Jazz Music on IBM® zEnterprise™ System

Coordinated, Collaborative, Automated software development and build for zEnterprise System Applications

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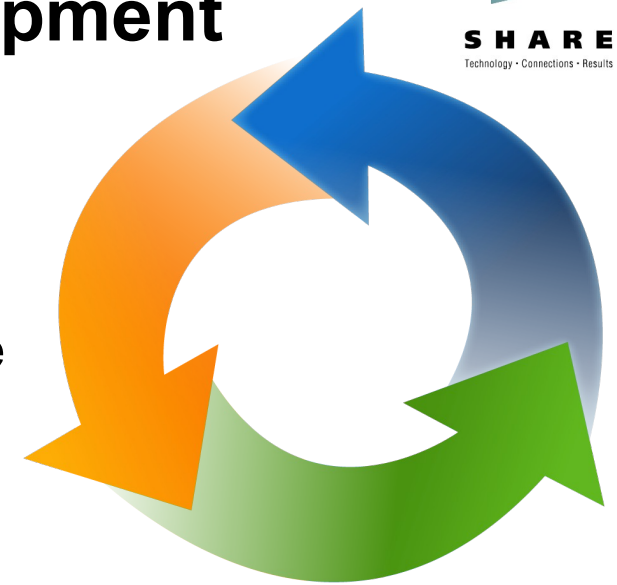
Acknowledgments

- Tim Hahn who contributed the slides for this deck

Agenda

- Collaborative Application Development
  - Application Development with widely dispersed development teams
  - Considerations for Application Development for zEnterprise applications
  - Deployment options for Application Development tools
    - Collaborative Application Lifecycle Management (CALM)
    - Integrated Development Environments (IDEs)
    - Application Analysis tools
    - Development and Unit test environment options
  - Integration amongst tools supporting application development and enhancement
- Rational tools for zEnterprise Application development
  - Rational Team Concert for System z
  - Rational Developer IDEs
  - Rational Asset Analyzer
  - Rational Developer for System z Unit Test Feature

Collaborative Application Development

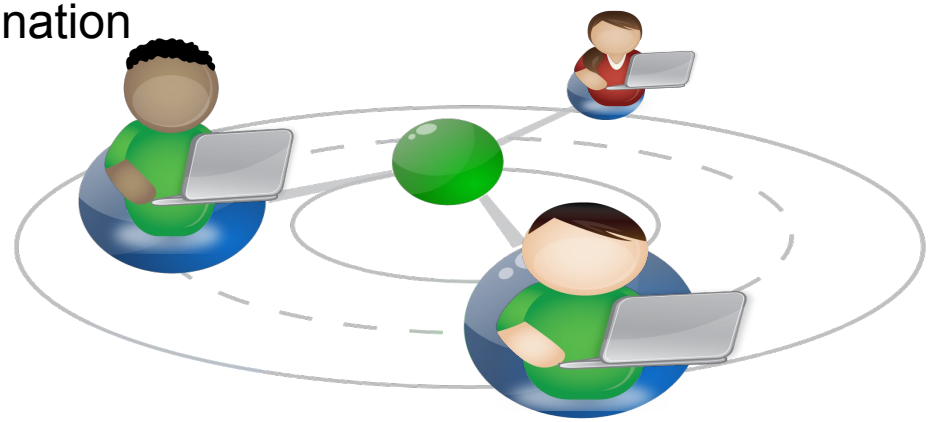


- The nature of applications has changed
  - loosely coupled components
  - teams need to collaborate
  - use multiple platforms that are fit-for-purpose

- Coordination required
  - requirements management
  - work item management
  - iteration planning (what should go into what level/release)
  - multi-platform build processing

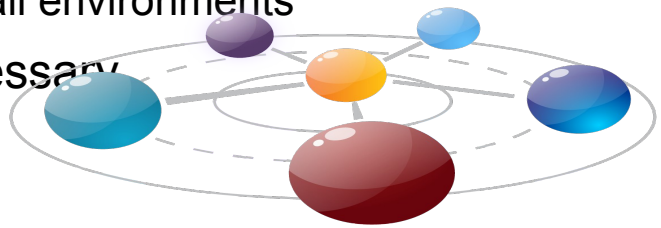
Physically Dispersed Development teams

- The nature of application development teams has changed
  - many people with diverse talents
  - multiple physical locations
  - multiple timezones
  - combination of employees and contracted teams
- Application development requires coordination
  - agreement on requirements
  - work item staging
  - test plan creation and test status
  - hand-off from development to QA
  - promotion to production systems
- Getting teams to collaborate in-context
  - work item management from within the IDE
  - browser-based interfaces for non-developers
  - linking work items to iteration plans and scheduled builds
  - integrated chat between team members



Considerations for Application Development for zEnterprise Systems

- Loose coupling between different application elements
  - interface specifications
  - use of SCA and RESTful services
- Align the various components which make up the application
  - correct levels of code on multiple systems
  - correct levels of toolkits and interface specifications used at build time
- On zEnterprise Systems, applications will span hardware architectures
  - running on zCPUs
  - running on Power CPUs
  - running on x86 CPUs
- Simultaneous access to multiple systems required
  - “remote” access to z/OS, Linux on System z, AIX, and x86-Linux environments
  - “remote” interactive debug of components running in all environments
- Coordinated multi-platform build processing is necessary
  - reliable and repeatable deployment to test and QA



