Micro Focus Studio Enterprise Edition

Micro Focus Studio Enterprise Edition™ is a contemporary development suite for migrating applications from traditional mainframe environments and modernizing them to meet business needs.
OVERVIEW

Micro Focus Studio Enterprise Edition™ is a highly productive graphical tool suite that enables organizations to migrate proven business applications to lower cost environments, and then maintain, improve and modernize the migrated applications to meet the changing needs of the business.

Studio Enterprise Edition supports IBM COBOL, IBM PL/I, IBM CICS, IBM IMS-TM, IBM JCL, IBM DB2, IBM IMS-DB, IBM z/OS file formats and common batch utilities including SORT on Intel or System z Linux, UNIX and Windows. This means that the core online and batch application logic, evolved over decades, that defines your business processes and delivers your competitive edge can be migrated and reused with minimum modification, on any of these environments.

Studio Enterprise Edition also contains all the development and testing tools you need to modernize the migrated applications. It releases the value of these business assets by exploiting existing interfaces and extending them to a Service Oriented Architecture (SOA) through .NET, Web services or J2EE.

The modernized applications, made portable using Studio Enterprise Edition, can then be deployed onto the new server environment with Micro Focus Server™ Enterprise Edition.

BENEFITS

- Complete projects earlier by migrating application functionality with minimum changes
- Increase productivity by as much as 40%, as developers reuse existing skills while working on the same application code, within a contemporary IDE, on a dedicated development workstation
- Reduce risk because the core online and batch logic that defines your unique business processes remains intact, the migrated applications behave as they did on the mainframe
- Reduce operating costs by up to 77%
- Modernize applications faster using the graphical tools, wizards and generators
- Improve agility by repurposing tried and tested business functions as Web services for faster reuse within strategic architectures like .NET, J2EE or SOA
- Increase flexibility and future-proof business assets, as applications can be moved to any Linux, UNIX or Windows platform to meet business process integration demands

APPLICATION DEVELOPMENT LIFECYCLE SUPPORT

Studio Enterprise Edition supports the development lifecycle within a Windows environment while targeting any popular server running Linux, UNIX or Windows.

Develop and build within Microsoft Visual Studio on Windows

Microsoft Visual Studio is a sophisticated integrated development environment (IDE) that incorporates a complete suite of application development tools and wizards.

To enable a fast start to any migration project, the product includes a Mainframe Access (MFA) client that can be quickly configured to connect with Micro Focus MFA server component which is installed on the mainframe. Source and data can then be transferred from the mainframe efficiently so Visual Studio projects can be set up quickly to demonstrate rapid progress to key stakeholders

The key capabilities provided with the MFA capability include:

- Mainframe Drag & Drop to enable mainframe source and data artifacts to be dragged from the mainframe and dropped into Visual Studio projects
- MFA Synchronization and Control Monitor (aka ‘Syncmon’) to synchronize selected source components between mainframe hosted source and a Windows development environment
- Automatic Synchronize and Compile to automatically compile modules after source code synchronization
- Remote Job (JCL) Step Execution to enable execution of jobs on mainframe that cannot be rehosted to Windows
Mainframe Call Generator to enable remote execution of mainframe programs that cannot be rehosted to Windows
SourceConnect for direct access to source hosted on mainframe
DataConnect to enable COBOL file access to data files hosted on mainframe

The integrated Visual Studio development environment then simplifies the edit, compile and debug cycle, and powerful editor and debug tools that support COBOL, PL/I, CICS, IMS and JCL make it easy to modify, test and debug code.

Central to the IDE are the Micro Focus COBOL and Open PL/I compilers which combine the creation of high-performance native code with extensive IBM mainframe COBOL and PL/I dialect support.

