

# How to Optimize Financial Operations That Are Tied to Mainframe Systems

## Executive Summary

For many decades, large financial institutions have relied heavily upon mission-critical applications and data residing on mainframe host systems. These systems support credit card payment processing, stock trades, insurance claims, and many other business-related services. Applications that run on every type of host platform (mainframe, AS/400, UNIX, Linux, Unisys, HP, etc.) are common in the financial industry.

Financial organizations will continue to rely upon mainframe systems for many more years; there is no acceptable alternative. But these host applications are *old* applications. Most of them were written decades ago, and reflect the technical capabilities and architectural standards of the time.

Accordingly, these applications fall far short of providing a user experience that matches modern standards. Users are likely to find these applications *anything* but user friendly, and the resulting frustrations and confusion can substantially diminish worker productivity. These systems also pose significant challenges in maintaining modern security standards, putting organizational compliance with regulatory and industry standards at risk. But efforts to update mainframe applications to more modern standards are quite challenging. The process is risky and expensive. And the necessary human resources, such as COBOL programmers, may not be readily available.

This paper outlines some of the challenges faced by financial organizations that depend upon older mainframe applications. The paper also showcases Micro Focus' (formerly Attachmate) terminal emulation solutions, Reflection Desktop and InfoConnect Desktop, and discusses how these solutions integrate with Citrix to provide a secure, centrally managed, modern experience for host system users.

## Business Challenge Summary

Many people involved in the world of Information Technology consider the mainframe computer to be yesteryear's technology. They tend to regard mainframes much as they might a Model T Ford or an ancient propeller-driven biplane: interesting, perhaps, in an anachronistic sense, but no longer particularly relevant to today's world.

They couldn't be more wrong.

Mainframe computers were the *first* business computers, and served as the foundation of business computing for more than half a century. And while they no longer hold the position of dominance that they once held, mainframes are still widely in use. And that will not be changing—at least not for the foreseeable future.

Countless companies worldwide continue to rely upon mainframe computers, with business systems and processes deeply rooted in the decades-old legacy systems of their

mainframes. In many organizations, mainframe-hosted legacy programs have reliably helped conduct business operations daily for 20-, 30-, 40-years, or even longer. These legacy systems continue to do the jobs they were designed to do, and the companies that rely upon them will continue to do so.

In no industry vertical is this more true than in finance. The financial industry continues to rely heavily on mainframe systems, just as they have for the past half-century. And by extension, most consumers also rely upon mainframes; any banking customer who has used an ATM has interacted with a mainframe computer.

But continued reliance upon older mainframe computers and legacy applications poses some problems for most financial organizations.

**Security** ranks high among the problems faced by financial organizations using legacy systems. The legacy mainframe systems still in use by financial organizations were conceived and constructed years, even decades ago. But in the interim, the world of technology has evolved dramatically. So too have the skills and capabilities of the cybercriminals that constantly seek to gain illicit access to proprietary data and applications.

Financial organizations that rely upon legacy mainframe systems must seek more effective means of assuring that only authorized personnel are permitted to connect to host systems. Sensitive data residing on host networks must be more vigilantly protected from external threats. Internal fraud—particularly the theft of data through internal host screens—must also be prevented. And financial organizations must be able to quickly adapt legacy systems to new security mandates and regulations.

**Managing host access** is an additional problem for financial organizations that depend upon legacy mainframe systems. Deploying and maintaining desktop applications, and locking down host access configurations, can be especially challenging in a legacy mainframe environment. Adhering to ever-expanding governmental and industry regulations regarding access grows increasingly difficult as legacy systems continue to age.

And finally, delivering a **modern user experience** that equals that of newer technologies has become a problem with legacy mainframe systems. The need to provide reliable, secure and user-friendly host access to mobile workers, for example, has expanded exponentially in recent years. But many organizations have encountered significant obstacles in optimizing the mainframe application experience for mobile users.

And for the millennial generation—many of whom must work with legacy systems older than themselves—enabling an optimal host use experience that conforms to their modern technology experience is particularly important. Few millennials would be comfortable connecting to a mainframe host with old ‘green screen’ terminals!