Deployment Options for Application Development Tools

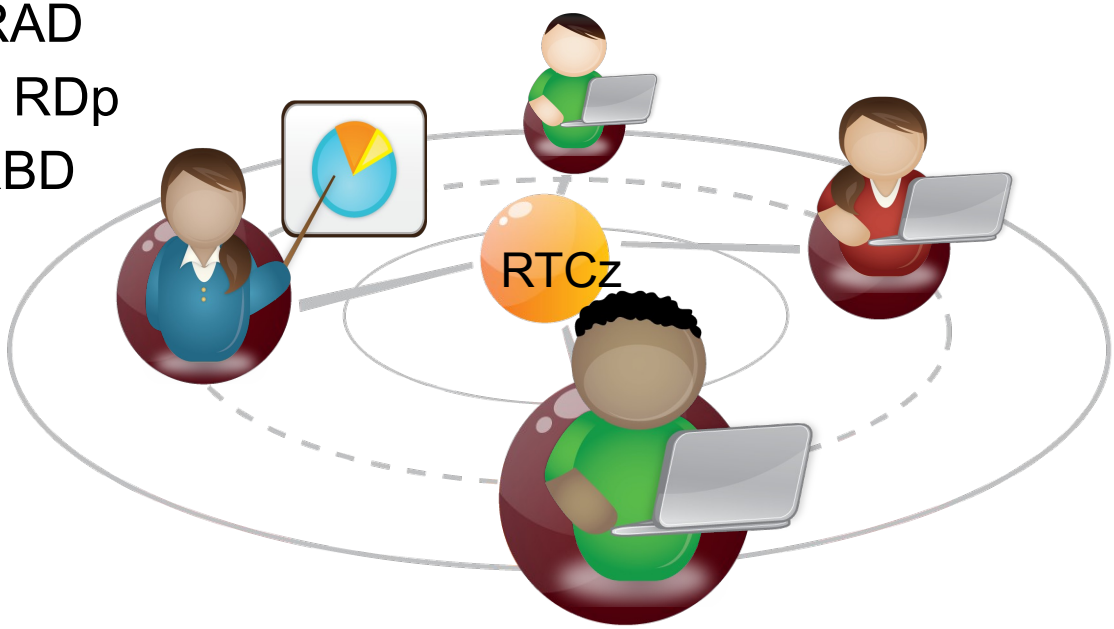
- zEnterprise System ensembles
  - multi-platform and “distributed”
  - Applications span multiple runtime environments
  - Example:
    - Database on z/OS with DB2 stored procedures
    - transactions within CICS
    - web services access through AIX-hosted WAS application
    - Web 2.0-style user interface from application servers running on x86 Linux blades

- Simultaneous access to these multiple environments is required
  - build
  - deploy
  - debug and test

Integration amongst Application Development Tools

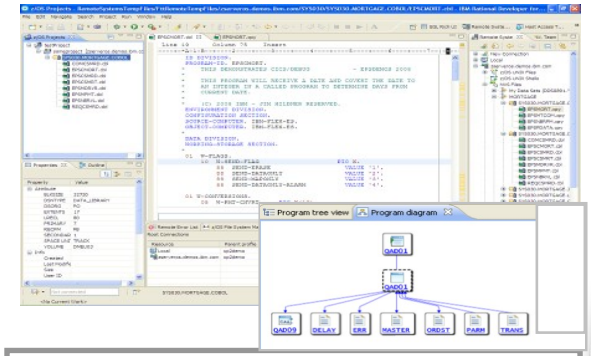
- Integrated application development tools enable developer productivity
  - RDz and RTCz
  - RDz and RAA

- Focused IDEs along with collaboration through the CALM environment
  - COBOL developers using RDz
  - Java developers using RAD
  - C/C++ developers using RDp
  - EGL developers using RBD



Overview

- Rational Development Tools **support the lifecycle of application development** and maintenance for multi-platform applications
  - on **z/OS, Linux, Unix, Windows**
  - using a combination of tools
  - running on a variety of platforms to best suit the client's requirements

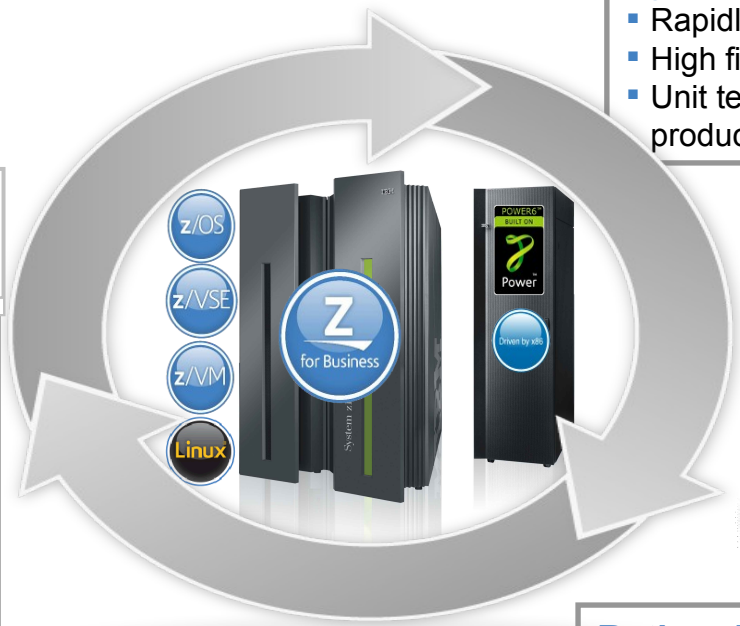


Rational Developer for System z and Power Systems

- IDE for COBOL, PL/I, HLASM, C/C++, Java and JCL
- Increase productivity
- Reduce MIPS

