

Manage your System z Cross-Platform Development

An IBM Teleconference
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Rational. software

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.

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

Distributed and disconnected teams

Lack of visibility into project status

Reduced staff

Inconsistent quality

No control or insight into development activities

Complex environments

And more!



What is the business impact of these software delivery challenges?

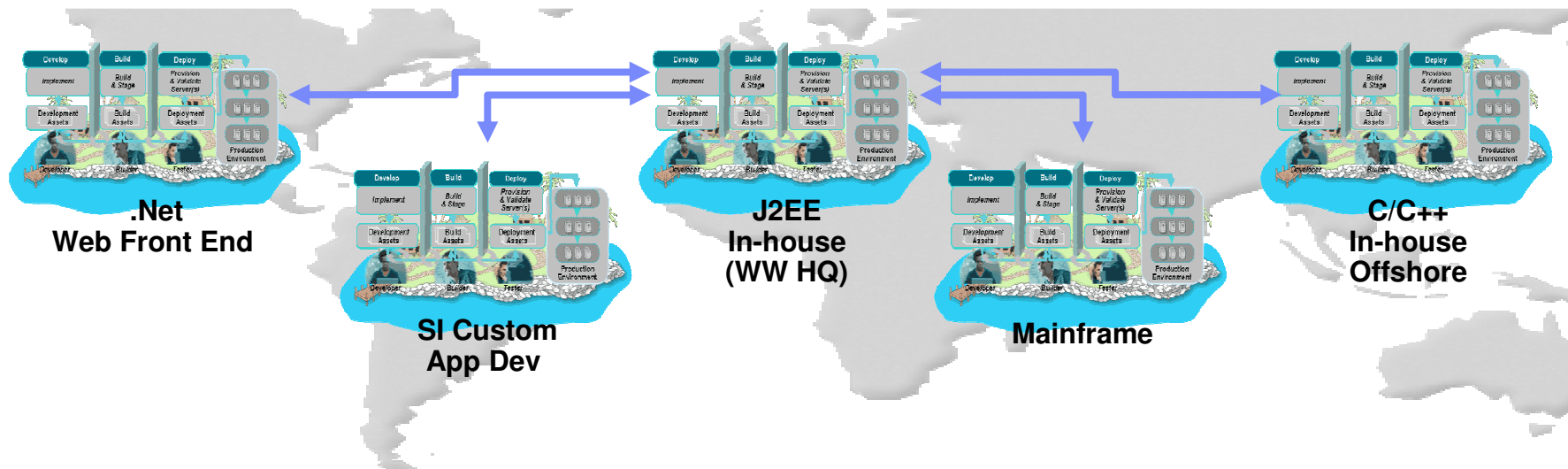


- Delayed and missed releases
 - Effecting the ability to compete with competition
- Increased development costs
 - Effecting the overall company 'bottom line'
- Poor and unpredictable quality
 - Effecting the business reputation
- Customer dissatisfaction
 - Effecting future and current business



Organizations are going global

Needed: multi-platform and cross-geo collaboration and governance



But...

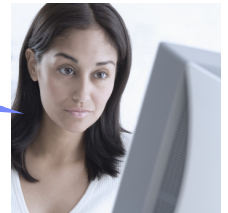
There are different tools, processes and team infrastructure for each deployment platform, greatly complicating development of composite apps

Organizations want continued value from their z investment

- ▶ The market demands integrated, multi-platform solutions
- ▶ However, many think of z development as “different and unique”, constraining efficiency & flexibility
- ▶ Rational’s Enterprise Modernization solutions provide:
 - a consolidated platform for multi-platform application development
 - a collaborative, integrated environment that supports innovation
 - the same power and flexibility for all types of applications, including z
- ▶ With totally modern tools for System z, customers can choose their deployment platform for new applications based upon runtime requirements (e.g. QoS, proximity to data)
... and NOT based on out-dated perceptions of z development
- ▶ It is time to re-think how z development is done!

Modernize your Skills - IDEs

I am NOT going to miss my green screen IDE



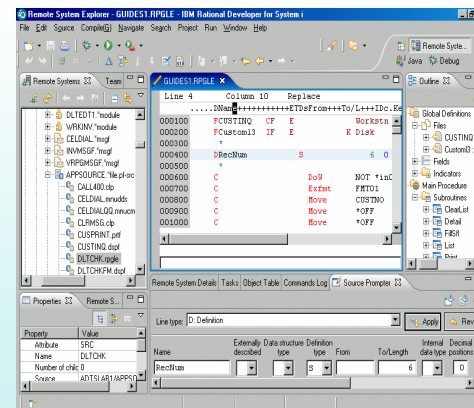
Business Challenge
Low productivity, non-competitive tools for new developers

How can we...

- ▶ Achieve higher productivity for our enterprise developers?
- ▶ Attract new and younger developers to backfill retiring System z and IBM i developers?
- ▶ Simplify license management by standardizing on a single, multi-platform development IDE?
- ▶ Free up System z MIPS for production use?

Solutions
Modern IDEs to achieve high productivity and attract new talent

- ✓ Use modern IDEs to develop and maintain code
- ✓ Debug and test from workstation
 - Rational Developer for System z
 - Rational Developer for System i
 - Rational Business Developer
 - Rational Developer for System i for SOA Construction
 - Rational Application Developer



Modernize Your Team Infrastructure

The only island I want to see has palm trees



Business Challenge

Inefficiencies and quality problems in multi-platform development

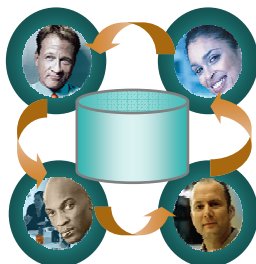
How can we...

- ▶ Increase quality and improve responsiveness for multi-platform development teams?
- ▶ Simplify management of team infrastructure for multiple development teams?
- ▶ Reduce team infrastructure costs across the enterprise?

Solutions

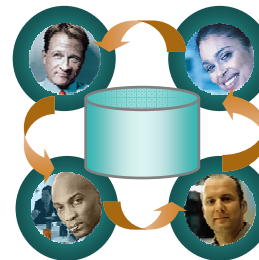
Coordination, traceability, consistency across platforms

- ✓ Consolidate enterprise and distributed source code management
 - *Rational ClearCase*
- ✓ Automate and orchestrate defect tracking and configuration management across the enterprise
 - *Rational ClearQuest*
- ✓ Produce coordinated, traceable, automated, and cross-platform builds
 - *Rational BuildForge*



Distributed Development Environment

RDz RDi RPP



Enterprise Development Environment

Enterprise
le Portal

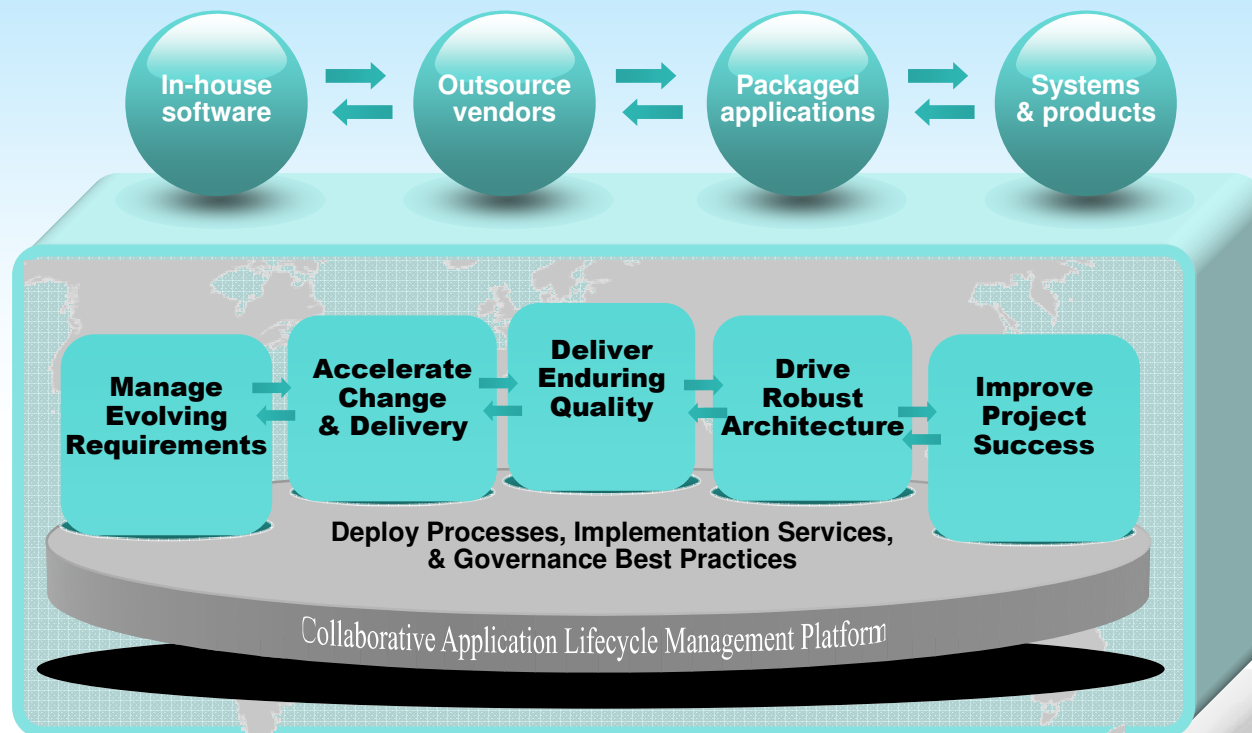
Enterprise
Asset
Repository

IBM Rational Software Delivery Platform

Accelerating software innovation for the entire enterprise

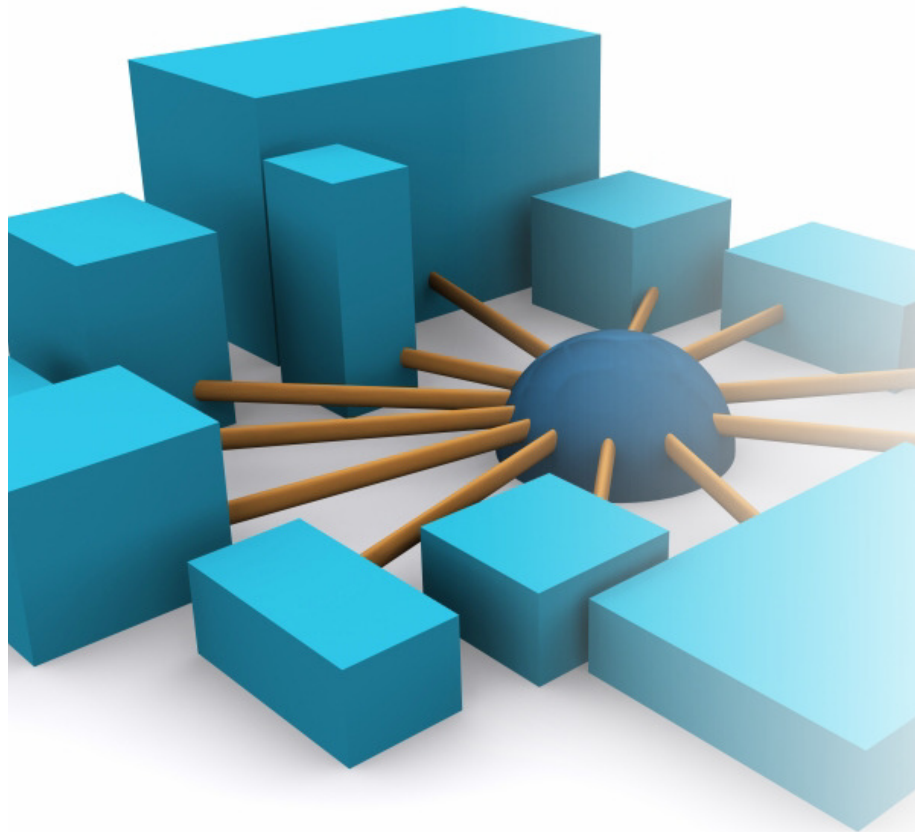
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Solutions to help customers achieve greater value and performance from their investments in delivering software



