



- Updated to add Rational ClearCase v7.1, Rational ClearQuest v7.1 and Rational Build Forge V7.1 as well as ROI slides --- Also, be sure to look at the **Optional Slides at the back of the presentation!**
- **Suggested Delivery:** This presentation is a core presentation – it is not intended to be delivered in its entirety due to the length/number of slides. It is recommended that you select the appropriate slides based on your audience. Notes have been added to this presentation to guide you with the delivery of the information.
- Overview:
- This presentation focuses on the IBM Rational solutions that help customers accelerate change and delivery.
- This slide deck includes topics on typical business challenges (related to Change, Configuration and Release Management (CRM)), how CRM addresses the needs at all levels/roles across businesses, and detailed overviews of Rational ClearCase, Rational ClearQuest, Rational Team Concert, Rational Build Forge and Rational Software Analyzer.

## Agenda

- Introductions
- The Challenges of Delivering Quality Software
- Technology Review - IBM Rational ClearQuest
- Technology Review - IBM Rational ClearCase
- Technology Review – IBM Rational Team Concert
- Technology Review - IBM Rational Build Forge




- Introductions of the IBM team

## Agenda

- Introductions
- The Challenges of Delivering Quality Software
- Technology Review - IBM Rational ClearQuest
- Technology Review - IBM Rational ClearCase
- Technology Review – IBM Rational Team Concert
- Technology Review - IBM Rational Build Forge



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## Business realities


*Software failure impacts the bottom line*

- **Airbus**  
Non-compatible software used at different Airbus factories  
**\$6.1 billion** profit hit over the next four years, 2006
- **TJX**  
Cost of data breach at TJX soars  
**\$256 million** cost, 2007
- **Hewlett-Packard**  
Problems with ERP system  
**\$160 million** loss, 2004

**Only 34% of software projects succeed**

**Only 37% of stakeholders are satisfied with the speed of internal application development, and just 42% are satisfied with the quality**

Sources: Forrester Research, Standish CHAOS Report, Comparative Economic Normalization Technology Study, Business Week, CEO Magazine, Computerworld, InfoWeek, Fortune, The New York Times, Time, The Wall Street Journal, Boston Globe.



### ▪ Businesses depend on software success

- You know that your business is growing increasingly dependent upon software. You use it to run your business processes. Maybe you use it to produce your products. Maybe software *is* your product.
- But what about the process you use to create this software? Do you sleep soundly at night, confident that your software and systems delivery process will consistently turn out reliable, high-performing software that aligns with your company's business strategy?
- If not, you are not alone. Recent studies show that the failure rate for software projects is still alarmingly high. According to the Standish Group, only 34 percent of all software projects succeed, and only about half of planned features and functions actually make it into the software that is released.
- Companies pay a high price for this failure. Half of the applications that make it into production get rolled back later, according to Gartner. And up to 4/5 of an average company's IT budget goes toward maintaining existing applications, according to a recent Intelligent Enterprise report. All told, software-related downtime drains \$300 billion in industry resources each year, estimates one industry study group.

### Source notes

- Forrester Research
- Airbus from Business Week - [http://yahoo.businessweek.com/globalbiz/content/oct2006/gb20061005\\_846432.htm](http://yahoo.businessweek.com/globalbiz/content/oct2006/gb20061005_846432.htm)
- TJX from Computerworld - <http://www.computerworld.com/action/article.do?command=viewArticleBasic&articleId=9014782>
- HP from ICMR – Center for Management Research. <http://www.icmrindia.org/casestudies/catalogue/IT%20and%20Systems/ITSY045.htm>
- Department of Commerce's National Institute of Standards and Technology (NIST) in the report released at [http://www.nist.gov/public\\_affairs/releases/n02-10.htm](http://www.nist.gov/public_affairs/releases/n02-10.htm) stated that software failure in the U.S. economy has cost an estimated \$59.5 billion annually, or about 0.6 percent of the gross domestic product



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## Why is it so difficult to quickly deliver quality software?

Difficult coordination and communication

Increasing development costs

Short deadlines/ need for faster time to market

Compliance mandates

Pressure from competition

Manual, error-prone tasks

Unpredictable and unreliable processes

Lack of visibility into project status

Distributed and disconnected teams

Inconsistent quality

Reduced staff

No control or insight into development activities

Complex environments

And more!

- **So, why is it so difficult to deliver quality software?**
- There are typical challenges associated with delivering quality software – they are numerous as you can see from the slide... Is your customer experience any others – not listed on this slide? Do any of these hit home?

## What is the business impact of these software delivery challenges?



- Delayed and missed releases
  - Effecting the ability to compete with competition
- Increased development costs
  - Effecting the overall company 'bottom line'
- Poor and unpredictable quality
  - Effecting the business reputation
- Customer dissatisfaction
  - Effecting future and current business



**So what is the business impact of these challenges to deliver quality software?** It is huge!

- ▶ The business impacts are costly – effecting the bottom line and even in some cases the business reputation and ability to compete with their competition. Poor quality software impacts project success (in delayed schedules and quality of delivered product) and customer satisfaction.

## Agenda

- Introductions
- The Challenges of Delivering Quality Software
- IBM Rational Software – Our Unique Value
- IBM Rational CRM Solution Overview
- Technology Review - IBM Rational ClearQuest
- Technology Review - IBM Rational ClearCase
- Technology Review – IBM Rational Team Concert
- Technology Review - IBM Rational Build Forge



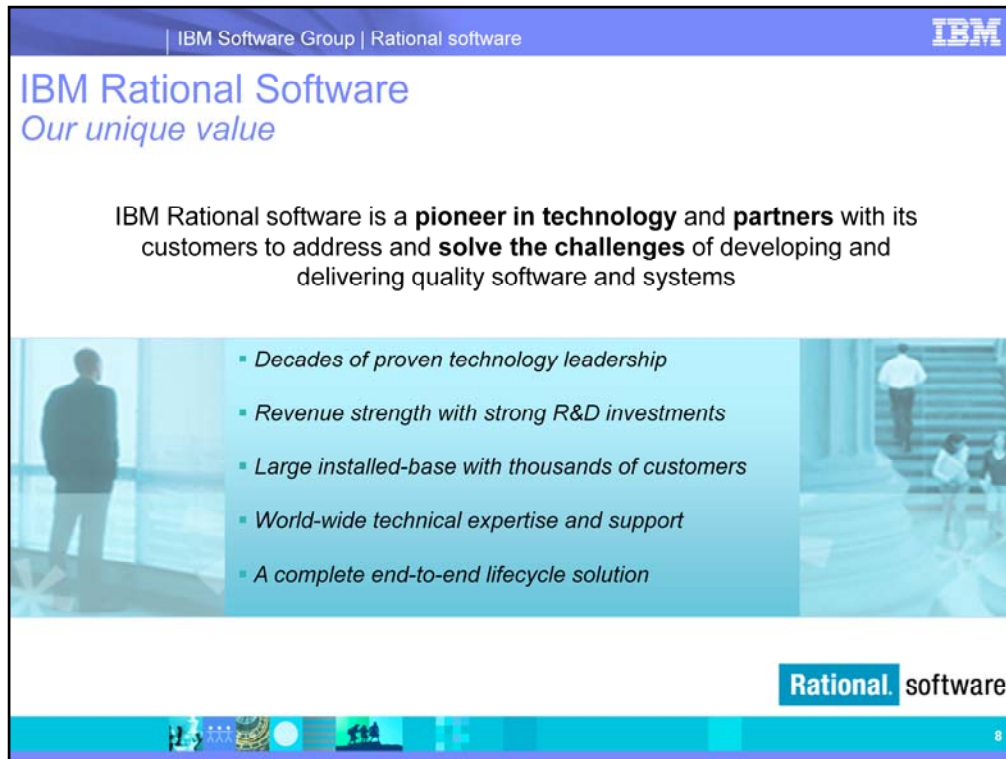
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**IBM Rational Software**  
*Our unique value*

IBM Rational software is a **pioneer in technology** and **partners** with its customers to address and **solve the challenges** of developing and delivering quality software and systems

- *Decades of proven technology leadership*
- *Revenue strength with strong R&D investments*
- *Large installed-base with thousands of customers*
- *World-wide technical expertise and support*
- *A complete end-to-end lifecycle solution*

**Rational.** software


 This is a presentation slide for IBM Rational Software. It features a blue header with the IBM logo and the text 'IBM Software Group | Rational software'. The main title is 'IBM Rational Software' with the subtitle 'Our unique value'. Below this, a paragraph states that IBM Rational software is a pioneer in technology and partners with customers to solve development challenges. A central light blue box contains five bullet points highlighting the company's strengths: decades of technology leadership, revenue strength from R&D, a large customer base, global technical expertise, and a complete end-to-end lifecycle solution. The slide is decorated with images of people in a modern office setting. At the bottom, there is a 'Rational. software' logo and a small number '8' in the bottom right corner.

▪What makes IBM Rational unique?

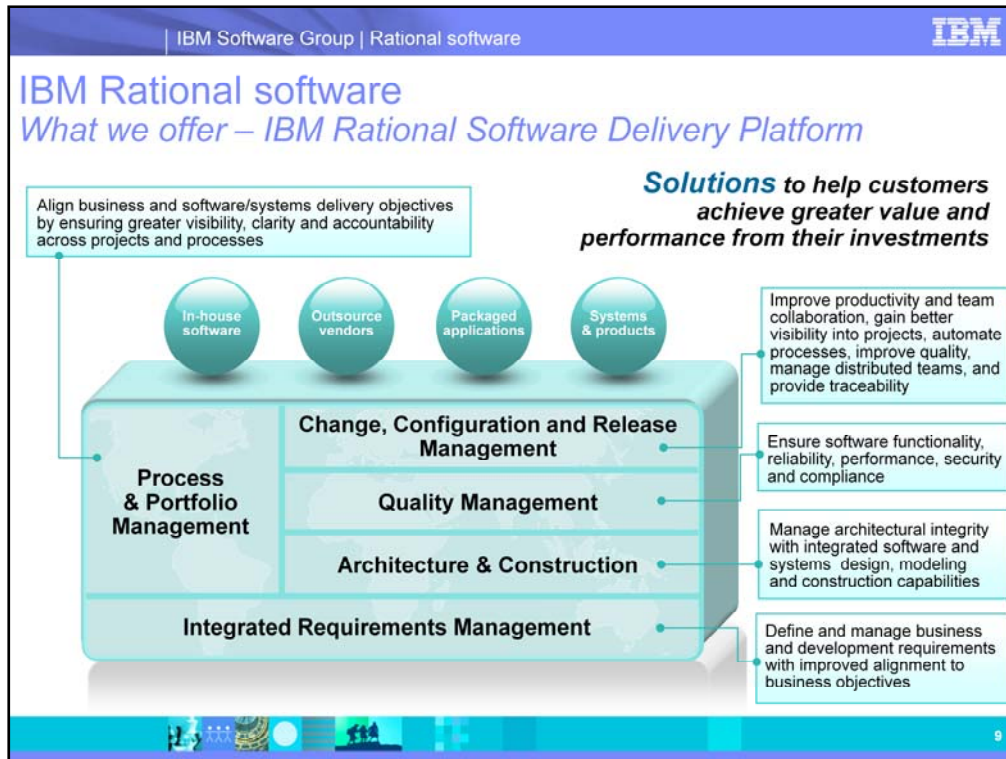
▪IBM Rational recognizes the importance of software and systems delivery to your core business and believes in being more than just a tools vendor – IBM Rational **partners** with you to help address and solve your business challenges.

▪IBM Rational is a pioneer in technology – Rational software was in business over 20 years prior to joining IBM where they set the standards with contributions such as the Unified Modeling Language (UML).

▪IBM was incorporated in the state of New York on June 15, 1911 and today is the world's largest information technology company. The company has over 300,000 employees and conducts business in some 170 countries.

▪IBM has the world's largest IT research organization, with more than 3,000 scientists and engineers working at eight labs in six countries. IBM invests more than \$5 billion a year in R&D.

▪There are over 2800 unique customers world-wide that are on active maintenance for either Rational ClearCase, Rational ClearQuest, Rational Build forge or the Rational Team Unifying Platform (TUP)



- The IBM Rational Software Delivery Platform provides solutions to help customers achieve greater value and performance in their investments. It includes the following functional areas: Process and Portfolio Management, Quality Management, Architecture and Construction, Integrated Requirements Management and of course Change, Configuration and Release Management – which is our focus in this presentation...

## Agenda

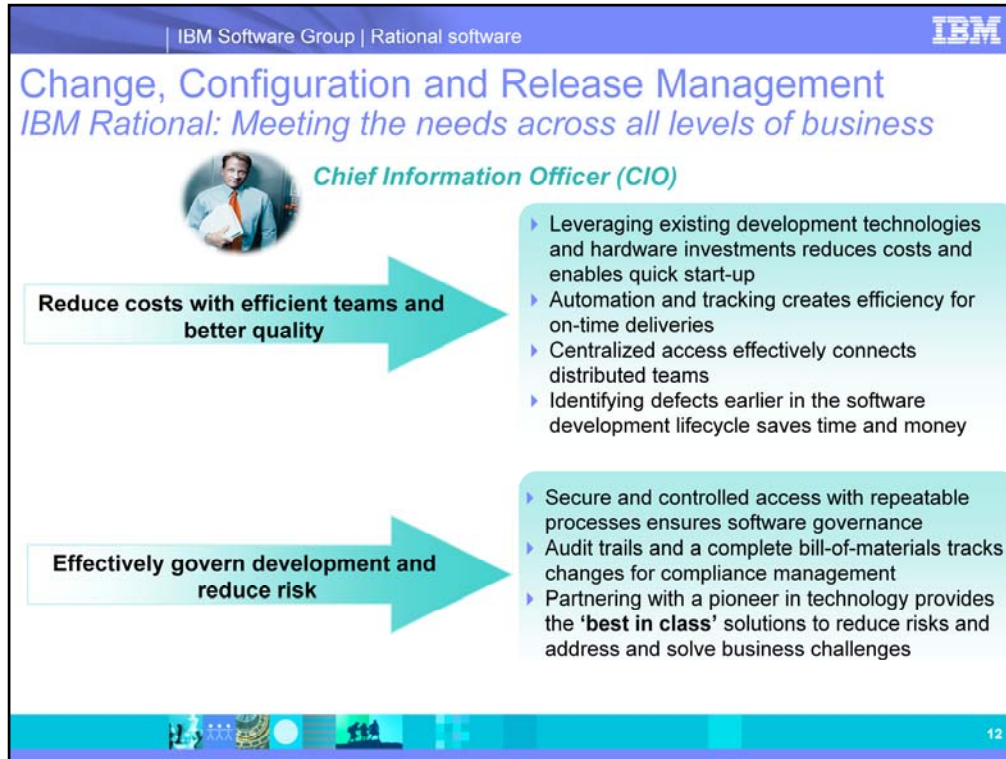
- Introductions
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- Technology Review - IBM Rational Build Forge
- Technology Review – IBM Rational Software Analyzer
- Next Steps



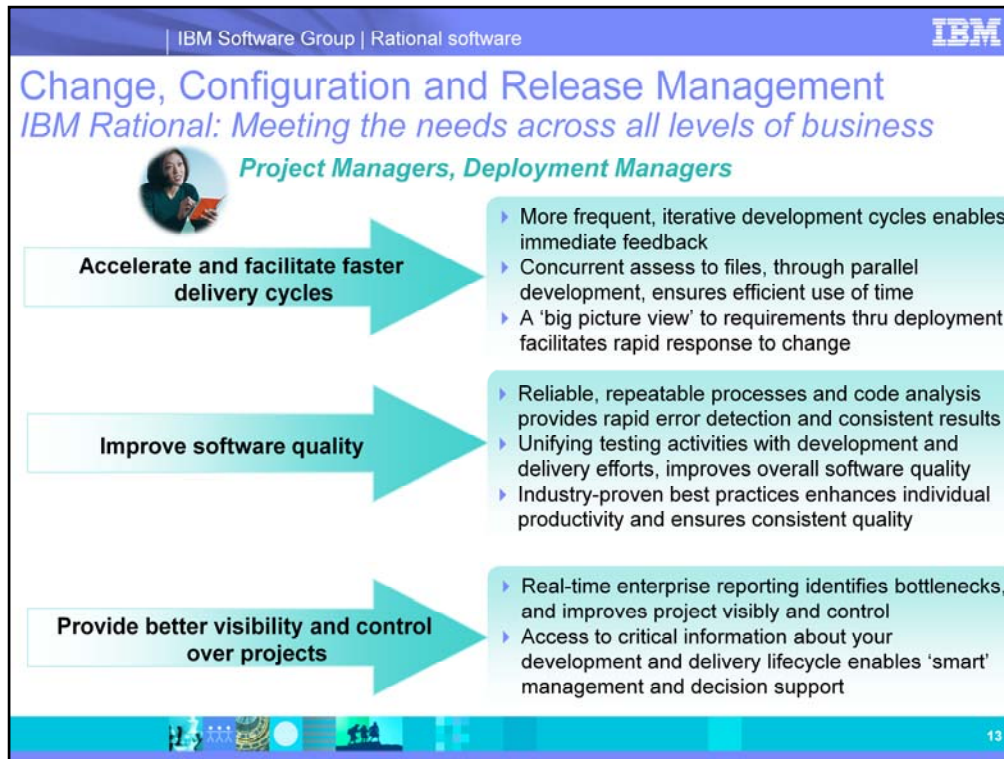


- Change, Configuration and Release Management applies to and affects all level across an organization. Each level of the organization has typical needs and requirements to be successful in their role. Change, Configuration and Release Management addresses the needs and requirements at the CxO level, levels of management (including Project Managers and Deployment Managers) and for the end-user (developers, testers and/or build engineers).





- IBM Rational's Change, Configuration and Release Management solutions focused on the key areas related to empowering teams to meet business goals.
- **Reduce costs with efficient teams and better quality:**
  - ▶ Leveraging existing development technologies and hardware investments reduces costs and enables quick start-up - making use of what you have in-house today reduces costs in that you are not required to change technologies in order to reap the benefits of our change and management solution
  - ▶ Automation and tracking creates efficiency for on-time deliveries – standardizing and tracking activities provides more efficient use of time and reduces any manual, costly processes for consistent and improved quality
  - ▶ Distributed and remote access enables cost effective availability to world-wide talent and expertise – remote access is built into our solution so you have access to it virtually from anywhere, anytime.
  - ▶ The costs associated with bug-fixes increases as a product matures through development, identifying defects earlier in the software development process significantly reduces expenses.
  - ▶ <CLICK>
- **Effectively govern development and reduce risk:**
  - ▶ Secure and controlled access with repeatable processes ensures software governance – repeatable processes improves quality and reduces risk while managing/governing the development process.
  - ▶ Audit trails and a complete bill-of-materials lists the changes and contents of deliverables for compliance management – this audit trail allows you to have easy access to materials that may be needed for compliance and regulations mandates.
  - ▶ Partnering with a pioneer in technology provides the 'best in class' solutions to reduce risks and address and solve business challenges – IBM partners with its customers to address and effectively solve the challenges of developing and delivering quality software and systems



IBM Rational's Change, Configuration and Release Management solutions focused on the key areas related providing visibility and control over software projects to ensure fast delivery of high-quality software

▪ **Accelerate and facilitate faster delivery cycles:**

- ▶ More frequent, iterative development cycles enables immediate feedback – with self-service access to production build processes, developers can quickly access the information that they need for debugging and building software quickly
- ▶ Concurrent access to files, through parallel development, ensures efficient use of time – team members can access files concurrently to prevent delays in waiting for files to be available thus utilizing their time effectively
- ▶ A 'big picture view' to requirements thru deployment facilitates rapid response to change – integrations with requirements, development, build, test, deployment and portfolio management tools to provide this complete view for better management of software projects. Project Managers have the visibility and predictability into the entire software development lifecycle from one source.