The compilers are tightly integrated into the Visual Studio Environment. This enables the following productivity aids tailored to COBOL and PL/I applications:

- Project Types which allow for creation of .DLL(s), and user application programs (.DLLs) targeted to execute within the Server Enterprise Edition JCL, CICS, and IMS rehosting environment
- Source Colorizing
- User Customizable Templates
- Compile, link and debug from the Visual Studio IDE

![Figure 1: Editing PL/I programs within Visual Studio IDE](image-url)
The Studio Enterprise Edition tool suite also includes an Interface Mapping Toolkit, which exposes COBOL program interfaces, CICS COMMAREA, CICS BMS screens and IMS MFS screens as components or Web services.

**Build using Micro Focus Server Express or Open PL/I on Linux or UNIX**

Organizations have the option to use popular Linux or UNIX servers as the deployment platform on which to run migrated applications. In this scenario, the Visual Studio IDE can still be utilized by programmers to maximize productivity. Once the programmer is happy that the application is functioning as expected under Windows, the project artifacts are simply transferred to the target Linux or UNIX server. The platform specific COBOL and PL/I compilers for the desired platform, that are available within the product suite, are then used to recompile and build a version of the application that will run on the target Linux or UNIX environment.

These compilers include native code generators that produce optimized native code specific to the target Linux or UNIX platform. Also included is a set of tools for debugging and managing diagnostics directly on Linux or UNIX.
Test using Visual Studio on Windows and Server Express/Open PL/I on Linux or UNIX

The Micro Focus Server Enterprise Edition run-time environment is included within the development product to enable developers to perform extensive unit testing.

This provides a local run-time environment for the migrated application that supports the execution of online COBOL or PL/I CICS/IMS applications or batch, JCL procedures and the COBOL or PL/I programs or utilities they call.

Programmers can use the monitoring and administration tools to start and stop instances of the Server Enterprise Edition environment and administer their local configuration by defining system parameters and setting up the appropriate communication facilities.

These tools enable developers to interact with a running Server Enterprise Edition environment in a similar way to a mainframe console. They also provide real-time reporting on the current status of any instance of Server Enterprise Edition for debugging and diagnostics purposes.

Each programmer effectively has their own isolated development and test environment to productively develop and test without impacting others, until they are satisfied that the modifications can be promoted for integration testing.

Deliver faster

These capabilities combine to make Studio Enterprise Edition a significantly more productive environment for maintaining and modernizing migrated applications.

The visual nature of the powerful development tools, and the use of a dedicated workstation for development and unit testing, increases the productivity of each programmer.

The power of today’s processors, and the fact that developers are no longer reliant on scarce and expensive mainframe processing power, means common tasks like compilation take a fraction of the time they took on the mainframe, increasing productivity still further.

User feedback and independent studies support the findings that programmer productivity increases between 30% and 40% and enables the development group to deliver new business capabilities significantly faster.

KEY FACTORS IN SUCCESSFUL MIGRATION AND MODERNIZATION PROJECTS

Migrating mission critical mainframe applications to a new platform is complex. Rehosting the application is seldom the end goal and is typically the first critical phase in a long term modernization journey. Critical factors to take into consideration include:

▶ Minimizing change to applications during migration is key to reducing risk and cost
▶ Comprehensive dialect support is vital to avoid changing existing COBOL business logic
▶ Rehosting PL/I applications, rather than converting to a new language, dramatically reduces risk
▶ Online systems are easier to migrate if the CICS or IMS TM infrastructure stays intact
▶ Reusing existing JCL greatly simplifies the batch elements of the migration
▶ Rich data access facilities, mainframe database support and efficient data migration capabilities are essential to keep any migration on time and within budget
▶ Flexible modernization capabilities are needed to respond to the future needs of the business
▶ Issues will arise during and after the migration project, making effective 24*7*365 vendor support essential

MINIMIZING CHANGE DURING MIGRATION

The complex nature of migrations means that projects undertaken internally are very challenging even for project teams that have experience of conducting migration projects.

For every line of code that is changed or added, the risk of introducing errors increases. Inexperienced or ill-advised organizations may be tempted to change more than they need to during the initial migration which often results in unnecessary project overruns with severe consequences.
It is important to minimize change whenever possible to reduce the risks and costs of a migration project.

Non essential application rewrites, data conversion or user interface changes should be tackled as part of a continuous modernization program, and can often be funded by the operational cost savings secured by the timely completion of the initial migration project.

