
White Paper

COBOL

Deploying Mainframe Applications to Amazon Web Services

Enabling COBOL and PL/I Applications for the cloud

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This paper specifically focuses on the potential to modernize and deploy them using a cloud-based infrastructure like Amazon Web Services (AWS).

Introduction

COBOL and PL/I applications, running on an IBM mainframe, still represent the core business systems for many global enterprises. Developed over decades, and surviving a number of IT trends, these systems have evolved to overcome the challenge of change to continue delivering real business value.

However, these COBOL and PL/I (mainframe) applications face a new challenge as organizations increasingly move their IT systems to the cloud.

The RightScale State of the Cloud, report, 2017, indicates that 79% of workload is now run in a cloud environment, with 41% being deployed to the public cloud¹.

This momentum demands a dedicated cloud strategy for mainframe applications. A strategy that enables businesses to modernize their mainframe applications, benefit from the cloud and retain the business logic and intellectual property within the COBOL and PL/I that delivers competitive advantage.

IT decision-makers responsible for delivering a strategy that covers both the continued operation and the modernization of their mainframe applications have options. This paper specifically focuses on the potential to modernize and deploy them using a cloud-based infrastructure like Amazon Web Services (AWS).

Background: The Application Is King

As IBM continues to remind us, 92% of the top 100 global banks, most credit card transactions and 90% of Fortune 500 companies rely on their mainframe².

The 12th BMC Annual Mainframe Survey³ confirms both the value of the mainframe, and the global enterprises' commitment to the platform.

But is the platform, or the customer's applications that it hosts, more important?

Look beyond the inevitable requirements to reduce cost and increase security and we see that priorities three and four for mainframe users are both application-centric:

- Application availability
- Application modernization

So any cloud-based solution for mainframe applications must be cost effective, secure, reliable and enable application modernization to meet the current and future demands of the business and its customers.

1 *RightScale* <https://www.rightscale.com/lp/2017-state-of-the-cloud-report>
2 <http://mainframeinsights.com/news/>
3 <http://www.bmcsoftware.uk/forms/mainframe-survey-results-2017.html>



Figure 1. General findings

Mainframe Applications

COBOL and PL/I were always the dominant development languages for organizations developing their own business applications on the mainframe, and both remain an essential part of the application landscape for global enterprises. Eighty-five per cent of customers in our 2017 COBOL Survey classified their mainframe applications as 'strategic'⁴.

COBOL and PL/I were always the dominant development languages for organizations developing their own business applications on the mainframe, and both remain an essential part of the application landscape for global enterprises.

⁴ <https://www.microfocus.com/campaign/cobol-survey/>

The Micro Focus Enterprise Analyzer, Enterprise Developer, Enterprise Test Server, Enterprise Sync and Enterprise Server technologies provide state-of-the-art mainframe application tooling.

The Choices

CIOs of organizations considering their strategic mainframe applications in the context of a future cloud strategy have the following options:

Option	Description	Pros	Cons
1. Rewrite	Recreate current mainframe application functionality in a language more typically associated with the cloud.	Addresses concern about programming language skills.	Significant investment with no additional function or benefit. High risk of failure to deliver fully functioning, supportable code.
2. Replace	Implement a Software as a Service (SaaS) packaged solution to replace current systems with readily-available alternatives.	Provides the opportunity to review and modify current business processes.	For all but the most basic applications lack of functionality within the package results in a loss of competitive advantage.
3. Rehost	Rehost the applications 'as is' to a platform supporting cloud deployment.	Retains the competitive advantage in current applications. Provides a platform for further application modernization.	Mainframe discussions and decisions are highly politicized.

Rehosting and Modernizing Mainframe Applications

Most organizations will combine elements of Replace and Rehost to create a platform that delivers the tools and processes required to support application modernization. This approach will, simultaneously, enable deployment to either the mainframe, or an alternative platform based on business and operational requirements.

Why Micro Focus?

Micro Focus is the market leader in this area. Our Enterprise product suite offers all of the tools necessary to analyze, rehost, support and modernize mainframe applications.

The experience gained from delivering more than 600 successful mainframe rehost projects has enabled us to continuously evolve and improve the Enterprise Portfolio. The Micro Focus® Enterprise Analyzer, Enterprise Developer, Enterprise Test Server, Enterprise Sync and Enterprise Server technologies provide state-of-the-art mainframe application tooling. They support application, process and infrastructure modernization, and represent a genuine alternative to developing, testing and deploying mainframe applications using traditional methods and tools.