<CLICK>

▪ **Improve software quality:**

- ▶ Reliable, repeatable processes and code analysis provides rapid error detection and consistent results – standardized and repeatable processes improve consistently among team member as well as productivity thus improving software quality
- ▶ Unifying testing activities with development and delivery efforts, improves overall software quality
- ▶ Industry-proven configurable techniques and best practices enhances individual productivity and ensures consistent quality – the IBM Rational solution is a comprehensive integrated solution that includes best practice guidance

<CLICK>

▪ **Provide better visibility and control over project:**

- ▶ Real-time enterprise reporting identifies bottlenecks, and improves project visibility and control - the IBM Rational solution collects valuable project information and enables you to generate intuitive reports to help your team uncover development bottlenecks and determine project trends.
- ▶ Access to critical information about your development and delivery lifecycle enables 'smart' management and decision support

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**Change, Configuration and Release Management**  
*IBM Rational: Meeting the needs across all levels of business*

**Developers, Testers, Build Engineers**

**Improve productivity**

- ▶ Automated notifications of assignments and priorities enables you to know what to work on and when
- ▶ Self-services access to software assembly processes allows you to build quickly, anytime
- ▶ Transparent real-time access to files and directories provides immediate access to assets virtually anywhere in your organization
- ▶ Automation of tedious tasks, defect detection, and best practices guidance improves efficiency, quality and ensures consistent techniques

**Support the way you work today – freedom of choice**

- ▶ Supported integrations with leading IDEs allows you to work in your preferred environment
- ▶ Remote access and disconnected usage enables you to work from any location (office, home, during travel, etc.)
- ▶ Open source environments provides added workspace flexibility

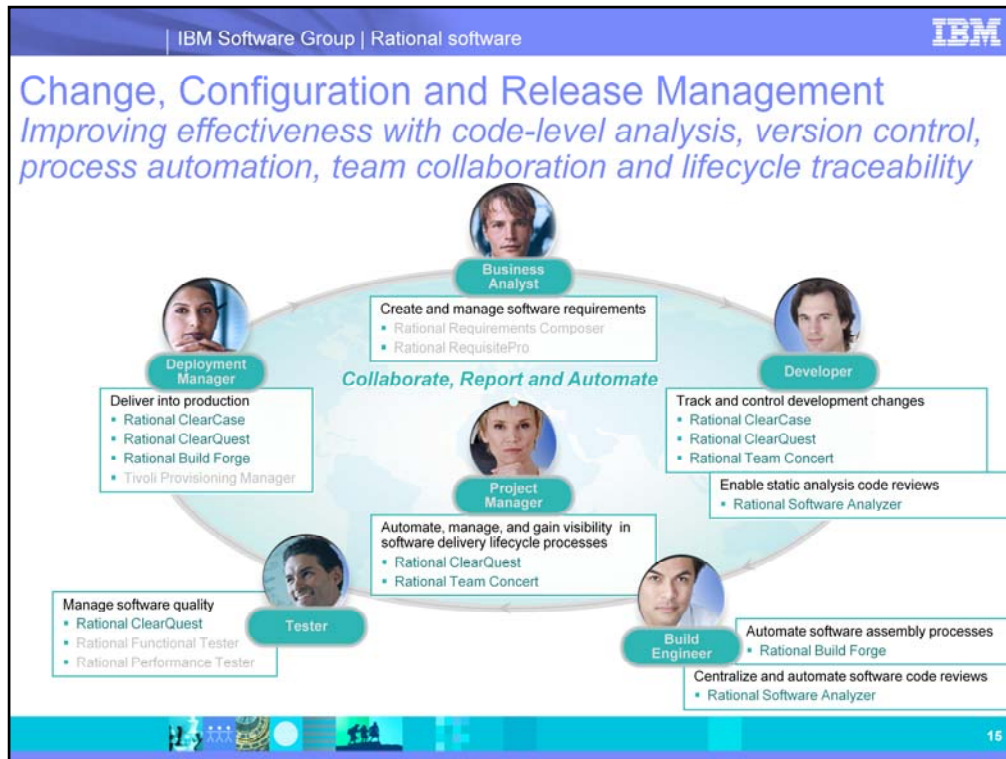
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- IBM Rational's Change, Configuration and Release Management solutions focused on the key areas related to being able to easily and quickly complete work with less defects
- **Improve productivity:**
  - ▶ Automated notifications of assignments and priorities enables you to know what to work on and when – email notifications are an easy way to let you know when you have new work assigned or when there are changes that you need to be aware of...
  - ▶ Self-services access to build and release processes allows you to build quickly, anytime – this allows you to be productive as you can build whenever you need.
  - ▶ Transparent real-time access to files and directories provides immediate access to assets virtually anywhere in your organization – no matter how large an organization and where files are located, you have access to files transparently any time, located anywhere
  - ▶ Automation of tedious tasks, defect detection, and best practices guidance improves efficiency, quality and ensures consistent techniques – no longer do you need to worry about missing defects, the 'paper-trail', process flow and approval cycle since it is automated, this saves you time and much frustration.

<CLICK>

- **Support the way you work today – freedom of choice**
  - ▶ Supported integrations with leading IDEs allows you to work in your preferred environment – you can complete your work from one location, you don't have to jump around to various tools to get the job done.
  - ▶ Remote access and disconnected usage enables you to work from any location (office, home, during travel, etc.) – this allows you the freedom for a flexible work schedule, working while on travel and telecommuting.
  - ▶ Open source environments provides added workspace flexibility – you can work the way you want but still have access to all the tools that you need to get my job done.





- ✓ As we look at the Change, Configuration and Release Management category of the Rational Software Delivery Platform we see that depending on your role, Change, Configuration and Release management software products improve software delivery and lifecycle traceability from requirements through deployment. For example:
  - Business and Requirements analysts can create and manage software requirements using **Rational RequisitePro** and **Rational Requirements Composer**. **Rational RequisitePro** improves the communication of project goals and ultimately increases the quality of applications before deployment and **Rational Requirements Composer** helps to capture and translate business goals into clear and actionable requirements for execution. Rational ClearQuest provides integrations with requirements management effectively collects stakeholder requests, then associate these requests to new or existing requirements.
- ✓ Developers can track and control development changes using **Rational ClearCase** for version control (software configuration management) and **Rational ClearQuest** for change tracking and process automation from requirements definition through production. **Rational Team Concert** combines basic version control while keeping track of assignments with work item support for small and mid size teams. Developers can also identify code-level issues earlier in the software development lifecycle and improve overall software quality by performing a static analysis review of their code using **Rational Software Analyzer**. **Rational Team Concert** also provides built in support for compiling software in continuous integration environments. Giving small and mid size teams out of the box support for agile processes.
- ✓ In order to automate build and release processes, Build Engineers can use **Rational Build Forge**. **Rational Build Forge** automates and accelerates build processes for agile development and high-performance builds of software. Using **Rational Software Analyzer**, Build Engineers can automate code quality analysis as part of the build process through the integration with **Rational Build Forge** for a centralized software code scan solution.
- ✓ Software quality can be managed using **Rational ClearQuest** with its integration to **Rational Functional Tester** and **Rational Performance Tester**.
- ✓ The software builds can get delivered in to a production environment by the Deployment Manager from **Rational ClearCase** using **Rational Build Forge** and/or **Tivoli Provisioning Manager** while **Rational ClearQuest** manages the deployment records.
- ✓ Project Managers can automate and get better visibility and control over software processes and projects with **Rational ClearQuest**. **Rational Team Concert** also has built in reporting and dashboards to give project


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## IBM Rational ClearQuest

### *Comprehensive Software Change Management*

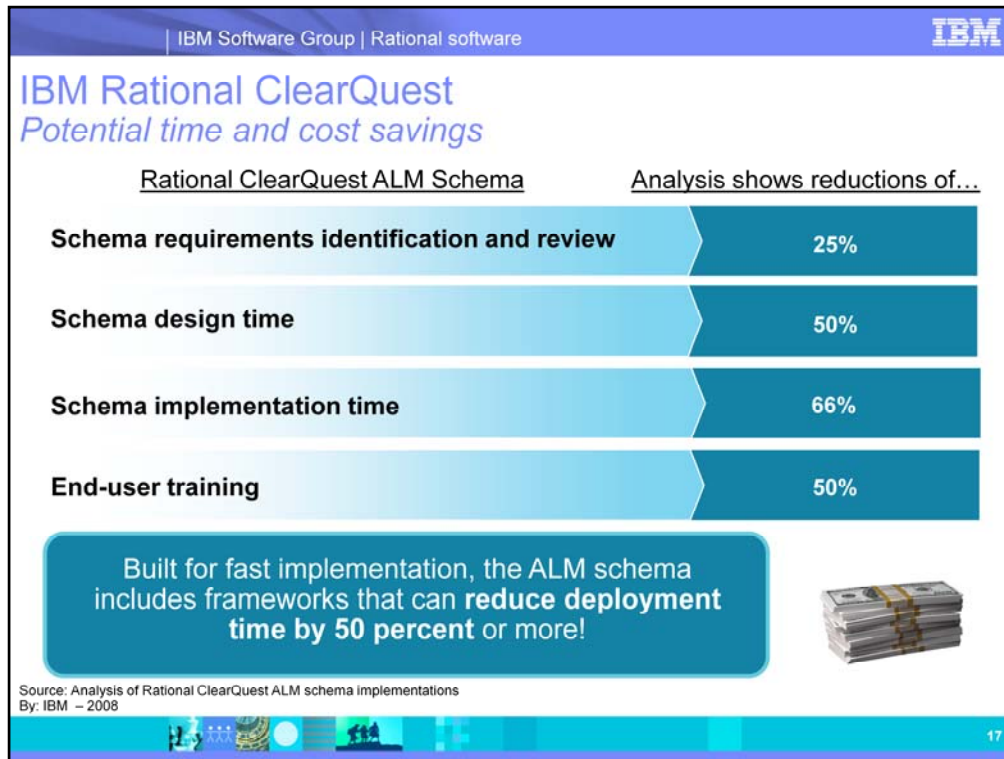
An industry-leading solution that provides flexible defect and change tracking, process automation, reporting and lifecycle traceability for better visibility and control of the software and systems development lifecycle

- ✓ Flexible, customizable and automated workflows provide repeatable, enforceable and predictable processes
-  An out-of-box Application Lifecycle Management (ALM) template provides a solid foundation for ALM best practices
- ✓ Real-time reporting and metrics improves project visibility and decision making
- ✓ Access control, electronic signatures, repeatable processes and audit trails simplify compliance management
- ✓ Scales to any size team from small workgroups to distributed enterprise teams to support evolving organizational needs
- ✓ Integration with requirements, development, build, test, deployment and portfolio management tools facilitates rapid response to change



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- IBM Rational ClearQuest provides comprehensive Software Change Management. “IBM is at the head of the pack” as noted in The Forrester Wave™: Software Change And Configuration Management, Q2 2007 report.
- Rational ClearQuest provides flexible defect and change tracking, process automation, reporting and lifecycle traceability for better visibility and control of the software and systems development lifecycle.
- It's key features and capabilities include:
  - Flexible, customizable and automated workflows provide repeatable, enforceable and predictable processes
  - New for v.7.1 is an out-of-box Application Lifecycle Management (ALM) template provides a solid foundation for ALM best practices
  - Real-time reporting and metrics improves project visibility and decision making
  - Access control, electronic signatures, repeatable processes and audit trails simplify compliance management
  - Scales to any size team from small workgroups to distributed enterprise teams to support evolving organizational needs
  - Integration with requirements, development, build, test, deployment and portfolio management tools facilitates rapid response to change



- As you can see, the reductions in deployment times (thus costs) are significant using the Rational ClearQuest ALM schema. It was designed and built for fast implementation and deployment.
- ---- Review the numbers with your customers ----
- Details:
  - ▶ Schema Requirements
    - includes customer meetings, documentation and review -> reduced by 25%
  - ▶ Schema Design
    - Includes customer meetings, documentation, and review -> reduced by 50%
  - ▶ Schema Implementation
    - 3 Iterations over the course of 3 months -> reduced by 66%
  - ▶ Training for end users
    - Activities performed during the schema implementation iterations

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## IBM Rational ClearQuest web

*Potentially lower development and infrastructure costs*

**Projection:** 50% of workforce will work "outside the walls" of a formal workplace\*

**Estimate:** 65% of IT budgets are allocated to operations and maintenance\*\*

**Survey Results:** Today's top priorities include cutting costs and improving workforce productivity\*\*\*

- ▶ Connects and unifies teams anywhere, anytime
- ▶ Light-weight, full featured web interface to help lower operational and maintenance costs
- ▶ Secure and controlled access with audit trails for reducing risk and aiding governance
- ▶ Repeatable and automated processes for improving productivity and reducing costs

Sources: \*Rebuilding the Competitive Foundation, ID Number: AV-18-9497, By: Gartner Research - December 2002  
 \*\* Proven Cost Cutting Strategies for IT, By: Info-Tech Research Group - August 2005  
 \*\*\* Top CIO Priorities for 2009: Technology Priorities, By: CIO Insight - 2009

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- **The Rational ClearQuest web interface** addresses the challenge of connecting remote teams, helps to lower operational costs since there is no need to install full Rational ClearQuest on the desktop, helps with productivity since it is feature-rich and mitigates risk with audit trails and secure access...
  - **Resources:**
  - **Rebuilding the Competitive Foundation**, ID Number: AV-18-9497
- By: Gartner Research - Kathy Harris, James Holincheck, Michael Bell, Diane Morello, Colleen Young  
 Publication Date: 6 December 2002
- \* Proven Cost Cutting Strategies for IT  
 Info-Tech Research Group - August 2005
- \*\* Top CIO Priorities for 2009: Technology Priorities  
 CIO Insight - 2009



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## IBM Rational ClearCase

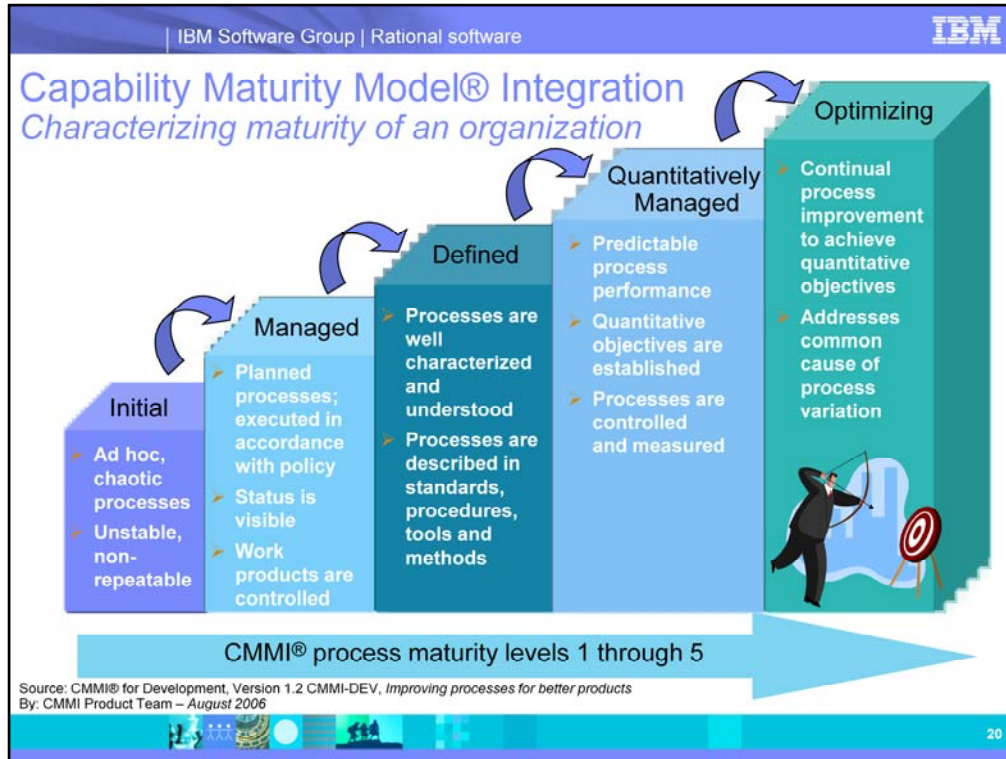
### Complete Software Configuration Management

An industry-leading solution that provides sophisticated version control, workspace management and parallel development support to improve productivity

- ✓ Light-weight feature-rich clients allow you to work locally or remotely
- ✓ Flexible out-of-box usage model based on proven best practices increases team productivity and efficiency
- ✓ Wide-range of supported environments and cross-platform support connects diverse teams
- ✓ Transparent real-time access to files and directories virtually anywhere in your organization
- ✓ Scales to any size team from small workgroups to distributed enterprise teams to support evolving organizational needs
- ✓ Integration with leading IDEs allows you to work in your preferred environment
- ✓ Sophisticated branching and graphical merge tools enable concurrent access to files and efficient use of time

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- IBM Rational ClearCase provides complete Software Configuration Management. “IBM is at the head of the pack” as noted in The Forrester Wave™: Software Change And Configuration Management, Q2 2007 report.
- IBM Rational ClearCase provides sophisticated version control, workspace management, parallel development support and build auditing to improve productivity.
- It's key features and capabilities include:
  - Light-weight feature-rich clients allow you to work locally or remotely – there have been huge enhancements to the remote interface for version v.7.1
  - Flexible out-of-box usage model based on proven best practices increases team productivity and efficiency
  - Wide-range of supported environments and cross-platform support ‘connects’ diverse teams
  - Transparent real-time access to files and directories virtually anywhere in your organization
  - Scales to any size team from small workgroups to distributed enterprise teams to support evolving organizational needs
  - Integration with leading IDEs allows you to work in your preferred environment
  - Sophisticated branching and graphical merge tools enable concurrent access to files and efficient use of time



- CMMI® (Capability Maturity Model® Integration) is a process improvement maturity model for the development of products and services. It consists of best practices that address development and maintenance activities that cover the product lifecycle from conception through delivery and maintenance.
- The maturity level of an organization provides a way to predict an organization's performance in a given discipline or set of disciplines. Each maturity level matures an important subset of the organization's processes, preparing it to move to the next maturity level. The maturity levels are measured by the achievement of the specific and generic goals associated with each predefined set of process areas.
- There are five maturity levels, each a layer in the foundation for ongoing process improvement, designated by the numbers 1 through 5:
  1. Initial
  2. Managed
  3. Defined
  4. Quantitatively Managed
  5. Optimizing
- Maturity Level 1: Initial**
  - At maturity level 1, processes are usually ad hoc and chaotic. The organization usually does not provide a stable environment to support the processes. Success in these organizations depends on the competence and heroics of the people in the organization and not on the use of proven processes. In spite of this chaos, maturity level 1 organizations often produce products and services that work; however, they frequently exceed their budgets and do not meet their schedules. Maturity level 1 organizations are characterized by a tendency to over commit, abandonment of processes in a time of crisis, and an inability to repeat their successes.
- Maturity Level 2: Managed**
  - At maturity level 2, the projects of the organization have ensured that processes are planned and executed in accordance with policy; the projects employ skilled people who have adequate resources to produce controlled outputs; involve relevant stakeholders; are monitored, controlled, and reviewed; and are evaluated for adherence to their process descriptions. The process discipline reflected by maturity level 2 helps to ensure that existing practices are retained during times of stress. When these practices are in place, projects are performed and managed according to their documented plans. At maturity level 2, the status of the work products and the delivery of services are visible to management at defined points (e.g., at major milestones and at the completion of major tasks). Commitments are established among relevant stakeholders and are revised as needed. Work products are appropriately controlled. The work products and services satisfy their specified process descriptions, standards, and procedures.
- Maturity Level 3: Defined**
  - At maturity level 3, processes are well characterized and understood, and are described in standards, procedures, tools, and methods. The organization's set of standard processes, which is the basis for maturity level 3, is established and improved over time. These standard processes are used to establish consistency across the organization. Projects establish their defined processes by tailoring the organization's set of standard processes according to tailoring guidelines. (See the glossary for a definition of "organization's set of standard processes.") A critical distinction between maturity levels 2 and 3 is the scope of standards, process descriptions, and procedures. At maturity level 2, the standards, process descriptions, and procedures may be quite different in each specific instance of the process (e.g., on a particular project). At maturity level 3, the standards, process descriptions, and procedures for a project are tailored from the organization's set of standard processes to suit a particular project or organizational unit and therefore are more consistent, except for the differences allowed by the tailoring guidelines. Another critical distinction is that at maturity level 3, processes are typically described more rigorously than at maturity level 2. A defined process clearly states the purpose, inputs, entry criteria, activities, roles, measures, verification steps, outputs, and exit criteria. At maturity level 3, processes are managed more proactively using an understanding of the interrelationships of the process activities and detailed measures of the process, its work products, and its services. At maturity level 3, the organization must further mature the maturity level 2 process areas. The generic practices associated with generic goal 3 that were not addressed at maturity level 2 are applied to achieve maturity level 3.
- Maturity Level 4: Quantitatively Managed**
  - At maturity level 4, the organization and projects establish quantitative objectives for quality and process performance and use them as criteria in managing processes. Quantitative objectives are based on the needs of the customer, end users, organization, and process implementers. Quality and process performance is understood in statistical terms and is managed throughout the life of the processes. For selected subprocesses, detailed measures of process performance are collected and statistically analyzed. Quality and process performance measures are incorporated into the organization's measurement repository to support fact-based decision making [McGarry 2000]. Special causes of process variation are identified and, where appropriate, the sources of special causes are corrected to prevent future occurrences. (See the definition of "special cause of process variation" in the glossary.) A critical distinction between maturity levels 3 and 4 is the predictability of process performance. At maturity level 4, the performance of processes is controlled using statistical and other quantitative techniques, and is quantitatively predictable. At maturity level 3, processes are typically only qualitatively predictable.
- Maturity Level 5: Optimizing**