- *Enterprise Modernization and Transformation*
- *Organizational Governance*
- *Skill Development and Community*
- *Implementation Services*

Solution: Simplify your Environment Standardize your cross-platform application development



Rational Developer for System z

Integrated Host/desktop IDE

- Local COBOL/PL1 edit, syntax check
- Integrated java, C/C++ development
- Automated host/local filesystem synchronization
- Remote test, debug, job monitoring

Rational Developer for System z

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Drive innovation with technology advancements

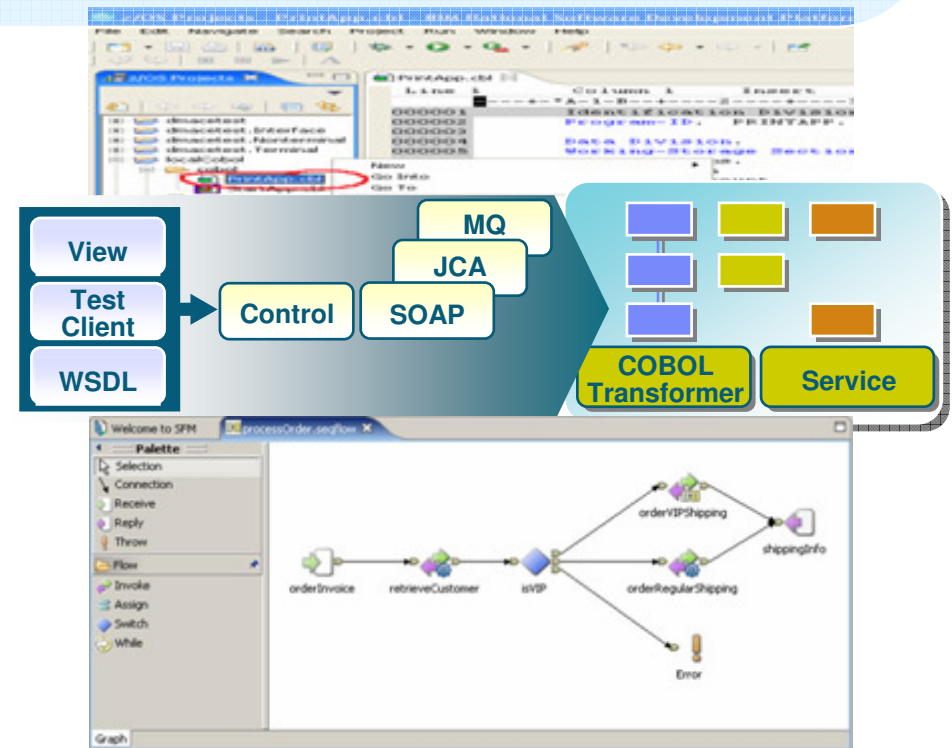
Build traditional and composite applications with Rational Developer for System z

IBM Rational Developer for System (RDz) provides powerful eclipse-based tools for building COBOL, PL/I, C/C++, Java, HLASM CICS, IMS and batch applications. RDz is designed to optimize and simplify application development for traditional processes, and for the SOA you're building to address your needs today and in the future—through best practices, visual tools, templates, code generation and a comprehensive development environment.

RDz 7.5

- ▶ Leverages service flow modeler to automate development of CICS services
- ▶ Develop z/OS applications and CICS and IMS Web services more productively than ever
- ▶ Manage core and composite artifacts from z/OS
- ▶ Speed software delivery with integrated, automated end-to-end processes

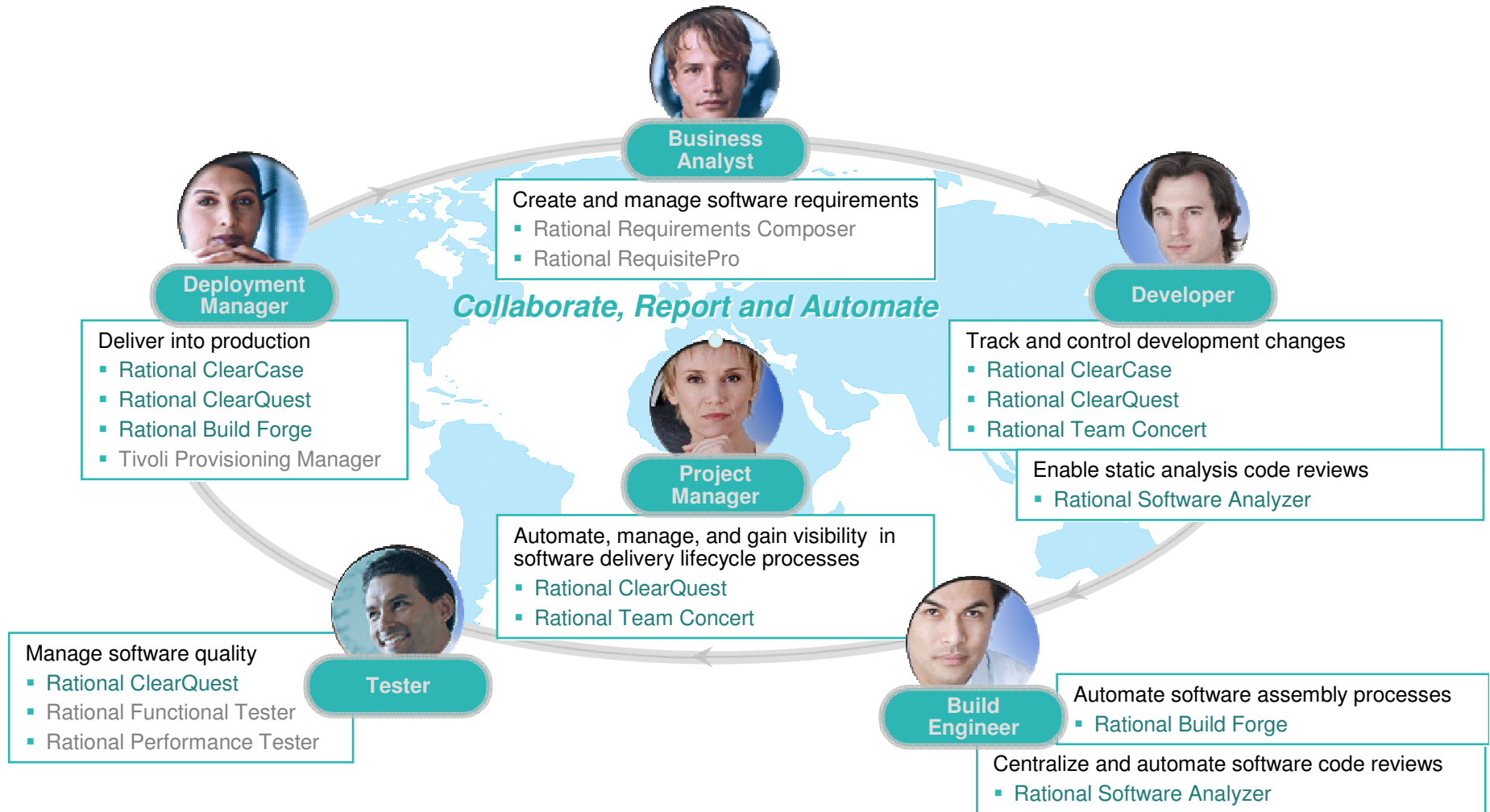
- Enables traditional; and modern UI's (via RBD)
- Supports local and remote development
- Creates connectivity via web services, CICS SFM, CTG, IMS Connect
- UML to COBOL speeds Model driven development
- Delivers distributed debugging support for SOA applications via Debug Tool
- Integrates to File Manager, Fault Analyzer



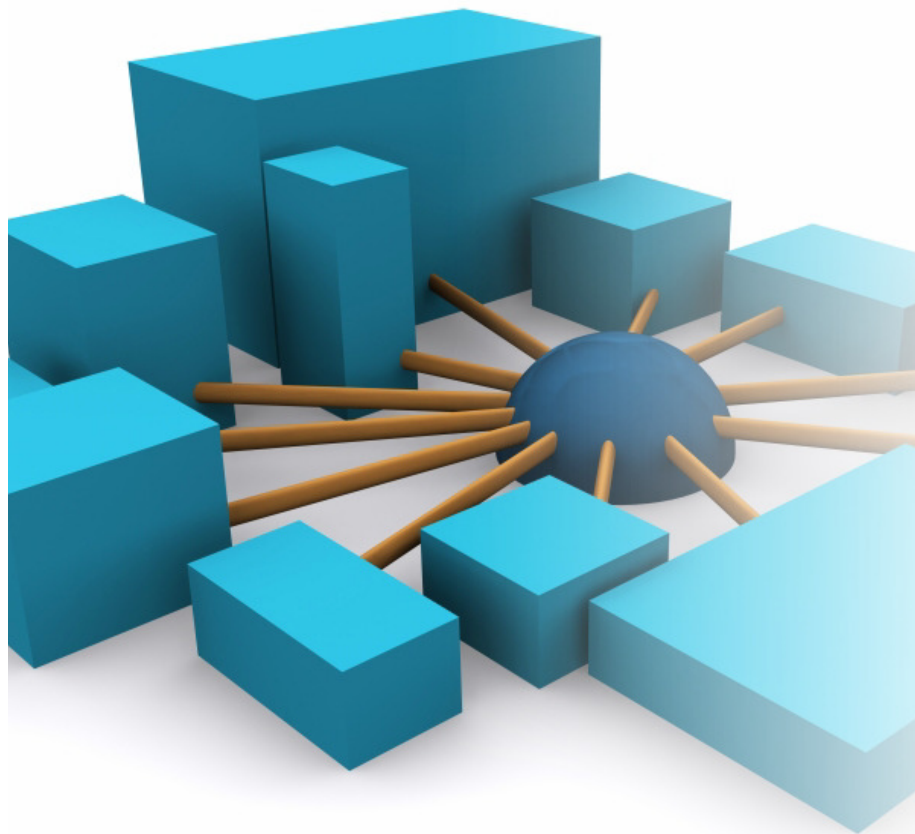
IBM Rational Developer for System z

Change, Configuration and Release Management

Improving effectiveness with code-level analysis, version control, process automation, team collaboration and lifecycle traceability



***Solution: Simplify your Application Lifecycle
Standardize your development process across your enterprise***



IBM Rational ClearQuest

Activity and Deployment Management

- Configurable, enforceable workflows
- Central repository, real-time status
- Graphical and text-based reporting
- RDz (Eclipse), Web, Windows clients

IBM Rational ClearQuest

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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