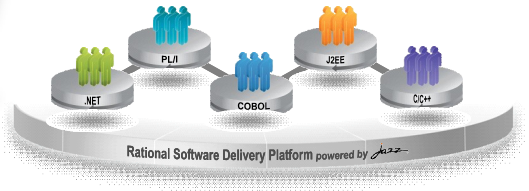
Rational Asset Analyzer

- Dramatically improve productivity
- Better manage quality



Rational Developer for System z Unit Test

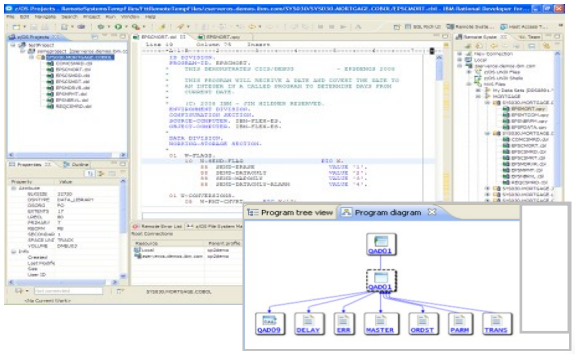
- Rapidly prototype z/OS apps
- High fidelity Unit Test
- Unit test without consuming valuable production MIPS



Rational Team Concert for System z

- Common repository across multiple platforms & languages
- Different processes by developer type
- Integrated or loosely federated processes across all development groups

Rational Tools for zEnterprise Applications Development



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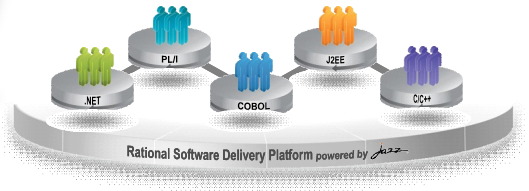

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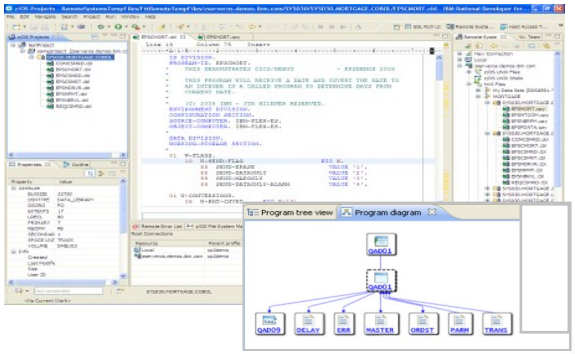
Rational Team Concert for System z - for and on zEnterprise Systems

- Team-centric tool for managing multiple software projects
- Contains specific support for
  - ► source code management
  - ► automated and scheduled build processing
  - ► work item tracking, including stories, tasks, defects, and features
- Has multiple components
  - ► build agent and file agent run on z/OS
  - ► server and database can run on z/OS, Linux for System z, AIX, or x86-Linux
  - ► clients are either browser-based or IDE-integrated (Eclipse-based)
- RTCz enables
  - ► central management of application source code
  - ► common tool across
    - multiple development teams writing applications
    - applications developed for multiple platforms

Rational Tools for zEnterprise Applications Development



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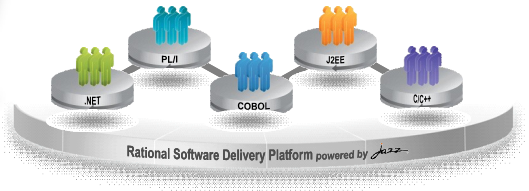

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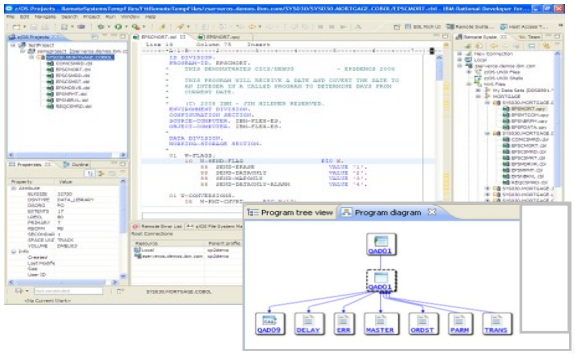
Rational Developer for System z and Power Systems

- Practitioner tools for application development and enhancement
  - Java
  - COBOL
  - PL/I
  - C/C++
  - Assembler
  - JCL
- Supporting tasks of
  - Remote access to files and jobs
  - Analyze, Understand, Edit, Build, and Unit Test of applications
  - Remote interactive debug of applications running in multiple environments
  - Integration with Rational Team Concert and other SCMs
- Support for several source code location models
  - “remote” source code (source code held on development system)
  - “local” source code (source code held on system where IDE is running)