Studies show that adherence to CMMI®-based processes...	Rational ClearCase may help teams...	To possibly realize these quantifiable benefits...
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**Reduce project costs through process improvements by up to 87%**

**Improve individual  
and team  
productivity by an  
average of 61%**

**Increase quality of software deliverables by up to 132%**

- **Resource: Performance Results of CMMI®-Based Process Improvement** *August 2006*

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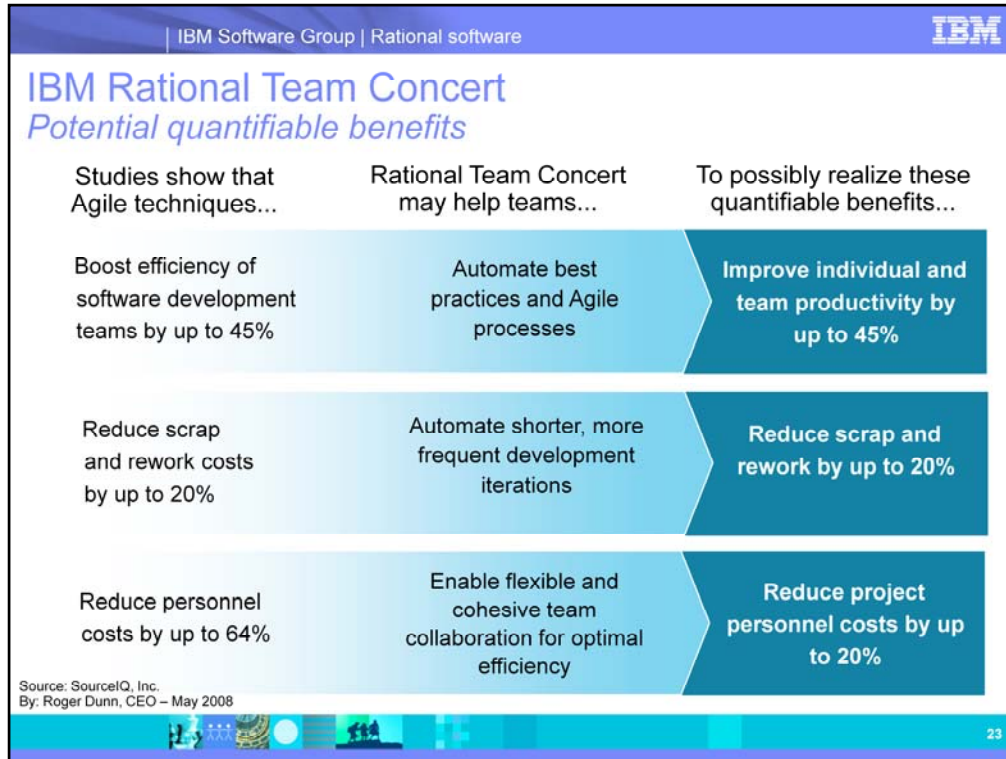
**IBM Rational Team Concert**  
*Software innovation through collaboration*

An innovative solution that provides integrated version control, automated workflows, and developer builds, in a single product for real-time visibility and complete project collaboration

- ✓ Think and work in unison across functional and organizational silos with integrated version control, change tracking and build capabilities
- ✓ Reporting and custom defined processes provide visibility and real-time project health information
- ✓ Built on IBM's newest innovative, collaborative platform – *Jazz*
- ✓ Unify teams that use a variety of clients – including the web, Eclipse and Rational development tools
- ✓ Leverage your existing investments – such as Rational ClearCase, Rational ClearQuest, Rational Build Forge and Subversion

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- IBM Rational Team Concert is an innovative solution that provides integrated version control, automated workflows, and developer builds, in a single product for real-time visibility and complete project collaboration
- Its key features and capabilities include:
  - Think and work in unison across functional and organizational silos with integrated version control, change tracking and build capabilities
  - Reporting and custom defined processes provide visibility and real-time project health information
  - Built on IBM's newest innovative, collaborative platform – *Jazz*
  - Unify teams that use a variety of clients – including the web, Eclipse and Rational development tools
  - Leverage your existing investments with integrations to: Rational ClearCase, Rational ClearQuest, Rational Build Forge and Subversion



- Studies show that Agile techniques boost efficiency of software development teams by up to 45%, reduce scrap and rework costs by up to 20% by prioritizing customers' most significant needs and reduce personnel costs by up to 64% by empowering teams to work with minimal overhead
- Rational Team Concert helps teams:
  - Automate best practices for any process -- with built-in support for agile practices to
  - Automate shorter, more frequent iterations to engage end users in more meaningful participation to
  - Enable flexible, global resourcing of projects and teams -- without compromising team cohesion to



## IBM Rational Team Concert

### Sample Return on Investment (ROI) scenario

**Goal:** Improve individual and team efficiency by up to 45%

**Goal:** Reduce scrap and rework by up to 20%

**Goal:** Reduce personnel costs by up to 20%

#### Sample ROI on \$2.5 M project, 12 month intended duration

Goal	Issue	Intended Benefit	Benefit / (cost)
Improve team efficiency	Agile practices reduce costs 45% (\$1.25m)	Save 10% team costs	\$250,000
Reduce scrap and rework	Increase customer focus 20% (\$.5m)	Increase returns 5%	\$125,000
Reduce personnel costs	Enable flexible project sourcing (64% (\$1.6m))	Reduce TCO (Total Cost of Ownership) 5%	\$125,000
Savings			\$500,000
Cost			(\$200,000)
ROI on one \$2.5m project		250%	\$300,000

Source: SourceIQ, Inc.  
By: Roger Dunn, CEO – May 2008



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Lets look at how these quantifiable benefits can relate to a project. In our example, we have a \$2.5 million dollar project that is scheduled for one year. We can see that we gain substantial benefits in team efficiency (\$250,000), reducing rework (\$125,000) and reducing personnel costs (\$125,000). After costs, we see that our total savings or return on investment (ROI) is \$300,000!


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## IBM Rational Build Forge

### *Automating software assembly*

An adaptive execution framework that automates software assembly processes to help development teams reduce costs and improve time to market

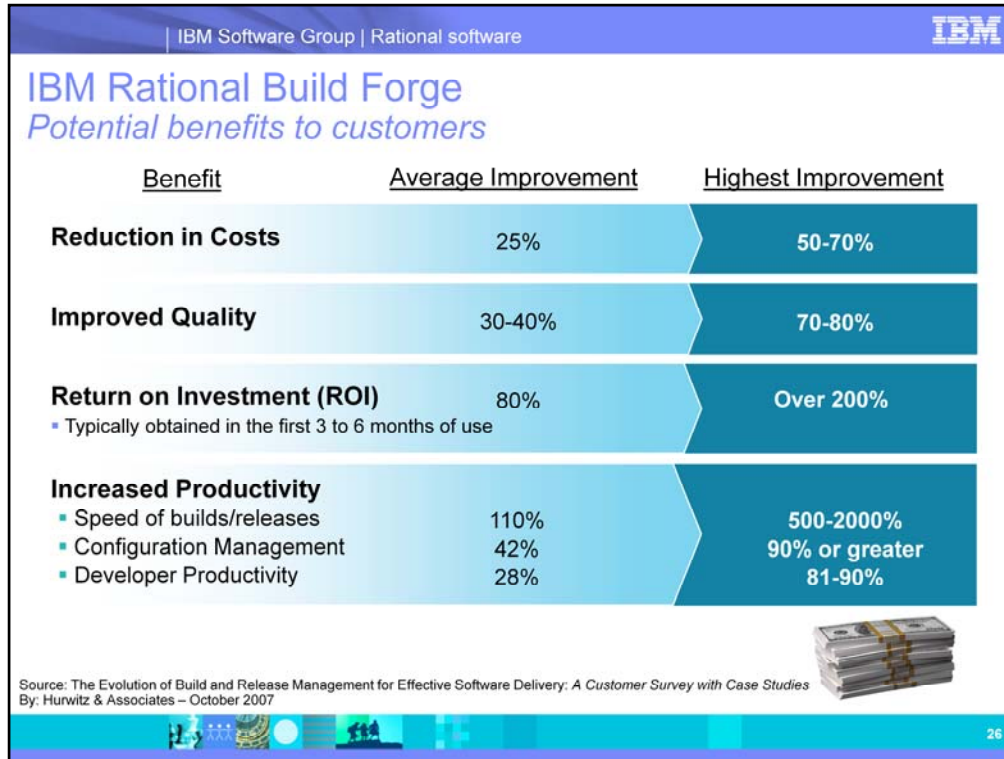
- ✓ Automate and standardize software assembly processes for improved productivity, efficiency, repeatability, reliability and tracking
- ✓ A reliable and automated 'Bill of Records' facilitates faster problem resolution, better reproducibility and compliance management
-  Job process optimization runs jobs the smartest way possible and project configuration snapshots manages various project configurations
- ✓ Web console for user access and administration provides a consolidated, real-time view to the assembly and build processes anytime, anywhere
- ✓ Integration with leading IDEs provides controlled, self service access to software assembly processes and allows you to work in your preferred environments
- ✓ Integration with existing development technologies (languages, scripts, tools, platforms) leverages existing investments and enables quick startup



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- Rational Build Forge allows you to automate software assembly – to create an assembly line that streamlines, automates, accelerates and executes your software assembly processes providing repeatability, reliability, and tracking. Rational Build Forge provides a framework to automate the \*entire\* software assembly process end-to-end. And Rational Build Forge was designed to integrate with existing scripts and tools, so there is no need to replace those pre-existing assets. Automation is really just one piece of what Rational Build Forge does; it also provides value-added capabilities such as build acceleration and automatic notifications. So the result is faster development cycles, higher product quality, increased staff productivity, and a shorter time-to-market.





- As you can see, the benefits to customers are substantial. Rational Build Forge has a direct impact on reduction of costs, improvement of quality, increasing productivity and there is a clear return on investment. The average Rational Build Forge customer experiences substantial ROI within 6 months. Customers have seen 2-3 day efforts reduced to 4 hours with IBM's solution.
- Review the numbers with your customers ----
- These benefits were found to help companies of all sizes in the areas of productivity and efficiency. Within the first year of using Rational Build Forge, customers have experienced an average first year savings of over \$918k which pencils out to an average ROI of 302%!!!
- Note: the data for the average first year savings was compiled from deals ranging from \$90k to \$2.4M – first year savings ranged from \$215k to \$6.8M!

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## IBM Rational Software Analyzer

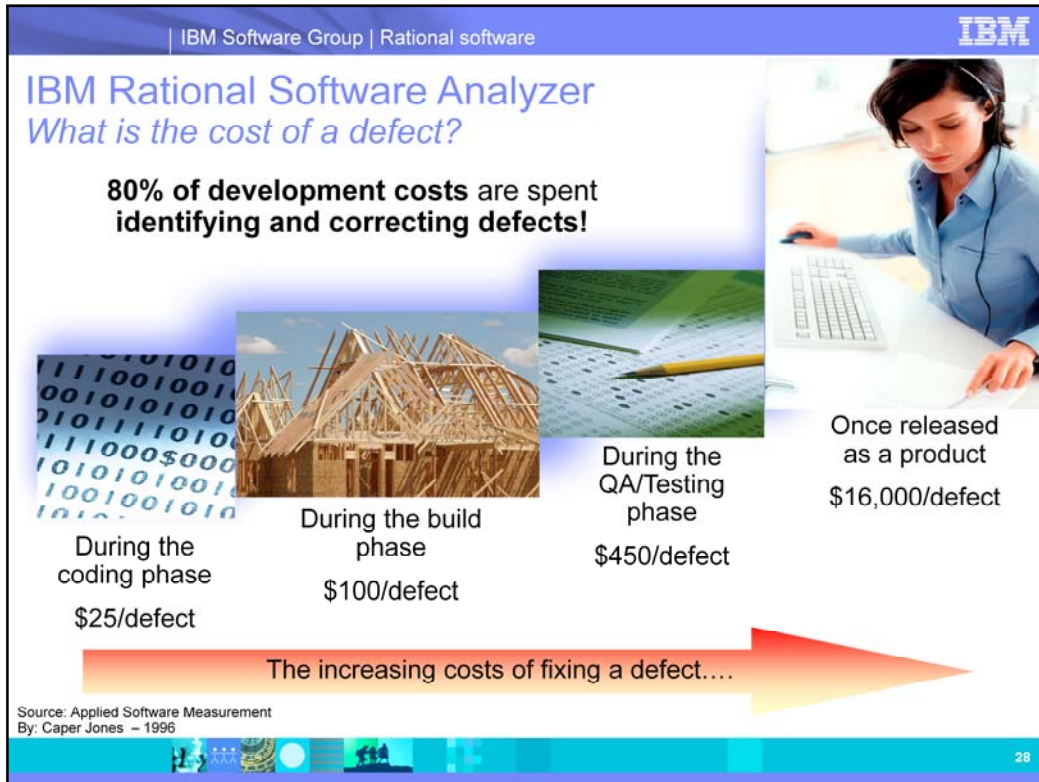
### Identifying code-level issues through Static Analysis

An extensible static analysis product that can help development teams detect - and in many cases correct - coding issues to help improve overall code quality

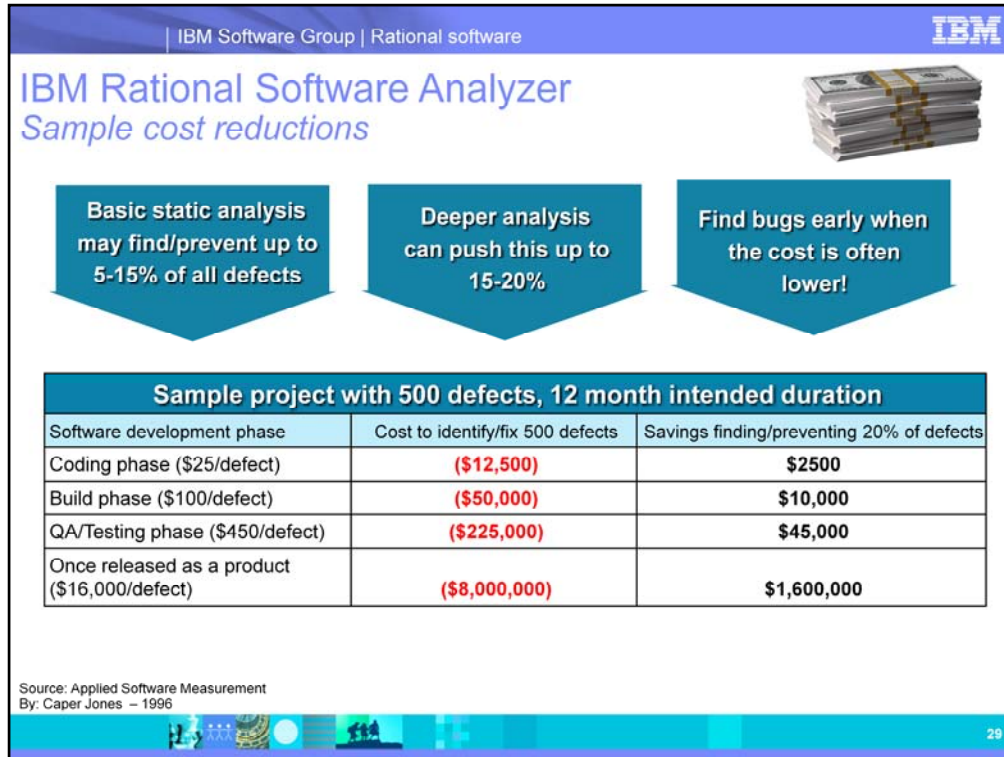
- ✓ Identify code-level issues early in the software development lifecycle, saving both time and money
- ✓ Extensible framework allows development teams to create custom rules and reports for added flexibility, and provides the ability to plug in to other analysis products for central management of third-party products
- ✓ Implement best practices across development teams to help enforce coding standards and adherence to compliance mandates
- ✓ Includes a rich set of out-of-box rules which enables code reviews using development best practices
- ✓ Enhance project visibility and more effectively manage governance and compliance
- ✓ Automate and centralize code quality analysis as part of the build process

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- IBM Rational Software Analyzer helps to identify code-level issues through *Static Analysis* code reviews. It is an extensible static analysis solution that enables code reviews and bug identification very early in the software development lifecycle saving both time and money.
- It's key features and capabilities include:
  - Improves overall code quality and predictability by identifying defects that may not be visible through manual code reviews.
  - Extensible framework allows development teams to create custom rules and reports for added flexibility, and provides the ability to plug in to other analysis products for central management of third-party products
  - Implement best practices across development teams to help enforce coding standards and adherence to compliance mandates
  - Includes a rich set of out-of-box rules which enables code reviews using development best practices
  - Enhance project visibility and more effectively manage governance and compliance
  - Automate and centralize code quality analysis as part of the build process. With the integration to Rational Build Forge you have the ability to have centralized software code scans as part of the build process adding another layer of code analysis.



- The National Institute of Standards and Technology (NIST) reports that “...**80% of development costs** [are spent] on **identifying and correcting defects**”
- The ‘Cost of Defect’ figures from Caper Jones (*Applied Software Measurement*, 1996):
  - ▶ At coding time - \$25/defect
  - ▶ At build time - \$100/defect
  - ▶ At QA - \$450/defect
  - ▶ At field level - \$16,000/defect



Lets look at how these quantifiable benefits can relate to a project. In our example, we have a project with 500 defects that is scheduled for one year. We can see that the later we find a defect, the more expensive it is to fix – for example, if we discover 500 defects in a product once it is released into production – it can cost \$8 M to fix these defects!!! That amount is staggering! If we simply reduce the number of defects found, you can see that the cost savings is impressive – in this example it is a savings of \$1.6 M... It is amazing that one simple change such as adding a static analysis solution such as Rational Software Analyzer can significantly reduce costs while improving software quality.

Resource: The 'Cost of Defect' figures from Caper Jones (*Applied Software Measurement, 1996*):

- ▶ At coding time - \$25/defect
- ▶ At build time - \$100/defect
- ▶ At QA - \$450/defect
- ▶ At field level - \$16,000/defect

- Static Analysis in Software Processes, Projects, and Products

By: IBM Academy of Technology Study (Paul E. McKenney, Jim Rumbaugh) - January 18, 2008

## Agenda

- Introductions
- The Challenges of Delivering Quality Software
- Technology Review - IBM Rational ClearQuest
- Technology Review - IBM Rational ClearCase
- Technology Review – IBM Rational Team Concert
- Technology Review - IBM Rational Build Forge



## IBM Rational ClearQuest

*Single solution to manage change across all projects*

- Consolidated, real-time view of entire project status
- Comprehensive quality metrics in project dashboards and reports
- Secure, central repository
- Traceable, auditable relationships between requirements, development, testing, project artifacts and deployment
- Easily customizable and configurable to meet your specific needs

**Visibility to changes anytime,  
anywhere!**



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- IBM Rational ClearQuest provides a consolidated, real-time view of the entire project status from requirements all the way to deployment. Rational ClearQuest integrates with requirements, development, build, test, deployment and portfolio management tools to provide this complete view for better management of software projects.
- This is a huge benefit for Project Managers as they now have the visibility and predictability into the entire software development lifecycle from one source.
- For the practitioner/end-user, this consolidated view into the project status provides traceable relationships between requirements, development, build, test and project artifacts which allows for streamline hand-offs and eliminates the solos between development teams for better quality, team communication and improved efficiency.








