

**Change and release management in
cross-platform application modernization**
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Rational. software

**Modernizing enterprise application
development with integrated change,
build and release management.**

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Extending the business value of core business systems

To meet the demand for business innovation and agility, organizations are looking to improve the structure, flexibility and reusability of their business software. In most companies, business software has evolved over time – by design or through acquisitions – into complex, multiplatform environments. Frequently, applications use components that run on both distributed and mainframe operating platforms, including the IBM z/OS®, UNIX®, Microsoft® Windows® and Linux® systems.

These applications support core business processes and provide crucial information for day-to-day operations. In addition to customer, product, supply chain and channel partner data, they contain business logic that provides competitive differentiation. And over the years, they’ve been optimized for performance and scale. But using them in new ways can be difficult. Rewriting – or replacing – platform-specific applications to exploit new cross-platform technologies can mean losing the intellectual capital buried deep in the software. As business conditions evolve, organizations need to find more creative ways to extend the business value in their enterprise applications.

Modernization is an effective approach to making existing mainframe and distributed systems more responsive to business needs. Instead of rewriting or replacing applications, organizations can modify them to be accessed by the latest technologies. By crafting a modular, service-oriented architecture (SOA), companies are able to tap into the business value in their current systems and position IT for rapid future changes to the business model.

Leveraging existing assets in modern application architectures means organizations will need to modernize development practices by transitioning from a multiple-silo mentality to a more collaborative mind-set. Technology and customer demand are driving deeper and more complex interdependencies between the traditional mainframe data center and distributed,

Highlights

IBM Rational software can help integrate cross-platform application development by automating the software lifecycle and providing a consistent process across distributed environments.

SOA and mainframe technologies can help make it easier to enrich, modernize, extend and reuse business assets to deliver new value to the business.

networked application middleware and front ends. Because changes to one part of an application on one platform can affect other parts of the application on another platform, effectively supporting application modernization requires an enterprise-scale approach to synchronizing activities relating to software development, management and release.

This paper describes common obstacles to application modernization and how the IBM Rational® change and release management family of products can help organizations overcome those obstacles. By automating the software lifecycle and providing a consistent process paradigm across distributed and z/OS environments, IBM Rational software can help integrate cross-platform, composite application development to:

- *Enhance project collaboration and release coordination across distributed development teams.*
- *Improve development responsiveness and agility.*
- *Increase operational efficiency.*

The modernization opportunity

In an enterprise-level IT organization, code, data and procedures represent a significant investment that, when managed cost-effectively, can continue to deliver value to the business. SOA and mainframe technologies can help enterprises liberate core business assets by making it easier to enrich, modernize, extend and reuse those assets well beyond their original scope of design.

Enterprise modernization is the process of exposing functionality in legacy systems for reuse in new systems to meet new and evolving business requirements – without rewriting the existing code. In particular, it offers a great opportunity for IBM System z™ platform-based organizations and practitioners.

Highlights

The IBM System z environment offers significant advantages as the core platform on which to run mission-critical business applications.

In software development environments, agility is critical to enabling cost-effective change management across heterogeneous systems.

The quality-of-service and data-serving advantages of the System z environment make it an excellent platform for the mission-critical applications that run businesses. Operationally, the System z platform is virtually unrivaled, and it offers significant processing power and support for a large developer community.

With modern architectures for the System z environment, organizations are able to:

- *Create services easily from existing code, including IBM CICS®, IBM IMS™ and other COBOL or PL/I applications.*
- *Define new cross-platform services through management of the development process from initial design to implementation.*
- *Separate service flow from service implementation to attain optimal flexibility.*

The ability to take advantage of the modernization opportunity, however, is hampered by complex environments and disparate, fractured development processes. Modernizing mainframe and distributed applications requires modernizing development processes.

Obstacles to enterprise application modernization

One of the most significant factors affecting application modernization is the agility of the software development environment. At the core is the ability to cost-effectively manage and control ongoing change to software assets in heterogeneous development environments.

Multiplatform environments

Most mature IT systems exist on multiple hardware and software platforms, and business software continues to be developed on each unique platform. For 40 years, the mainframe has served as a primary platform for business-critical application development. The history of the distributed platform in enterprise application development is about half as long.

Highlights

SOA can allow enterprises to exploit the unique advantages offered by mainframe, distributed and networking platforms.

To overcome technical obstacles to change, organizations must improve mainframe interaction with other platforms and simplify application architectures.

Today, many business applications are built with components developed on both mainframe and distributed systems. Typically, application components that power complex transactions and/or require databases are developed on mainframes. Distributed servers generally support the development of application elements, such as a graphical user interface, that serve end users.