The Micro Focus solution enables:

- The ability to rehost mainframe applications with minimum change to Linux®, Windows® or UNIX® either on-premises or in the cloud.
- The transition of DB2, IMS-DB, QSAM and VSAM data into alternative database and file systems on Linux, Windows or UNIX.
- Support for online CICS and IMS applications.
- A batch environment to support the move of current jobs, job control and batch utilities.

AWS Rehost Service Mapping	
Mainframe Source	Micro Focus Target
z/OS, z/VSE	Windows, Linux
CICS, IMS TM	Enterprise Server Online Support
Batch JCL (JES2, JES3, POWER)	Enterprise Server Batch Support
COBOL	Micro Focus COBOL
PL/I	Micro Focus Open PL/I
REXX	Enterprise Server REXX Support
VSAM	Enterprise Server VSAM Support
IMS	Enterprise Server IMS Support
DB2	SQL Server, UDB, Oracle

Table 1. How Micro Focus can enable current mainframe services to be mapped to AWS, while retaining the core services needed to enable the applications to run unchanged.

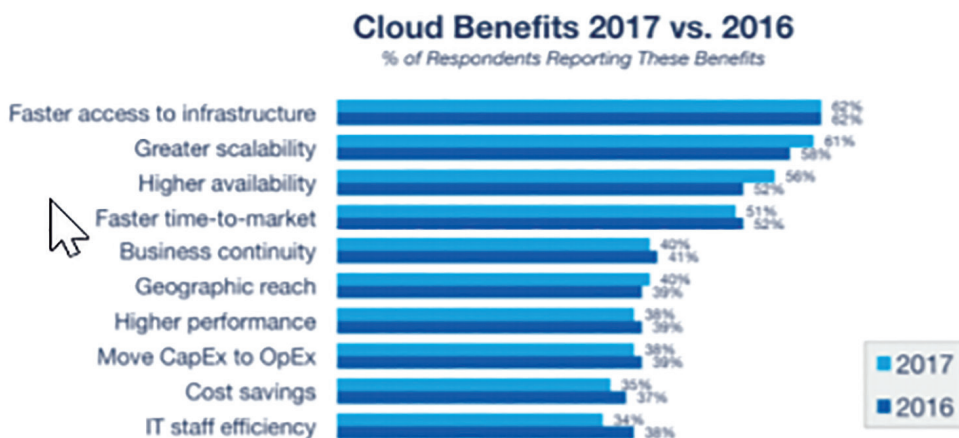
This approach offers Micro Focus customers:

- The opportunity to expand into new territories without mainframe data centers
- Greater flexibility in mainframe utilization by freeing up headroom for other application workload
- Time-to-market reduction of up to 40% through development productivity improvements
- Increased customer satisfaction via improved system performance and quality
- Operating cost reductions of up to 90% per annum

Why AWS?

Free of the constraints of proprietary mainframe hardware and software, Micro Focus customers can deploy their mainframe applications to the cloud, perhaps within the scope of the initial rehost, or delivered as a subsequent phase.

AWS is deployed in highly secure regional data centers, enabling the highest levels of cost-effective system flexibility and availability.



Source: RightScale 2017 State of the Cloud Report

Figure 2. Cloud Benefits

The benefits of a cloud-based deployment include faster access to infrastructure, greater scalability, higher availability, improved time to market, and business continuity.⁵ AWS is deployed in highly secure regional data centers, enabling the highest levels of cost-effective system flexibility and availability.

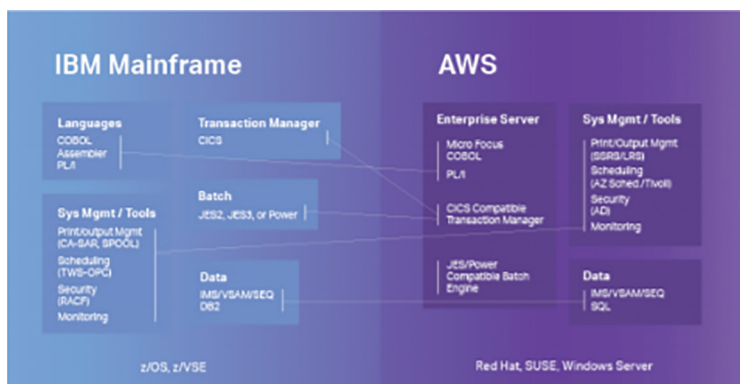


Figure 3. How a mainframe application developed in COBOL or PL/I and dependent on online and batch services can be mapped into an AWS environment using Micro Focus Enterprise Server.