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## IBM Rational ClearQuest

*Easy access using the client of choice*

- For team members:**
  - 
Web – rewritten with focus on increasing productivity, enhancing usability and providing easy access to information!
  - Eclipse
  - Windows
  - UNIX/Linux
  - 
Command Line Interface (CLI)
- For administrators:**
  - 
Designer – rewritten with new features to reduce time spent on schema design!
  - 
Import tool – rewritten to provide multi-platform support!





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■ IBM Rational ClearQuest allows you to choose your preferred client – you are able to choose the platform (and even work across mixed platforms), and work locally or remotely.

■ For v.7.1, we included some great new clients and significant enhancements to existing clients including:

- ▶ Web – Rewritten with new features focused on increasing Productivity, enhancing Usability and providing Easy Access to information
- ▶ New Command Line Interface (CLI)
- ▶ Designer - Rewritten and includes new features such as compare/merge -- reducing time spent on schema design
- ▶ Import Tool – Rewritten to provide multi-platform support (Windows/Unix/Linux)



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# IBM Rational ClearQuest Web

*Easily connect your distributed teams*

- Lightweight
- Full featured
- Centralized, real-time view

**Multi-tasking tabbed display**

**Full text search**

**Record index (query results)**

**Secure login**

**Short-cut to favorites**

**Record view**

■ The Rational ClearQuest web interface has been enhanced (for v.7.1) to be the premier client for world-wide access to ClearQuest's change management capabilities-- providing the same capabilities as the traditional thick clients, along with impressive new features. The web client now provides a rich multi-tasking tabbed display that provides the novice to the advanced user access to multiple sources of data without losing their orientation.

■ New v.7.1 features include:

## ■ Increasing Productivity and Efficiency


- ▶ Responsive UI – “background tasks”
- ▶ Multiple tab displays (Forms and Results)
- ▶ Multiple row select
- ▶ Multi-record select and update
- ▶ Save/display only favorite queries

## ■ Enhancing Usability

- ▶ Personalization of Forms (show or hide fields/tabs)
- ▶ Change Folder Permissions
- ▶ Translated in 9 languages



## ■ Easy Access to Information


- ▶ Report management
- ▶ Atom feeds and REST Style Services
- ▶ Full text search
- ▶ Resize and resort results


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## IBM Rational ClearQuest

*Powerful metrics and real-time project status*

- Full database search capabilities 
  - ▶ Secured, fast and powerful
- Queries & Charts
  - ▶ Easily create and modify with Wizards
  - ▶ Charts: Aging, Trend, Distribution
- E-mail notification rules
  - ▶ Automatic notification of events and state changes
  - ▶ Configurable through GUI interface
- Enhanced Reporting and Charting 
  - ▶ Provides development teams with flexible and enterprise level access to real-time reporting and metrics
    - Data can be 'pulled' to be used by a wide variety of reporting engines such as: SAP BusinessObjects XI including Crystal Reports, Eclipse BIRT (included) and Actuate's BIRT Reporting Products
    - New Report Server allows teams to manage and run reports from a web browser providing access anywhere, anytime




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■ IBM Rational ClearQuest provides powerful metrics for the entire team through querying, charting, and reporting. ANY user has the ability to create charts, reports and queries. These powerful metrics are easy to create and modify through step-by-step Wizards that guide you through the process. Additionally, Rational ClearQuest provides predefined charts, queries and reports that you can run to view the status of your project at a glance.

■ The chart types, include aging, distribution, and trend charts. Distribution charts show the current status of data; trend and aging charts show historical information. You can use Rational ClearQuest report formats and reports to format the display of ClearQuest data returned by a query.

■ In Rational ClearQuest, you run a query to find specific defect or change request records in the database. Rational ClearQuest queries make it easy for everyone on your team to track change request records as they move through your software development lifecycle.

■ E-mail notifications help your team to be more efficient and proactive as the notifications are automated which allows teams to focus on events when they occur.

■ New for v7.1, is enhanced reporting features:

■ **Real-time reporting and metrics**

■ Rational ClearQuest provides a flexible reporting mechanism so that individual team members gain quick access to development activities. Data can be 'pulled' from Rational ClearQuest to be used by a wide variety of reporting engines such as: SAP BusinessObjects XI including Crystal Reports, Eclipse BIRT & and Actuate's BIRT Reporting Products. This reporting model allows development teams to have flexible and enterprise level access to real-time reporting and metrics.

■ **Report Server for Rational ClearQuest**

■ The Report Server for Rational ClearQuest allows teams to manage and run reports from a web browser. Access to the web server is controlled by your Rational ClearQuest login credentials – allowing the management and running of reports from anywhere, anytime.

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## IBM Rational ClearQuest

*Project metrics for Managers*

Get answers to common questions  
anytime, anywhere...

- Resource allocation
  - ▶ "Are change requests distributed evenly across the team?"
  - ▶ "Who is available to take on a mission-critical bug fix?"
- Project status
  - ▶ "How many Priority 1 defects are still outstanding?"
  - ▶ "How many defects have been submitted for this release?"
- Trends
  - ▶ "How long is it taking to fix the average bug?"
  - ▶ "How long is taking to implement enhancement requests?"
- Testing
  - ▶ "How many defects are in the verifying state?"



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- The powerful metrics in IBM Rational ClearQuest provide real-time information to answer Project Manager's questions. These questions can be related to resource allocation, general project status, trends, testing activities, etc....
- Project Managers (or any user) can create and modify metrics (charts, reports and queries) at any time and save them for repeated access to quickly get the answers to project status questions.

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# IBM Rational ClearQuest

Improve individual and team effectiveness

Know what to work on and when...

- To-do list
  - "What Change Requests have been assigned to me?"
  - "What should I work on first"

- Individual team members can also take advantage of Rational ClearQuest's metrics to improve personal productivity. The "To Do" list is an example of a query that can be run at start-up and is completely customizable. It can be used to identify what tasks to work on and when based on the priority of a task.

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## IBM Rational ClearQuest

*Simplify security and compliance management*

- **Electronic Signature**
  - ▶ Choose what records and states require Electronic Signature approval
- **LDAP Authentication and User Authorization**
  - ▶ Rational ClearCase and Rational ClearQuest secured login
- **Audit Trail and Field Logging**
- **Secure Repository**
  - ▶ Supports popular database vendors
- **Enhanced Security**
  - ▶ Disabled "Remember Password"
  - ▶ Federal Information Processing Standards (FIPS) 140-2 approved encryption
  - ▶ Internet Protocol version 6 (IPv6) support



Repeatable, reliable  
and enforceable  
security




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- IBM Rational ClearQuest provides repeatable, reliable and enforceable processes and ensures lifecycle traceability for better visibility and control of the software development lifecycle. Rational ClearQuest security and compliance features enable you to protect your data and ensure that only authorized users view or change records. You can hide specific records from some users while allowing other users to view or change the same records.
- Highlights to the security and compliance features include Electronic Signature for electronic approval of records, the industry standard Lightweight Directory Access Protocol (LDAP) to authenticate using an LDAP directory server, and automatic audit trail and field logging capabilities. Additionally, the Rational ClearQuest supported databases are industry proven, secure and popular databases.
- New for Rational ClearQuest v7.1 are the following enhanced security items:
  - ▶ Disabled "Remember Password"
  - ▶ Federal Information Processing Standards (FIPS) 140-2 approved encryption
  - ▶ Internet Protocol version 6 (IPv6) support



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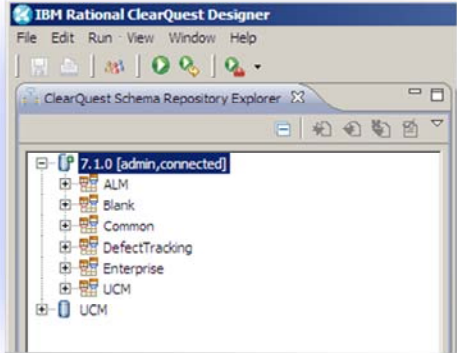
## IBM Rational ClearQuest

*Customize and configure to meet your needs*

**Quick start-up with “out of the box” schemas**

*Easily customized for any process or create your own schema from scratch*

- **ALM Schema** NEW
  - Deployment ready out-of-the-box using ALM best practices
- **DefectTracking**
  - Standard out-of-the-box defect tracking
- **Unified Change Management**
  - Supports UCM-enabled projects, allowing true “Activity-based” development
- and more...



**Rational ClearQuest allows you to develop and test your changes (in a test environment) BEFORE applying them to production!**


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- IBM Rational ClearQuest includes several predefined **“out of the box”** schemas. Each ClearQuest predefined schema provides specific functionality or specific support for integrations. You can customize an existing predefined schema or create a new schema from scratch.
- New for v.7.1 is the Rational ClearQuest ALM schema – this schema allows you to quickly and easily implement ALM best practices to new or existing Rational ClearQuest installations – it is VERY customizable easily meeting the diverse requirements of various projects.
- One HUGE differentiator of Rational ClearQuest is that fact that you can customize and test your Rational ClearQuest schema changes in a test environment and then when ready, you choose when to publish your changes into production. This allows for minimal disruption of the production environment and ensures your changes work as expected prior to releasing them for use to your user community.
- New for v.7.1: The new Designer in Rational ClearQuest provides design flexibility for Rational ClearQuest forms by supporting schema development compare/merge and cross-platform support -- reducing time spent on schema design.

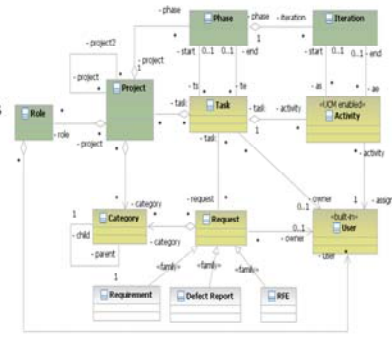
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## IBM Rational ClearQuest ALM Schema


*Simplifying Application Lifecycle Management (ALM)*



- **Solid foundation for scalable ALM**
  - ▶ Deployment ready out-of-the-box using ALM best practices
  - ▶ Bring new projects to ALM or enhance existing ClearQuest projects
  - ▶ Scalable from small teams to enterprise-wide organizations
- **Boost team performance**
  - ▶ Support for Agile techniques or high process needs – meeting every team's requirements
- **Reduce implementation time, maintenance and administration**
  - ▶ Streamline project creation: Copy any project or setup a project as a template
  - ▶ Empower Project Managers to configure work processes, team vocabularies and security settings
- **Collaborate and coordinate (people, processes and information) among team members**
  - ▶ Manage a single request in more than one project
  - ▶ Maintain relationships between requests, tasks and activities



Streamline a team's ability to deliver software without extensive schema development


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- The IBM Rational ClearQuest software includes an out-of-the-box ALM schema that is both role based and process driven, allowing organizations to manage and improve software delivery through ALM. It helps teams provide a security-rich project context, coordinate work throughout the software development lifecycle, support regulatory compliance initiatives, and empower project managers and team leads to adapt configurations to meet project needs.
- The challenge for software development teams is not in creating a single artifact (source code, requirement or test case), but rather in collaborating across disciplines and understanding the relationships between artifacts. To enable this understanding, the Rational ClearQuest ALM schema is based on three essential concepts:
  - Projects provide context, roles and security.
  - Work is completed in the context of a project.
  - There are system-wide settings that you can modify without having to change the schema.
- With the ALM packages for Rational ClearQuest, system administrators can empower project managers to complete these requests themselves. System-wide settings can be defined using a group of records described as “labels” that can be easily be adapted to support individual team needs—without affecting the underlying schema. Labels can be used to enable consistency among multiple projects across the enterprise, while also providing the power to adapt to new vocabularies.
- Additionally, security policies are system-wide settings that can be established by users with the *SecurityAdmin* privilege. This allows the Rational ClearQuest schema to meeting the diverse needs of different projects.
- Also, the design time is significantly reduced with the Rational ClearQuest ALM schema as not only can you empower the project managers to make the changes we discussed but there is also the ability to copy any project or setup a project template for quick start-up of a new project.

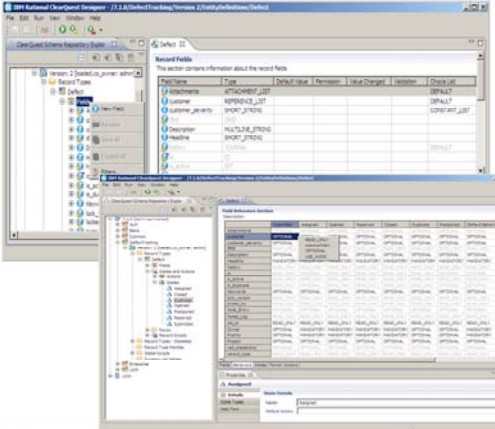
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## IBM Rational ClearQuest

*Customize and configure to meet your needs*

**Add your own fields and modify behaviors**

- Create new fields of any type
  - ▶ Integer
  - ▶ date/time
  - ▶ short string
  - ▶ multi-line string
  - ▶ attachment list
  - ▶ Reference
  - ▶ reference list
- Easily set a field's behavior
  - ▶ Read-only
  - ▶ Mandatory
  - ▶ Optional
  - ▶ Script (VBScript or Perl)



The screenshot shows the IBM Rational ClearQuest Designer interface. The top window, 'Record Fields', displays a table of fields for a record type. The bottom window, 'Field Behaviors', shows a detailed configuration for a specific field, including options for read-only, mandatory, and optional status, as well as a script editor for VBScript or Perl.

■NOTE: If presenting a Rational ClearQuest demo that includes the Rational ClearQuest Designer, you can skip this slide.

■Rational ClearQuest enables Administrators to add as many new fields as you need (using various field types) as well as control their associated behaviors (to make a field option, read-only, mandatory, etc).

■You can tailor Rational ClearQuest to model your existing process, or create a new one. And because you're able to add whatever fields you want, Rational ClearQuest makes it easy to migrate data from your legacy system.

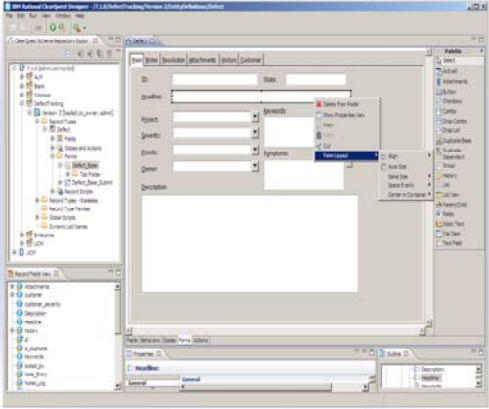
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## IBM Rational ClearQuest

*Customize and configure to meet your needs*

**Modify the forms for your desired look**

- Built-in visual form editor
  - ▶ Drag and drop into place
  - ▶ Add tabs to group fields
  - ▶ Choose the control type from the control palette
    - Check box
    - Drop-down list
    - Combo box
    - Option button
    - Text box, etc.



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■NOTE: If presenting a Rational ClearQuest demo that includes the Rational ClearQuest Designer, you can skip this slide.

- Administrators can easily customize and configure the Rational ClearQuest forms to look the way you want them to look.
- The built-in forms editor allows you to drag-and-drop controls (check boxes, drop-down lists, text boxes, etc) into place. You can add controls and tabs to organize the fields for your desired look.
- All customizations and changes to forms are automatically pushed out to all clients (Windows, UNIX/Linux and Web clients), eliminating the need to spend time building Web pages. **No other tool makes it this easy to customize the interface.**

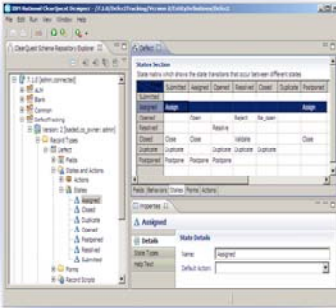
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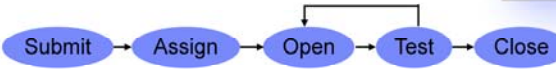
## IBM Rational ClearQuest

*Customize and configure to meet your needs*

### Configure your unique state transition matrix

- Automate and configure your process workflow
  - ▶ Automatic e-mail notifications
- Control access to/from states
- Easy to configure
  - ▶ Drop-down selections





■NOTE: If presenting a Rational ClearQuest demo that includes the Rational ClearQuest Designer, you can skip this slide.

- Rational ClearQuest allows you to easily define and automate your process model.
- Rational ClearQuest offers out-of-the-box state transition models (included with the out-of-the-box schemas) that can be used as is or modified to be as complex as needed based on your desired process
- You may want to transition from one state to the next based on some action that's performed, based on security permissions, etc. Rational ClearQuest allows you to easily configure your unique state transition matrix and it can be modified/adjusted as needed at any time via simple drop-down selections.
- Additionally, you can include email notifications at any state in your process model that allows users to be notified of changes or of any actions they may need to take.
- .



*Customize and configure to meet your needs*

Pre-defined “**Packages**” provide a variety of functional building blocks

- [illegible]



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**IBM Rational ClearQuest**  
*Unify teams for improved coordination and collaboration*

**The 'hub' for development activities**

Rational ClearQuest allows you to integrate the full development lifecycle for visibility and rapid response to change

- IBM Rational RequisitePro for requirements management and traceability
- IBM Rational ClearCase for configuration management of development activities
- IBM Rational Team Concert for collaborative software development
- IBM Rational Asset Manager to cooperatively develop and reuse assets
- And more...

The diagram illustrates Rational ClearQuest as a central hub. It is represented by a blue cube with a circular base. Eight light blue ovals, each containing a development activity, are arranged in a circle around the central cube. Lines connect the central cube to each of these ovals, signifying integration. The activities are: Requirements Management (top), Testing (top-right), Partner solutions (right), Portfolio Management (bottom-right), Build and deploy (bottom), Configuration Management (bottom-left), Open source tools (left), and Asset Management (top-left).

■ Rational ClearQuest provides change management (defect/enhancement tracking), automated workflows, access control and electronic signatures for process implementation or compliance mandates as well as real-time reporting. ...It is the hub for all development activities providing complete visibility and traceability between requirements, testing, build and deploy processes.


■ Examples include:

- RequisitePro for Requirements Management and Trace Relationships
- Asset Manager (RAM) to Cooperatively Develop & Reuse Assets
- ClearCase/UCM for Version Control of Development Activities
- Team Concert for Agile Teams
- Partner Extensibility for Inclusion of Complementary Solutions
- And more!