**COMPREHENSIVE MAINFRAME COMPATIBILITY**

Mainframe applications have typically been developed and refined over many years to produce online and batch systems tailored to meet specific business requirements. The working code logic is proven and all changes made to working code increase the risk of introducing errors, particularly if the code is not well documented.

If the original core logic can be kept intact, the application will perform as it did on the mainframe and existing tests can be used to confirm this.

A wide breadth of mainframe compatibility is instrumental in minimizing application updates and subsequently mitigating risk, reducing effort and minimizing delays caused by unnecessary rework.

Micro Focus’ mainframe compatibility has evolved over 30 years, during which time Micro Focus has provided workstation based development tools for maintaining IBM mainframe applications.

The result is unsurpassed breadth of mainframe compatibility provided by the COBOL, PL/I, CICS, IMS TM, SQL, IMS DB, VSAM, and JCL technology within Studio Enterprise Edition and Server Enterprise Edition.

**MATURE MAINFRAME COBOL DIALECT SUPPORT**

The COBOL compiler within Studio Enterprise Edition is the leading open systems COBOL, and includes:

- High-performance native code optimized for peak performance on specific operating environments
- Full support for object oriented application development (including COBOL ISO2002 syntax)
- Support for creating, consuming and updating XML documents from COBOL

Micro Focus COBOL also features a host of directives to enable it to compile various IBM COBOL dialects including OSVS, VSC2, COB370 and Enterprise COBOL. This extensive compatibility minimizes the changes required to the COBOL code during the migration and ensures the COBOL business logic and file I/O code will behave as it did on the mainframe with very few, if any, changes.

**PL/I REHOSTING CAPABILITY**

PL/I is the second most prevalent language for developing business applications on the IBM mainframe. PL/I applications also use the same transaction processing systems, databases and batch infrastructure utilized by COBOL applications. This is why Micro Focus has integrated the mature Open PL/I compiler technology, which it obtained through the acquisition of Liant Corporation, into its Studio and Server Enterprise Edition product family.

By combining the two technologies, Micro Focus now offers organizations a comprehensive low risk PL/I application rehosting solution as an alternative modernization strategy to rewriting PL/I applications or attempting to replace them with packaged applications.

The working PL/I applications are effectively kept intact as they are moved to lower cost platforms. The PL/I programs are simply updated to replace any proprietary mainframe PL/I extensions that are not currently supported with alternative PL/I code that achieves the same result.

However, to make the migration process even more efficient, Micro Focus regularly adds support for more mainframe PL/I features to ensure more programs can be moved unchanged or with fewer changes. For details of what features have been added recently, please consult the ‘What’s New’ documents that are published with each significant new release of the products.
ONLINE APPLICATION - CICS AND IMS TRANSACTION SYSTEM SUPPORT

Studio Enterprise Edition contains a comprehensive environment to productively maintain and modernize online applications which use either CICS or IMS as their transaction processing system. This includes:

- An integrated EXEC CICS pre-compiler to support command level CICS
- An integrated EXEC DLI pre-compiler for COBOL
- Support for CBLTDLI and PLITDLI/PLIHSSR call interfaces
- CICS and IMS application source editing and debugging capabilities, including color tokenizing
- BMS and MFS macro compilers, so existing BMS and MFS macros can be compiled within the IDE or from the command line. If the BMS macros were defined using IBM SDF II, equivalent copybooks can be generated while maintaining long names and arrays as appropriate
- A BMS painter for effective maintenance of existing screens or the creation of new screens without having to manually edit macros
- Extensive modernization capabilities to supplement or replace BMS/MFS user interfaces or to expose the CICS/IMS transactions as services within a SOA

This comprehensive support ensures there are very few changes to any CICS/IMS code, the MFS/BMS macros or the resulting screens. The complete transaction processing logic, user interface and screen interactions of online applications remain unchanged during the migration.