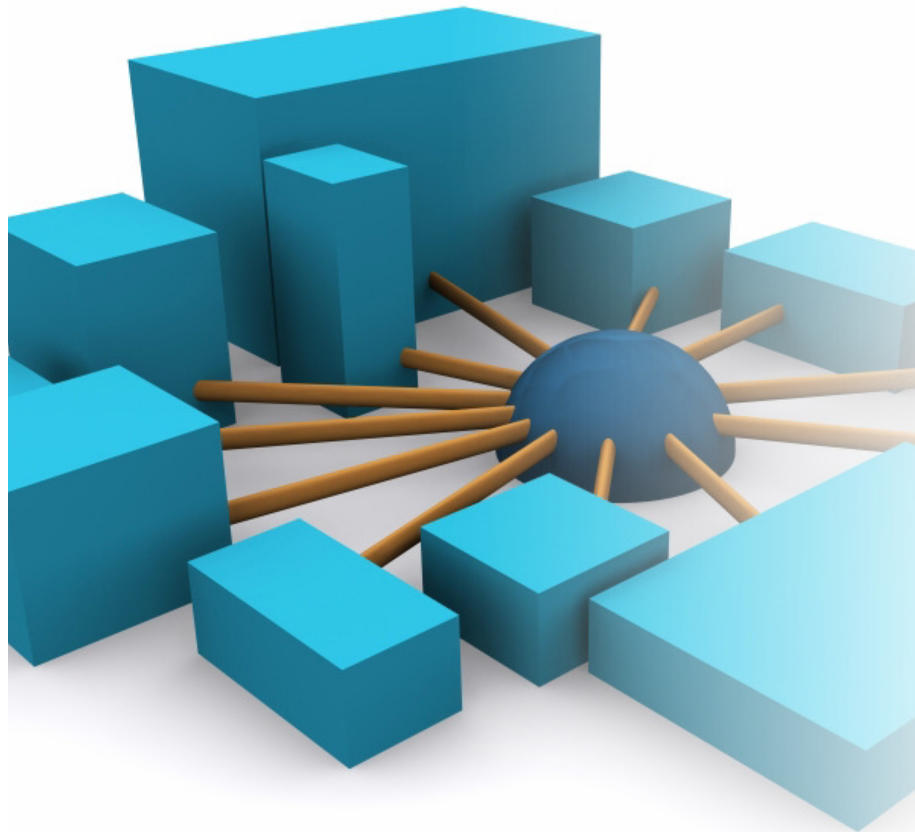
- ✓ Flexible, customizable and automated workflows provide repeatable, enforceable and predictable processes



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

Solution: Simplify Software Asset Management ***Manage enterprise assets with a single repository solution***



Rational ClearCase

Enterprise-level SCM

- Secure hosting of software assets
- Desktop, RDz, z/OS, web clients
- Distributed and z/OS build capability
- Built-in extensible process model

Rational ClearCase

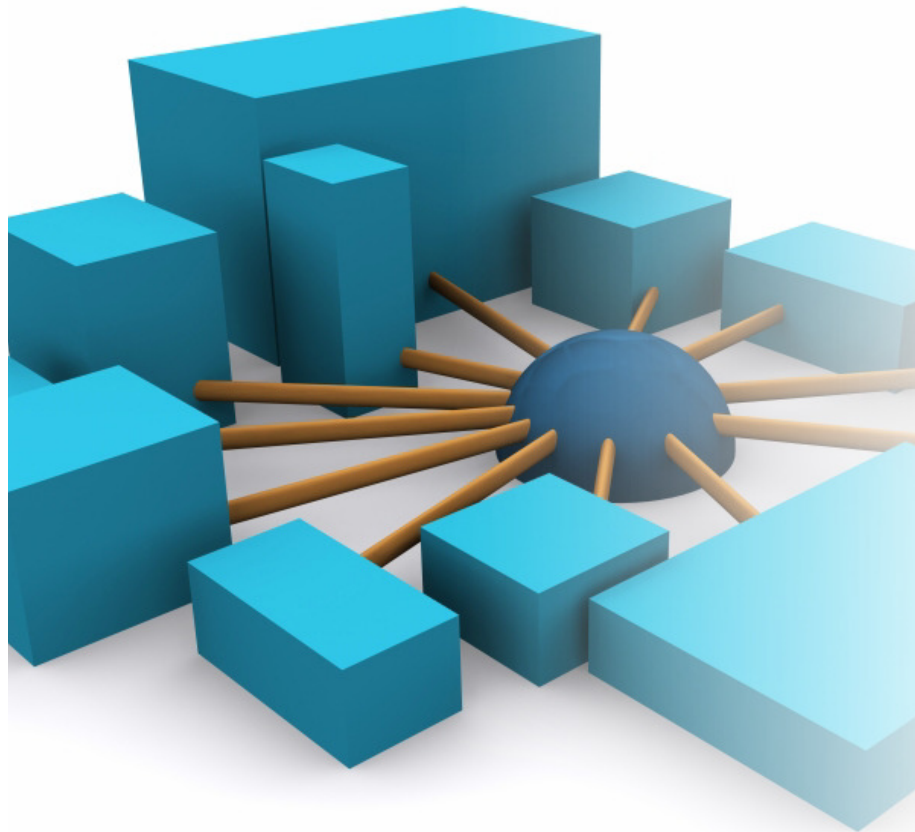
IBM Rational ClearCase

Complete Software Configuration Management

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

- ✓ Suitable for small teams, yet scales to the enterprise
- ✓ Light-weight clients, full featured Eclipse plugins enable transparent remote and local access
- ✓ Flexible out-of-box usage model based on proven best practices increases team productivity and efficiency
- ✓ Transparent real-time access to files and directories virtually anywhere in your organization, including from z/OS
- ✓ Integration with leading IDEs allows you to work in your preferred environment
- ✓ ISPF client and z/OS build management extend value to mainframe, enables enterprise-wide standardized software configuration management

Solution: Simplify Builds and Deployments cross-platform application builds and deployments



Rational Build Forge

Synchronize enterprise builds

- Centralized build management
- Local (host and distributed) agents
- RDz (Eclipse), Web clients
- Comprehensive audit trails

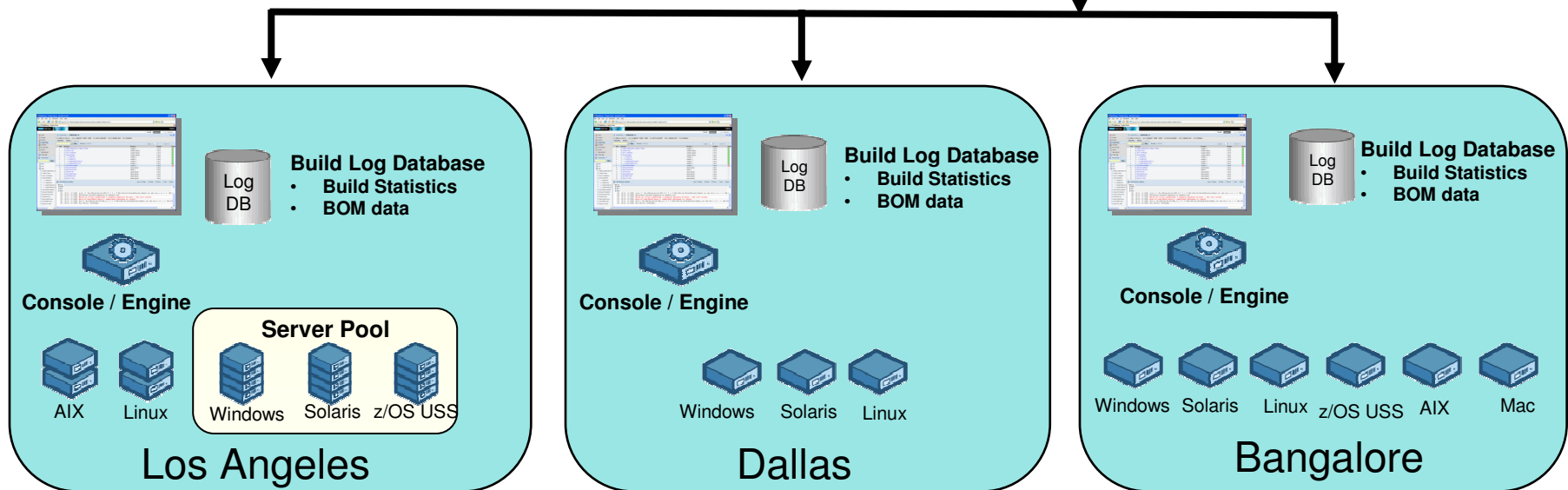
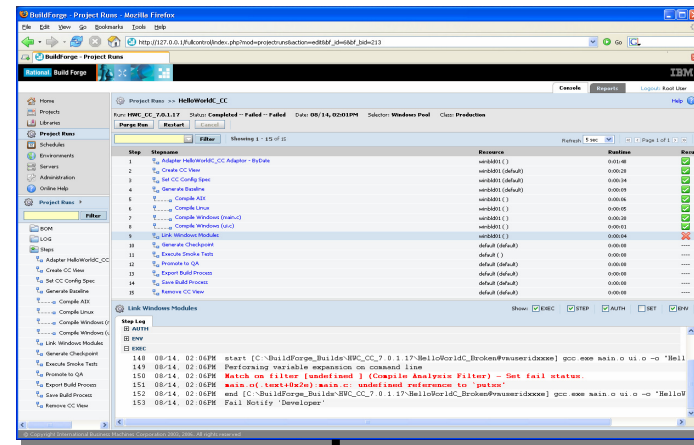
Rational Developer for System z

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IBM Rational Build Forge

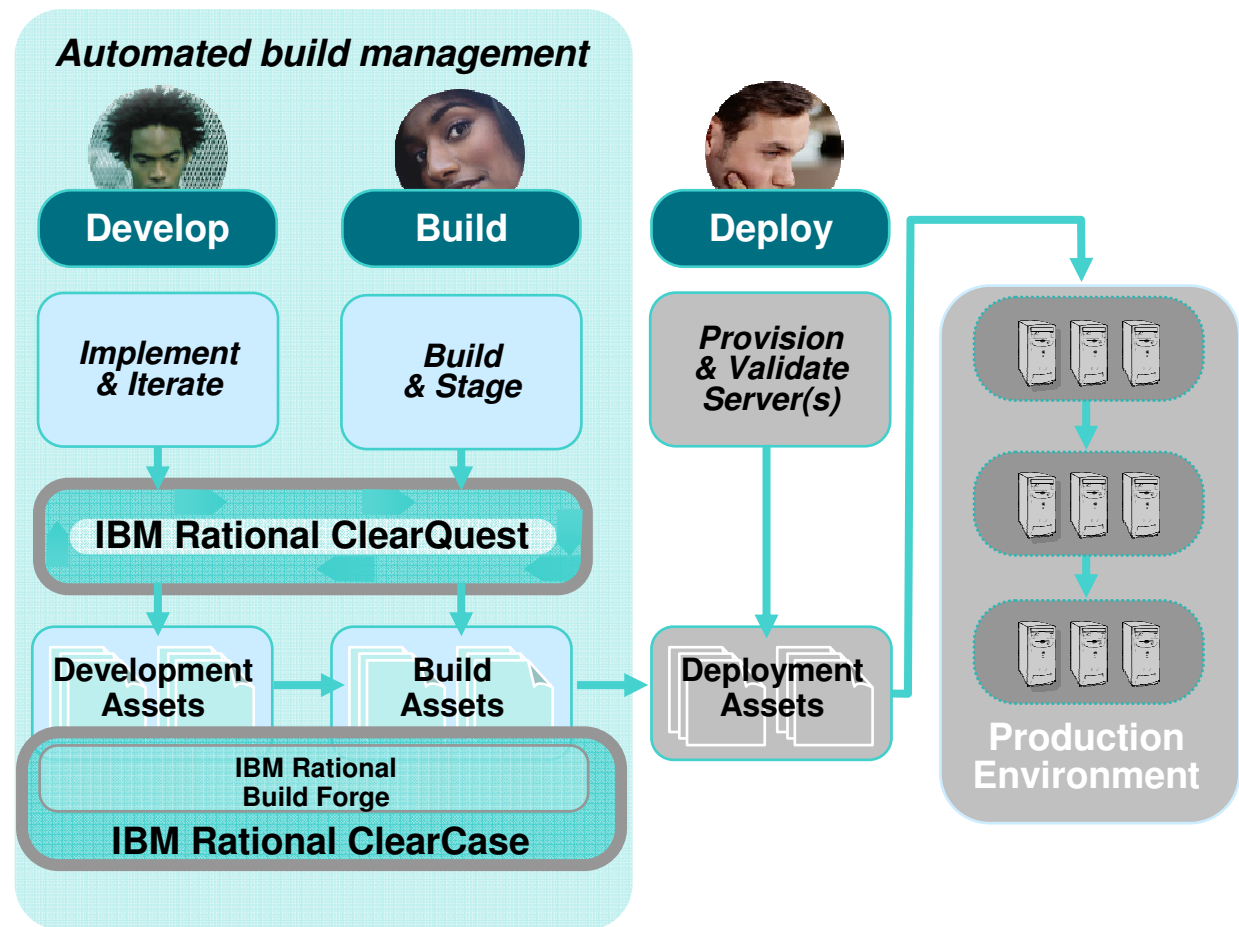
Centralized management across geographically distributed teams