Organizations using Micro Focus Enterprise solutions retain the business logic within the application, along with the user and data access interfaces. When rehosted to AWS, the application functions as it did on the mainframe, delivering the same quality of service with a 50 to 90% cost reduction.

5 RightScale

A number of customers have already used Enterprise Server to successfully deploy production mainframe applications to AWS. A retail organization in the US made the move and can now scale flexibly to manage seasonal variations in business demand, and has enhanced their Disaster Recovery capability.

In Europe, a global insurance company uses AWS to deploy business-critical services, previously located on an IBM mainframe, for a number of countries. Other customers, including a major global insurer,⁶ use our Enterprise products in AWS to support mainframe development and testing.

IT and Business Benefits of Enterprise Server in AWS

The benefits of this approach fall into seven main areas:

Reduced risk: With change comes risk: any deviation from the status quo could have an adverse impact. By retaining the intellectual property and competitive advantage within the systems, application rehost can keep the amount of change, and therefore risk, at a manageable level.

Flexibility: By removing the need for specialist support skills, Enterprise Server offers greater deployment flexibility and choice than the mainframe. Customers deploying to AWS can choose from a wide range of virtual environments and significantly enhance this flexibility. For example, the changes can be provisioned on demand for customers looking to upgrade their compute or storage capabilities.

Cost optimization: Moving development, testing and production workloads to AWS avoids or reduces the need for further mainframe investment. Billing for AWS services is based on a consumption model – compute and storage usage – and can be paid for either with no upfront costs or as part of a long term contractual commitment offering additional savings.

Reliability: Reliability is everything for business services, and applications running Micro Focus Enterprise products are enabling more than 600 companies to deliver theirs, 24/7, using rehosted mainframe applications*. The AWS Cloud solution delivers a highly resilient infrastructure for the rehosted applications with automated failover options all delivered as a fully managed service.

Scalable: Enterprise Server can be deployed flexibly to match the requirements of rehosted applications. Deployment to AWS supports immediate auto scaling and load balancing, with no loss of performance, enabling the customer to define an infrastructure capable of scaling up and down to meet business demands

⁶ <https://www.microfocus.com/success/stories/major-global-insurer/>

Micro Focus solutions support the modernization of core mainframe COBOL and PL/I applications through its class-leading Enterprise Analyzer, Enterprise Developer and Enterprise Server products.

High Performance: Customers successfully completing a rehost typically report improved user response times, and reduced elapsed batch run times. AWS supports multiple configurations based on a variety of compute/IO ratios to match the performance customer workload requires.

Secure: Rehosting to Enterprise Server enables applications to be integrated within the standard security infrastructure, and use industry standard tools. Security can be further enhanced using long user name and password support, and through the introduction of Multi Factor Authentication.⁷

Conclusion

By providing a mainframe application deployment environment that supports industry-standard operating systems, Micro Focus enables customers to deploy business-critical mainframe applications to AWS and achieve greater flexibility, while reducing delivery costs.

Retaining the intellectual property of the applications with minimal change and low risk, helps customers benefit from an AWS-based Enterprise Server application infrastructure, fit to deliver value for years to come.

Micro Focus solutions support the modernization of core mainframe COBOL and PL/I applications through its class-leading Enterprise Analyzer, Enterprise Developer and Enterprise Server products⁸.

Of course, no two mainframe organizations are the same. To find out how a combination of Micro Focus and AWS technology could benefit your mainframe environment, [contact us](#)⁹ to arrange a free consultation.

Learn More At
www.microfocus.com/cobol-development

7 www.microfocus.com/campaign/download/use-multifactor-authentication/
8 <http://www.microfocus.com/products/enterprise/index.aspx>
9 <https://www.microfocus.com/forms/contactus.aspx>

*See Case Studies for examples

Additional contact information and office locations:
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