The need to retrain the application end user community is removed and, as the application behaves exactly as it did on the mainframe, any existing test cases or automated tests can be reused. This is instrumental in getting through test phases, including user acceptance test, and ensuring the migration project is a success before moving on to second phase modernization initiatives. A good measure of a successful migration project is that end users don’t notice the platform has changed, other than reporting that “the applications seem to be performing faster.”

BATCH APPLICATION AND JCL SUPPORT

Batch applications form a key element of mainframe systems and the Job Control Language (JCL) within these applications is often more than simply a method for executing programs. It helps define the relationship between components of a system and important application logic can be contained within Job Control scripts. Studio Enterprise Edition provides a robust Job Execution System (JES) engine for the submission, prioritization and execution of batch initiators that supports both MVS (z/OS) and VSE JCL.

Existing JCL that defines the batch processes can be kept intact, avoiding the risks associated with converting the JCL to scripting languages.

JCL syntax and utilities

Job Control statements such as JOB CARD, DISP, DSN, OUTPUT etc., as well as COND CODE logic and Sort Control Sequences, all contribute to the overall functionality of an application. The collection of JCL accounting information is provided to facilitate billing, charge backs etc. Batch application migration is enabled by a high degree of VSE and z/OS JCL syntax support as well as the emulation of key utilities such as DFSORT, ICEGENER, IDCAMS, IEBGENER, IKJEFT01 and many others.

Integrated development

JCL support is fully integrated into the Visual Studio IDE providing the capabilities expected for productive development including:

- Integrated editing including color tokenizing for z/OS and VSE JCL syntax
- File type recognition
- Hosted web pages for administration, spool and catalog features
- Job submission from the IDE
JCL user exits and third-party interoperability

JCL user exits maximize the compatibility between custom extensions and the original mainframe implementation. User exits can be invoked at different stages during the execution process, including before or after job or job step execution. Exits can perform a wide range of functions including modification of JCL before execution, monitoring and responding appropriately to other events happening during JCL execution and enhanced event logging.

Batch applications deployed with Server Enterprise Edition can interoperate with third-party schedulers for job management and control. These scheduler products not only support the typical batch scheduling functions such as starting/restarting a job after 1-n jobs have completed, but their ability to trigger processes from a wide range of events (such as a file arriving on an FTP site, an email, completion of a process) provides new options for improved automation of existing business workflow.

Some job scheduler vendors have expanded scheduler support to allow for replaceable parameters that are processed prior to the job being submitted. This means a single job can be developed within Studio Enterprise Edition and used in multiple data centers where operators can vary parameters based on their own individual criteria.

Batch printers can be configured using facilities within the administration tool to enable integration with chosen printing subsystems. JCL printing support captures/parses all elements of the OUTPUT statement and all information is presented to the batch printer exit for processing. Third party printing vendors have integrated with Server Enterprise Edition to provide full emulation of the Distributed Resource Scheduler (DRS) and CA-SPOOL API layers, along with support for printing via a JES Subsystem replacement. They also have the ability to handle mainframe standard printing facilities such as Advanced Function Printing.

Internal reader support

Support is provided for the z/OS internal reader in batch, CICS and IMS environments (JES2 and JES3 job delimiters). Batch support is provided via SYSOUT INTRDR DD, while CICS support is provided via Transient Data queues, SVC99 (CICS/IMS) and the EXEC CICS SPOOL API. Many applications build JCL dynamically and then submit that JCL to JES. Without this support, any programs that created JCL in this way would have to be modified to provide an alternate way to submit their JCL, meaning additional effort, modifications and risk.
HIGH LEVEL ASSEMBLER SUPPORT

Support for High Level Assembler (HLA) is available within Studio Enterprise Edition to support demonstrations and parallel testing before Assembler is removed, rewritten or converted. During migration projects, this tool can be used if the mainframe Assembler compiles cleanly and executes correctly on Windows. If it does, then this means that COBOL or PL/I programs which call Assembler programs can be demonstrated running on Windows before the Assembler programs have to be converted. This can be instrumental in proof of value exercises that may be required before investing in the conversion of the Assembler programs.