Financial organizations need a solution that addresses these problems by providing secure, centrally-managed access to legacy hosts, with a user interface that is intuitive and modern.

## **Citrix Ready Financial Solutions Program Overview**

The Citrix Ready Financial Solutions program has been launched with the sole objective of building and sharing a library of white papers and case studies that portray the best integrated joint solutions for Financial Services and related industries. Each of these documents illustrates the teaming of a Citrix partner and Citrix solution in helping financial institutions to secure instant access to apps, data and communications on any device, over any network and cloud.

Through this program, we identify and showcase partner technologies such as applications, peripherals and endpoints that meet the essential and focused needs of financial institutions. Our joint white papers illustrate how Citrix and partners work in symbiosis to address one or many of these use cases to customers' satisfaction:

- **Workplace flexibility**
- **Virtualizing and securing business-critical apps**
- **Centralizing, streamlining and securing IT**
- **FSI security and compliance**

## **Overview of Micro Focus**

Micro Focus is a global software company dedicated to helping customers maximize the value of their legacy IT investments. The company recognizes that legacy host systems serve as foundational components of many financial enterprises. And yet most legacy systems do not mesh well with modern systems, users and security needs. Micro Focus provides a single solution for “translating” a host system, enabling it to seamlessly deliver business-critical applications with a modern user interface.

In effect, Micro Focus modernizes three key components of legacy systems: security, host access management and user experience. Upgrading each of these to modern standards assures that financial organizations can continue to rely upon their foundational legacy host systems, and will be able to do so for many years.

**Security** in legacy host systems commonly lags far behind modern standards, often placing organizations' most precious assets at extreme risk. Micro Focus enforces modern security standards by ensuring that only authorized personnel are permitted to connect with legacy hosts. Micro Focus' user-friendly terminal emulators integrate smoothly with existing Identity and Access Management Systems (IAM), preventing rogue clients from accessing host systems—they will never even get to a host log-on screen.

Micro Focus also enhances security by protecting sensitive data that resides on the host network. Military-strength encryption technology that supports the highest U.S. government security standards serves to protect host data in motion on the network.

Micro Focus makes enforcing security standards easy by facilitating fast adjustments to new security mandates and regulations—*without* making changes on the host. User configurations may be rapidly updated to comply with new or changing mandates or regulations (i.e. PCI DSS, HIPAA, GDPR). Micro Focus makes it easy to demonstrate system-wide organizational compliance with requirements.

The threat of internal fraud has grown into one of the most urgent of security concerns at most organizations. Micro Focus helps thwart the theft of sensitive data from host screens by enabling real-time data masking, hiding sensitive data as it is entered—with no host application changes required. Access to sensitive data can also be managed based upon job function or role.

**Host access management** is greatly simplified with Micro Focus. Desktop applications can be installed once on a central server and made available to groups of users as needed, making deployment and maintenance much easier. Changing user configurations is also streamlined. A change must be entered only one time; the change will automatically be migrated to all users upon their next log in. And Micro Focus locks down all host access configurations. Users cannot make changes to their own configurations, and no insecure macros or automations may be created.

Compliance with governmental and industry regulations regarding access management is also made easier with Micro Focus. Central user configurations may be set up to assure compliance with applicable regulations and mandates. Micro Focus makes it possible to demonstrate to auditors, with absolute certainty, that all systems are compliant when accessing host systems.

A major failing of many legacy host systems is the lack of a modern user experience—a problem that only intensifies as technology evolves and legacy systems remain static. Mobile users, particularly, are often frustrated in their attempts to remotely access legacy host systems. Mainframe applications typically do not translate well to mobile devices. They are not optimized for the diminished screen real estate available on mobile devices, and they are not designed to support the touch-based user experience that has become commonplace.

Micro Focus solves the problem by delivering the industry's leading terminal emulation interface for all types of legacy hosts: Reflection Desktop. And Reflection's TouchUx provides a simplified, streamlined interface that utilizes the easy-to-tap buttons that make touch interfaces a pleasure to use, and that today's users have come to expect.

