oracle and IBM DB2 on Linux, UNIX and Windows.

Efficient application modernization: Tools and processes to support application modernization, whether these are:

- Capabilities to extend applications through J2EE, COM, web services and SOA.
- Graphical and web user interface generation and development.
- Terminal emulator user interface modernization and aggregation.
- Development of applications targeted for the .NET or JVM environments.

Easy transition for Mainframe Express users: Existing Mainframe Express and App-Master Builder (AMB) users can now more easily move across to Enterprise Developer, while preserving many of the assets and project structures. The product provides the flexibility to run Enterprise Developer side-by-side with the existing Micro Focus product IDEs, to support a phased transition at the customer's own pace.

Product Options

The Enterprise Developer product range to meet your development requirements:

Enterprise Developer for z Systems: For developers who want the flexibility to develop and test applications both on and off the mainframe, giving them freedom to choose how and where they develop and modernize applications.

Enterprise Developer for z Systems comprises the following:

Enterprise Developer: A full function mainframe development environment running under Windows. With the choice of Visual Studio or

Eclipse developers have all the tools to develop, compile, debug, test and modernize applications disconnected from the mainframe. This means no wait times or resource contention. Applications can be deployed back to the mainframe or modernized for deployment on distributed, virtual or cloud platforms.

Enterprise Developer Connect: An Eclipse based development environment that enables developers to take advantage of modern development tooling integrated directly into current mainframe tools and processes. The product's easy customization offers a fast transition to new tooling.

System Requirements and Platform Support

- Visual Studio 2017*, Visual Studio 2015*, Visual Studio 2013
- 64 bit Eclipse 4.7/4.6 and 32 bit Eclipse 4.7/4.6
- Windows 7, Windows 8.1, Windows 10, Windows Server 2008 R2 SP1, Windows Server 2016
- UNIX and Linux support across a variety of platforms including SUSE, Red Hat, AIX, Solaris and HP-UX.

For full details, check the Micro Focus SupportLine site: <https://supportline.microfocus.com/prodavail.aspx>

**Use of the Visual Studio 2017 and 2015 IDE versions will require a separate purchasable license from Microsoft*

“The approach proposed by Micro Focus was 20 percent cheaper than the alternative option of expanding our mainframe capacity. Over three years, we expect to cut development and testing costs by 40 percent through heightened productivity and by exploiting efficiencies.”

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