DATA ACCESS CAPABILITIES AND DATABASE SUPPORT

Comprehensive data access options

Studio Enterprise Edition supports QSAM, the main VSAM file types (KSDS, RRDS and ESDS), as well as Partitioned Datasets (PDSs) and Generation Dataset Groups (GDGs). This support is vital to migrate COBOL or PL/I applications using these mainframe file formats without changing the file access logic of the application.

The most popular relational databases on Linux, UNIX and Windows (LUW) are also supported, including IBM DB2 LUW, Microsoft SQL Server and Oracle 11g. Micro Focus also provides OpenESQL, a platform and database independent SQL access capability which requires no database specific pre-compiler. OpenESQL transparently converts embedded SQL statements into ODBC or ADO.NET API calls, enabling access to different database systems through any appropriate ODBC driver or ADO.NET provider for the database. OpenESQL also provides comprehensive support for ADO.NET’s disconnected data management capabilities that are intuitive for developers familiar with EXEC SQL syntax. This can provide a highly productive route to XML-based modernization and integration.

To improve productivity and quality when developing SQL access from COBOL programs, Studio Enterprise Edition includes a tool called OpenESQL Assistant. This provides a graphical view of the database tables and a point-and-click interface to build visually the SQL and ADO functions required before generating the EXEC SQL code for inserting at the appropriate point in the COBOL source code.

IMS DB support

Studio Enterprise Edition includes support for IMS DB to enable applications accessing IMS databases to be migrated to Linux, UNIX or Windows without changing the hierarchical data model or modifying the IMS database access code within the COBOL or PL/I programs.

The IMS support within the development environment includes:

- Problem determination facilities, tracing, debugging, etc.
- Support for COBOL applications using the CBLTDLI API interface
- Support for PL/I applications using the PLITDLI API interface
- A pre-processor to support COBOL applications using EXEC DLI.

A rich set of system definition and database management facilities is also provided including:

- Database schema (DBDGEN, PSBGEN) compilation within the IDE
- Utilities to unload, reload and reorganize databases
- Database editing and database recovery tooling.

DB2 data migration support

As none of the popular relational databases available on LUW are completely compatible with DB2 on the mainframe, applications that access the host databases typically require some level of change to ensure they behave the same post migration.

‘Data migration’ is recognized as one of the more difficult, time consuming and risky elements of any migration. The more changes that have to be made to application code, the higher the risk.
Studio Enterprise Edition provides two options to make it easier to migrate mainframe DB2 data to new relational databases while minimizing the changes required to the application code:

- Host Compatibility Option for IBM DB2 for LUW (HCODB2)
- Host Compatibility Option for Microsoft SQL Server (HCOSS)

Both these options provide:

- Tools and utilities to make it easier to migrate DB2 environment characteristics, schema and data into DB2 LUW and SQL Server respectively.
- A run-time layer behind the SQL pre-compiler, where common mainframe DB2 SQL syntax, which is not supported within the target database, is interpreted and dynamically modified to deliver the same results against the new database.

In addition, HCOSS offers:

- An assessment tool that identifies mainframe SQL that will work and will not work with SQL Server without changing existing SQL. This tool also shows exactly what SQL statements will work unchanged if HCOSS is utilized and the remaining SQL that requires updates.
- DATE and TIME directives to support standard mainframe DB2 date/time formats with SQL Server.
- GUI Bind Tool that provides a simple way to bind SQL Server packages and plans.

The result is a faster, safer migration because changes to the application code are minimized while the data migration exercise is accelerated.

The migration tools and run-time technology are provided as part of Studio Enterprise Edition to perform the data migration and to unit test the application. The run-time for system testing and deployment is available within Micro Focus Server Enterprise Edition.

**VSAM DATA TO SQL SERVER MIGRATION SUPPORT**

Micro Focus generally recommends keeping VSAM data intact during initial migrations in order to minimize change and mitigate risk. Any VSAM to relational database data transformation would therefore normally be tackled as a second step in the modernization journey. However, if changing data models to relational is part of the initial migration, Micro Focus offers technology to minimize the changes involved and ensure the transition can occur within the target timescale for the overall migration.