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## IBM Rational ClearQuest 7.1

### *New features summary*



- **New and Improved Rational ClearQuest Clients**
  - ▶ Web – Rewritten with new features focused productivity, usability and easy access to information
  - ▶ New Command Line Interface (CLI)
  - ▶ Designer – Rewritten with new features such as compare/merge -- reducing time spent on schema design
  - ▶ Import Tool – Rewritten to provide multi-platform support (Windows/Unix/Linux)
- **New Application Lifecycle Management (ALM) Schema**
  - ▶ Out-of-box template provides a solid foundation for ALM best practices
- **New Powerful Reporting**
  - ▶ Data can be 'pulled' and used by a wide variety of reporting engines
- **New CM Server**
  - ▶ Single server for both Rational ClearCase Remote Client and ClearQuest Web
- **New IBM Installation Manager**
  - ▶ IBM Installation Manager (IIM) provides users and administrators with a common install experience
- **Enhanced Security**
  - ▶ Includes FIPS 140-2 approved encryption, IPv6 support and disabled "Remember Password"
- **New Common Rational ClearQuest/ClearCase Help**
  - ▶ Allowing the user quick access to all help, regardless of the point of entry

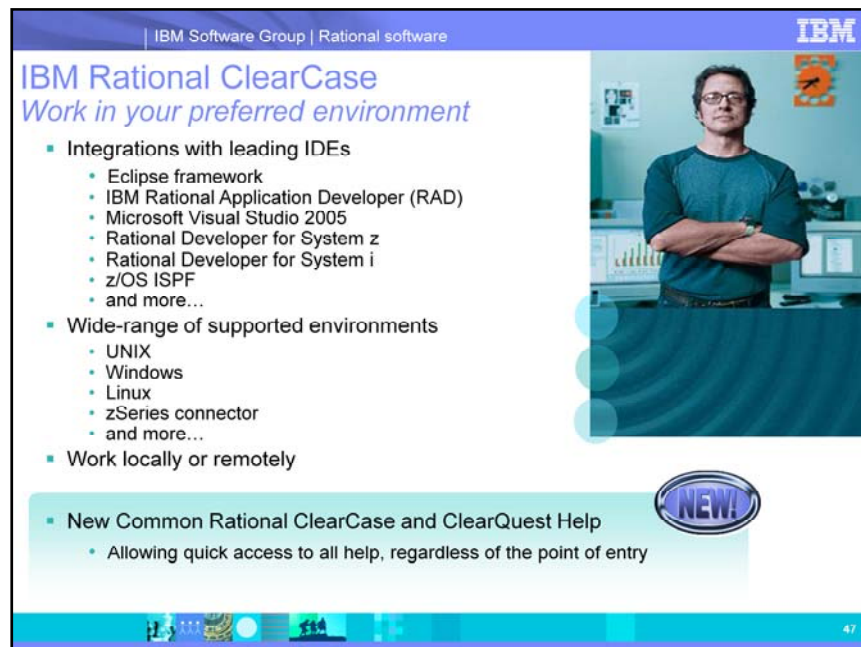

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- In addition to the items listed in this slide, **over 75 Requirements and 375 RFEs were incorporated into 7.1**
- **Some more info....**
- The Rational ClearQuest web interface has been enhanced to be the premier client for world-wide access to ClearQuest's change management capabilities-- providing the same capabilities as the traditional thick clients, along with impressive new features. The web client now provides a rich multi-tasking tabbed display that provides the novice to the advanced user access to multiple sources of data without losing their orientation.
- The new Designer in Rational ClearQuest provides design flexibility for Rational ClearQuest forms by supporting schema development compare/merge and cross-platform support -- reducing time spent on schema design.
- Rational ClearQuest includes an out-of-the-box ALM schema that is both role-based and process driven, allowing organizations to manage and improve software delivery through ALM.
- Reporting improvements include a report designer (with the ability to report across multiple record types and data sources), integrations to provide summary charts, and detailed parent-child drill down reports. An industry standard search facility provides Google-like criteria for quick access to information.
- Both Rational ClearCase Remote Client and Rational ClearQuest web share a common server infrastructure based on WebSphere Application Server (WAS). This simplifies install, setup and tuning for administrators by reducing the complexities of separate servers for these clients. It also provide a common set of capabilities -- High Availability, load balancing and the ability to leverage high performing hardware.
- Rational ClearCase and Rational ClearQuest 7.1 install technology has been upgraded to the IBM Installation Manager (IIM), which provides users and administrators a common install experience for both tools on all OS platforms, and is consistent with other IBM Rational tools. With IIM repositories, Rational ClearCase and Rational ClearQuest install configuration can be combined with other Rational tools to simplify installation across a tool set, thereby reducing the complexities of configuring a desktop with multiple Rational tools.
- Rational ClearCase and Rational ClearQuest now provide a common help system for all UIs and CLI, allowing the user quick access to all help, regardless of the point of entry. These common help systems use the same standard help capabilities as Information Centers ([www.ibm.com/support/publications/us/library](http://www.ibm.com/support/publications/us/library)) and other Rational tools, which reduces the learning curve for users familiar with these other IBM help facilities.

## Agenda

- Introductions
- The Challenges of Delivering Quality Software
- Technology Review - IBM Rational ClearQuest
- Technology Review - IBM Rational ClearCase
- Technology Review – IBM Rational Team Concert
- Technology Review - IBM Rational Build Forge





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## IBM Rational ClearCase

*Work in your preferred environment*

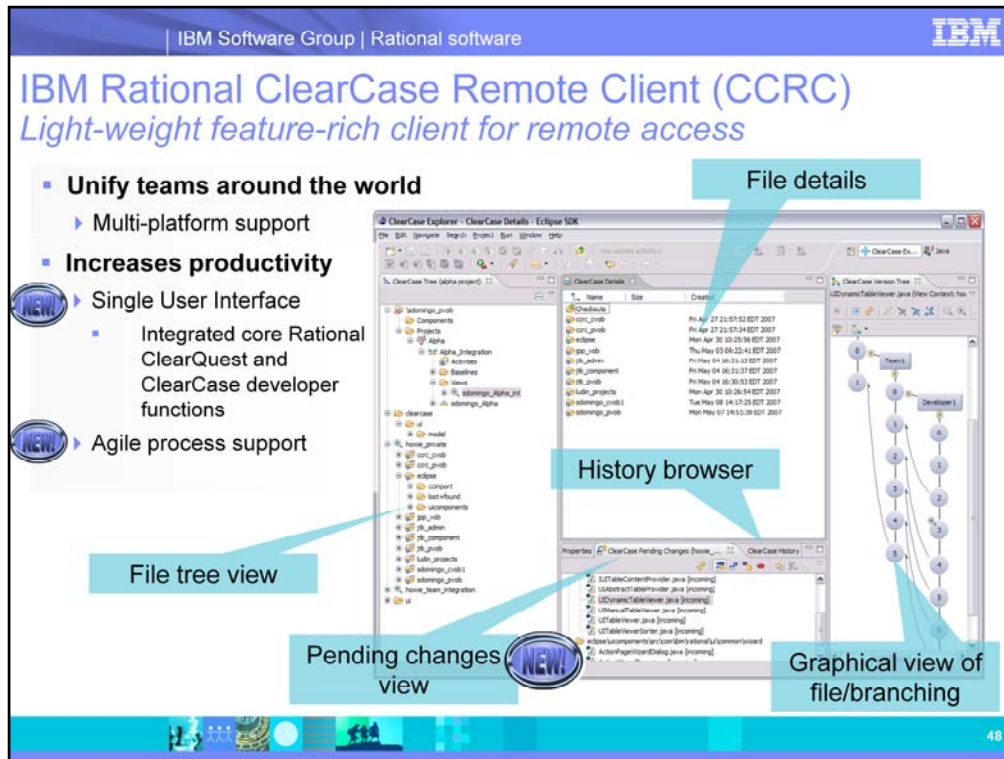
- Integrations with leading IDEs
  - Eclipse framework
  - IBM Rational Application Developer (RAD)
  - Microsoft Visual Studio 2005
  - Rational Developer for System z
  - Rational Developer for System i
  - z/OS ISPF
  - and more...
- Wide-range of supported environments
  - UNIX
  - Windows
  - Linux
  - zSeries connector
  - and more...
- Work locally or remotely
- New Common Rational ClearCase and ClearQuest Help
  - Allowing quick access to all help, regardless of the point of entry

NEW

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- IBM Rational ClearCase allows you to have the flexibility to work in your preferred environment – you are able to choose the IDEs to work from, choose the platform (and even work across mixed platforms), and work locally or remotely.
- For the full list of supported OSs – please refer to the Systems Requirements technote for Rational ClearCase v.7.1
- Integrations for High availability** help ensure operational continuity – these include:
  - ▶ Symantec Veritas Cluster Server on Solaris
  - ▶ Steeleye LifeKeeper on Linux
  - ▶ New for v.7.1:
    - ▶ Rational ClearCase and Rational ClearQuest now provide a common help system for all UIs and CLI, allowing the user quick access to all help, regardless of the point of entry. These common help systems use the same standard help capabilities as Information Centers ([www.ibm.com/support/publications/us/library](http://www.ibm.com/support/publications/us/library)) and other Rational tools, which reduces the learning curve for users familiar with these other IBM help facilities.





- The Rational ClearCase Remote Client (CCRC) is client software that has been engineered to operate efficiently over high latency networks or WANs. CCRC is a light-weight feature-rich client (no need to install the full Rational ClearCase client on user desktop) that is multi-platform and provides out-of-box functionality.
- This client is included with Rational ClearCase and is perfect for users that require remote access to the files and project assets stored in Rational ClearCase. It integrates with Rational ClearQuest (using base Rational ClearCase or Unified Change Management (UCM))
- New for v.7.1:
- Software developers will find the Rational ClearCase Remote Client (CCRC) has been enriched with the necessary developer change management capabilities from Rational ClearQuest. These include powerful filtering and advanced user features providing a single UI to accomplish their daily tasks. Agile process support has been added to enhance the user experience for increased productivity which will simplify many tasks with user preferences and intuitive navigation. The Agile capabilities include a recursive 'add to source/Checkin/checkout control', pending changes view, and scheduled updating/notification of changes from the integration branch/stream. With access to both Rational ClearCase and Rational ClearQuest functions in the same UI, developer productivity is increased by providing visibility to information based on their daily tasks.
- **Increases developer productivity with:**
  - ▶ Single UI with core Rational ClearQuest and ClearCase developer functions
  - ▶ Preferences and workspace filters
  - ▶ One click deliver and rebase
  - ▶ Agile process support
    - Recursive check-in, check-out
- **Increases team productivity with:**
  - ▶ Integrated Rational ClearQuest forms and queries
  - ▶ Agile process support
    - Pending changes view

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## IBM Rational ClearCase

*Transparent real-time access or copy-based access to files*

- **Dynamic Views**
  - › Immediate, real-time and transparent access directly to project assets
  - › Allows for fast iterations while having the needed visibility to file changes
- **Snapshot Views**
  - › Provides a copy of project assets for local access
  - › Automatically detects and re-synchronizes all modified files
  - › Provides intelligent disconnected use

**The only SCM solution to provide two workspace models**

- Files stored within Rational ClearCase are accessed from a workspace called a View. Rational ClearCase is the only solution to offer two ways to access your files – you choose which way you prefer!
- The two types of views offered with Rational ClearCase are: Dynamic Views and Snapshot Views.
- Dynamic views provide immediate, real-time and transparent access directly to source files. Changes to files are visible to the team as soon as the files are 'checked-into' the Rational ClearCase repository. This allows teams to work with fast iterations while having the needed visibility to file changes.
- Snapshot views copy files from Rational ClearCase to a specified location. This allows for controlled updates to the Rational ClearCase repository or for intelligent disconnected use from the network environment and then resynchronization once the network connectivity is reestablished. Rational ClearCase recognizes any and all files that have been changed while disconnected from the network and includes these changes into the Rational ClearCase repository once reconnected to the network. This allows users to have the ability to work 'off-line' but still maintain control over file changes.

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## IBM Rational ClearCase

*Implementation flexibility – you choose...*

Rational ClearCase supports two implementation methods:

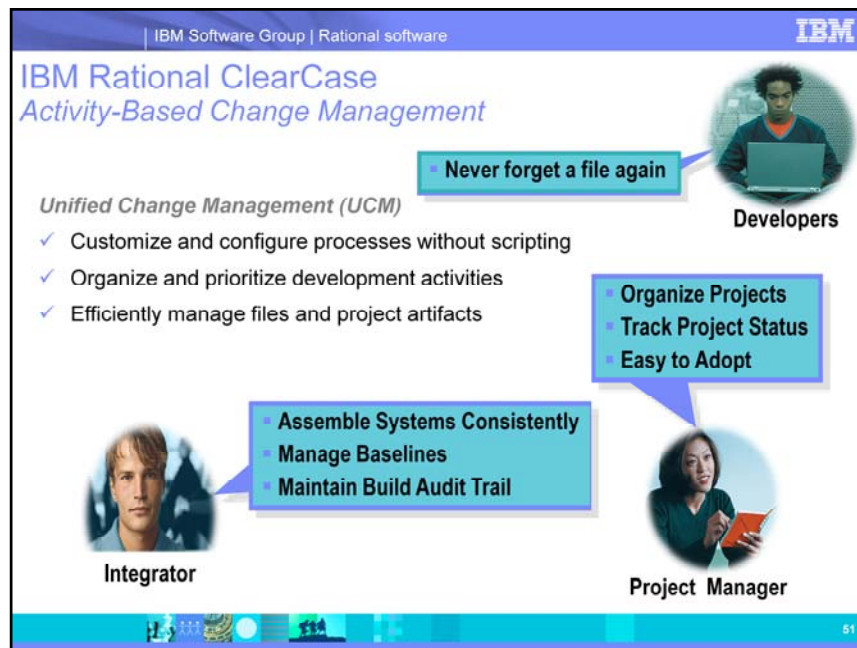
- Unified Change Management (UCM)**
  - Out-of-the-box solution
  - Activity-based change management process
  - Customizable, configurable and automated workflow process
  - Proven best practices
  - Increased abstraction Level - UCM is layered on base Rational ClearCase
- Base Rational ClearCase**
  - Flexibility to implement virtually any configuration management solution tailored to a particular development environment
    - Unlimited and automated branching
    - Customize to your needs





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- IBM Rational ClearCase provides two implementation methods for complete flexibility. These methods are Unified Change Management (UCM) and Base Rational ClearCase.
- UCM offers the convenience of an out-of-the-box solution using proven best practices; base Rational ClearCase offers the flexibility to implement virtually any configuration management solution that you deem appropriate for your environment.
- Base Rational ClearCase consists of a set of powerful tools to establish an environment in which developers can work in parallel on a shared set of files, and project managers can define policies that govern how developers work together.
- Unified Change Management (UCM) takes the integration of software artifact management and defect and change tracking several steps further by providing a pre-defined process that organizes work around activities and artifacts.
- Based on the Rational best practice of managing change, UCM is enabled by Rational ClearCase and optionally Rational ClearQuest. It accelerates development with an out-of-the-box process model that can be turned on or off, based on the specific needs of a software development team.
- UCM is one recommended method of using Rational ClearCase for version control and configuration management. UCM is layered on base ClearCase. Therefore, it is possible to work efficiently in UCM without having to master the details of base ClearCase.
- We will discuss UCM further on the next slide....



- As software systems and teams grow in size and complexity, it becomes increasingly important for teams to logically organize activities around periodic releases and efficiently manage the artifacts used to implement these activities.

- An *activity* (stored in Rational ClearQuest) can involve fixing a defect or building an enhancement for an existing product.

- An *artifact* (stored in Rational ClearCase) is anything that evolves over the course of the development lifecycle, such as a requirements document, source code, design model or test script.

- Teams perform *activities* and produce *artifacts*

- Each team member realizes benefits from UCM.

- Project Managers have a mechanism for organizing software and systems development activities using easy to adopt best practices for quick startup. They also have powerful metrics to provide real-time information and tracking on the project status.

- Integrators assemble systems at the activity level – they no longer need to worry about getting the right versions of files as all artifacts associated with an activity are automatically assembled. They can manage the various baselines knowing which ones have not yet been tested, which ones have failed testing and which baselines has been moved into production. UCM removes the low-level worry about building the wrong files and identifying 'good' baselines.

- Developers no longer need to worry about forgetting files since all files associated with an activity are tracked which improves software quality and reduces manual errors. It removes the tedious work from software and systems development.

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**IBM Rational ClearCase**  
Unified Change Management (UCM)

- Choose between serial or cyclical development workflows
- Seamlessly unify activities with project artifacts to better coordinate project changes across the development lifecycle

Request	Priority	Owner	Project
Define Promo	1	Sam	WebRelay
Define GUI	3	Sandy	WebRelay
Add Use Case	1	Kim	WebRelay

TO DO LIST

WORK ON

DELIVER

MAKE BASELINE

PROMOTE BASELINE

Production

Acceptance

System

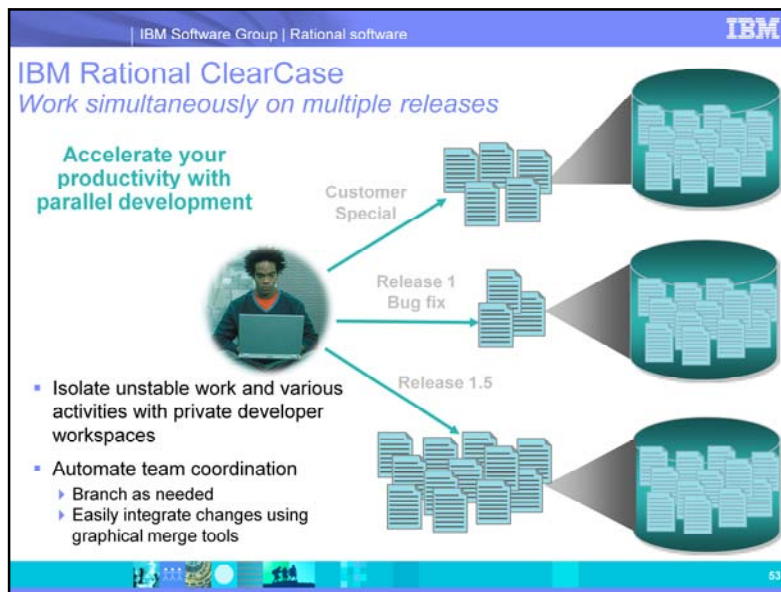
REBASE

- With a serial workflow (single-stream project), you access source files in a work area that you share with your team members. A small number of individuals work relatively closely. In this model, isolation is minimal and integration is fairly rapid because team members do not have to perform an explicit integrate action
- With a cyclical workflow (multiple-stream project), other developers on the project do not see your work until you deliver your activities to a shared work area (as shown in this diagram). Developers deliver their work and then rebase from a recommended/preferred baseline as needed; thus, the cyclical workflow.

**You choose the model that works best for your project!**

- Periodically, the activities in the shared work area are incorporated into baselines, which are sets of activities that represent a significant change.
- You may customize your baseline promotion levels using any labels that you wish. A promotion level is an attribute of a baseline that you can use to indicate the quality, stability or the phase of testing of the baseline.
- The seamless integration of Rational ClearCase with Rational ClearQuest unifies activities with file changes to help you increase team productivity, gain better visibility into projects and processes, and provide traceability across the software development lifecycle for rapid delivery of high-quality software.





- Small teams of developers working together closely may prefer a *serial* development environment. Rational ClearCase easily supports **BOTH** serial development and parallel development. When using serial development, all development work is performed in an common integration area rather than in individual development areas.
- But as the need arises due to growth in team size, application complexity and schedule demands, Rational ClearCase allows developers to work in parallel - simultaneously working on multiple releases and possibly the same files, at the same time.
- Rational ClearCase provides unique and sophisticated capabilities to allow teams to easily work in parallel to accelerate productivity.
- For example, you might need access to files in a previous release while working on a bug fix in the current release and still progressing with development in a future release.
- Rational ClearCase allows developers to work in private areas to keep unstable work isolated and then when ready, they can integrate their changes with the rest of the team using Rational ClearCase's sophisticated and automated graphical branching and merge utilities.

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**IBM Rational ClearCase**  
*Visually view your file versions*

Using the Version Tree Browser, view your branching structure, performed merges, file versions, labels, etc...


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- IBM Rational ClearCase provides a graphical view of a file through the Version Tree Browser. Graphically, it is easy to see what branching structure has been implemented, what merges have been performed, how many file versions have been created, what labels have been used, etc... This graphical view provides a wealth of information at a quick glance...

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**IBM Rational ClearCase**  
*Unify teams around the world*

- Rational ClearCase Remote Client
  - ▶ Light-weight feature-rich client
  - ▶ Multi-platform support
  - ▶ Agile process support
- Rational ClearCase Multisite
  - ▶ Distributed access to project assets through repository replication and synchronization
  - ▶ Extends development scalability - scales to support thousands of users, working in dozens of sites
  - ▶ Supports disaster recovery, enabling file retrieval from replicated sites
  - ▶ Maintains data integrity in the event of network failure



Access to current  
information, anytime,  
anywhere

65

- Many customers are challenged with different time zones, geographic distribution and process differences. Through either the ClearCase Remote Client or an add-on product called Rational ClearCase MultiSite developers can contribute changes to integration streams from anywhere in the world.