More recently, the advance of the Internet and newly developed technologies with more mature network connectivity and compatibility have allowed businesses to integrate multiple platforms in new ways. Each platform has its strength and businesses are now able to exploit these unique strengths with SOAs on all platforms.

Cross-platform dependency

With the volume of raw data and business logic still residing on mainframes, the need to improve mainframe interaction with other platforms becomes paramount. Most applications communicate across systems through hardwired integration with one another or with interfaces to end users.

That's why many organizations run into technical obstacles as they try to incorporate change.

Their application architectures are made up of a multitude of custom-coded connections—many of which must be recoded every time a connection, or connecting application, is altered in any way. Trying to implement changes on top of these hardwired foundations can be challenging.

Highlights

Consider the example of an online travel enterprise. A company like this may use mainframes to build and house database applications that store and integrate content in different forms from many sources. This could include customer profile data; calendars; pricing information from airlines, railroads, cruise lines and rental car agencies; and hotel property descriptions. When purchases are made via a Web interface application built on distributed systems, mainframes process the complex transactions that coordinate information, such as customer preferences, dates, transportation and lodging costs, and confirmation and ticketing procedures.

When the travel company's IT staff makes a change to the mainframe application that manages airline pricing, the deployment of the change must synchronize with the distributed application that delivers it. Failure to do so could result in information inconsistencies. Even worse, it could cause service disruptions that can result in customer defections and revenue loss—not only for the online travel enterprise, but also for the airline and other travel partners affected by the pricing change.

Siloed development in geographically distributed teams

When companies first began incorporating distributed servers and Internet applications into their computing environments, they managed them independently from their mainframe environments with different people, processes and tools. The resulting development islands have ended up severely constraining IT flexibility and performance.

Staff and code mobility are inhibited by multiple implementation technologies and middleware. Duplicate infrastructures and skills specialization reduce productivity. And multiple infrastructures increase costs, so less money is available for new projects.

As a result of siloed growth of distributed and Internet applications, enterprises often have computing environments that deliver limited flexibility and performance.

Highlights

Configuration management solutions evolved to support the niche software development needs of various individual platforms.

Effective cross-platform application development and modernization require a holistic approach to software change and release management.

Multiple configuration and change management systems

As software platforms were evolving, so too were configuration management solutions. Each solution evolved independently because it had to support the way software was being developed and deployed on a given platform. Many companies created homegrown configuration management tools to meet their specific needs. Software vendors also responded with a plethora of products, most with a niche in a single platform.

Meanwhile, either by acquisitions or in response to business needs, companies were busy adding platforms to their software architectures, inheriting additional configuration management tools. In some cases, there are multiple toolsets for a single platform. So as business grew across platforms, so did the number of configuration management products and processes.

The role of enterprise change and release management in cross-platform development

Overcoming the obstacles to cross-platform application development and modernization requires an enterprise-wide approach to change and release management. The best approach provides a consistent process paradigm and common tools to reduce cost, minimize risk exposure and improve development agility. It helps organizations ensure that the right versions of the right applications are available at all times, and that they can provide an audit trail of changes across the software lifecycle to prevent application failures and help meet increasingly stringent regulatory requirements.

An effective solution also enables organizations to automate and enforce best-practice development processes that enhance collaboration and productivity across distributed and mainframe development teams at every stage of the application lifecycle. And it provides controlled, highly secure access to the information that practitioners in various roles need in order to create, update, build, deliver, reuse and maintain business-critical software assets – no matter where they are located.

Highlights

IBM Rational change and release management products provide a complete software lifecycle solution that can simplify and accelerate enterprise software development.

IBM products that help break down development silos

IBM Rational change and release management products are an integral part of the IBM Rational Software Delivery Platform. They provide a solid foundation for a complete software lifecycle solution that can simplify and accelerate enterprise software development.

- ***IBM Rational ClearQuest® software provides flexible workflow management and change tracking across the application lifecycle to help improve the focus, predictability and control of software development processes.***
- ***IBM Rational ClearCase® software enables the lifecycle management of software development assets through integrated version control, automated workspace management, parallel development support, baseline management, and build and release management.***
- ***IBM Rational Build Forge® software offers a centralized solution that can coordinate and execute repeatable build and release processes.***

By providing an enterprise approach to managing assets with consistent processes, common reporting and common project management across z/OS, UNIX, Windows and Linux platforms, these Rational products bridge the gap between mainframe and distributed development. As a result, organizations can increase project collaboration, improve release coordination and unify development and modernization efforts for heterogeneous IT environments.

Highlights

Rational ClearQuest software provides distributed teams with end-to-end visibility and automated control to improve processes throughout the application lifecycle.

With Rational ClearCase software, enterprises can use a common repository to provide application development teams with quick and security-rich access to assets.

