MICRO FOCUS | white paper

Deliver mainframe applications with confidence

Revolutionizing how mainframe applications are tested and key IT services are delivered

INTRODUCTION

Every technology investment decision has to return demonstrable value to the business. This is certainly true of investment in core business systems, whether the investment is in technical innovation or in keeping existing technology current, relevant and supported.

For many organizations the natural home for their core business applications is the mainframe. The original investment in that technology can date back thirty or more years, and the continued investment in maintenance, product updates and support has to show a return year on year. That is why it makes sound fiscal – as well as business and technical – sense to ensure that the quality of your applications is optimized through robust testing procedures. However, on the mainframe, these can come at a cost. The purpose of this white paper is to examine the alternative approaches to testing mainframe applications, and highlight the most cost-effective and pragmatic ways of addressing mainframe testing concerns.

THE IMPORTANCE OF TESTING MAINFRAME APPLICATIONS

Let's start by asking the obvious question: Why? After all, if these systems and applications have been in place on the mainframe and delivering value to the enterprise for up to thirty years, surely they have already been tested time and again.

As mainframe applications supply core services to the enterprise, and contain vital competitive assets, they have to remain updated and enhanced to meet changing business demands. The truth is that nothing stays the same, even in the mainframe world. As commercial pressures drive business change, the mainframe applications that support the business face radical changes across their interfaces, data, reporting demands and more. The changes can come from within an organization: such as the need to make more efficient use of resources, alter reporting requirements, or M&A activity; or be driven by external factors such as legislative change, competitive pressure or changes imposed by the mainframe vendor.

Because the applications are critical to the enterprise, it is essential to test any updates thoroughly before releasing them to the business user. Any compromise on quality, for whatever reason, presents unacceptable risk to the organization's business.

That's not to say it doesn't happen. The history of IT is littered with horror stories, and the IT press with lurid headlines:

- Mainframe crash takes ATMs down. Four-hour outage remains unexplained[1]
- Online ticketing system restored. Baseball team announces sales to resume after system crash at automated ticketing vendor[2]
- Corrupt file brought down antiquated IT System. Fouled up the plans of thousands in more than 40 airports[3]
- Web fright after system crash. Computer blunder saw [retailer] lose £15million on the busiest days of the year[4]

And, at the time of writing, Research In Motion (RIM) has announced a $100 package of applications to each subscriber affected by the three-day outage of its Blackberry network in October 2011. This is likely to be a substantial financial cost, but the cost of these failures goes beyond pure revenue considerations. Each failure incurs a very real cost in terms of customer confidence, reputation, brand image and ultimately stock price. These real headlines, quoting real failures that have affected major commercial organizations, demonstrate the importance of delivering on quality commitments – and that means overcoming the challenges of testing your applications, whatever platforms they are on.

THE CHALLENGES INVOLVED

Testing is a vast discipline within the IT landscape. There is a multitude of sources describing how to set about appropriate levels of testing, the impact of not doing enough and even how many errors you might expect to find within an application. But all the accumulated wisdom points to the following over-riding principles:

- All software contains errors
- The cost of fixing errors goes up the later they are found

According to IDC, "The increased complexity of software development environments and the cost of fixing defects in the field (rather than early in the software cycle) combine in exorbitant ways to drain income and to hamstring businesses as a result of critical software downtime."[5] To head off the costs of finding and fixing defects in the field many organizations adopt Agile practices where mission critical applications undergo rigorous testing at each stage of development. While this approach improves quality and reduces longer-term development costs, it adds to the testing requirement and the pressure on testing capacity and capability increases.

Testing mainframe applications presents its own challenges:

Time pressure

Getting updates into the hands of the user, delivering value, on time is a major responsibility for IT. This puts testing mainframe applications under enormous time pressure as key updates have to meet aggressive delivery timescales.

With the IT organization facing increasing demands to deliver better service from all internal providers, even essential pre-production test phases come under scrutiny as potential bottlenecks in the release process.

Resource pressure

Having sufficient resource to carry out testing is a primary concern of any mainframe test environment.

Pre-production testing can only be scheduled according to the capacity available on the mainframe – in MIPS (Millions of Instructions per Second). Inadequate mainframe capacity for testing compromises the delivery of updates that meet the functional and time demands of the business. QA Directors and Service Delivery Managers are tied to the existing capacity provided by the mainframe, with little scope to improve test throughput in this environment. Worse, they are frequently under pressure to reduce the amount of MIPS and time that important testing activities consume.

Likewise, throwing more people at manual testing is unlikely to provide the solution – even if it were affordable. Outsourced testing is no longer the cheap option as demand for skilled test professionals increases and the test environment and datasets used may not sufficiently represent the mainframe environment.