Rational Asset Analyzer - integration with Rational Developer for System z

- Analyze, Understand, and Navigate complex application source code
  - COBOL
  - PL/I
  - C/C++
  - Java
  - JCL
  - Database: DDL, SQL
- Supporting tasks of
  - Understand source code complexity
  - Impact analysis of potential code changes or database changes
  - Find “dead code” for deletion from source base
- Two user interfaces for ease of access and use
  - Integration with Rational Developer for System z for IDE users
  - Browser-based user interface for dashboard and complex query construction

Rational Tools for zEnterprise Applications Development



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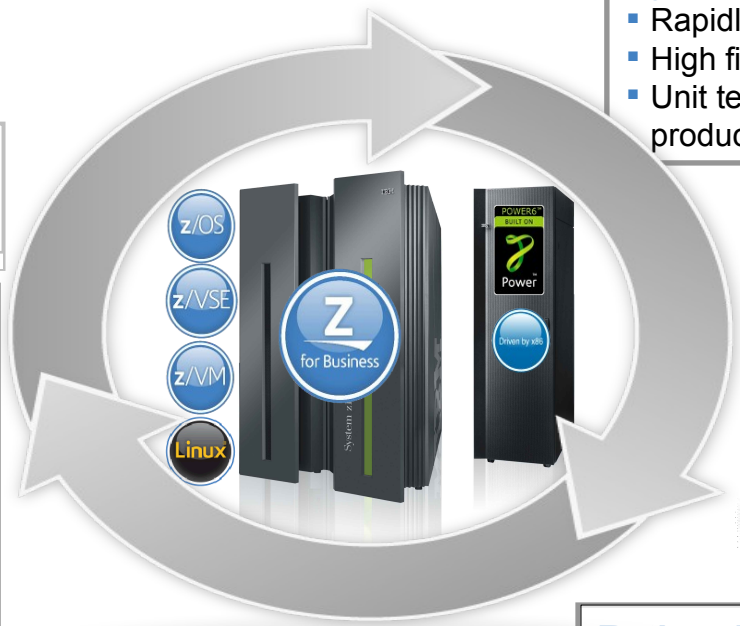

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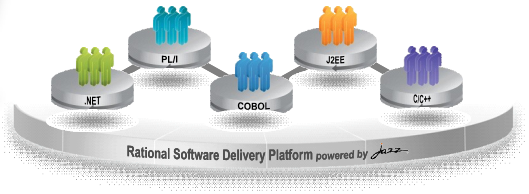

Rational Team Concert for System z

- Common repository across multiple platforms & languages
- Different processes by developer type
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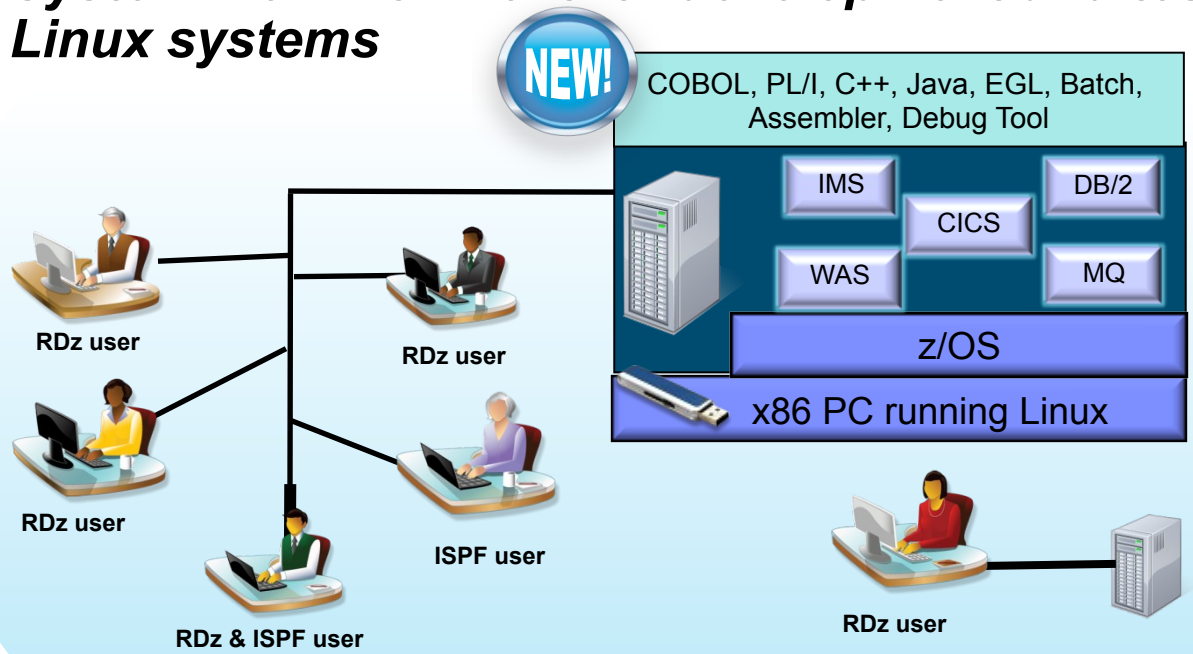
Rational Developer for System z Unit Test Feature