**MODERNIZATION, EXTENSION, INTEGRATION AND SOA**

As well as reducing annual operating costs, a significant business justification for a mainframe application migration project is the ability to adapt the applications to better meet IT or business requirements, such as:

- Making it possible to access vital business processes, which may be locked within existing systems, as Web services for easier integration into other mainframe, Java or .NET based applications.
- Ensuring greater access to data usually accessed via mature mainframe applications.
- Providing simpler and more productive user interfaces to improve customer self service capabilities or improve efficiency of call center staff.

**Extension to J2EE, .NET, Web services and SOA**

Using the Interface Mapping Toolkit within Studio Enterprise Edition, COBOL programs or CICS/IMS transactions can be exposed as components or Web services, supporting the reuse and integration of existing business services within contemporary .NET, J2EE and SOA architectures.

COBOL Linkage Section, CICS COMAREA interfaces, CICS BMS screens and IMS MFS screens can be exposed as programmable interfaces and rendered as .NET WinForms/WebForms, Java Server Pages (JSP) or Web services.

The application interface presented to the Interface Mapping Toolkit can be tailored to present the appropriate functionality to different user types. For example, some fields may be deleted and set to default values before an existing program is exposed as a service. The mapping created for each service definition may be reimported later for subsequent updates as required.
With this support, traditional character interfaces can be supplemented or replaced with modern GUI or Web user interfaces, and through Web services, CICS and IMS transactions or COBOL applications can be accessed by new users or applications across the enterprise.

**Graphical and Web User Interfaces**

By exposing interfaces as services, additional or replacement browser or GUI user interfaces that meet specific business requirements can be created.

**Transforming the user interface to drive efficiency**

Exposing existing COBOL, CICS or IMS business functions as services means they can be used like any other service, the programming language behind the service becomes irrelevant.

If existing COBOL programmers need to build new, contemporary user interfaces, they can paint these using the Microsoft Visual Studio Form Designer included within Studio Enterprise Edition, which can automatically generate COBOL WinForm or WebForm screens.

**Terminal Emulator user interfaces and modernization**

Studio Enterprise Edition includes the Micro Focus RUMBA® terminal emulator to provide developers with connectivity from Microsoft Windows desktops to virtually any ‘host’ system. This includes connectivity to migrated 3270 based applications executing within Server Enterprise Edition. The innovative features within RUMBA enable organizations to increase end user productivity, reduce total cost of ownership and simplify the move to browser-based and server-based computing as part of the modernization journey.
For Linux or UNIX target environments, RUMBA also provides a VT100 connection to allow developers to connect from Windows to the Linux or UNIX environment without having to install any other third party software on the Windows desktop.

**ACCESSING MAINFRAME TRANSACTIONS AND DATA DURING PARTIAL OR GRADUAL MIGRATION PROJECTS**

Migrated mainframe applications often need to communicate with other applications or access data that continue to reside on mainframe environments.

Studio Enterprise Edition and Server Enterprise Edition support CICS Inter-System Communication (ISC) to enable connectivity to mainframe CICS systems.

Programmers can develop and test the appropriate interfaces to integrate CICS transactions running on Linux, UNIX or Windows with other CICS transactions running on the mainframe, and vice versa.

Server Enterprise Edition includes technology that can be deployed on the mainframe to handle the conversion between TCP/IP protocol stacks on Linux, UNIX or Windows and the SNA/LU6.2 protocol stack on the mainframe.

However, sometimes the migrated application must interface with partners’ or even competitors’ CICS systems on other mainframes, where installing third party communication technology is simply not an option.

In this situation, Server Enterprise Edition can exploit the Host Integration Server capabilities of Microsoft BizTalk, running on a Windows Server, to allow direct 2-Phase Commit communication flows with other mainframe CICS systems through SNA/LU6.2.

During early phases of a full migration or as part of partial or gradual migration projects there is often a requirement to access mainframe data directly rather than migrating the data to files or databases available in the new target environment.