- Web-based management console
- Consolidated, real-time project view
- Safe, secure access via user authentication
- Unicode support for international projects



IBM Rational ClearQuest and IBM Rational ClearCase with IBM Rational Build Forge integration

- Automated build management
- Detailed record of build content
- Support for continuous builds
- New IBM Rational ClearQuest build record for tracking and reporting



Scenario:

- **Help desk retirement application – returning errors!**
 - J2EE light desktop client
 - CICS back end

```
EPS TOOLS BIRTHDAY/RETIREMENT EXAMPLE

PLEASE ENTER BIRTHDATE: 19900101

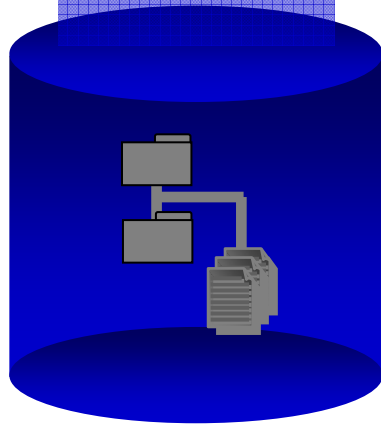
ENTER A 1 TO SEE YOUR BIRTHDAY
ENTER A 2 TO CALCULATE YOUR RETIREMENT

HERE IS YOUR BIRTHDATE AND NO DAYS FROM CURR

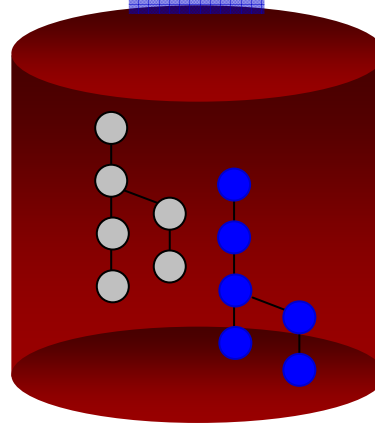
YOUR BIRTHDATE AND DAY: Monday 01 January 1990
HOW LONG AGO WAS THIS?: 000000888 DAYS

F3/F12 TO TERMINATE, ENTER TO PROCESS, CLEAR TO START OVER
```

Enterprise Application Lifecycle



COBOL Source,
CICS, DB2 Tables



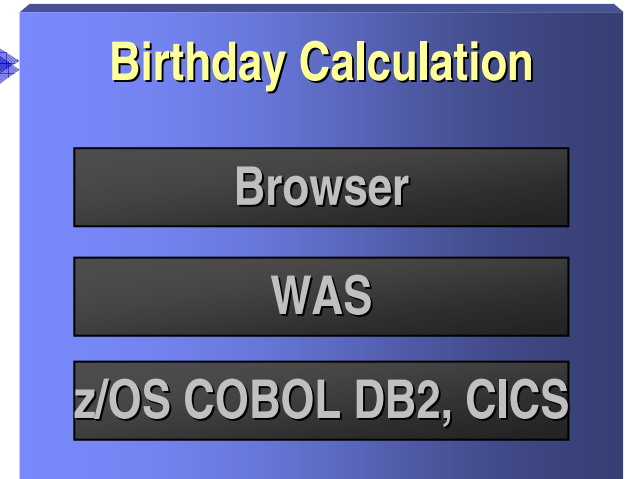
Desktop
Java, C, C++, Struts



ISPF



*Linux, Windows
Desktop*



“Mixed Workload”
“Cross Platform”

Production Help Desk:

- Discovers issue
- Inputs issue with CQ Web client . .

The screenshot displays the Rational ClearQuest web client interface. The top navigation bar includes the Rational logo, the text "Rational ClearQuest", and user information: "Welcome admin | Demo/SAMPL | Log out" and "You have 0 new items". Below this, there are tabs for "New Defect", "Site Administration", "Preferences", and "Help".

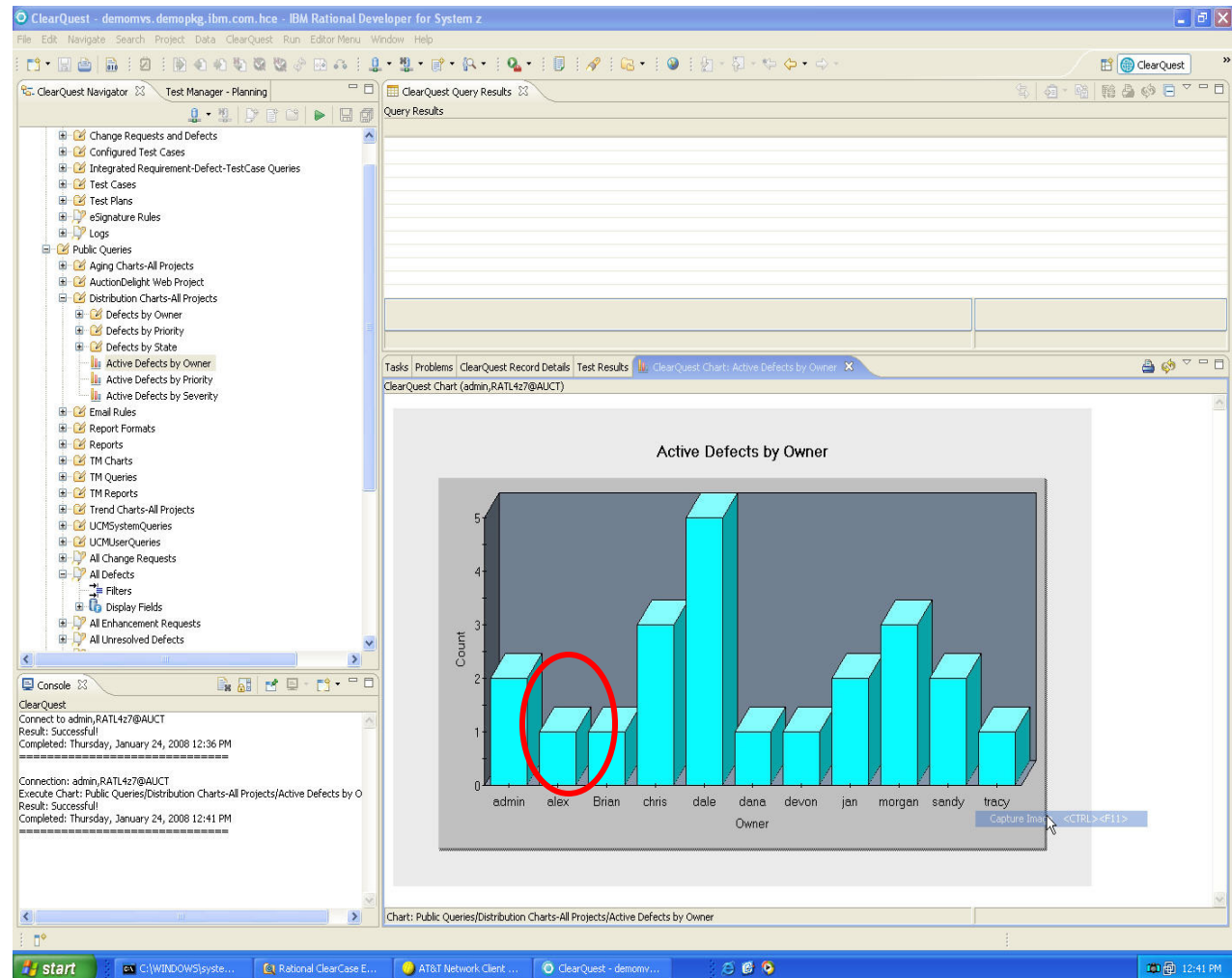
The main content area is divided into two sections. The upper section shows a search bar with the text "my query 112" and a table of search results. The table has columns for "#", "id", "State", "Headline", and "version".

#	id	State	Headline	version
	SAMPL00000001	Opened	spelling error in login screen	4
	SAMPL00000002	Resolved	demo sales tax incorrect if item deleted from purchase	3
	SAMPL00000003	Opened	cancel sale doesn't correctly repaint screen	4
	SAMPL00000004	Resolved	demo want more help on inventory report	4
	SAMPL00000005	Resolved	columns out of alignment	2
	SAMPL00000006	Opened	Batch update headline (7.01)	5

The lower section shows the detailed view of a defect with ID "SAMPL00000079". The defect is in the "Opened" state. The "Headline" field contains the text "teasdfsdfafd", which is circled in red. Other fields include "Project: Classics", "Severity: 1-Critical", "Priority: 1-Resolve Immediately", and "Owner: QE". The "Description" field is empty. The interface also includes tabs for "Main", "Notes", "Resolution", "Attachments", "History", "Customer", and "eSignature".