- Provide a local unit test environment for z/OS application development
  - Hosted on a x86-Linux machine (must have a USB port available)
  - z/OS runtime environment, including compilers, subsystems, databases, job schedulers, etc.
  - Emulates System z GPs, zAAPs, and zIIPs
  - Will utilize multiple CPUs for multi-threaded applications
- Contains software for development of applications
  - Compilers
  - Debugger
  - CICS, IMS, DB2, WAS
  - Rational development tools daemons
- Addresses hardware and software costs associated with application development for zEnterprise Systems
  - cost of acquisition
  - frees zEnterprise zCEC MIPS for production use
  - also consider Solution Edition for Application Development
  - allows for fit-for-purpose usage of zEnterprise System resources

Rational Developer for System z Unit Test Feature

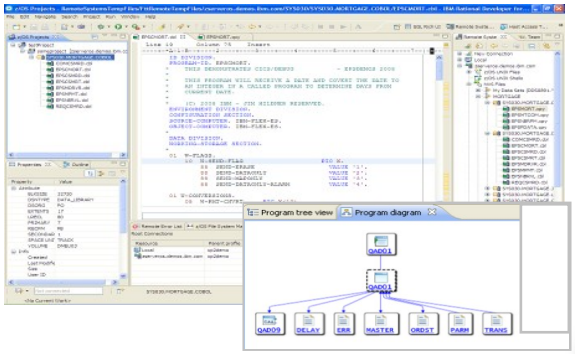
System z environment for development and testing on x86 Linux systems



- Liberate developers to rapidly prototype new applications
- Develop and test System z applications anywhere, anytime
- Free up mainframe development MIPS for production capacity
- Eliminate costly delays by reducing dependencies on operations staff

Note: This Program is licensed only for development and test of applications that run on IBM z/OS. The Program may not be used to run production workloads of any kind, nor more robust development workloads including without limitation production module builds, pre-production testing, stress testing, or performance testing.

Rational Tools for zEnterprise Applications Development



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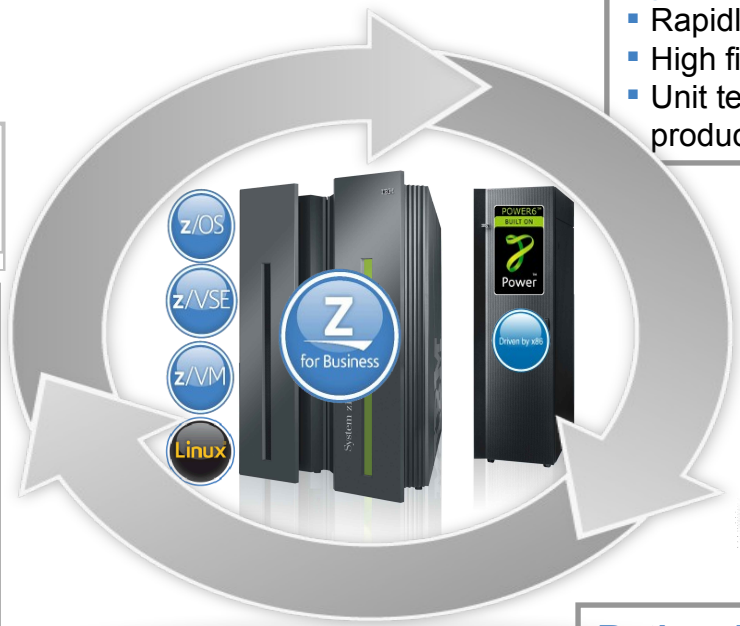

Rational Developer for System z Unit Test

- Rapidly prototype z/OS apps
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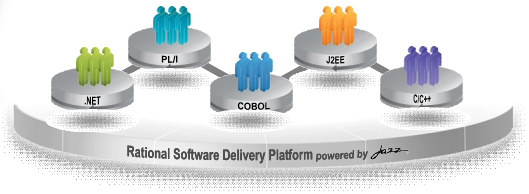