Financial pressure

We started this discussion by asserting that "every technology investment decision has to return demonstrable value to the business." Testing is no exception – and is under the same financial constraints as every part of the business. "Deliver more with less" is a familiar refrain across IT organizations. Ensuring that core systems deliver trusted performance year after year, and continue to support the need to reduce cost and accelerate time to market is a persistent challenge.

The 6th annual BMC Mainframe Survey[6] found that while "60% believe that keeping costs down is the number one IT priority", they also found that "93% at large companies expect capacity to grow or remain steady". In short, delivering more with less.

Of course, economic conditions remain challenging across all sectors and geographies – without much indication that this will change. IT spending, according to the UK's National Computing Center is "predicted to decline by 3.7%".[7]

Technical and competitive pressure

The mix of platform and application portfolios presents an ever-changing landscape. A generation of technically-aware consumers demand more from providers – better access to more services – and they are more aware than ever of the power of choice. CNN recently reported that more Americans get their news online than via any other media channel[8], and Forrester revealed that although the percentage of overall trade remains under 10%, 61% of all Americans have shopped online[9].

It is unimaginable for an insurer not to offer quotes online, or for a retailer not to take money for goods through the web, or for a bank not to offer internet banking. Many industries have made innovation part of their unique customer experience – business flyers check-in at the gate by showing their boarding pass on their iphone, logistics companies provide an 'app' enabling clients to track their delivery on their mobile device, and innovative boutique hotels are providing free iPads for guests for the duration of their stay so they can use smart technology to locate local restaurants, theatres etc.

Services delivered on these new platforms have to be appropriately verified before going live. Typically, existing mainframe test practices are just not enough. These are Java or other new-breed technologies that need testing, probably in conjunction with a back-end mainframe process. Traditional methods of quality assurance invariably do not allow for this.

In the face of such pressures, the onus is on IT to deliver greater value from its mainframe investments, and manage costs better. A substantial challenge which calls for a substantial solution.

ALTERNATIVE APPROACHES TO MEET THE CHALLENGES OF MAINFRAME APPLICATION TESTING

With processes and schedules for mainframe application delivery handcuffed to the mainframe environment and capacity constraints, delivery managers and CIOs need a game-changing approach to meet the challenges described.

Do the same thing, only do it better

One possible approach lies in providing 'better' ways of testing applications on the mainframe. A range of technical and consultancy-led solutions claim to improve testing performance, either through some level of automation or other productivity-improving technology, or by employing skilled or lower-cost resources to provide testing expertise.

While these have their merits, neither tackles the core issue of the high cost of testing using the mainframe, as both solutions require further investment in the same environment either in terms of technology or people (or both).

Or, take a second look

However, rather than simply increasing resources to do 'more of the same', a more creative and innovative approach is to look at the common denominator linking the 'challenges' – the mainframe platform itself and ask whether it is possible to replace the mainframe as the primary testing platform; in essence, to provide a mainframe application test execution environment on Windows.

This would enable heavy-lifting testing to take place on Windows server rather than the expensive and resource-constrained mainframe. This high-availability and low-cost environment would fundamentally resolve the major bottleneck and cost constraints presented by the mainframe.

In a typical mainframe test environment, testing requirements are channelled directly into the mainframe – competing with production systems for resource in terms of both MIPS and time. Inevitably, there is a bottleneck which delays testing and compromises quality.