Project Lead

- Reviews team workload



Project Lead

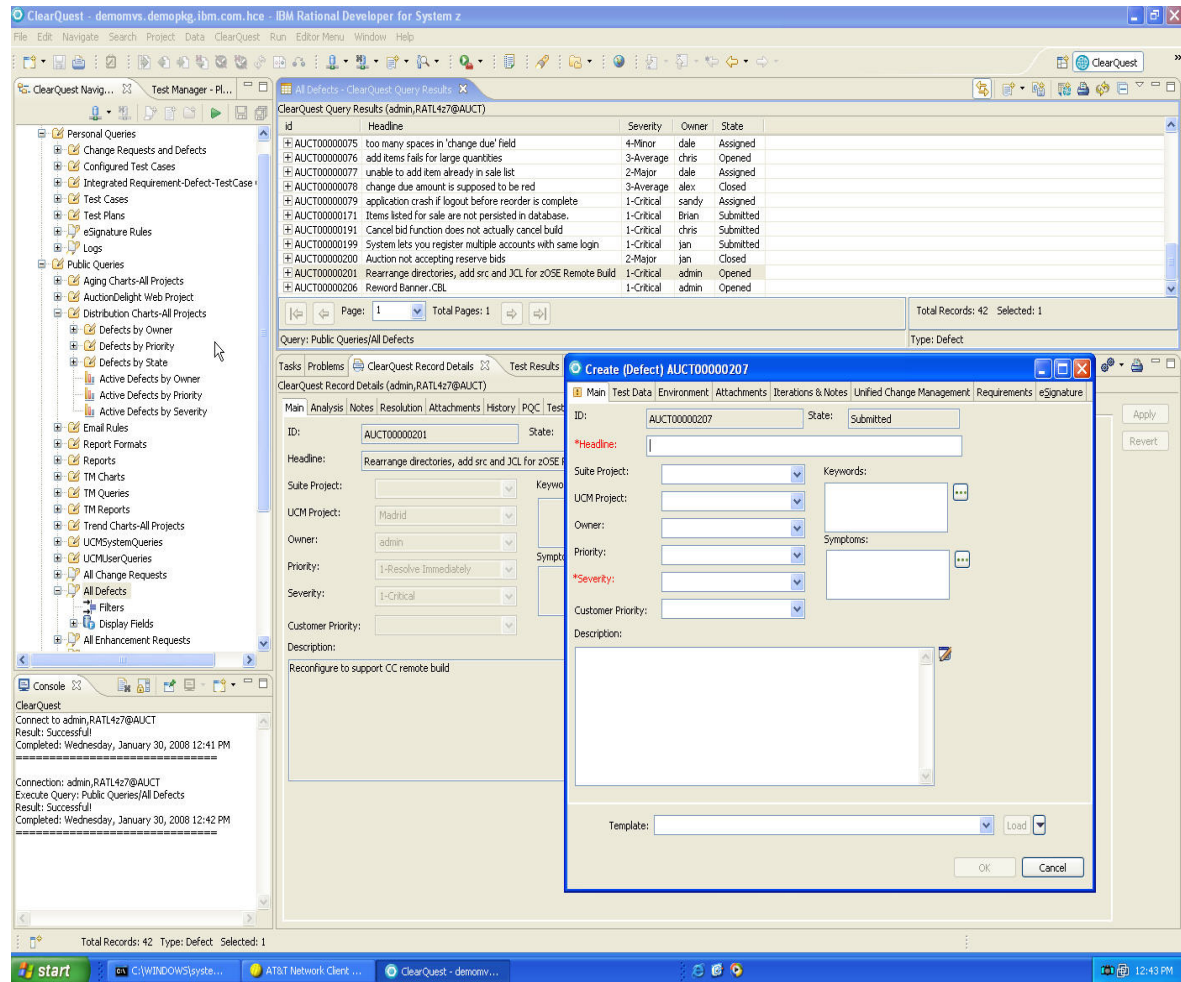
- Assigns issue to "alex"

The screenshot displays the IBM Rational Developer for System z interface. The main window shows the 'ClearQuest Navigator' on the left with a tree view of project queries. The central pane displays a table of 'All Unresolved Defects - ClearQuest Query Results'. The table has columns for ID, Headline, Severity, Owner, and State. The bottom pane shows the 'ClearQuest Record Details' for defect ID AUCT00000210. In this record, the 'Owner' field is set to 'alex', which is circled in red. Other fields include Suite Project (Madrid), UCM Project (Madrid), Priority (2-Give High Attention), and Severity (1-Critical). The headline is 'We need to update the Banner Application'. The console at the bottom left shows system messages.

ID	Headline	Severity	Owner	State
AUCT00000047	delete item not working correctly	2-Major	sandy	Opened
AUCT00000054	sales tax incorrect for NH	1-Critical	morgan	Assigned
AUCT00000056	inventory report is not running correctly	1-Critical	morgan	Assigned
AUCT00000058	overriding price operation allows negative number	2-Major	devon	Assigned
AUCT00000060	part number column not wide enough	3-Average	jan	Opened
AUCT00000061	add item button is out of line with the other buttons	3-Average	morgan	Assigned
AUCT00000062	context: sensitive help falls from reorder window	2-Major	dana	Assigned
AUCT00000063	formatting does not look right in inventory report	3-Average	dale	Opened
AUCT00000065	shortcut to logout does not work	2-Major	tracy	Assigned
AUCT00000066	cancel sale leaves item in purchase list	3-Average	dale	Opened
AUCT00000068	inventory report is displaying an empty column	2-Major	alex	Opened
AUCT00000072	application crashes with low memory condition	2-Major	chris	Assigned
AUCT00000073	reorder quantity is sometimes incorrect	2-Major	dale	Assigned
AUCT00000075	too many spaces in change due field	4-Minor	dale	Assigned
AUCT00000076	add items fails for large quantities	3-Average	chris	Opened
AUCT00000077	unable to add item already in sale list	2-Major	dale	Assigned
AUCT00000079	application crash if logout before reorder is complete	1-Critical	sandy	Assigned
AUCT00000171	Items listed for sale are not persisted in database.	1-Critical	Brian	Submitted
AUCT00000191	Cancel bid function does not actually cancel build	1-Critical	chris	Submitted
AUCT00000199	System lets you register multiple accounts with same login	1-Critical	jan	Submitted
AUCT00000206	Reword Banner.CBL	1-Critical	admin	Opened
AUCT00000208	Make a change to the Banner Program	2-Major	alex	Opened
AUCT00000210	We need to update the Banner Application.	1-Critical	alex	Opened

Developer Alex:

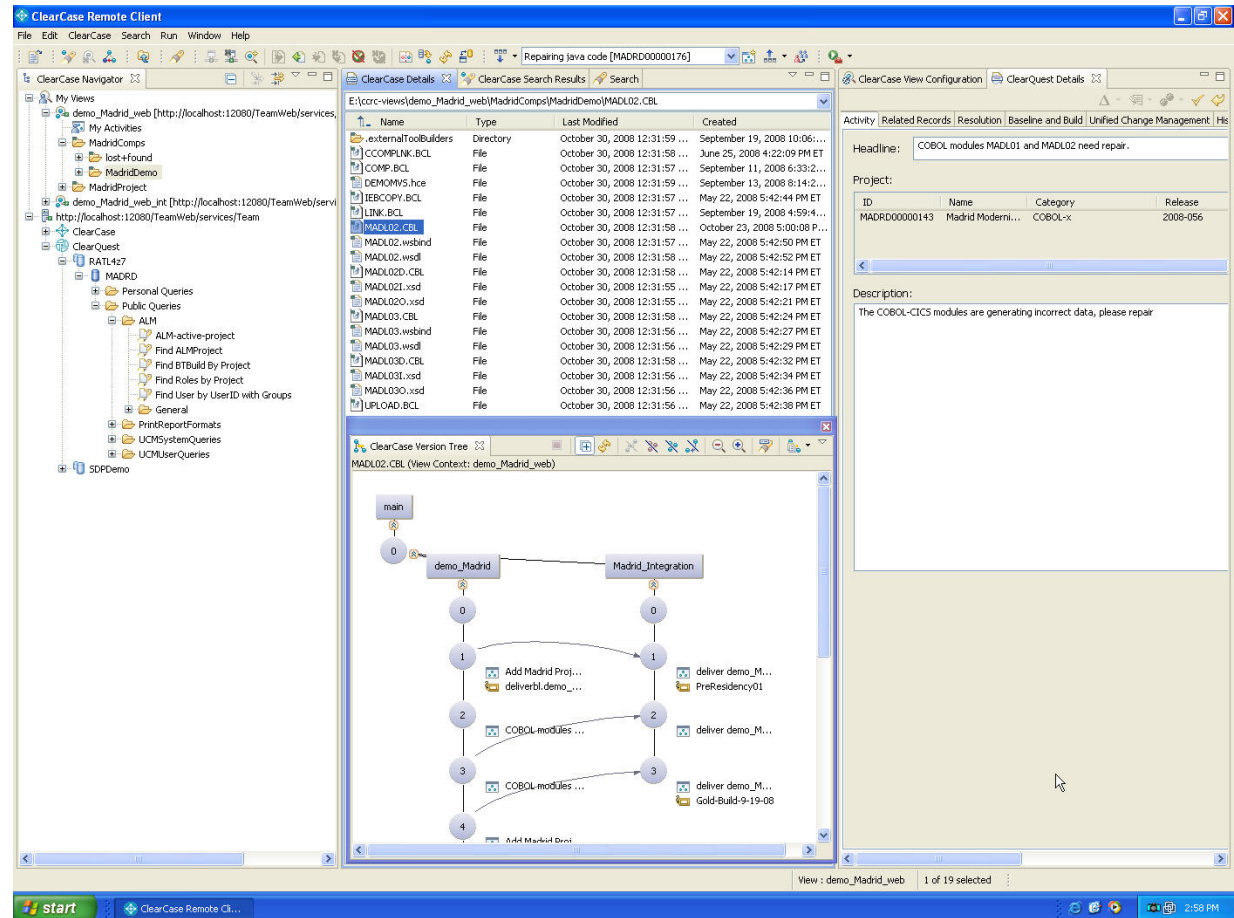
- **Notified by:**
 - Email, or
 - ClearQuest to-do
- **Opens issue in RDz**
 - Marks it as “opened”
 - Investigates issue



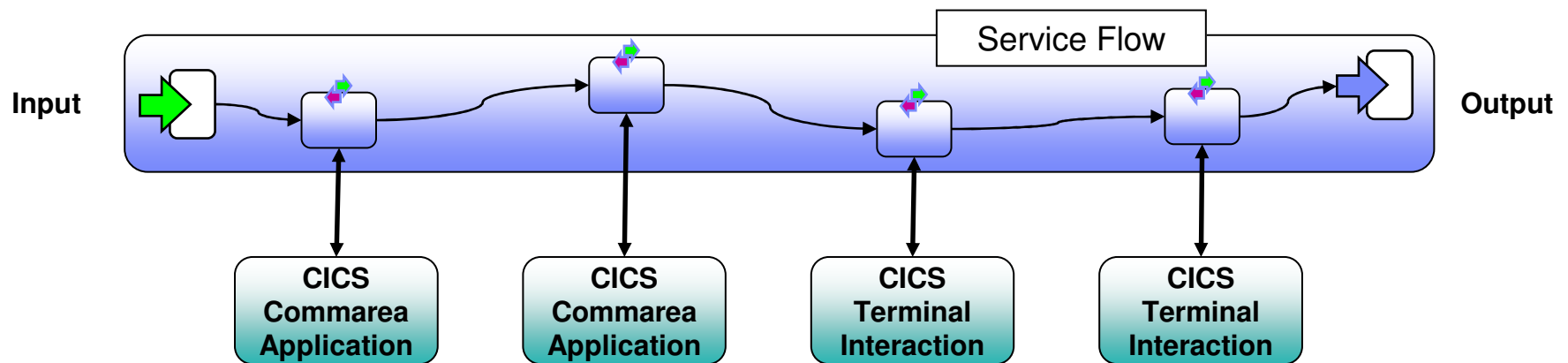
Developer Alex:

Researches problem

- Locates problem file
- Reviews history
- Determines need to migrate code to new “Service Flow”