Rational Team Concert for System z

- Common repository across multiple platforms & languages
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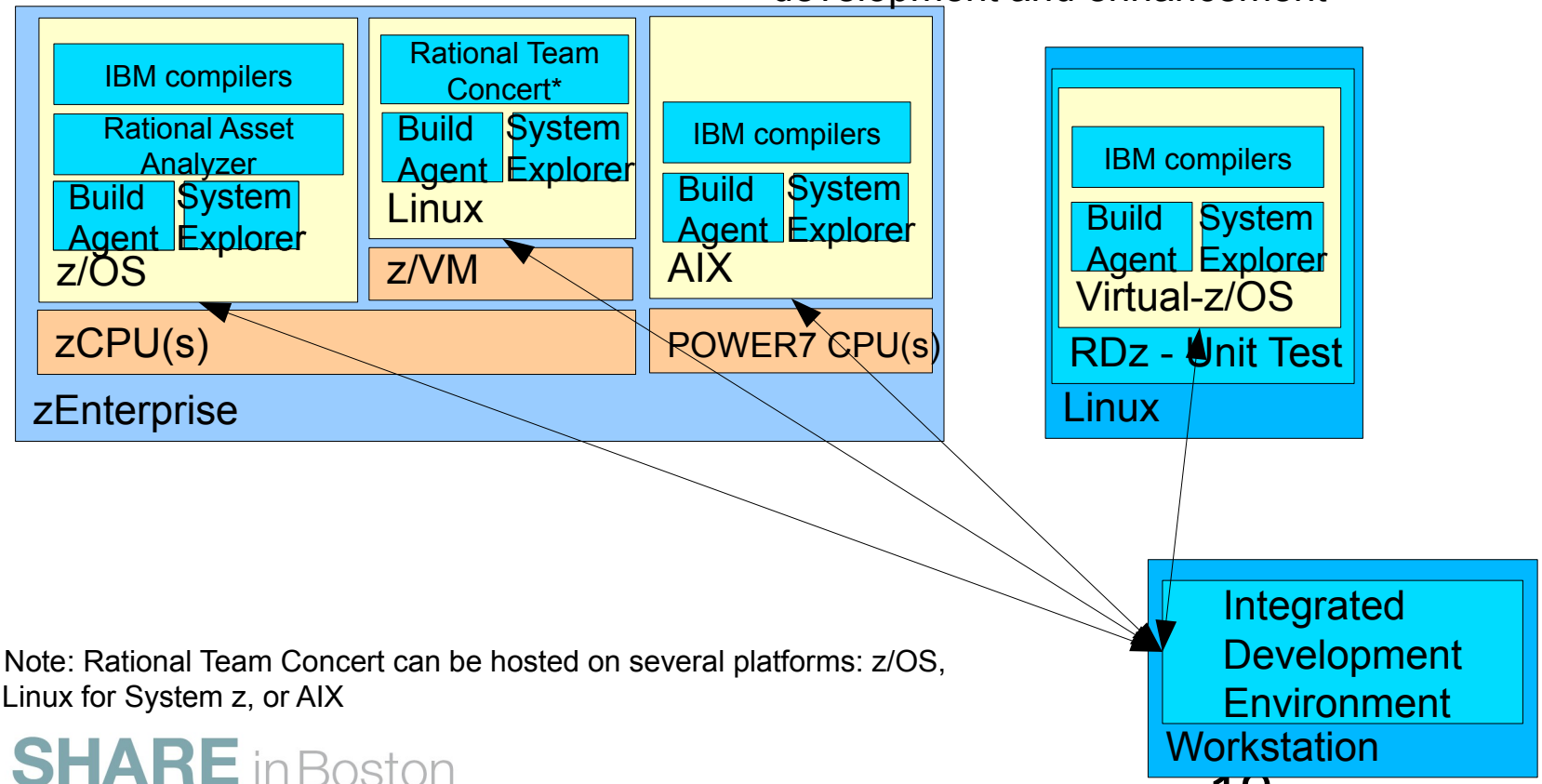
Multi-platform Development and Deployment

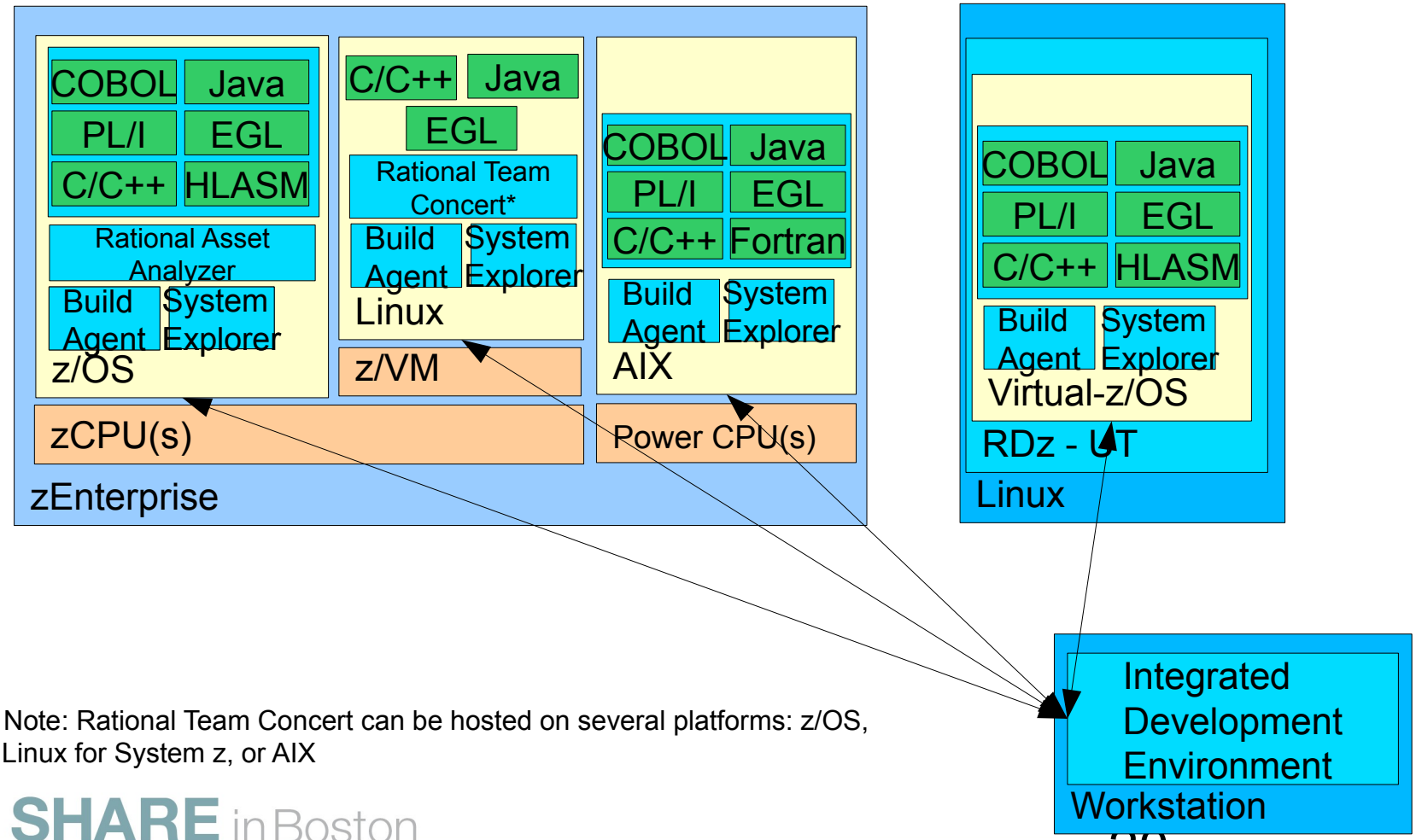
- Development and Unit Test environment for z/OS applications
- Allows for compile, debug, and unit test of application elements
- Expands options for cost-effective application development and enhancement