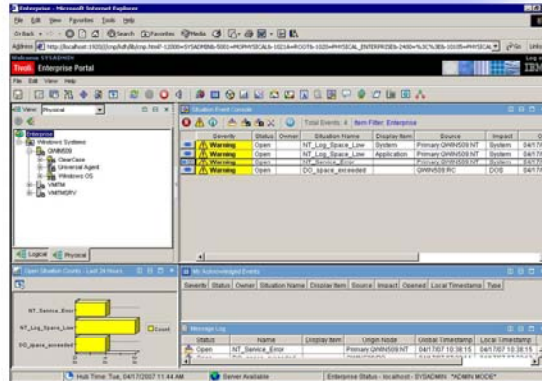
# IBM Rational ClearCase MultiSite

Monitor your global operations



## Monitors for Events

- Operating System agent
  - ▶ Memory usage, disk space, CPU
- Rational ClearCase agent
  - ▶ Shipping bay threshold issues
  - ▶ Multisite import/export failures
  - ▶ ALBD process failures
- Expert advice on events
- Customizable event settings
  - ▶ User specified thresholds and severity
- Historical collection of data
  - ▶ Reporting templates (Birt)



**Reduces time to resolution for administrators!!**







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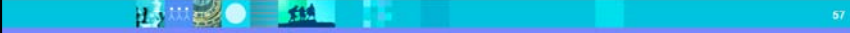
IBM

## IBM Rational ClearCase

*Reducing your cost of ownership*

- Integrations for High Availability
  - Helping to provide operational continuity
-  Single CM Server for both Rational ClearCase Remote Client and ClearQuest Web
  - Simplifies deployment for administrators and connections for teams
-  IBM Installation Manager (IIM)
  - Provides users and administrators with a common install experience for Rational ClearCase and ClearQuest on all OS platforms
-  Rational ClearCase MultiSite monitoring
  - Web interface to statistics on Rational ClearCase servers and OS messages
  - Enables administrators to easily view status of world-wide deployments





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■ Reduce your cost of ownership and worry with:

■ **Integrations for High availability** help ensure operational continuity – these include:

- ▶ Symantec Veritas Cluster Server on Solaris
- ▶ Steeleye LifeKeeper on Linux

■ And new for v.7.1:

■ Both Rational ClearCase Remote Client and Rational ClearQuest web share a common server infrastructure based on WebSphere Application Server (WAS). This simplifies install, setup and tuning for administrators by reducing the complexities of separate servers for these clients. It also provide a common set of capabilities -- High Availability, load balancing and the ability to leverage high performing hardware.


■ Rational ClearCase and Rational ClearQuest 7.1 install technology has been upgraded to the IBM Installation Manager (IIM), which provides users and administrators a common install experience for both tools on all OS platforms, and is consistent with other IBM Rational tools. With IIM repositories, Rational ClearCase and Rational ClearQuest install configuration can be combined with other Rational tools to simplify installation across a tool set, thereby reducing the complexities of configuring a desktop with multiple Rational tools.

■ Rational ClearCase Multisite includes new monitoring capabilities which provide a web interface to statistics on Rational ClearCase servers and OS messages, which enable administrators to easily view status of their entire world-wide deployment for any web browser.

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**IBM**

## IBM Rational ClearCase 7.1

### *New features summary*



- **Rational ClearCase Remote Client (CCRC)**
  - Rewritten with new features focused on increasing Developer and Team Productivity
- **New Unicode Type Manager**
  - Identifies and allows for merging of files with embedded Unicode data
- **New CM Server**
  - Single server for both Rational ClearCase Remote Client and ClearQuest Web
  - Simplifies deployment for administrators and connections for teams
- **Enhanced security with IPv6 support**
- **New IBM Installation Manager**
  - IBM Installation Manager (IIM) provides users and administrators with a common install experience for Rational ClearCase and ClearQuest on all OS platforms
- **New Common Rational ClearQuest/ClearCase Help**
  - Allowing the user quick access to all help, regardless of the point of entry
- **New Rational ClearCase MultiSite monitoring**
  - Web interface to statistics on Rational ClearCase servers and OS messages
  - Enables administrators to easily view status of world-wide deployments

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- In addition to the items listed in this slide, **over 80 Requirements and 300 RFEs were incorporated into 7.1**
- **Some more info....**
- Software developers will find the Rational ClearCase Remote Client (CCRC) has been enriched with the necessary developer change management capabilities from Rational ClearQuest. These include powerful filtering and advanced user features providing a single UI to accomplish their daily tasks. Agile process support has been added to enhance the user experience for increased productivity which will simplify many tasks with user preferences and intuitive navigation. The Agile capabilities include a recursive 'add to source/Checkin/checkout control', pending changes view, and scheduled updating/notification of changes from the integration branch/stream. With access to both Rational ClearCase and Rational ClearQuest functions in the same UI, developer productivity is increased by providing visibility to information based on their daily tasks.
- Software development continues to change putting more requirements on the SCCM tools used to manage those changes. Among these changes is the addition of Unicode data to the application source. Rational ClearCase has responded by adding in a new Type Manager designed to help identify and merge changes to these files with embedded Unicode data
- Both Rational ClearCase Remote Client and Rational ClearQuest web share a common server infrastructure based on WebSphere Application Server (WAS). This simplifies install, setup and tuning for administrators by reducing the complexities of separate servers for these clients. It also provide a common set of capabilities -- High Availability, load balancing and the ability to leverage high performing hardware.
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- Rational ClearCase Multisite includes new monitoring capabilities which provide a web interface to



## Agenda

- Introductions
- The Challenges of Delivering Quality Software
- Technology Review - IBM Rational ClearQuest
- Technology Review - IBM Rational ClearCase
- Technology Review – IBM Rational Team Concert
- Technology Review - IBM Rational Build Forge



## IBM Rational Team Concert

*Software innovation through collaboration*

- **Real time, in-context team collaboration**
  - Make software development more automated, transparent and predictive
- **"Think and work in unison"**
  - Integrated source control, work item and build management
- **Assess real-time project health**
  - Capture data automatically and unobtrusively
- **Automate best practices**
  - Dynamic processes accelerate team workflow
  - Out-of-the-box or custom processes
- **Unify software teams**
  - Integrate a broad array of tools and clients
  - Extend the value of ClearQuest and ClearCase
  - Visual Studio Client (4Q08)
  - Support for System z and System i servers (2H08)

Open and extensible on

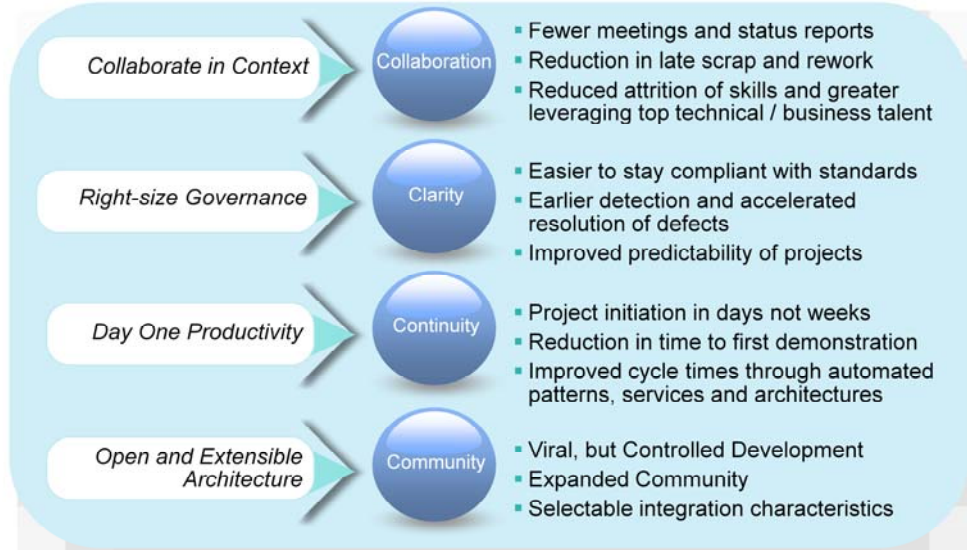
Jazz

- ✓ Collaborate in context
- ✓ Right-size governance
- ✓ Day one productivity



## IBM Rational Team Concert

*Translating words to actions*



## IBM Rational Team Concert

### Iteration Planning

- Integrated iteration planning and execution
- Task estimation linked to key milestones
- Out of the box agile process templates

### Project Transparency

- Customizable web based dashboards
- Real time metrics and reports
- Project milestone tracking and status

### SCM

- Integrated stream management with flow relationships
- Component level baselines
- Server-based sandboxes
- Identifies component in streams and available baselines
- ClearCase connector

### Work Items

- Defects, enhancements and conversations
- Query results view and share queries with team or member
- Support for approvals and discussions
- ClearQuest connector
- Query editor interface

### Build

- Work item and change set traceability
- Local or remote build servers
- Supports ant and command line tools
- Integration with build forge
- Build definitions for team and private builds

### Jazz Team Server

- Single structure for project related artifacts
- World-class team on-boarding / offboarding including team membership, sub-teams and project inheritance
- Role-based operational control for flexible definition of process and capabilities
- Team advisor for defining / refining "rules" and enabling continuous improvement
- Process enactment and enforcement
- In-context collaboration shows team members and status of their work

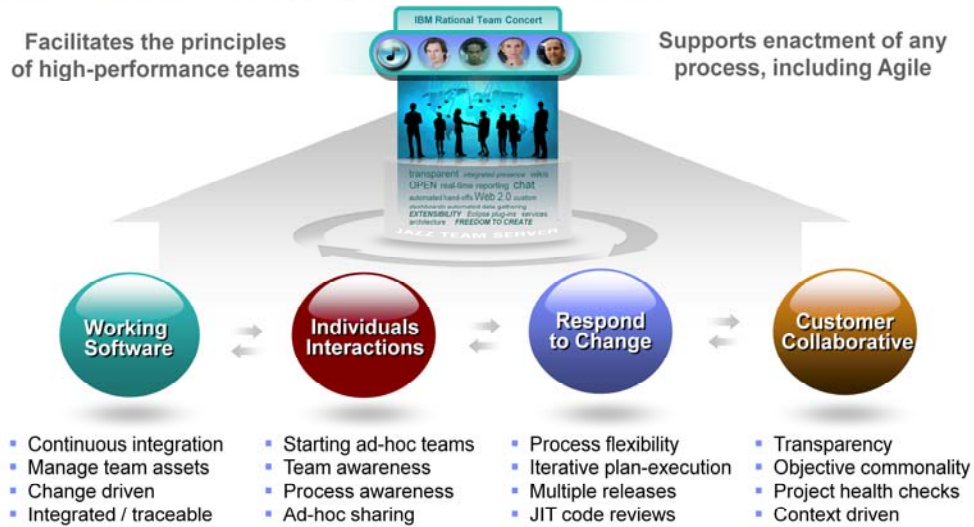


## IBM Rational Team Concert

*Improve business agility and project success rates*

Facilitates the principles of high-performance teams

Supports enactment of any process, including Agile

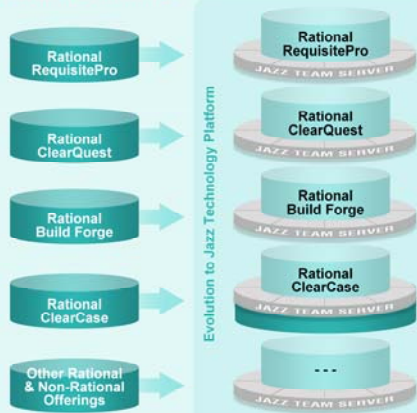


# IBM Rational Team Concert

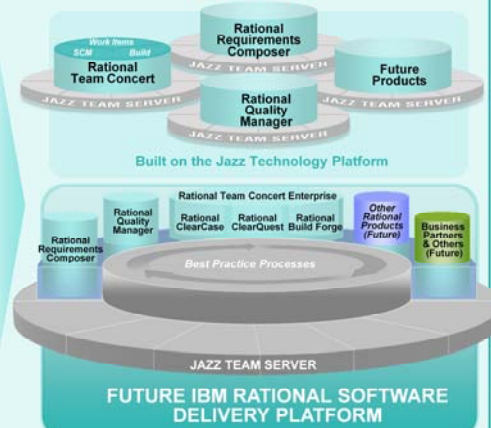
*An evolution for new and existing customers*

## The Evolution of the IBM Rational Software Delivery Platform

### Existing Offerings



### New Offerings



FUTURE IBM RATIONAL SOFTWARE DELIVERY PLATFORM





## Agenda

- Introductions
- The Challenges of Delivering Quality Software
- Technology Review - IBM Rational ClearQuest
- Technology Review - IBM Rational ClearCase
- Technology Review – IBM Rational Team Concert
- Technology Review - IBM Rational Build Forge



## What is IBM Rational Build Forge?

**An adaptive execution framework  
that automates software assembly  
processes**

- Allowing you to *automate* software production
  - ▶ Eliminating manual, error prone tasks
  - ▶ Reducing maintenance of proprietary homegrown scripts
  - ▶ Utilizing existing tools, scripts and hardware
  - ▶ Providing repeatable and consistent processes for improved efficiency
  - ▶ Capturing self-documenting data/audit trail
  - ▶ Connecting team members with self-service access to pre-configured processes

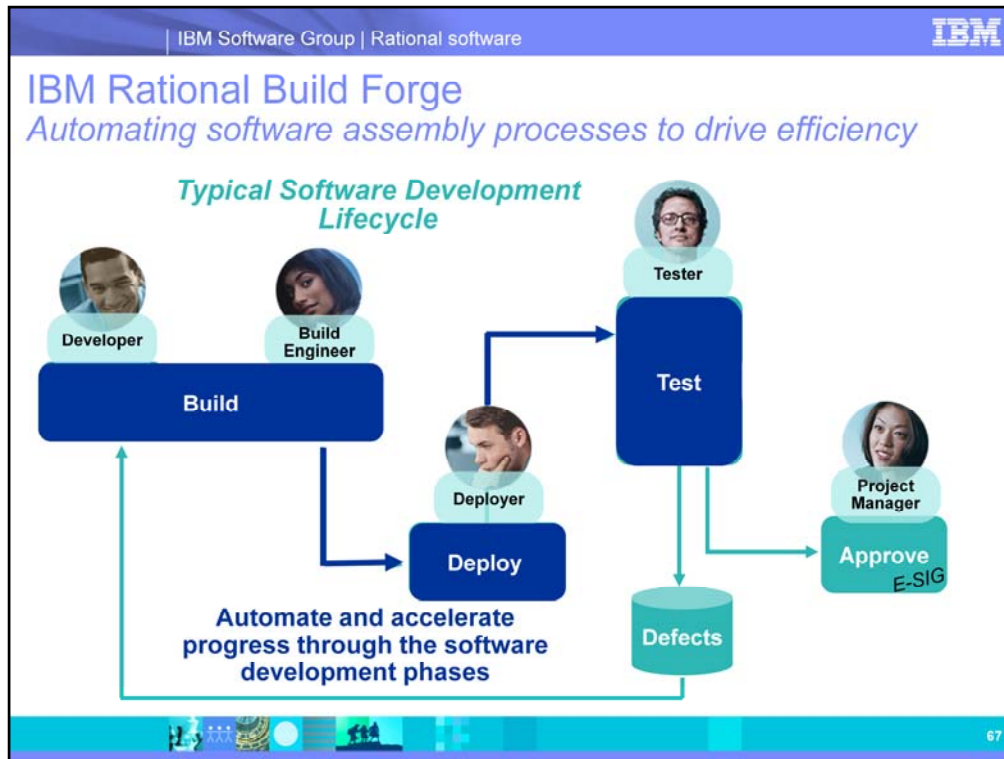


**Helping development teams reduce costs and improve time to market**



66

- While the product name may imply it is limited to builds, what Rational Build Forge provides is really a framework to automate and execute the assembly of software applications.
- It allows you to automate your software production --- and can support all of your tools, technologies, and platforms so you can achieve, repeatable, reliable, and traceable build and release processes.



▶ As we look at a typical software development lifecycle, we can see that we go through a path of code, build, deploy and then test the software to ensure that it performs as expected. It is then either approved or we submit a defect and begin the cycle again.

▶ What if you could automate much of these repetitive tasks???

▶ That is exactly what Rational Build Forge does... It allows you to automate, accelerate and standardize the building, deploying and testing of software to drive efficiency and productivity.

▶ Basically, you are able to:

▶ Create "on-demand" jobs or schedule job(s) – which you can start/stop at any time

▶ Monitor job progress in real-time

▶ Access pre-configured build processes with push-button execution (IDE plug-ins provided)

▶ And receive email notifications on status.



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## IBM Rational Build Forge

*Direct access to software assembly functions*

### Working in your preferred environment

- Integrations with leading IDEs and development tools
  - NEW** IBM Rational Team Concert
  - Eclipse framework
  - IBM Rational Application Developer (RAD)
  - and more...
- Wide-range of supported environments
  - Windows
  - AIX
  - Solaris
  - HP-UX
  - Linux
  - Mac OS
  - z/OS
  - i5/OS
  - Linux on Z

**Support for more environments than ANY other software assembly tool!**

**NEW**

**New platforms added!**

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- IBM Rational Build Forge provides direct access to software assembly functions from within leading integrated development environments (IDEs), including IBM Rational Application Developer and the Eclipse framework. This enables team members to preview automated software delivery processes they may include very diverse tasks such as executing automated tests, running installers, updating database or web sites or compiling an application —without leaving their preferred tools. For developers specifically, they can test the code they've been working on using a separate preconfigured build environment to catch potential errors before they check in to source control.
- New for v7.1:** Integration with Rational Team Concert! Allows you to leverage sophisticated, enterprise-class automation of software assembly processes from the collaboration toolset of Rational Team Concert.
- IBM Rational Build Forge supports more environments than any other software assembly tool!**
- Agent support for Windows, AIX, Solaris, HP-UX, Linux, Mac OS X, z/OS, i5/OS
- Note: the Management console support for Rational Build Forge Express is Windows only.
- And with support for distributed, mainframe and midrange platforms, Rational Build Forge software provides a centralized solution that can coordinate and execute repeatable build and release processes across the entire enterprise.
- New for v7.1:**
  - Support has been added for:
    - SuSE Linux Enterprise Server 10.x for Intel
    - SuSE Linux Enterprise Server 10.x for SystemZ
    - Windows Server 2003 64-bit
    - Redhat Enterprise Linux 5 for Intel
  - Running Management Console in VMWare VMs now officially supported
  - New server component support:
    - IBM HTTP Server
    - WebSphere Application Server

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**IBM Rational Build Forge**

*Job process optimization – increase efficiency, save time*

**Taking automation to the next level with...**

- **Step avoidance**
  - ▶ Dynamically determine when to skip a step or not
- **Dynamic step order**
  - ▶ Dynamically control the execution order of steps
- **Change history**
  - ▶ Report on history of order/execution changes over time for continued process improvement
- **Step iterations**
  - ▶ Loop through steps until a condition is met

**Automatically run jobs in the most efficient manner possible!**



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- **New for V7.1:** Job process optimization provides the ability to use dependency-based information to ensure that jobs automatically run in the most efficient manner possible. Rational Build Forge has the ability to analyze, sequence, and optimize runs. The differences in the various run will be tracked over time for continued process improvement. By being able to optimize jobs, Rational Build Forge takes automation to the next level – helping to save time and further increase efficiency.