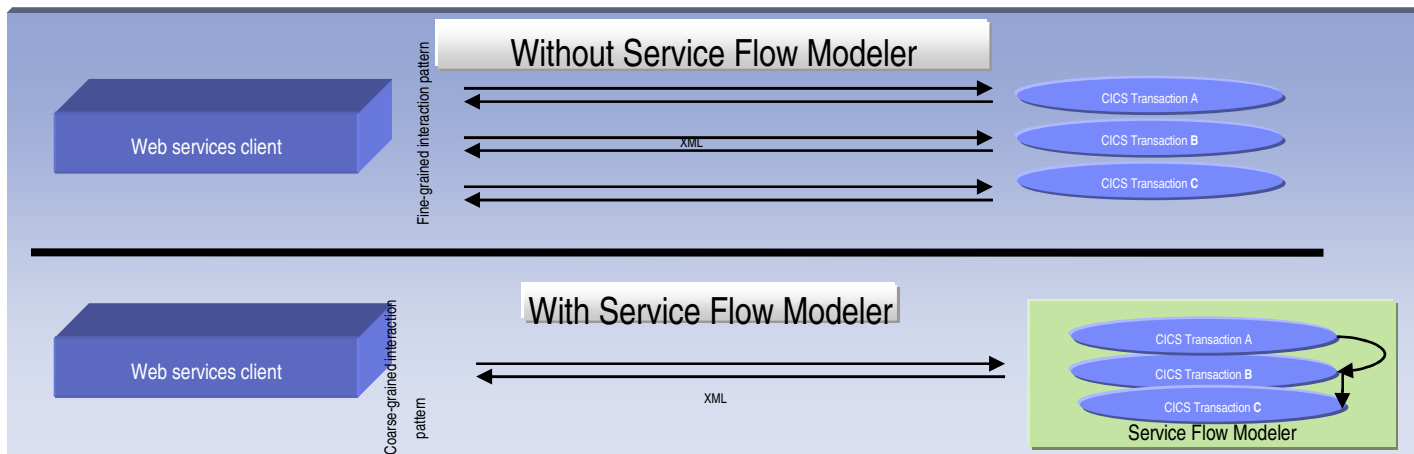
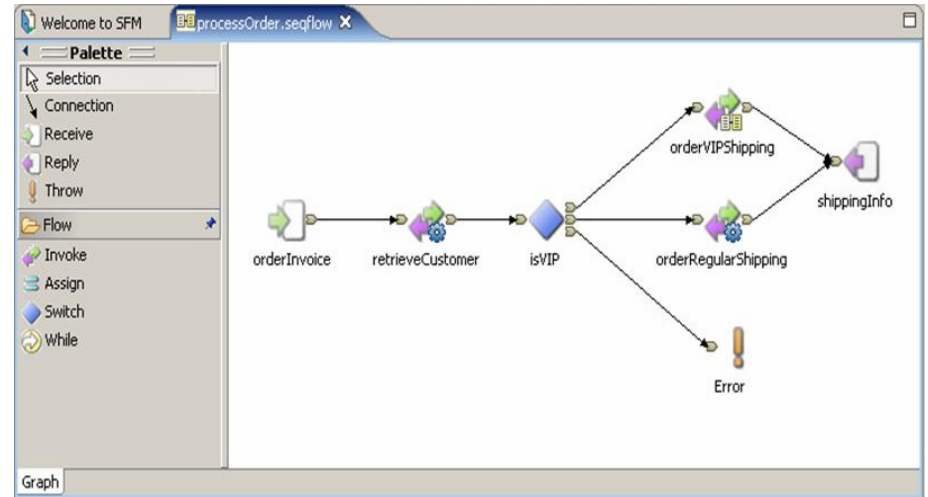
What is a Service Flow?



- A service flow is a non-interruptible micro-flow that is constructed from a collection of nodes that represent the invocation of CICS resources
- The flow describes the navigation of the nodes and allows data mapping between the nodes
- A single request may cause the execution of many CICS resources
- Allows for the development of coarse grained services from fine grained resources

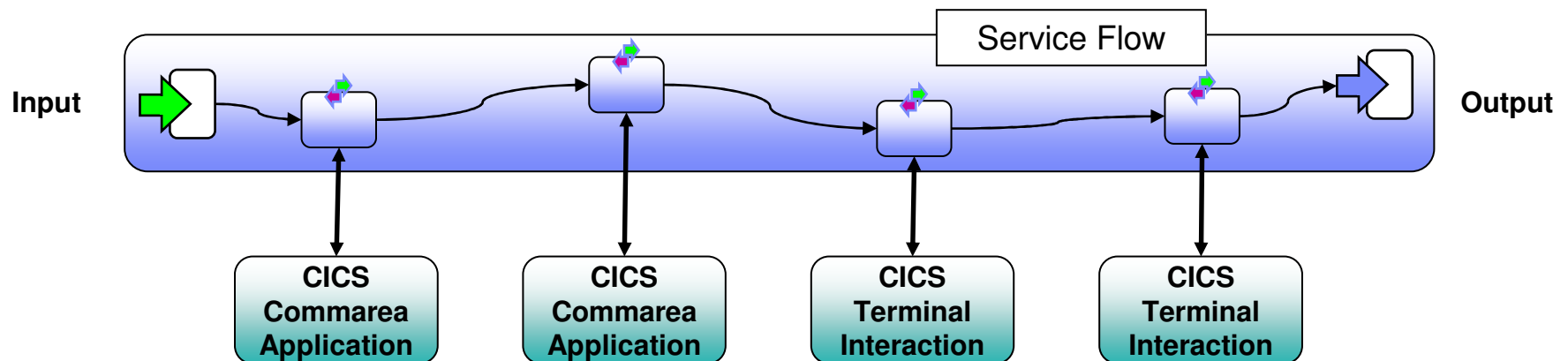
What is Service Flow Modeler?

- Service Flow Modeler is the tooling required to develop service flows
- A feature of Rational Developer for System z
- Model, Deploy, and Test Service Flows
 - Aggregates multiple CICS transactions into high-level business processes through visual modeling
 - Supports CICS BMS (terminal-based) applications & CICS commarea/container/channel applications
 - Deploys to the optimized CICS Service Flow Runtime



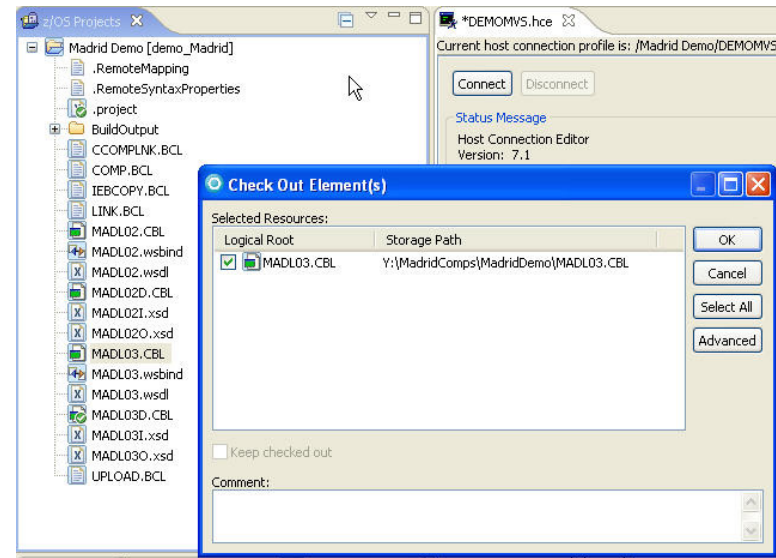
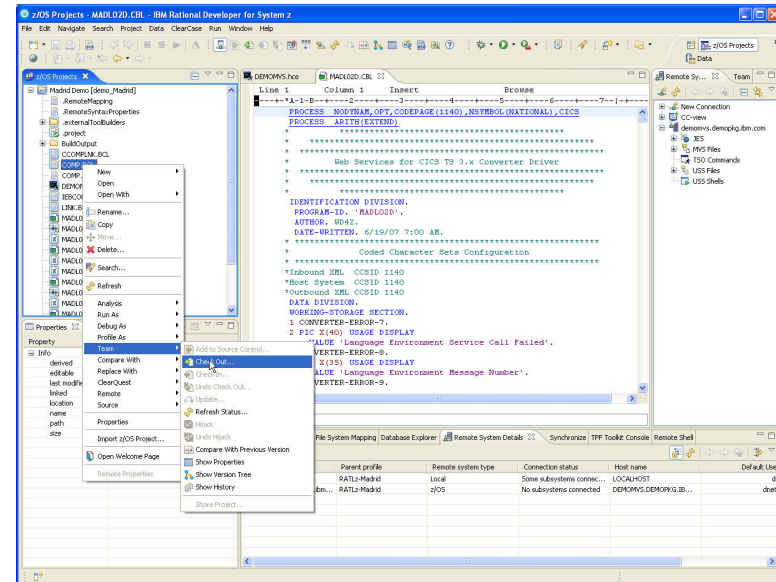
What is the Service Flow Runtime?

- The CICS Service Flow Runtime is a no-charge, fully supported, orderable feature for CICS TS v3.X
- A business service integration adapter for all CICS applications
- Create optimized CICS services orchestrating CICS terminal, non-terminal, and web services into a composite service
 - In a fast moving market, companies need to embrace new technologies whilst leveraging their existing assets.
 - Compose new services by aggregating these existing proven assets into new services.



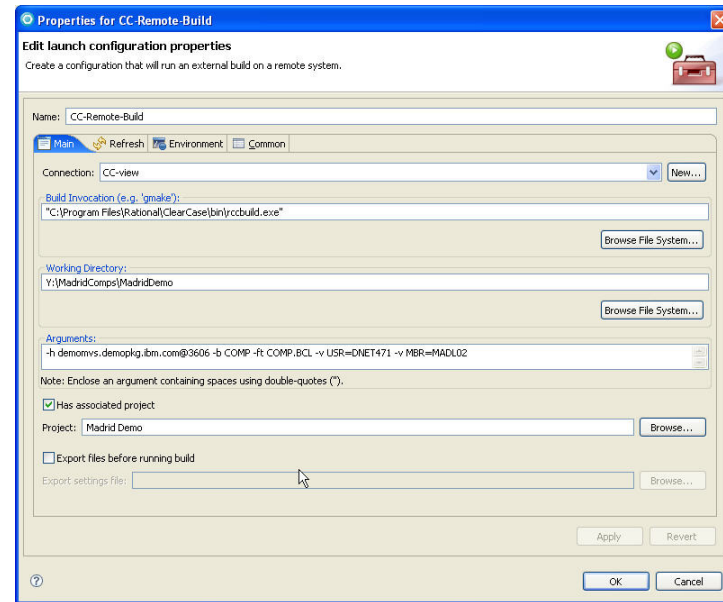
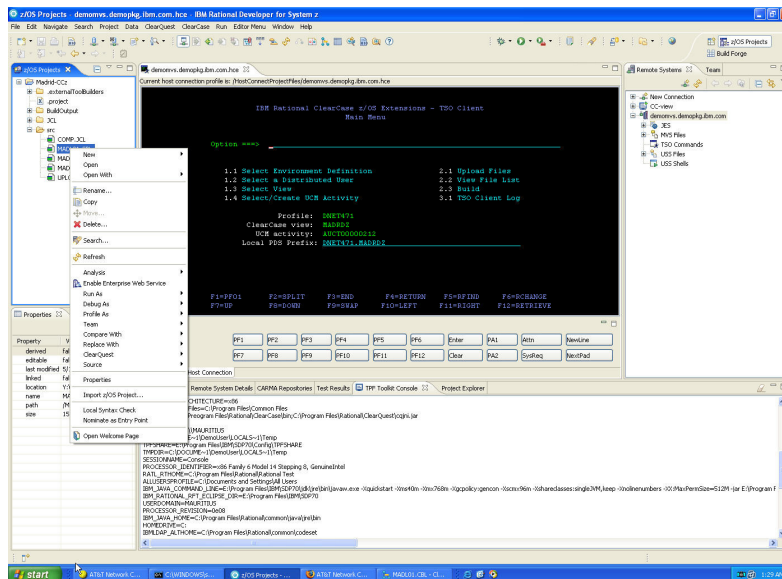
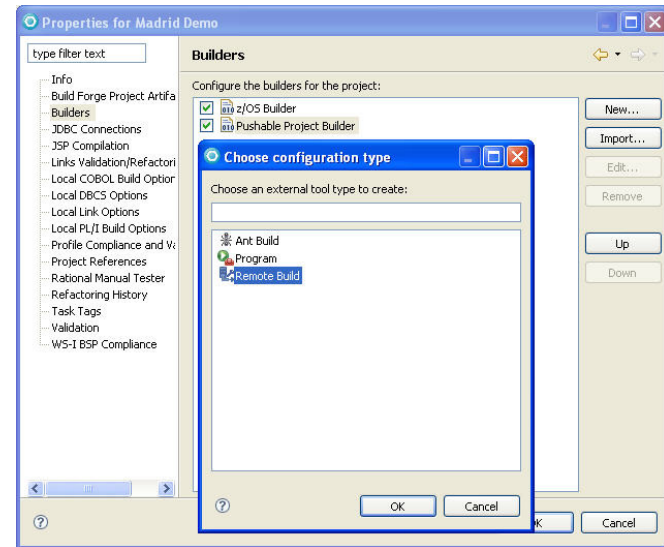
Developer Alex:

- **Implements CICS Service flow feature in MADL02.CBL**
 - Checks out file against the ClearQuest activity
 - Performs Modifications
 - Checks file back in



Developer Alex:

- Tests build
 - Local RDz syntax check
 - Host Build using ClearCase z/OS remote build feature



Building with RDz and ClearCase Remote Build

The screenshot displays the IBM Rational Developer for System z interface. The main editor window shows a JCL file named 'MADLO2D.CBL' with the following content:

```

PROCESS NODYNAM,OPT,CODEPAGE(1140),NSYMBOL(NATIONAL),CICS
PROCESS ARITH(EXTEND)
*****
*****
*****
Web Services for CICS TS 3.x Converter Driver
*****
*****
IDENTIFICATION DIVISION.
PROGRAM-ID. 'MADLO2D'.
AUTHOR. WD42.
DATE-WRITTEN. 6/19/07 7:00 AM.
    
```

The 'Properties for CC-Remote-Build' dialog box is open, showing the following configuration:

- Name: CC-Remote-Build
- Connection: CC-view
- Build Invocation (e.g. 'grake!'): "C:\Program Files\Rational\ClearCase\bin\rccbuild.exe"
- Working Directory: Y:\MadridComps\MadridDemo
- Arguments: -h demomvs.demopkg.ibm.com@3606 -b COMP -ft COMP.BCL -v USR=DNET471 -v MBR=MADLO2
- Project: Madrid Demo

The Command Shell - Running window shows the following output:

```

Y:\MadridComps\MadridDemo>
cd Y:\MadridComps\MadridDemo

08/09/15 09:38:53 (c) Copyright, IBM Corp. 2001
Copyright (c) 2002 Rational Software Corporation
08/09/15 09:39:00 *** Success ***
08/09/15 09:39:01
RCCI-003
Program Name : 'IGYCRCTL'.
PARM : 'EXIT(ADEXIT(ELAXNGUX)),&DATA,LIB,TEST(NONE,SYM,SEP),LIST,FLAG(I,
RCCI-004
The MVS step 'COMP' return code is '000000'.
08/09/15 09:39:01 Message files from build:
08/09/15 09:39:01 1:COMP.SYSPRINT
08/09/15 09:39:02 *-----
    
```

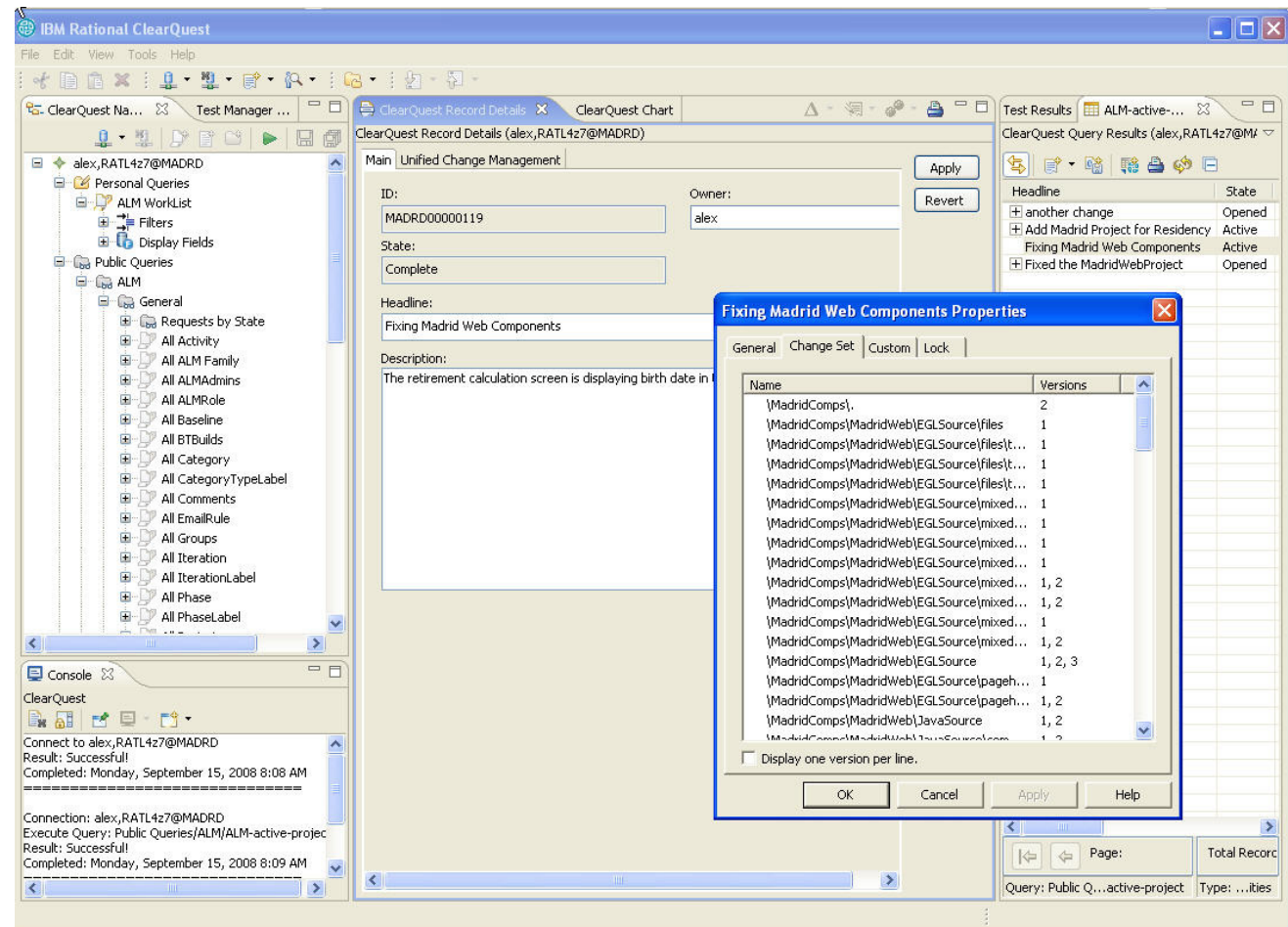
The Command Shell - Command window shows the following command:

```

"C:\Program Files\Rational\ClearCase\bin\rccbuild.exe" -h demomvs.demopkg.ibm.com@3606 -b
    
```


Build/Release Engineer

- Verifies change set is in order
- Promotes issue to QA for verification



Build/Release Engineer

- **Initiates formal build**
 - Uses Rational Build Forge project console
 - Launches java and native COBOL build, CICS binds
 - Promotes ClearQuest issue to “Production Ready”

The screenshot displays the Rational Build Forge web console. The browser address bar shows a URL: `http://localhost:83/fullcontrol/index.php?mod=projects&action=steps.view&bf_id=2`. The interface includes a navigation menu on the left with options like Home, Projects, Adaptors, and Libraries. The main content area shows a project named 'Madrid Demo' with a table of build steps:

#	Step Name	Selector	Environment	Result	Access
1	Upload			Exit Code	Build Engineer
2	Host Compile			Exit Code	Default
3	Compile			Exit Code	Build Engineer
4	Link			Exit Code	Build Engineer

