Optimizing Financial Operations Tied to Mainframe Systems

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For decades, financial institutions have relied on mission-critical applications and data that reside on every type of host platform — AS/400, UNIX, Linux, Unisys, HP, and especially mainframe. These systems support credit card payment processing, stock trades, insurance claims, and many other fintech services.

Financial organizations will continue to rely on mainframe applications, as there is no acceptable alternative. But these host applications are old. Most of them were written decades ago and reflect the technical capabilities and architectural standards of the time.

Accordingly, these applications fall short of providing a user experience that matches modern standards. Users are likely to find these applications anything but user friendly, and the resulting frustration can 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 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 on older mainframe applications. The paper also showcases a Micro Focus® (formerly Attachmate®) terminal emulation solution, Reflection Desktop, and discusses how this solution integrates with Citrix to provide a secure, centrally managed experience for host system users.
Many people involved in 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 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. While they no longer hold the position of dominance they once had, mainframes are still widely used. And that will not change — at least not for the foreseeable future.

Countless companies worldwide continue to rely on mainframe computers, with business systems and processes deeply rooted in these decades-old applications. In many organizations, mainframe-hosted programs have helped conduct business operations for 20, 30 or 40 years, or even longer. These critical systems continue to do the jobs they were designed to do, and the companies that rely on them will continue to do so.

This is especially true in the financial services industry. By extension, most consumers also rely on mainframes. Any banking customer who uses an ATM or a credit card has interacted with a mainframe computer.

But continued reliance on mainframe computers running these older applications poses some problems.

Security is a top concern for financial organizations using mainframe applications. These applications were constructed decades ago, but the world of technology has evolved dramatically. So too have the skills and capabilities of the cybercriminals who constantly seek to gain illicit access to proprietary or personal financial data.

Financial services organizations that rely on these mainframe applications must seek more effective means of allowing only authorized personnel to connect to host systems.

Sensitive data residing on host applications — often protected by eight-character case insensitive passwords — need stronger protection from external threats. Internal fraud — particularly the theft of data through internal host screens — must also be prevented. Financial organizations must be able to quickly adapt host applications and systems to meet new security mandates and regulations.

Managing host access is an additional problem for financial organizations that depend on mainframe systems. Deploying and maintaining desktop applications, as well as locking down host access configurations inside of desktop applications, can be especially challenging. Adhering to ever-expanding government and industry regulations grows increasingly difficult as these host systems continue to age.

Finally, delivering a modern user experience equal to newer technologies has become a problem with older mainframe applications. The need to provide reliable, secure and user-friendly host access to mobile workers using their own devices, for example, has expanded exponentially in recent years. But many organizations have encountered significant obstacles in optimizing the mainframe application experience for mobile users.

For digital natives — many of whom must work with host systems that are older than themselves — enabling an optimal host user experience that conforms to their expectations is particularly important. Few of them would be comfortable with the user experience associated with connecting to a mainframe host with outdated “green screen” terminals.

Financial organizations need a solution that addresses these problems by providing secure, centrally managed access to host systems with an intuitive and modern user interface.
Micro Focus solves these problems by delivering the industry’s leading terminal emulation interface solution for all types of host systems: Reflection Desktop.

Micro Focus is a global software company helping customers maximize the value of their IT investments. The company recognizes that host systems serve as foundational components of many financial enterprises. Yet many host systems and applications do not mesh well with modern environments, users and security needs. Micro Focus provides a single solution for modernizing host systems, enabling them to seamlessly deliver business-critical applications with a modern user interface.

Specifically, Micro Focus helps financial organizations streamline and modernize the use of host systems and applications, 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 services organizations:

• **Business Critical Application Access:** Financial services organizations are dependent on mainframe-based applications for daily operations — perhaps more than any other industry. Micro Focus and Citrix virtualize and secure high-value business-critical applications that move, process, accept or store sensitive host system data while enabling a user experience that rivals the latest applications and technologies.

• **Security and Compliance:** Micro Focus adds layers of security to host applications, helping to assist with regulatory compliance and bringing host applications up to date with modern security needs. Data masking, SSH-encrypted file transfers and strengthened authentication all enhance security so host systems and applications can conform to government and industry mandates.

• **Workplace Flexibility:** Flexibility and versatility in the workforce are critical to the success of today’s businesses. Both improve worker productivity while maintaining satisfaction among employees, which translate to better customer service and increased profitability. Micro Focus and Citrix provide anytime, anywhere secure and user-friendly access to host systems.

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**Technical Details At-a-Glance**

• Connect to key business applications on host systems.

• Leverage the Citrix XenApp platform to centrally deploy a Citrix Ready logo’d solution.

• Protect critical data in motion with latest security standards and protocols, including TLS 1.2, SHA-256, FIPS 140-2, PKI, and IPv6.

• Employ patent-pending data masking technology to strengthen security and facilitate PCI DSS compliance.

• Easily automate processes with a business macro language for citizen developers.

• Quickly input data into host applications via Bluetooth barcode scanning.

• Centrally manage access to host systems using Host Access Management and Security Server.

• Give mobile device users with smaller form factor devices an optimal data entry experience with green screen applications.

• Add modern user experiences to legacy host applications for digital natives.

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Micro Focus Solution Detail

Micro Focus Reflection Desktop works with Citrix to provide financial organizations with a competitive edge while addressing key security and compliance priorities.

Reflection Desktop modernizes three key components of legacy systems: security, centralized management and control, and user experience. Updating each of these to modern standards assures that financial organizations can continue to rely on their foundational host systems and applications.

Security in host applications can commonly lag behind modern standards, often placing financial information at risk. Reflection Desktop helps enforce modern security standards by ensuring that only authorized personnel are permitted to connect with these critical host systems. Micro Focus’ user friendly terminal emulators integrate smoothly with existing identity and access management (IAM) systems. It can also prevent rogue clients from accessing host systems making it so that they will never even get to a host log-on screen.