- **Step Avoidance**
- Ability to dynamically decide whether to run a step or not to avoid time spent on a project execution.
- **Dynamic step order**
- Ability to dynamically control the order of execution of its steps. For example: to ensure that the compile phase of a job is accomplished in the least amount of time possible.
- **Change History**
- Ability to report on history of order / execution changes over time based on data stored in Rational Build Forge
- **Step iterations**
  - ▶ Loop through steps until a condition is met




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IBM

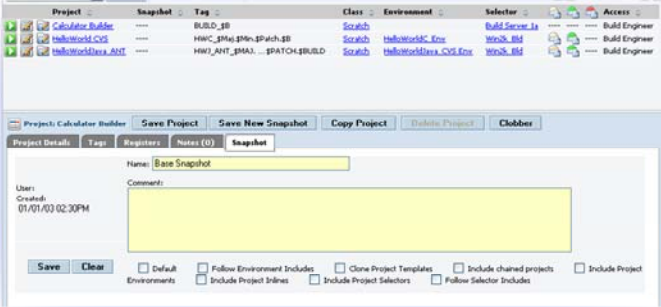
## IBM Rational Build Forge

### Project configuration snapshots

- Preserve older, superseded project configurations
  - ▶ Allows older versions of products to be easily reproduced
  - ▶ Responds to audits/compliance mandates or legacy support requirements
- Create templates of project definitions for quick project startup
- Modify project configurations without disrupting production project configurations



Easily manage  
various  
project  
configurations




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- **New for V7.1:** Project configuration snapshots allows customers to easily manage various project configurations. Some examples of things customers can do with this capability include:
- **Preserve older, superseded project configurations**
  - ▶ Allows older versions of products to be easily reproduced
  - ▶ Responds to audits/compliance mandates or legacy support requirements
- **Create templates of project definitions for quick project startup OR clone project templates for reuse on other project OR to edit**
- **Modify project configurations without disrupting production project configurations**

## IBM Rational Build Forge

*Automated, documented data and audit trail*

### Better reproducibility and simplifying compliance management

- Comprehensive bill-of-materials (BOM)
  - files that were changed
  - any automated unit tests performed
  - environment used to create the build
  - thorough account of build processes
- Documented audit trail of release contents, process changes and user access to the systems



### No need to manually gather information!

- IBM Rational Build Forge software tracks and stores comprehensive data on builds, releases and related tasks to provide a detailed bill of materials that documents the contents of each release for better reproducibility and compliance management.
- Role-based security manages and controls user access, and notifications and alerts inform you if someone steps outside your IT controls. Rational Build Forge software also provides a documented audit trail of release contents, process changes and user access to the system.
- **Teams don't have to gather this important information manually.**

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**IBM Rational Build Forge**  
*Improve visibility and decision support*

**Fast analysis and insight to valuable build information**

- Intuitive out-of-the-box reporting
  - Uncover development bottlenecks
  - Determine trends for specific projects
  - Pinpoint areas for performance tuning
- "Really Simple Syndication" (RSS) data feeds
  - Real-time notifications and monitoring
  - Works with any RSS-compliant reader/aggregator
- Advanced reporting with Rational Build Forge Quick Report
  - Quickly create, modify and run ad-hoc custom or out-of-the-box reports
  - Zero footprint web client
  - Public and private access to reports
  - Save/export to different formats

**No Scripting!**

 Improved and easy to use - now includes the ability to report on "Bill of Materials" data



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■ IBM Rational Build Forge software collects valuable build information and generates intuitive reports to help your team uncover development bottlenecks, determine trends for specific projects and pinpoint areas where performance can be tuned.

■ Numerous reports are provided out of the box for fast analysis and insight. A detailed historical record about each build is maintained. And a delta report shows details of previous builds and provides performance confidence indicators for how a build will run in the future.

■ "Really Simple Syndication" (RSS) data feeds for real-time notifications and monitoring. An alternate to email for real-time notifications that works with any RSS-compliant reader/aggregator. Monitor Rational Build Forge events and status in real-time. This feature embraces new technology and gives customers more choices in accessing information.

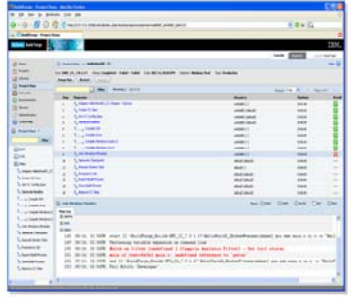
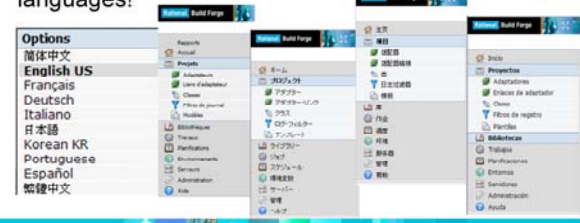
■ IBM Rational Build Forge Quick Report is an advanced reporting tool that offers exceptional ease of use and flexibility. A zero-footprint Web client allows users to quickly create, modify and run ad hoc custom reports on the Rational Build Forge repository. A point-and-click wizard interface and predefined report types make reporting on metrics and data easy for all stakeholders. No structured query language (SQL) expertise, API skills or manual scripting efforts are required to get the information you need, when you need it.

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**IBM**

## IBM Rational Build Forge

*Centralized management across geographically distributed teams*

- Web-based management console
- Consolidated, real-time project view
- Safe, secure access
  - NEW Security enhancements to: Password Encryption, Secure Sockets Layer (SSL), Single Sign-On (SSO), LDAP
- Unicode support for international projects - translated and available in 10 different languages!

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- It is the new norm to have distributed development across organizations requiring access to remote development sites and addressing the challenges of disparate tools and processes.
- Rational Build Forge provides central management across geographically distributed teams to keep global teams in sync. The Web-based management console provides a consolidated, real-time view of each project, so everyone stays on the same page. It can integrate with your existing tools so teams can share common processes, even if they're using different technologies across different sites. By sharing processes and information, the software makes handoffs smooth and fast.
- Comprehensive Unicode support for international teaming/support gives you the flexibility to save and execute build content for multibyte character sets. It is translated and available in 10 different languages!
- In addition, Rational Build Forge software supports your platform of choice, including distributed, mainframe and midrange platforms, giving you the flexibility to support the environments you need, enterprise wide.
- **New for V7.1:**
  - Password Encryption
    - Consistent password encryption across all points of password persistence
  - Single Sign-on (SSO)
    - SPNEGO SSO
    - WAS integration SSO
    - Pluggable SSO (customers can create custom interceptors)
  - Secure Sockets Layer (SSL)
    - Configurable SSL on all Over-the-Wire points

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# IBM Rational Build Forge

## Adaptor Toolkit - Extend and utilize existing tools



**Integrate third party software such as version control, defect tracking and test managers**

- Allows you to correlate source code changes, defects and tests with specific builds for a detailed understanding of the software assembly components
- Out of the box adaptors available for:
  - CVS, Perforce® SCM, Borland® StarTeam®, Microsoft® Visual Source Safe® and Subversion
  - Adaptors for Rational ClearCase, Rational ClearQuest and Rational Team Concert  are provided out-of-the-box
- Modify available adaptors or create your own for homegrown or other third party software development tools
- Provides continuous monitoring of the third party source repository, and executes builds automatically when a change occurs



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Optional adaptor toolkit allows customers to extend Rational Build Forge for more robust integrations with other ALM tools. Source code control adaptor templates provided out of the box include CVS, Perforce, StarTeam, Subversion, and Visual SourceSafe. New templates can be created with the adaptor toolkit to support integrations with test management tools as well.




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**IBM Rational Build Forge Enterprise Plus Edition**  
*For very large enterprise environments*

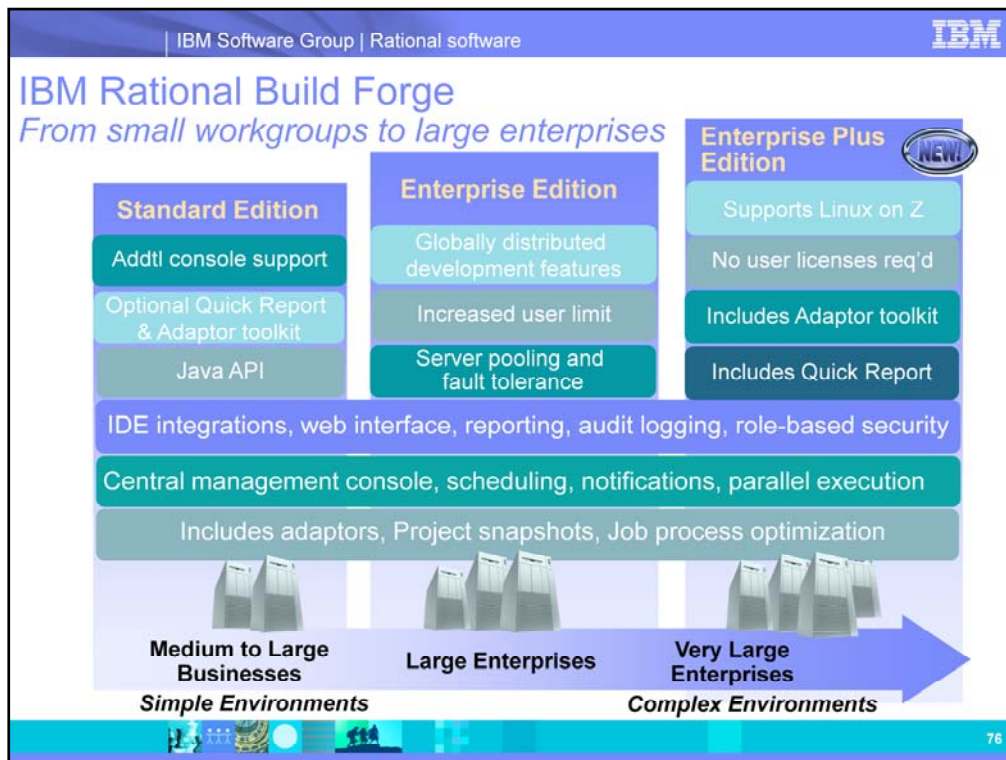
**Specifically focused on helping large companies automate and standardize software assembly processes**

- Wide-range of supported environments
  - Only Build Forge Edition that supports Linux on Z
- Up to 250 concurrent connections
- Includes all options
  - Adaptor Toolkit to extend and utilize existing tools
  - Rational Build Forge Quick Report for improved visibility
- No requirement for Rational License Server
  - No user licenses required
  - Improved availability



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- New for V7.1 is the Rational Build Forge Enterprise Plus edition. It is specifically focused on helping very large enterprise companies automate and standardize software assembly processes.
- And includes the following features:
- **Wide-range of supported environments**
  - Only Build Forge Edition that supports Linux on Z
- **Up to 250 concurrent connections**
- **Includes all options**
  - Adaptor Toolkit to extend and utilize existing tools
  - Rational Build Forge Quick Report for improved visibility
- **No requirement for Rational License Server**
  - No user licenses required
  - Improved availability



■ IBM Rational offers a solution for every team size.

■ For smaller teams (up to 5 seats), there is **IBM Rational Build Forge Express Edition (V7.0.2)**

■ Key benefits of Rational Build Forge Express include:

- ▶ Easy to install, deploy, and use --- fast ROI
- ▶ Leverage existing tools, platforms, technologies; no "rip-and-replace" required to begin usage
- ▶ Example project templates for quick startup
- ▶ This is a solution for small to medium customers supporting heterogeneous, distributed environments using a home-grown solution and looking to deliver software in a more automated, repeatable, and predictable fashion. As well as customers with inefficient processes that are working in 'silos' performing manual handoffs and experiencing delayed releases and poor quality.

■ For medium to large teams with simple environments (up to 25 concurrent users) there is **IBM Rational Build Forge Standard Edition (V7.1)**

▶ To allow for integrations with the Rational Build Forge Enterprise Edition, it includes a Java API. Thus, providing greater functional coverage and more choice for customers who wish to customize and extend Build Forge in their environment.

■ For larger teams (up to 150 seats), there is **IBM Rational Build Forge Enterprise Edition (V7.1)**. The Enterprise edition automates and accelerates build and release processes through server pooling and fault tolerance and includes globally distributed development features.

▶ Dynamic server pooling helps optimize your hardware environment. Servers that were previously dedicated to a single project become highly productive shared server pools. The configurations and capabilities of each server in the pool are detected automatically to provide support for dynamic server selection and load balancing.

■ For advanced reporting needs, Rational Build Forge Quick Report is available as an add-on to either the Standard or Enterprise Editions of Rational Build Forge. It offers exceptional ease-of-use and unmatched flexibility for better visibility and decision support across build and release processes.

■ All editions allow for IDE integrations, remote site support and provide detailed audit logging and bill-of-materials report. They allow you to support remote sites as well as distributed multiplatform builds.

■ New for V7.1 is **IBM Rational Enterprise Plus Edition!** It is specifically focused on helping very large enterprise companies automate and standardize software assembly processes.

■ And includes the following features:

■ **Wide-range of supported environments**

▶ Only Build Forge Edition that supports Linux on Z

■ **Up to 250 concurrent connections**

■ **Includes all options**

- ▶ Adaptor Toolkit to extend and utilize existing tools
- ▶ Rational Build Forge Quick Report for improved visibility

■ **No requirement for Rational License Server**

- ▶ No user licenses required
- ▶ Improved availability

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## IBM Rational Build Forge 7.1

### New features summary

- **Job process optimization**
  - ▶ Automatically run jobs in the most efficient manner possible
- **Project configuration snapshots**
  - ▶ Easily manage various project configurations
- **IBM Rational Team Concert integration**
- **Enhanced security**
  - ▶ Password Encryption, Secure Sockets Layer (SSL), Single Sign-On (SSO), and LDAP
- **Configurable User Interface (UI)**
  - ▶ Configure custom tabs
- **New Rational Build Forge Enterprise Plus Edition**
  - ▶ Specifically focused on helping very large enterprises automate software assembly processes
- **New IBM Installation Manager**
  - ▶ Provides users and administrators with a common install experience on both Windows and UNIX
- **New platform support**
- **Rational Quick Report ease of use enhancements**

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- Rational Build Forge V7.1 takes the automation of software assembly processes to new levels to accelerate and streamline software delivery. The ability to create an automated software assembly line is enhanced by these new features:

#### Job Process Optimization

- ▶ Automatically run jobs in the most efficient manner possible with:
  - **Step avoidance**
    - Dynamically determine when to skip a step or not
  - **Dynamic step order**
    - Dynamically change the execution order of steps
  - **Change history**
    - Report on history of order/execution changes over time for continued process improvement
  - **Step iterations**
    - Loop through steps until a condition is met

#### Project Configuration Snapshots

- Preserve older, superseded project configurations
  - Allows older versions of products to be easily reproduced
  - Responds to audits/compliance mandates or legacy support requirements
- Create templates of project definitions for quick project startup
- Modify project configurations without disrupting production project configurations

#### Rational Team Concert Integration

- Allows you to leverage sophisticated, enterprise-class automation of software assembly processes from the collaboration toolset of Rational Team Concert.

#### Enhanced Security

- Password Encryption
  - Consistent password encryption across all points of password persistence
- Single Sign-on (SSO)
  - SPNEGO SSO
  - WAS integration SSO
  - Pluggable SSO (customers can create custom interceptors)
- Secure Sockets Layer (SSL)
  - Configurable SSL on all Over-the-Wire points:
    - Optional auto-redirect of form to SSL (just for login)
  - Apache Inbound SSL
  - Tomcat Inbound SSL
  - Services Layer Inbound SSL
  - PHP Outbound SSL to Services Layer
  - Java and Perl Services Layer Client Outbound SSL
  - LDAP Outbound SSL
  - Perl Engine Outbound (to Agent) SSL
  - Agent Inbound SSL
- LDAP

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## IBM Rational Build Forge

*What are customers saying about V7.1?*


**NEW!**

"Rational Build Forge allows us to standardize our software development process across the organization and do more with fewer resources"

-- Airline industry customer

"The enhancements in the security and job process optimization areas are big steps forward that will help Build Forge maintain its leadership position in the build automation arena."

-- Financial industry customer



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**Actual customer feedback on V7.1 of Rational Build Forge!**

## Agenda

- Introductions
- The Challenges of Delivering Quality Software
- IBM Rational Software – Our Unique Value
- IBM Rational CRM Solution Overview
- Technology Review - IBM Rational ClearQuest
- Technology Review - IBM Rational ClearCase
- Technology Review – IBM Rational Team Concert
- Technology Review - IBM Rational Build Forge





## IBM Rational Software Analyzer

### *What is Static Analysis?*

*A method of software code debugging that is done by examining the code without executing the program*



#### **What are the benefits?**

- Improves code quality by identifying defects
- Reduces costs by locating defects earlier in the software development lifecycle
- Provides an understanding of the code structure
- Ensures adherence to corporate and industry coding guidelines
- Discovers problems relating to dependencies in code
- Examines complexity of code

▪ As the software industry has matured, the trend has been towards increasing demand for high quality, but also increasing pressures for low development cost, compressed schedules, and fast response to changing requirements. Static analysis is a method of computer program debugging that is done by examining the code without executing the program. It locates defects by directly analyzing source code, object code, or other software artifacts, and has the potential to help software development organizations respond to these trends.

By using static analysis, you get the benefits of:

- Improved code quality since defects can be identified and resolved before delivery
- Reduced costs since defects are located earlier in the software development lifecycle (when it is less expensive to fix)
- An understanding of your code structure
- Helping to ensure adherence to corporate and industry coding guidelines
- Identifying problems related to dependencies in code
- An understanding of your code complexity



## IBM Rational Software Analyzer

*Improving code quality using Static Analysis*

**There are many types of static analysis...**

▶ **Code review**

- Generally concerned with coding style
- Identifies rudimentary bugs

▶ **Structural analysis**

- Identifies inter-class dependencies
- Locates cyclical dependencies, hubs, etc.

▶ **Software metrics**

- Measures the complexity of software
- Uses standard metrics (line counting, McCabe, Halstead)

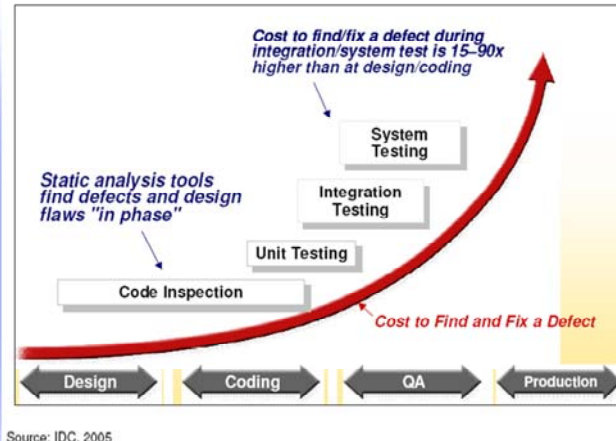
▶ **Data Flow Analysis**

- Symbolic Execution of code
- Aids in locating resource and memory leaks



## IBM Rational Software Analyzer

*Identify software defects early in the lifecycle*



**The costs associated with bug fixes increase as a product matures through the software development lifecycle**

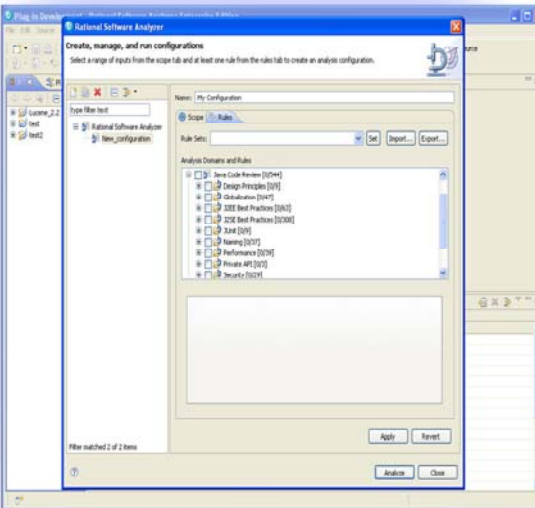
- Rational Software Analyzer is an extensible software development solution that enables software code reviews, bug identification, and policy enforcement very early in the development cycle. The costs associated with bug-fixes and policy vulnerabilities increase as a product matures through development, and Rational Software Analyzer is designed to reduce this expense by identifying these earlier in the software development process.

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## IBM Rational Software Analyzer

*Tailor to your company's best practices*

- Rich set of programming rules
  - ▶ More than 550 Java rules
    - Code review
    - Architectural discovery
    - Deep analysis
  - ▶ Over 130 C/C++ code review rules
  - ▶ More than 40 Java software metrics rules
- Modify existing rules or easily create new rules



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- The IBM Rational® Software Analyzer includes a rich set of analysis rules including more than 550 Java™ rules, more than 130 C/C++ rules and more than 40 Java software metrics rules which enables code reviews using development best practices. This approach can result in increased style consistency, fewer errors and better application performance. Using Rational Software Analyzer is almost like having a master programmer review the code developed by practically every member of your team—except it accomplishes this review in a fraction of the time. Much like the grammar-checking feature in your word-processing application, the analysis capabilities in Rational Software Analyzer can offer quick fixes for some types of bugs, enabling you to easily select an automatic fix.
- Rational Software Analyzer also enables your developers to modify existing rules and even create new rules through a flexible rule structure. So you can use Rational Software Analyzer tailored to your company's software development best practices.