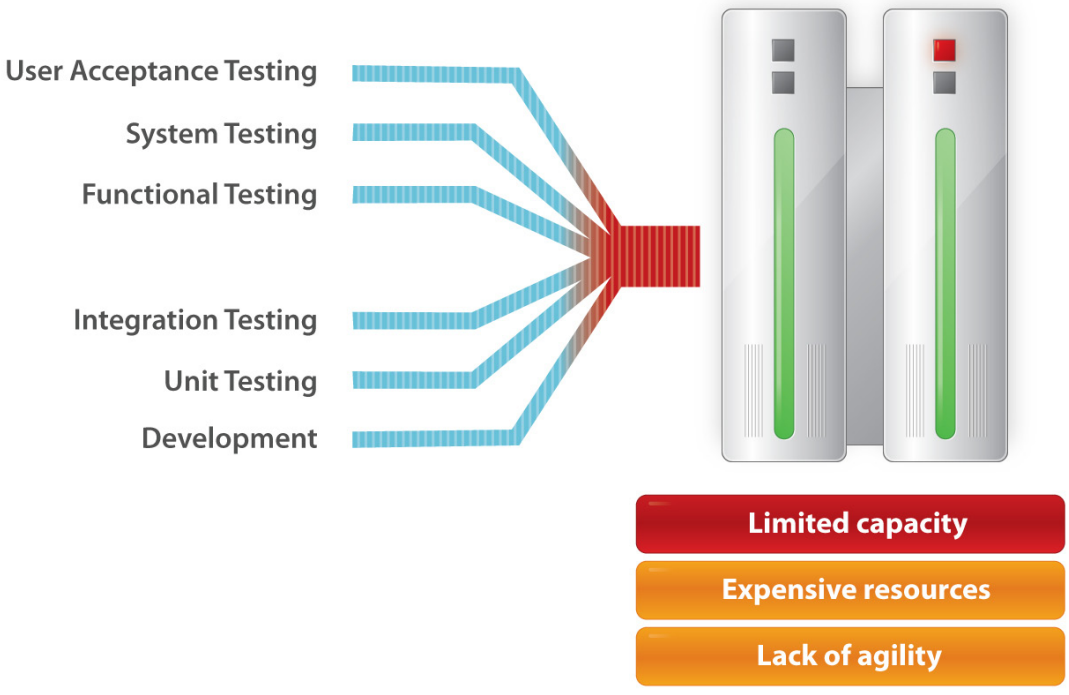

Figure 1: How the mainframe environment is a bottleneck for application service delivery

Removing this bottleneck by increasing the capacity of pre-production test cycles means that greater functionality can be delivered to the business in less time. However, this can require significant additional investment to acquire the necessary MIPS to increase mainframe capacity to accommodate expanded test phases. Even then many mainframe environments will prioritize production needs over test, so there is no guarantee that the additional capacity is ring-fenced, and testing MIPS may be lost to a critical production run.

To meet business demands, organizations need to find flexibility from somewhere in order to increase capacity easily, quickly and reliably.

THE PRAGMATIC APPROACH TO IMPROVING MAINFRAME APPLICATION SERVICE DELIVERY

Releasing test processes from the constraints of the mainframe enables an organization to:

- Reduce the costs of key functional testing activities
- Complete testing phases faster, resulting in quicker time-to-market
- Improve quality through more extensive testing completed in a shorter timeframe

The costs saved within the testing process can be re-allocated to other areas of the business, such as increasing focus on customer service or product innovation, while faster time-to-market and improved product quality can improve competitive positioning.

The mainframe testing bottleneck is eliminated and IT application service delivery dramatically accelerated. Exploiting a low-cost commodity platform provides highly-flexible test capacity, so testing can scale up to meet delivery expectations set by the business.

Providing the execution environment for testing mainframe applications off the mainframe breaks the vicious cycle of resource dependency and releases teams to set their own testing and delivery schedules (Figure 2) without jeopardizing standards or quality.

What's more, developers, test teams, quality assurance engineers, end-users, or non-mainframe programmers, (Java or. NET programmers, for example) developing composite applications that use mainframe resources, can access the applications to conduct their testing and consume little or no mainframe processing power.

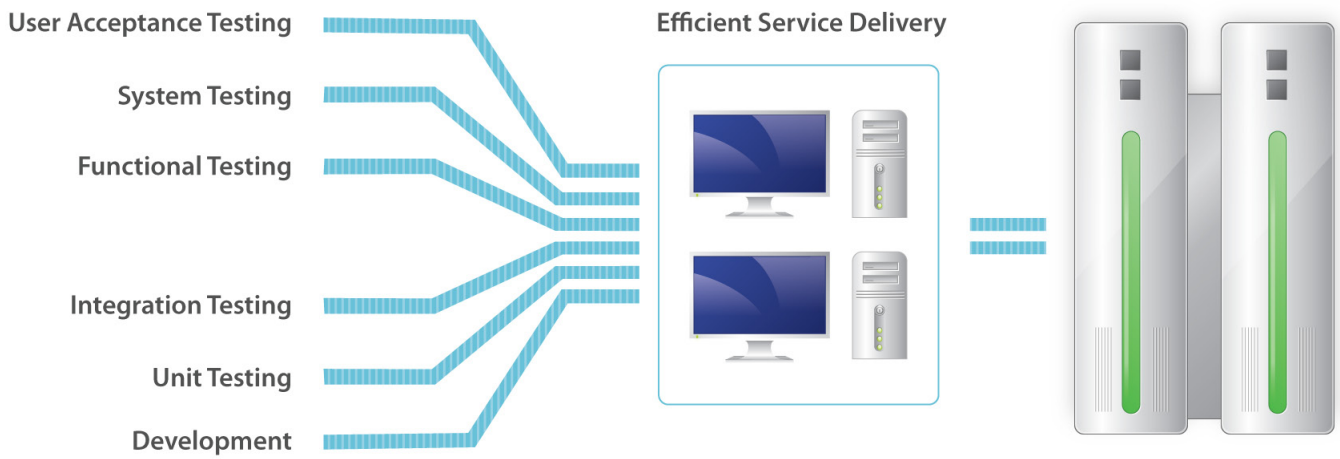

Figure 2: Efficient application service delivery

Key factors in successful off mainframe testing

Performing pre-production testing on a lower cost commodity platform like Windows returns cost savings and a level of testing that is often not possible on the mainframe. Critical factors to consider when rehosting pre-production testing are:

- Comprehensive language support to ensure that mainframe COBOL and Assembler applications can run on the test platform with a very high degree of compatibility
- Support for mainframe sub systems so that online and batch applications remain intact in a multi-user environment
- Rich data access facilities and mainframe database support to allow data to be hosted either on the pre-production test environment or to continue to reside on the mainframe
- Mainframe connectivity to provide the flexibility to enable core components of the system to continue to reside on the mainframe, where required
- Flexibility in configuring the test environment to ensure that multiple regions can easily be created and maintained to support different levels of testing by different teams
- A black box environment to allow non-mainframe JAVA or .NET programmers to develop and test integrations with mainframe host systems
- Robust run time capabilities to provide the reliability and scalability to support a multi-user, multi-level test environment

A leading bank put the spotlight on the entire delivery process to find ways to accelerate innovation and delivery. Testing was a major cost element of the process – and therefore came under scrutiny. A senior IT manager remarked: "We needed to find an innovative solution that would facilitate higher quality, scalable testing."

The bank has adopted the efficient application service delivery approach, offered by Micro Focus through its Enterprise Test Server product. Exploiting this cost-effective mainframe testing solution, the spokesperson commented, "We will be able to deliver changes faster and deliver more robust software through to the User Acceptance Test phase and subsequent production."

Remarking on the same solution the industry journal, Professional Tester, commented "integration, system and even acceptance testing could be done with no need for a real mainframe!"[10]

What does this need, technically?

Transforming mainframe application delivery without calling on mainframe resources is no simple task. It is vital that applications perform on the Windows testing environment just as they would on the mainframe. The technology needed to provide a testing environment away from the mainframe must incorporate a number of key capabilities:

- Mainframe equivalence for CICS, VSAM, IMS, DB2 and JCL sub-systems
- Support for assembler and COBOL applications
- Scalable solution to allow smaller- or large-scale testing to be undertaken
- Flexibility of data access, where data can remain on the mainframe or be brought down to the server
- Flexibility of application access, where unchanged code can remain on the mainframe, and only the changed elements that need testing can be focused on in isolation

What does this deliver?

The benefits of this approach fall into four main areas:

Capacity/Time to market: QA and delivery teams can complete testing phases faster and with higher quality as test cycles are not constrained by scarce mainframe processing power. Test capacity can be scaled up immediately to meet fresh business demands, and as the test environment is on Windows, non-mainframe stakeholders including business users and front-end (Java) developers have access to the testing framework.

Cost containment/Reduction: Increasing test capacity on a low cost commodity platform avoids the need for substantial investment in new mainframe MIPS. In fact, organizations have been able to reduce mainframe MIPS consumption while increasing test capability by performing testing off the mainframe.

Quality: None of the benefits count if the quality of delivered applications is at risk. In fact quality improves as teams are able to identify issues earlier in the development cycle and reduce costly rework. With more testing achievable in shorter timeframes, increased testing raises quality.

This approach enables many organizations to deliver genuine end-to-end testing of composite COBOL and Java applications in a single environment for the first time, again improving overall quality.

Business Relevance: Because today's enterprise applications are often composite, involving Java and .NET applications that access applications residing on the mainframe, it makes little sense for old mainframe programming conventions and constraints to dictate testing procedures. Java and .NET teams are not accustomed to enforced delays caused by scarce mainframe resources. Offloading batch or online testing off of the mainframe enables testing to reflect the way the business operates.

> The head of IT at a leading provider of IT services to the banking, insurance and finance industries commented, "Testing is the costly part of the mainframe and here the Micro Focus solution really works wonders. At this point we are using on average 50 MIPS annually and that is not much for an organization doing development and testing with 100 programmers and testers on major COBOL applications to several hundred large customers."

Tackling a major MIPS management need

As IT organizations look to save cost and provide better value of service, they are compelled to look at all aspects of their operations. Managing and reducing expensive OpEx items is a natural point of scrutiny, and this inevitably includes mainframe MIPS costs. Pre-production testing is particularly suited to efficiency improvements, and with the advent of enabling technology to support off-mainframe testing of mainframe applications very real savings and operational service delivery improvements are achievable.

By providing a compatible mainframe testing environment away from the mainframe, Micro Focus is changing the game – revolutionizing how mainframe applications are tested and how key IT services are delivered.

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About Micro Focus

Micro Focus, a member of the FTSE 250, provides innovative software that allows companies to dramatically improve the business value of their enterprise applications. Micro Focus Enterprise Application Modernization, Testing and Management software enables customers' business applications to respond rapidly to market changes and embrace modern architectures with reduced cost and risk.

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