* Note: Rational Team Concert can be hosted on several platforms: z/OS, Linux for System z, or AIX

Multi-platform Development and Deployment

With Multi-Language Support



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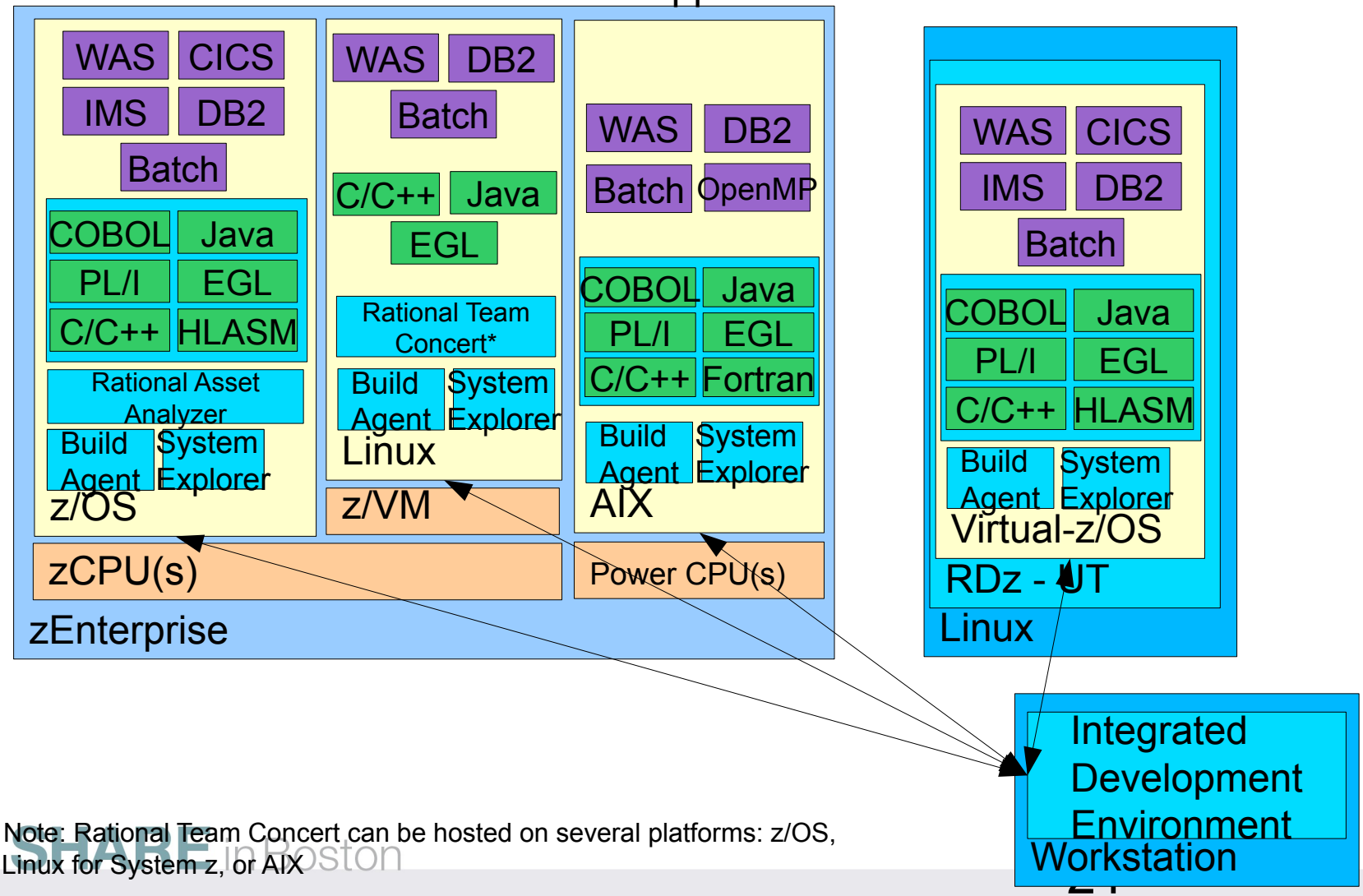
Multi-platform Development and Deployment