Optimizing the host user experience for millennial users is now a priority for many organizations. Micro Focus' Reflection Mobile is specifically designed to provide an iOS/Android compatible experience for remote users of legacy host systems. The Plus

add-on for Reflection Desktop modernizes outdated “green screen” applications to modern business standards, making ancient applications familiar and comfortable for today’s users. And new applications that customize the mainframe experience can be created with Microsoft Visual Basic for Applications.

Reflection integrates perfectly with Citrix in delivering the world’s most reliable terminal emulation solution. In fact, Reflection is the *only* terminal emulation solution to earn the Citrix Ready logo. The Citrix application interacts directly with the legacy host system, and with Reflection. Reflection, in turn, delivers the business application to the end user.

Micro Focus works with Citrix to deliver two innovative and unique features that simply aren't available with any competing product. Features that are unique to the Micro Focus / Citrix integration include:

- **Data Masking:** Micro Focus’ patent-pending data masking technology enables great flexibility in controlling the host data that users are permitted to view. Data can easily be redacted on mainframe-interfacing screens as it is displayed or entered. And data masking is very easily enabled; data can be masked without making any changes to mainframe applications, and can be centrally managed for thousands of users across multiple locations.

Reflection’s unique data masking capabilities significantly boosts the ease with which financial organizations can maintain compliance with industry regulations such as PCI DSS Requirement 3. Users are provided with the information they require in the performance of their jobs, while sensitive and regulatory-protected customer information remains hidden.

- **TouchUx Mode:** Touch interface screens may be considered among the most significant of recent advancements in boosting user productivity. But it is a technology that significantly post-dates most legacy host systems. Host system user interaction capabilities can be brought up-to-date with Reflection’s TouchUx.

TouchUx provides the ability to productively interact with a host system from a Windows device. It eliminates the common problem of interfacing with mainframe applications that utilize program function keys which simply aren’t available on Windows keyboards. Reflection’s TouchUx provides a simplified, streamlined interface with easy-to-tap buttons that makes touch screens simple and enjoyable to use. And TouchUx integrates with the Citrix API such that change-orientation is enabled: the view automatically switches to landscape or portrait as the user repositions the viewing device.

TouchUx offers great versatility to users, with standard features such as a peek key, full-screen mode and a session-switcher button.

## **Micro Focus Solution Detail**

Micro Focus has been selected to participate in the Citrix Ready Financial Solutions program. Micro Focus Reflection works seamlessly with Citrix in achieving the goals of the Citrix Ready Financial Solutions program: providing financial organizations with a competitive edge, while addressing key security and compliance priorities.

Specifically, Micro Focus helps financial organizations streamline and modernize the use of legacy host systems, assuring that these critically-important systems remain accessible and user-friendly far into the future. The following are among the most important benefits that Micro Focus provides for financial organizations:

- **Workplace Flexibility:** Flexibility and versatility are much-sought-after success factors for today's business organizations. Both enable worker productivity to achieve and sustain the highest levels, while simultaneously maintaining employee workplace satisfaction ratings at consistently high marks. Enabling work mobility is key to sustaining high levels of flexibility and versatility, and Micro Focus Reflection and Citrix provides anytime, anywhere secure and user-friendly access to legacy host systems.
- **Business-Critical Application Access:** Financial organizations—perhaps more than any other industry vertical—are dependent upon mainframe-based applications that are highly integral to daily operations. Micro Focus and Citrix team to virtualize and secure high-value business-critical applications that move, process, accept, or store sensitive host system data—and all while enabling a UX that rivals the most modern business applications and technologies.
- **FSI Security and Compliance:** Reflection adds layers of security to legacy host applications, helping assure compliance and bringing host applications up-to-date with modern security needs. Data masking, SSH-encrypted file transfers and strengthened authentication all enhance security, and help to assure that host systems and applications conform to governmental and regulatory mandates.