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## IBM Rational Software Analyzer

### Extensible framework

- Provides the ability to execute multiple scan rules and tools from a common framework
  - Central management of legacy and third-party technologies
- Enables a unified, customizable and consistent work-flow
- Provides selectable and customizable rules
  - Rules can be customized, imported or created from scratch
  - Enables inclusion of rules for security, compliance and intellectual property vulnerabilities increasing team responsiveness to business priorities

Extensible foundation for increasing productivity and simplifying static analysis

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Not all companies do things the same way. It is for this reason that selectable and customizable rules as well as being able to utilize legacy and third-party technologies are so important. By being able to customize and/or create new rules, Rational Software Analyzer can be customized to exactly meet the development guidelines enforced by a company. This also fosters a collaborative approach, since newly-created best practices can be adapted and easily enforced by introducing new rules into Rational Software Analyzer.

- An extensible framework is an effective way to adapt a static analysis solution into your specialized corporate environment as it:
  - Provides the ability to execute multiple scan rules and tools from a common framework to increase productivity
    - Complements and extends third party tools
  - Enables customizable and consistent work-flow
  - Simplifies static analysis utilization
  - Enables selectable and customizable rules for a collaborative enterprise approach to development best practices
  - Rules can be customized, imported, or created from scratch

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IBM Rational Software Analyzer

Improve project visibility

- Easy to read analysis results
- Rich set of out-of-the box reports and metrics
  - View reports in HTML or PDF
  - Customizable data export formats
- Flexible reporting framework
- Centralized reporting for high-level view of software quality and compliance-related issues

The static analysis scan results are very easy to read – as seen in this screen shot. But in addition to this clear view is a rich set of out of the box reports and metrics. These reports can be viewed in HTML or PDF formats AND you can export the data in customizable formats. Rational Software Analyzer also includes the extensible framework with provides flexibility with reporting.

Using the Enterprise Edition of Rational Software Analyzer, you have the ability to get centralized reporting. Centralized reporting of course is much easier to review than requesting individual developers to submit reporting results... imagine the mess if there are 50 developers submitting 50 reports... This central view also provides the level of visibility necessary to determine whether code adheres to the development rules established for the company – desktop-level products, since they only focus on sections of the code, wouldn't meet this requirement.

- Centralized reporting provides management with a high-level view of software quality and compliance-related issues as it provides a concise, consolidated view of the project analysis information.

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## IBM Rational Software Analyzer




*Automating and centralizing code scans*

Using Rational Software Analyzer Enterprise Edition...

- Automates and centralizes code reviews
- Incorporates code quality analysis into existing software build processes
- Integration with Rational Build Forge via adaptor
- Additional layer of static analysis quality check



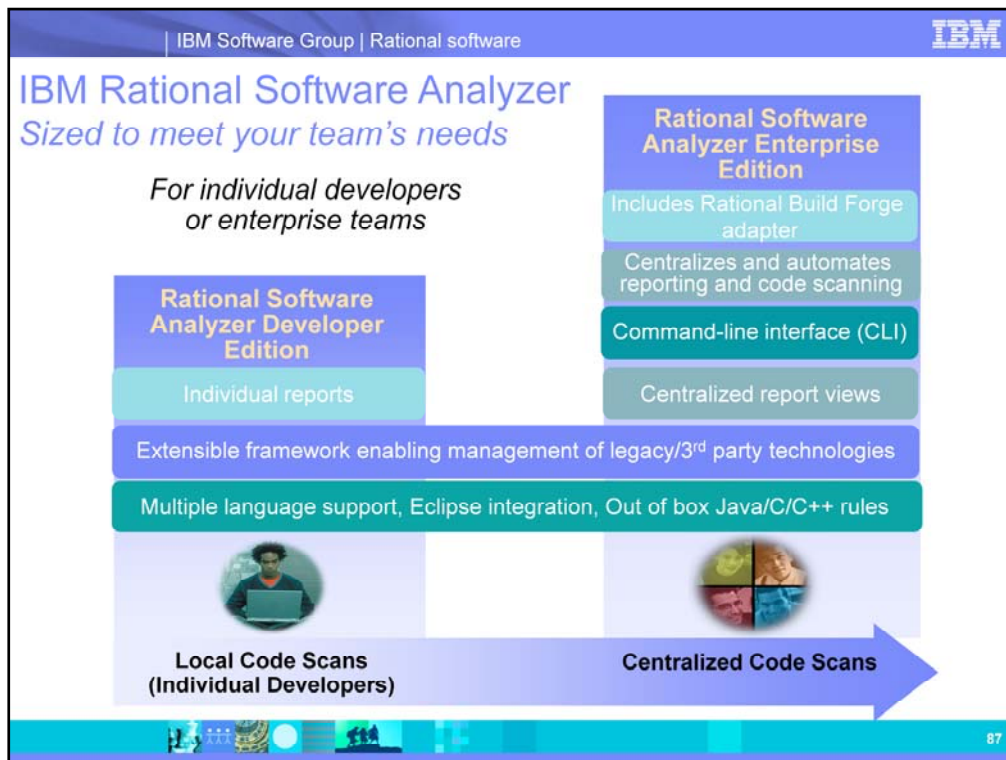
Centralized quality automation



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Rational Software Analyzer Enterprise Edition automates code quality analysis as part of the build process through the integration with Rational Build Forge for a centralized software code scan solution. This allows you to check for quality as part of the build process – adding a layer of code scanning prior to releasing your software to ensure what you will be delivering is the best quality possible and helping to reduce the number of defects sent on to your customers.





- IBM Rational offers a Static Analysis solution for individuals and/or enterprise teams providing centralized and automated code scans.
- For individual developers, there is IBM Rational Software Analyzer Developer Edition allowing Developers to scan their code for quality early in the software development lifecycle. This edition includes individual reports that can be exported or run any time.
- For automated and centralized code scanning, there is Rational Software Analyzer Enterprise Edition. This edition includes centralized report views, a command line interface and an adaptor to Rational Build Forge which allows for the code scans to be included as part of the build process.

## Agenda

- Introductions
- The Challenges of Delivering Quality Software
- IBM Rational Software – Our Unique Value
- IBM Rational CRM Solution Overview
- Technology Review - IBM Rational ClearQuest
- Technology Review - IBM Rational ClearCase
- Technology Review – IBM Rational Team Concert
- Technology Review - IBM Rational Build Forge
- Technology Review – IBM Rational Software Analyzer
- Next Steps



- Introductions of the IBM team

## Change, Configuration and Release Management

### *Additional information*

For additional information on the IBM Rational Change, Configuration and Release Management solutions please refer to the following websites:

**IBM Rational Change, Configuration and Release Management:**

<http://www-01.ibm.com/software/rational/offerings/crm/>

**IBM Rational ClearQuest:**

<http://www-01.ibm.com/software/rational/offerings/crm/change.html>

**IBM Rational ClearCase:**

<http://www-01.ibm.com/software/rational/offerings/crm/configuration.html>

**IBM Rational Team Concert:**

<http://www-01.ibm.com/software/awdtools rtc/>

**IBM Rational Build Forge:**

<http://www-01.ibm.com/software/rational/offerings/crm/build.html>

**IBM Rational Software Analyzer:**

<http://www-01.ibm.com/software/awdtools/swanalyzer/>



- These websites provide additional information on IBM Rational's Change, Configuration and Release Management solutions (Rational ClearQuest, Rational ClearCase, Rational Team Concert, Rational Build Forge and Rational Software Analyzer).

## Change, Configuration and Release Management

### *Additional resources*

For additional resources related to the IBM Rational Change, Configuration and Release Management solutions please refer to the following websites:

**IBM Rational Change, Configuration and Release Management Product Library:**

<http://www.ibm.com/software/awdtools/resources/scm.html>

**IBM developerWorks for hints, tools, tips and tricks:**

<http://www.ibm.com/developerworks/rational>

**IBM Rational demos, evaluations, upgrades, patches, hot fixes, add-ins, plug-ins, models, scripts, and documentation:**

<http://www.ibm.com/developerworks/rational/downloads>

**The Jazz community site:**

<https://jazz.net/pub/index.jsp>

**The Eclipse open development platform:**

<http://www.eclipse.org>



- Additional helpful resources related to IBM Rational Change, Configuration and Release Management.

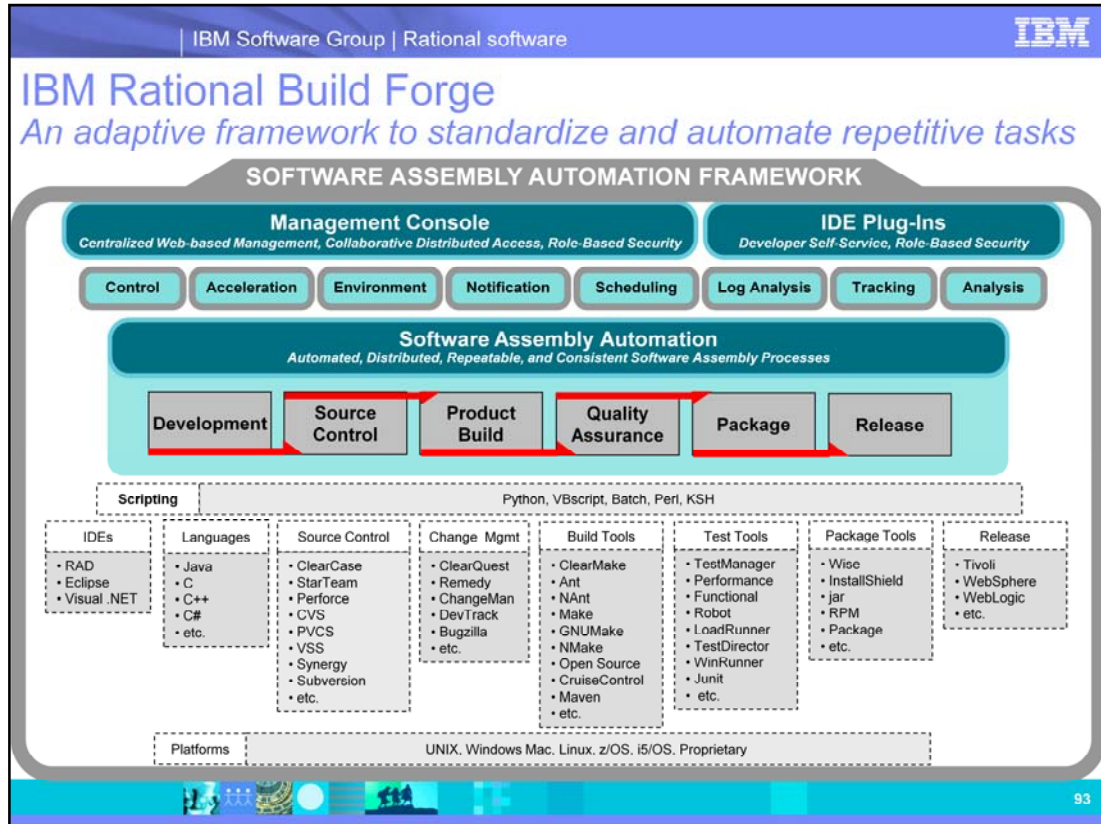
Thank  
You



# Optional Slides







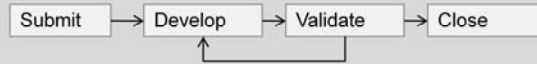
- Getting a product from initial coding all the way into production involves a complex task involving a network of people, processes, and technologies that need to be integrated.
- This slide has animation to show the value-add Rational Build Forge can bring to an existing customer environment
- The software development process stages in the middle are an example- every company will be slightly different
- The boxes that are grey in color, represent the customer's existing platforms they develop and build on, their existing tools, and any scripting they have on top of all that
- The Rational Build Forge value-add capabilities around process automation, acceleration, notification, scheduling, etc. are represented by the color boxes. Interfaces to the system at the top of the chart include a web browser based user interface, as well as IDE plug-ins for seamless developer desktop access
- Rational Build Forge wraps this whole solution in an automated framework

# IBM Rational ClearQuest ALM Schema

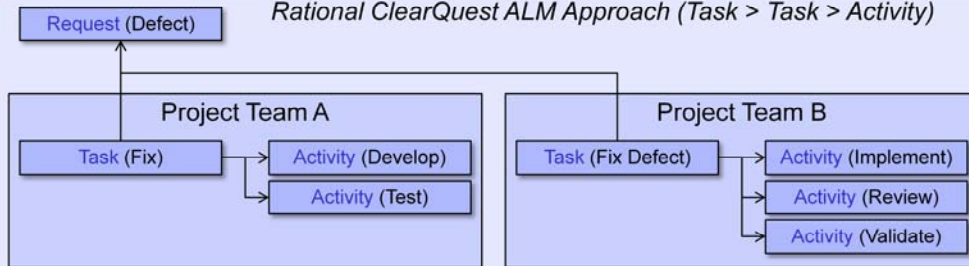
*Project level process support*



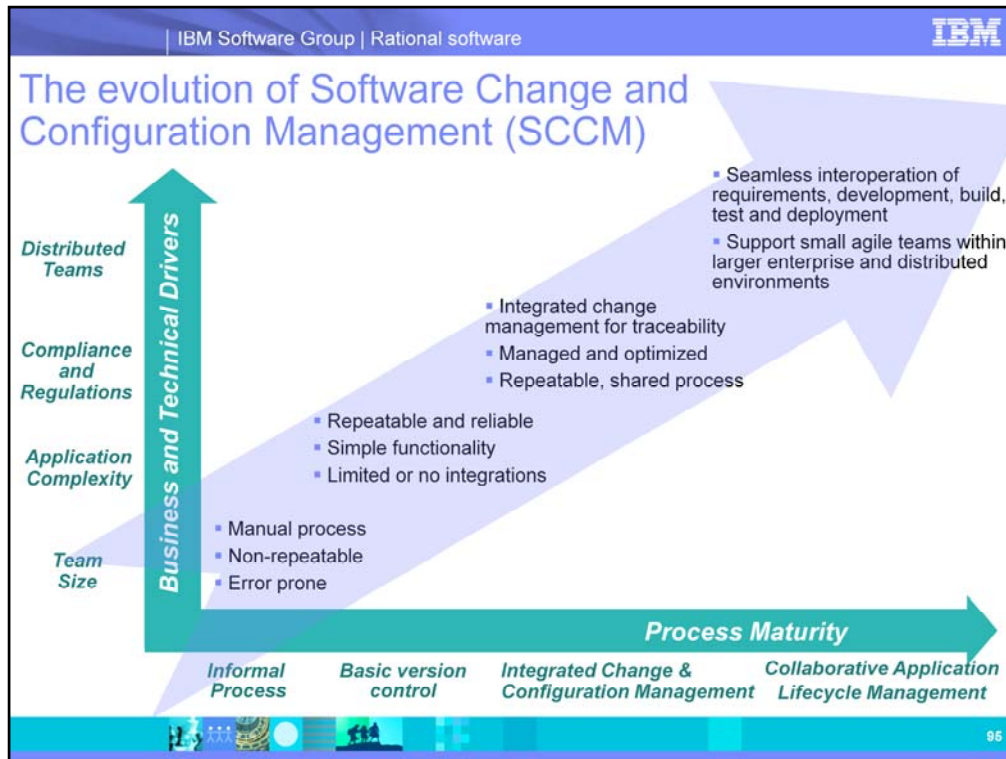
## State Transition Approach (Single record)



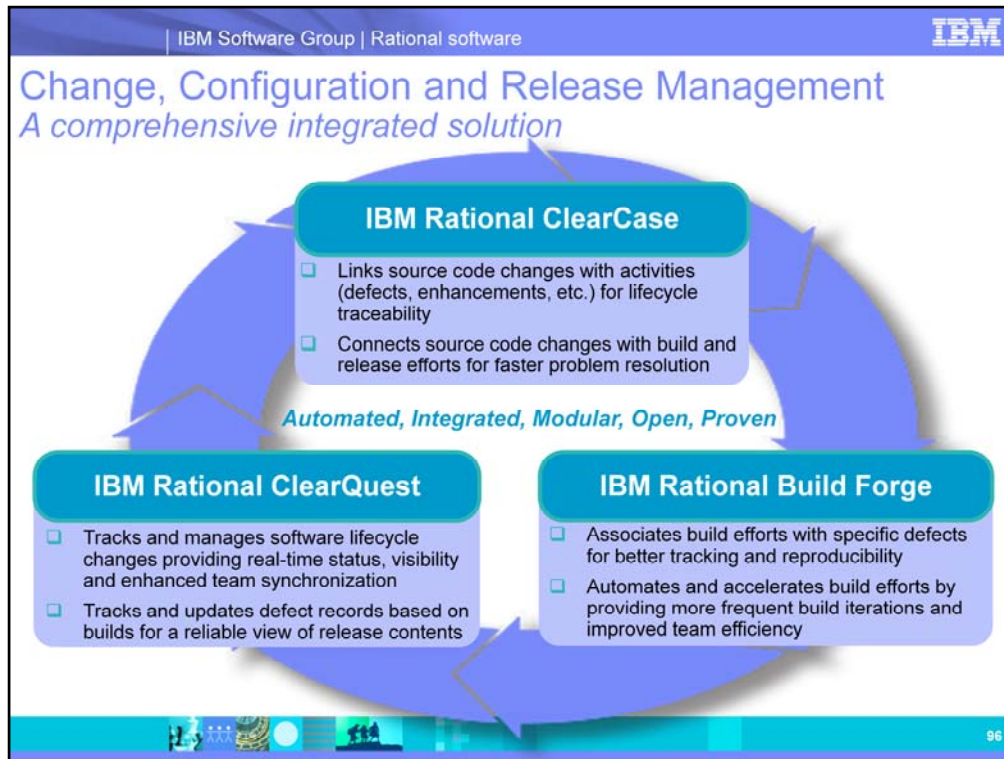
## Rational ClearQuest ALM Approach (Task > Task > Activity)



Replace one-size fits-all state transitions with project defined activity sets



- So, why isn't every organization where it wants to be?
- Well, there is definitely an evolution of Software Change and Configuration Management (SCCM). The things that force process maturity are technical and business drivers such as application complexity, team size, compliance mandates, distributed teams, etc – they all drive the need for a more evolved configuration management solution.
- It is typical to start with a solution that is manual and non-repeatable or fairly basic. The need for a more complete solution becomes evident due to the increase in errors, decrease in quality, missed deadlines and an overall lack of team efficiency. Using an integrated change & release management solution you are able to associate changes to software code with development activities as well as know what is built so it can be reproduced any time which speeds up defect detection.
- The further you move to the right, the benefits and return on investment increase substantially.
- An evolved and complete configuration management solution increases quality and team productivity. The value of a collaborative application lifecycle management approach is huge. You are able to seamlessly have access to software requirements and change management – allowing you to develop in agile ways while still have a robust enterprise SCCM environment.



■ The seamless integration of our tools is one IBM Rational's strong values. The comprehensive integration between Software Configuration Management (Rational ClearCase), Software Change Management (Rational ClearQuest) and Software Assembly (Rational Build Forge) provides end-to-end traceability and visibility into the software development lifecycle. Our Change, Configuration and Release Management solutions are a key component of the complete end-to-end lifecycle solution allowing you to integrate requirements, development, build, test, deployment and portfolio management tools to facilitate rapid response to change.

■ **Rational ClearCase** links source code changes to activities (defects, enhancement, etc) that are stored in Rational ClearQuest – this links “why” a file was changed to the actual source code change. It also connects source code changes with Rational Build Forge's build and release efforts for faster problem resolution.

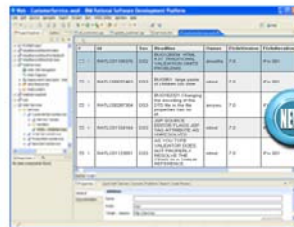
■ **Rational ClearQuest** tracks the lifecycle of a change (defect, enhancement, etc) associating requirements, code changes, build information, and testing to the activity for real-time status, visibility and team synchronization.

■ **Rational Build Forge** associates build efforts to specific changes (defect, enhancement, etc) that are stored in Rational ClearQuest for better tracking and reproducibility. It also automates and accelerates build efforts by providing easy access to process for more frequent build iterations and improved team efficiency.

# IBM Rational Asset Manager

*A collaborative software development asset management solution*

- ✓ Understand and leverage artifacts used to develop and build assets
  - ▶ Identify an asset's versioned artifacts quickly
- ✓ Submit change requests for an asset
  - ▶ Track and fix problems quickly - all in the same IDE!
- ✓ Increase productivity
  - ▶ Develop code in a team environment
  - ▶ Integrate with a customer's existing environment
  - ▶ Search, create, reuse and communicate created assets



Eclipse based Rational Software Delivery Platform