Cross-platform process management

Rational ClearQuest software helps organizations integrate the activities of cross-platform and geographically distributed teams by providing a comprehensive, end-to-end project view and automated control over processes throughout the application lifecycle. Organizations can integrate and enforce repeatable processes. The appropriate team members are automatically notified when action is required. Project managers have the information they need to make better decisions with realtime, consolidated reporting and metrics that streamline performance measurement and management of tasks and schedules. And they're able to simplify compliance management with access control, electronic signatures, repeatable processes and audit trails. With Rational ClearQuest software, organizations can make sure everyone is working on the right activities and on the right versions of the right files, and that no tasks are skipped – reducing overall project risk.

Cross-platform asset repository

Rational ClearCase software uses a common repository to maintain both distributed and z/OS assets. All members of enterprise-wide application development teams can have instant, controlled and highly secure access to the digital content they need to do their work.

Assets are securely captured and versioned with automatic documentation of what changes were made, when they were made and who made them. This tight version control, together with build auditing, helps ensure high-quality code. User authentication and audit trails simplify compliance with government regulations and industry mandates. And, with integration to design, development, build, test and deployment tools, organizations can manage their software assets across the full development lifecycle.

Highlights

Rational ClearCase can track and enforce how assets are built throughout the software lifecycle, streamlining development processes and enabling reuse.

To help reduce costly errors, Rational Build Forge software can automate build and release management processes across multiple projects and platforms.

Heterogeneous build support

Performing z/OS builds is fundamentally different from performing builds in distributed environments. With the Rational ClearCase build facility for z/OS assets, you're able to manage and distribute builds in a z/OS environment in the same way you can in other environments. Using this approach, z/OS developers can initiate a build from their client of choice. Rational ClearCase initiates the appropriate build scripts on z/OS to generate the appropriate executables and other derived objects where the build is performed. The derived objects are returned to the Rational ClearCase repository for integration with other platforms.

With powerful asset attribute capabilities, Rational ClearCase can track and enforce how assets are built at each phase of the software lifecycle. And, to further streamline the development process, Rational ClearCase can be extended to automatically rebuild affected assets.

Centralized build and release processes

Rational Build Forge software is designed to automate build and release management processes across multiple projects and platforms, including z/OS and Linux for System z environments. It helps reduce errors that delay downstream testing and deployment activities by enabling developers to quickly build the system while writing code. Diverse build tasks are executed automatically so there are no time gaps due to manual intervention. A detailed bill of materials documents the contents of each release for better reproducibility and compliance management.

Highlights

IBM delivers a comprehensive, integrated portfolio of change and release management software—plus expertise and services—to help enterprises address their specific business needs.

Access anytime, from anywhere

In many organizations, z/OS developers continue to develop on the z/OS platform using ISPF/PDF. The centralized asset and process management approach extends the power of Rational change and release management software to z/OS development by enabling access through its ISPF client. With the Rational ClearCase ISPF client, z/OS developers can work in their traditional environment using assets that are stored in the same central repository and easily shared across the enterprise.

Other organizations are modernizing their z/OS development using powerful desktop development environments such as IBM Rational Developer for System z software. Rational Developer for System z provides z/OS developers with a modern and powerful environment for both maintaining existing applications and modernizing them for SOA. Organizations can deploy Rational Developer for System z in concert with Rational ClearCase to provide their developers with a modern development and lifecycle solution. The products work together in both local and remote perspectives to support off-host and on-host development environments.

Matching solution scope to organization needs

For flexibility in targeting a solution to specific needs, IBM delivers the full range of change and release management software within an integrated family of products. Highly trained IBM and IBM Business Partner sales professionals can help organizations select the best combination of capabilities to address specific needs.

What is the extent of enterprise development in which the organization is engaged? If many applications are being built with both distributed and z/OS components, a consolidated cross-platform solution exploiting the integrations available with the Rational Software Delivery Platform may be the right approach. Otherwise, implementing individual solutions to address specific pain points may provide the appropriate value.



Do developers often work concurrently on the same code base or product release? Rational ClearCase and Rational ClearQuest provide powerful facilities to enable any level of parallel development and release management.

Is the IT organization engaged in or planning initiatives to move z/OS developers to desktop development tools and environments? If so, it may want to consider exploiting Rational ClearCase and Rational Developer for System z.

Is the company looking for a more integrated approach to development across the application lifecycle? Rational change and release management products are tightly integrated with the IBM Rational Software Delivery Platform to expand visibility and control from requirements to deployment.

Every implemented IBM change and release management product can help further enhance individual and team productivity, expand visibility into projects and processes, improve management of distributed organizations, and extend audit trails and traceability across the software lifecycle.

For more information

To learn more about IBM Rational change and release management solutions, contact your IBM representative or IBM Business Partner, or visit:

ibm.com/software/rational/offerings/scm.html

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