Such access can be tested from within the Studio Enterprise Edition Environment by simply providing developers with access to the desired third party middleware in products like Microsoft BizTalk, IBM DB2 Connect or Alebra PDM zOpenGate.

Accessing remote data is therefore very straightforward during development, but Micro Focus always advises comprehensive testing that simulates production level demands very early. This is advisable because the overheads in remote data access, especially for I/O bound applications, can severely impact performance compared with accessing the data locally on the mainframe. In addition, the overhead in processing the data remotely can sometimes drive up the MIPS utilization on the mainframe.

Depending on the business drivers, and how important performance and MIPS utilization are, the overheads may be acceptable but this should be determined early in the project.

**DEVELOPING FOR A TARGET REFERENCE ARCHITECTURE**

Micro Focus has developed a reference architecture for migrated applications that includes Micro Focus software and common third party software utilized by migrated applications when they operate in production off the mainframe.

The third party software used in production includes databases, job schedulers, high performance sort and output and print management software.

During migration, and when maintaining or improving the applications post-migration, developers using the Studio Enterprise Edition software have to have a clear understanding of the target reference environment and have access to relevant third party software during appropriate development and test phases.

It follows that a vital part of any migration project, in addition to setting up the production reference environment, is setting up the new development, build and testing environments.

Having a standard target reference environment is invaluable. It does not mean that you cannot deviate from it; it simply provides a reference of what is required, so decisions can be made about the actual technology or product to be used to fulfill the common requirement, if appropriate.
The Micro Focus Reference Architecture (MFRA), Figure 7, shows the type of tools and technologies involved when a mainframe application is migrated to a Windows server environment. All of these capabilities are typically also required when Linux or UNIX servers are used as the target production environment. If a technology depicted in the MFRA for Windows is not available on the target Linux or UNIX environment, a decision must be made to determine what equivalent technology will be used instead to fulfill the requirement. Alternatively, it may well be that for a specific migration or application there is no requirement for any technology to fulfill the requirement. For example,

- If migrating to a Linux server then a source management technology will definitely be required but it may not be Microsoft Visual Studio Team System.
- An application may be moving to Windows but for sound business reasons the chosen target database could be Oracle.
- A requirements management technology, like Micro Focus Caliber, is recommended but it is agreed that as a manual process was used to manage requirements on the mainframe, then the same process will be used on Windows until the savings in operating costs are realized.

The key is to use the MFRA as a guide, adopt as much as possible that makes sense and proactively decide on what alternative to use, or not, as part of the migration project plan.

MARKET LEADING PRODUCT SUPPORT

Of primary concern during and after migration is the long-term viability of any vendor who provides production level software and the vendor’s ability to deliver the level of product support required to meet appropriate Service Level Agreements.

SupportLine is Micro Focus’ award winning product support organization operated through in-house SupportLine centers in the North America, UK, France, Germany, Japan and Australia.

Skilled engineers provide technical support 24 hours a day, 7 days a week, 365 days a year via telephone, e-mail and the Internet. In addition, the SupportLine website provides on-line incident reporting and tracking, along with the latest product downloads, a Google searchable knowledge base, code samples, and full product documentation.
TECHNICAL SPECIFICATIONS

Windows Components - Operating System requirements


UNIX/Linux Components - Operating System requirements

➤ Vary depending on the specific platform.

REFERENCES

1. Unless PL/I portability standards have been adhered to, you should expect that some changes to PL/I code will be required.

2. PL/I applications are not currently supported on z/Linux or Itanium-based servers and PL/I application support is 32-bit only at this time. If PL/I application are migrated, a 32-bit or 64-bit environment that supports 32-bit is required.

3. These MFA capabilities are provided for development and test only, they are not supported in production.

4. For PL/I applications a specific Micro Focus debug capability called CodeWatch is invoked from the Visual Studio IDE.

5. At time of release Oracle support for PL/I applications was at "planned" status. Contact Micro Focus sales for details.

6. At time of release HCOSS assessment for PL/I SQL applications was in progress. Contact Micro Focus sales for details.