Micro Focus also enhances security by protecting sensitive data that travels on the enterprise network. Military-strength encryption technology that supports the highest US government security standards protects 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 (e.g. PCI DSS, HIPAA, GDPR). Micro Focus makes it easy to demonstrate system-wide organizational compliance.

The threat of internal fraud has grown into one of the most urgent security concerns at financial services 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 on job function or role.

Micro Focus greatly simplifies centralized management and control via Citrix. 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 entered once will automatically be migrated to all users on their next login. And Micro Focus provides advanced tools that enable IT to lock down all host access configurations. Users cannot make changes to their own configurations, and no insecure macros or automations may be created.

Micro Focus also makes it easier to comply with government and industry regulations via centralized management. Central user configurations can 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 user access is compliant when accessing host systems.

Reflection’s data protection extends to sharing data with other applications. Reflection can mask static financial data on host screens as well as when data is being input.
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 older host applications remain static. Mobile users, particularly, are often frustrated in their attempts to remotely access 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.

Additionally, Reflection’s TouchUx provides a simplified, streamlined interface that uses easy-to-tap buttons that today’s mobile users have come to expect. It makes the host interface equal to today’s most modern applications and delivers a user-friendly experience on modern devices, including iOS and Android mobile platforms.

The Plus add-on for Reflection Desktop modernizes outdated “green screen” applications to current standards, making ancient applications familiar and comfortable for today’s users. New applications that customize the mainframe experience can be created with Microsoft Visual Basic for Applications (VBA).

Reflection integrates with Citrix to deliver a reliable terminal emulation experience. The Citrix application platform in concert with Reflection delivers the business application to the end user.

Micro Focus works with Citrix to deliver two innovative features that aren’t available with any competing product. Features 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. 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 boost the ease with which financial organizations can maintain compliance with regulations such as PCI DSS Requirement 3. Users are provided with the information they require in the performance of their jobs while sensitive or protected customer information remains hidden. Data masking helps prevent internal fraud.

- **TouchUx Mode**: TouchUx Mode is a significant advancement in boosting user productivity when interacting with host applications on mobile devices.

TouchUx provides the ability to productively interact with a host system from non-Windows devices, like iPad or Android tablet. It eliminates the common problem of interfacing with mainframe applications that use program function (PF) keys that aren’t available on non-Windows physical and virtual keyboards. Reflection’s TouchUx provides a simplified, streamlined interface with easy-to-tap buttons that make touch screens simple and enjoyable to use. TouchUx integrates with the Citrix API such that change-orientation is enabled: the mainframe application 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.

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Reflection Desktop’s additional features help to:

- Easily automate business processes with a broad range of tools
- Protect critical host data with the latest security standards and protocols, including TLS 1.2, SHA-2, FIPS 140-2 cryptographic validation, PKI and IPv6
- Centrally secure and manage access to host systems
- Add modern, time-saving controls to IBM host applications using the new Plus mode for UI modernization

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. Reflection’s ability to alternate between landscape and portrait modes, depending on 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 an older 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. 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 on the unique benefits that Citrix solutions provide. These enterprises all require Citrix applications.
Virtually all financial organizations depend on host system applications, but many struggle to keep up with the ever-changing IT security landscape and modern user experiences. Many of these applications are decades old; some have been providing service daily for half a century. Yet these systems incorporate data and applications that financial services organizations, more than any other vertical, are utterly dependent upon. Financial organizations will continue to rely on these systems and applications for many more years.

Decades ago, users of these 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 provide a perfect solution for keeping host systems easily accessible, virtualized, secure and user friendly. Together, Citrix and Micro Focus Reflection Desktop 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 Desktop features like TouchUX elevate the host interface to equal today’s most modern applications and deliver a user-friendly experience on any device, including mobile iOS and Android. Reflection Desktop provides 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 reside on host systems. This capability helps financial organizations enforce information privacy, a requirement of the PCI DSS security standards.

Micro Focus Reflection has been proven to smoothly integrate with Citrix environments. Micro Focus’ verification by 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


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 Reflection Desktop’s compatibility with Windows 10, please visit: https://www.microfocus.com/media/flyer/windows_10_is_coming_ready_or_not_flyer.pdf.

To learn more about Reflection Desktop’s technical specifications, please visit: https://www.microfocus.com/products/reflection/desktop/tech-specs.

To learn more about security and performance solutions for financial enterprises, contact Citrix and Micro Focus.

Citrix Ready Financial Solutions Program Overview

The Citrix Ready Financial Solutions program has the 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 how a Citrix partner and a Citrix solution team up to help financial institutions 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 more of these use cases to customers’ satisfaction:

- Workplace flexibility
- Virtualizing and securing business-critical apps
- Centralizing, streamlining and securing IT
- FSI security and compliance
About Citrix Ready
Citrix Ready identifies recommended solutions that are trusted to enhance the Citrix Delivery Center infrastructure. All products featured in Citrix Ready have completed verification testing, thereby providing confidence in joint solution compatibility. Leveraging its industry-leading alliances and partner ecosystem, Citrix Ready showcases select trusted solutions designed to meet a variety of business needs. Through the online catalog and Citrix Ready branding program, you can easily find and build a trusted infrastructure. Citrix Ready not only demonstrates current mutual product compatibility, but through continued industry relationships also ensures future interoperability. Learn more at citrixready.citrix.com.

About Micro Focus
Micro Focus is a global software company with 40 years of experience in delivering and supporting enterprise software solutions that help customers innovate faster with lower risk. Our portfolio enables our 20,000 customers to build, operate, and secure the applications and IT systems that meet the challenges of change.

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