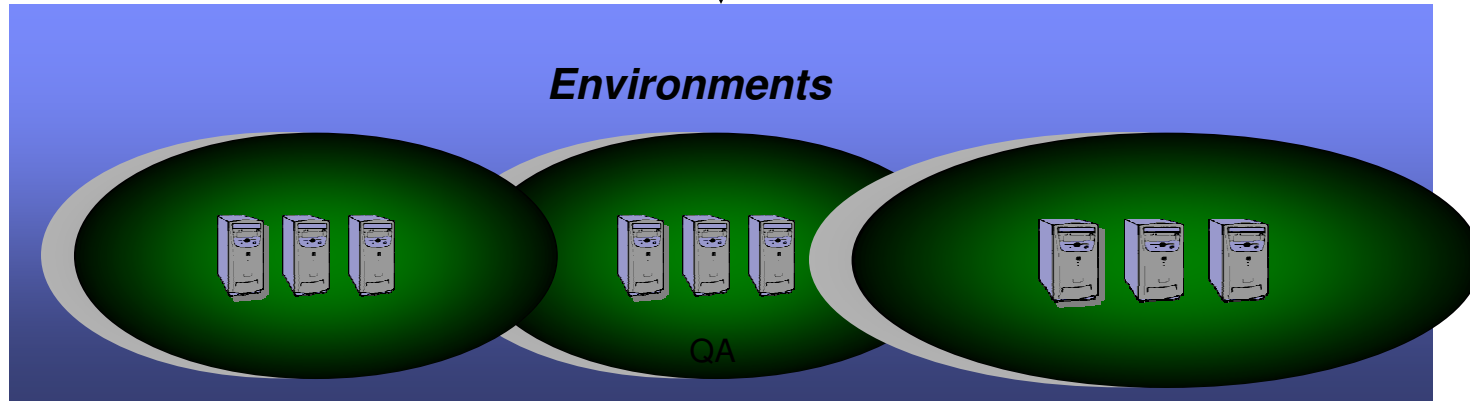
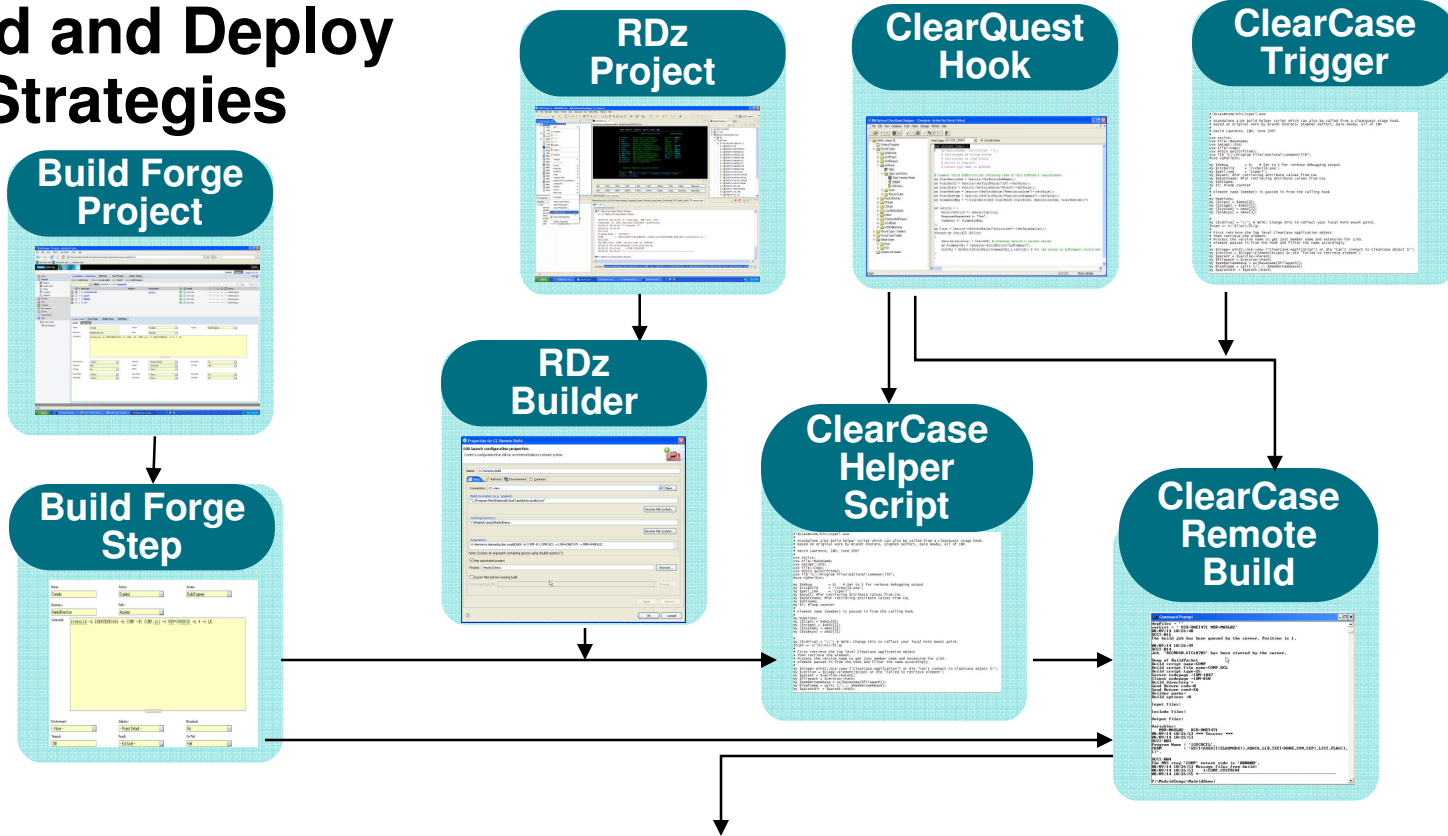
The 'Host Compile' step is selected, and its details are shown below. The 'Name' is 'Host Compile', 'Active' is 'Disabled', and 'Access' is '--Project Default--'. The 'Command' field contains the following COBOL compiler script:

```

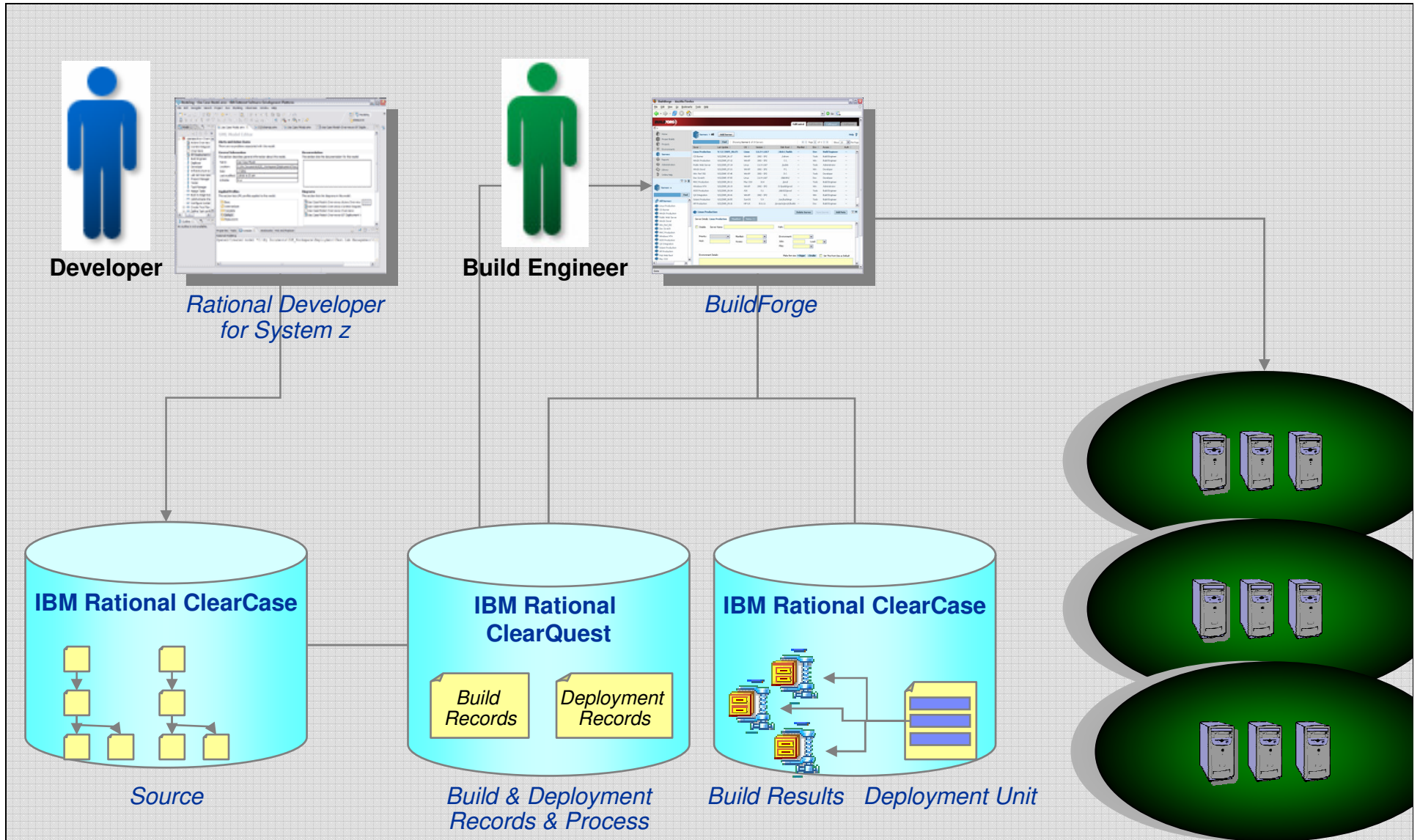
/* REXX -- COBOL Compile */
program = 'HIHO'
trace error
address TSO
address syscall "getcwd cwd"
if rc <> 0 then cwd = "."
COBOLCompileOptions = "LIST,NOCOMPILE(S),OBJECT,FLAG(E,E) "
/******
/* Definitions for the COBOL Compiler */
/******
"FREEALL"
"DELETE OBJECTS." || program || ".OBJ"
"DELETE COBOL.LISTINGS"
"ALLOC DSN(COBOL.LISTINGS) NEW DIR(4) BLOCK(800) SPACE(20,10) DSORG(po)
RECFM(F,b) LRECL(80) BLKSIZE(3200) "
  
```

At the bottom, there are configuration fields for Environment, Selector, Broadcast, Timeout, Results, and On Fail.

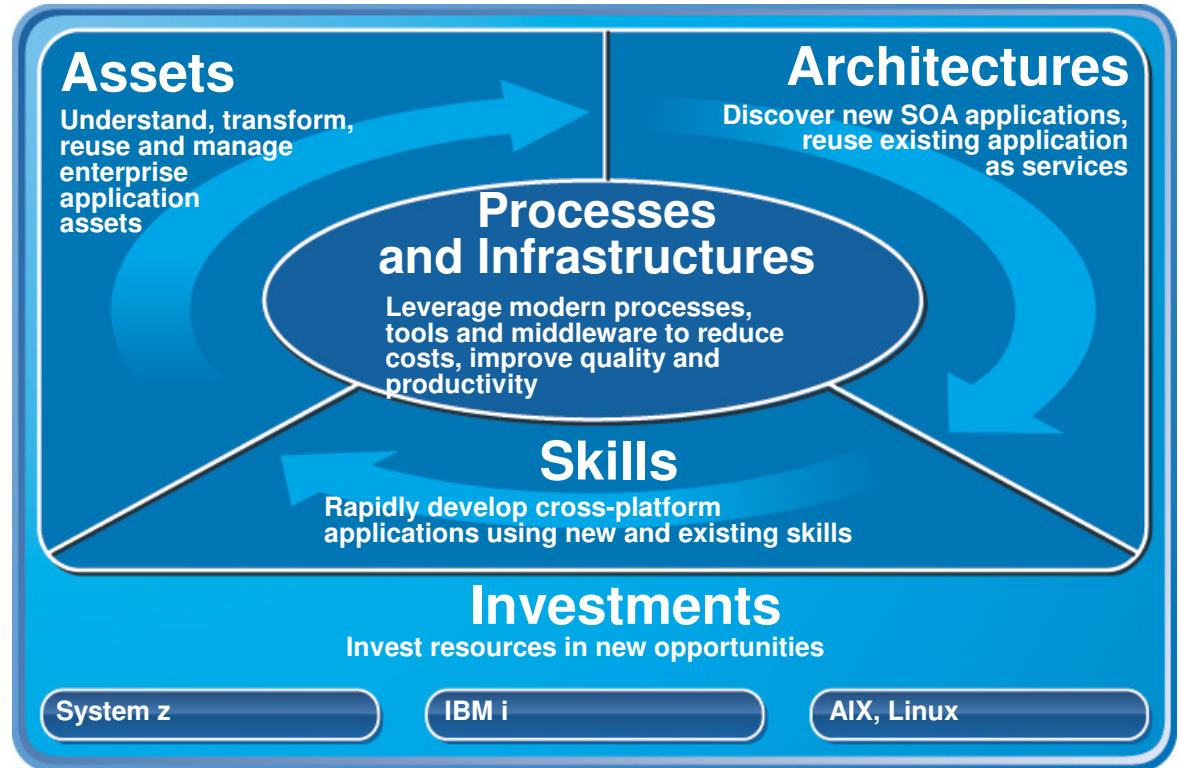
Build and Deploy Strategies



Bringing it all together . . .



Summary



Rational ...

- is working closely with the System z hardware team
- has a strong portfolio of tools for System z application development
- is investing in new tools for application development for System z

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