With Multi-Language Support

With Runtime Environment Support



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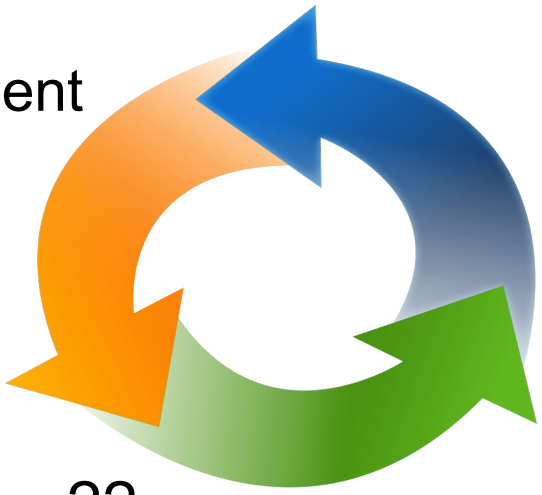
Summary

- Collaborative Application Development
  - Application Development with widely dispersed development teams
  - Considerations for Application Development for zEnterprise applications
  - Deployment options for Application Development tools
    - Collaborative Application Lifecycle Management (C/ALM)
    - Integrated Development Environments (IDEs)
    - Application Analysis tools
    - Development and Unit test environment options
  - Integration amongst tools supporting application development and enhancement
- Rational tools for zEnterprise System development
  - Rational Team Concert
  - Rational Developer IDEs
  - Rational Developer for System z Unit Test Feature




Questions

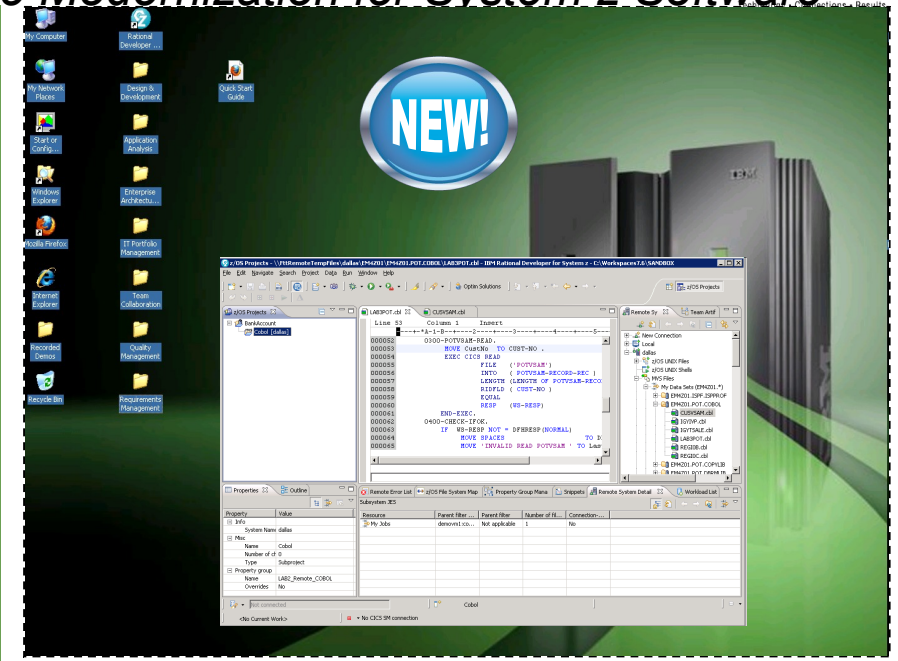
Useful Links

- Rational Asset Analyzer:
  - http://www.ibm.com/software/awdtools/raa/
- Rational Developer for System z:
  - http://www.ibm.com/software/awdtools/rdz/
- Rational Team Concert for System z:
  - http://www.ibm.com/software/rational/products/rtcz/
  - http://jazz.net/projects/rational-team-concert-z/
- Rational Cafes
  - http://www.ibm.com/software/rational/cafe/index.jspa
- RAA on developerWorks
  - http://www.ibm.com/developerworks/rational/products/raa/
- RAA Forum on developerWorks
  - http://www.ibm.com/developerworks/forums/forum.jspa?forumID=2046

Enterprise Modernization Sandbox for System z

Contains a large subset of IBM's Enterprise Modernization for System z Software

- **Business Planning and Alignment**
  - Rational System Architect
- **Project and Portfolio Management**
  - Rational Focal Point
  - Rational Asset Analyzer
- **Design and Development**
  - Rational Developer for System z
  - Rational Host Access Transformation Services
  - Rational Business Developer
  - Rational Application Developer for WebSphere
  - Rational Software Architect for WebSphere
  - WebSphere ILOG Rules Studio
  - WebSphere ILOG Rules for COBOL
  - Optim Development Studio
  - Problem Determination Integration
  - CICS Explorer
- **Collaborative Application Lifecycle Management**
  - Rational Team Concert for System z Client
  - Rational Requirements Composer Client
  - Rational Quality Manager Client



- **System z Environment**
  - Test System z10 Server (zserveros.demos.ibm.com)
  - IMS
  - CICS
  - Rational Team Concert for System z Server
  - Problem Determination Tools Components

- **Local Runtimes**
  - IMS Enterprise Suite SOAP Gateway
  - CICS Transaction Gateway
  - DB2 Enterprise Server Edition
  - IMS Mashup Center
  - WebSphere Application Server
  - Rational Requirements Composer Server
  - Rational Quality Manager Server
  - Problem Determination System z Components
  - TX Series for Multiplatforms
  - Apache Tomcat
  - PostgreSQL

www.ibm.com/software/rational