Additional Reflection features help to:

- Easily automate business processes with a visual code editor
- Input data via Bluetooth barcode scanning
- Protect critical data with the latest security standards and protocols, including TLS 1.2, SHA-256, FIPS, RSA-2048, PKI and IPv6
- Centrally secure and manage sessions using Host Access Management and Security Server
- Make host connections using virtualized platforms with Citrix XenApp
- Add modern, time-saving controls to IBM host applications using the new Plus mode (Additional controls are available with Reflection Desktop Plus Add-On)

Reflection is optimized specifically for Citrix. Reflection's TouchUx mode permits users in a Citrix environment to connect to host systems with a wide variety of devices, including laptops and mobile devices. This versatility provides a modern, mobile-friendly

touch experience when interacting with host systems. The ability of Reflection to alternate between landscape and portrait modes, depending upon device orientation, is an example of the solution's optimization for Citrix.

Users entering data into a host field from a mobile device such as an iPad often encounter difficulties; standard mobile device keyboards typically do not include the necessary keys for interacting with a legacy host system. TouchUx mode eliminates that common problem by providing a virtual keyboard.

The virtual keyboard is displayed as a transparent overlay, which includes all necessary program function (PF) and attention identifier (AID) keys. Geared to the symbols and items that mainframe application users are most likely to need, the TouchUx virtual keyboard provides an easy-to-use means of sending relevant keystrokes to the host. And zoom-to-cursor capability avoids data entry frustration by immediately locating the host application's input field.

Virtually all large enterprises in the financial services industry are heavily invested in the Citrix platform, and are highly dependent upon the unique benefits that Citrix solutions provide. These enterprises all require Citrix Ready applications, and Micro Focus is the *only* terminal emulation vendor to have achieved Citrix Ready certification.

### **A Proven Partnership that Keeps Legacy Hosts Relevant and User-Friendly—Now and Far Into the Future**

The legacy host systems that virtually all financial organizations depend upon are, in many cases, growing quite aged. Many of these systems are decades old; some have been providing service daily for nearly a half century. And yet these systems incorporate data and applications upon which financial organizations, more than any other vertical, are utterly dependent. Financial organizations will continue to rely upon these legacy systems for many more years.

Decades ago, users of these ancient systems would have been perfectly comfortable with the primitive 'green screen' mainframe interface that is common with these systems. But that is no longer true. Today's users are accustomed to user interfaces that are far more intuitive, easy-to-use, and adaptable to a wide range of devices, including mobile.

Citrix and Micro Focus team to provide a perfect solution for keeping host systems easily accessible, virtualized, secure and user friendly. Together, Citrix and Micro Focus Reflection can provide a one-stop host access solution that modernizes host access, makes the host interface relevant for modern users, and updates security to modern standards.

Reflection features such as TouchUx elevates the host interface to the equal of today's most modern applications, and delivers a user-friendly experience on any device, including mobile iOS and Android devices. Reflection Desktop and InfoConnect Desktop both provide unique, patent-pending data masking technology that assures users have all

the information pertinent to the performance of their jobs, while protecting the vast quantities of confidential information that commonly resides on host systems. This capability helps financial organizations enforce information privacy, a requirement of the PCI DSS security standard.

Micro Focus Reflection has been proven to integrate seamlessly and easily with Citrix environments. Micro Focus' selection to the Citrix Ready Financial Solutions Program provides financial organizations with a proven, reliable solution for keeping host systems relevant, reliable and user-friendly for many years to come.

*For more information about Micro Focus, please visit: <https://www.microfocus.com/>*

*To learn more about the Reflection desktop terminal emulator, please visit:  
<https://www.microfocus.com/products/reflection/desktop/>*

*For more information about Citrix application and desktop virtualization, please visit:  
<https://www.citrix.com/virtualization/>*

## Appendix

Learn more about the Citrix Ready Marketplace for Financial Institutions at:

<https://citrixready.citrix.com/info/financial-services.html>

To learn more about the Citrix Ready Program partnership with Micro Focus (previously Attachmate), please visit: <https://citrixready.citrix.com/attachmate-corporation/reflection-desktop.html>

To learn more about security and performance solutions for financial enterprises, contact [Citrix](#) and [Micro Focus](#).