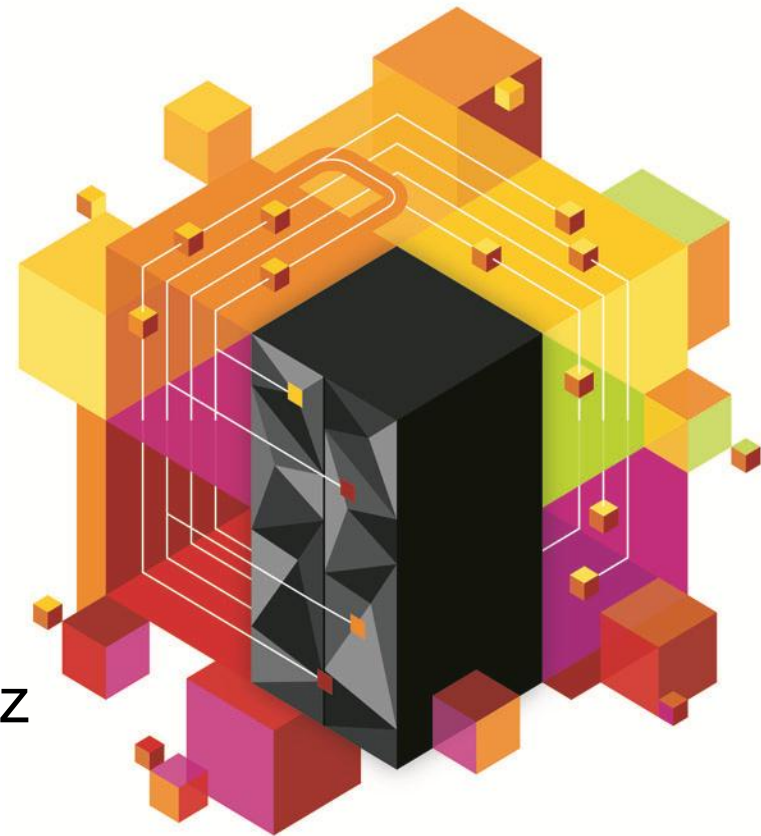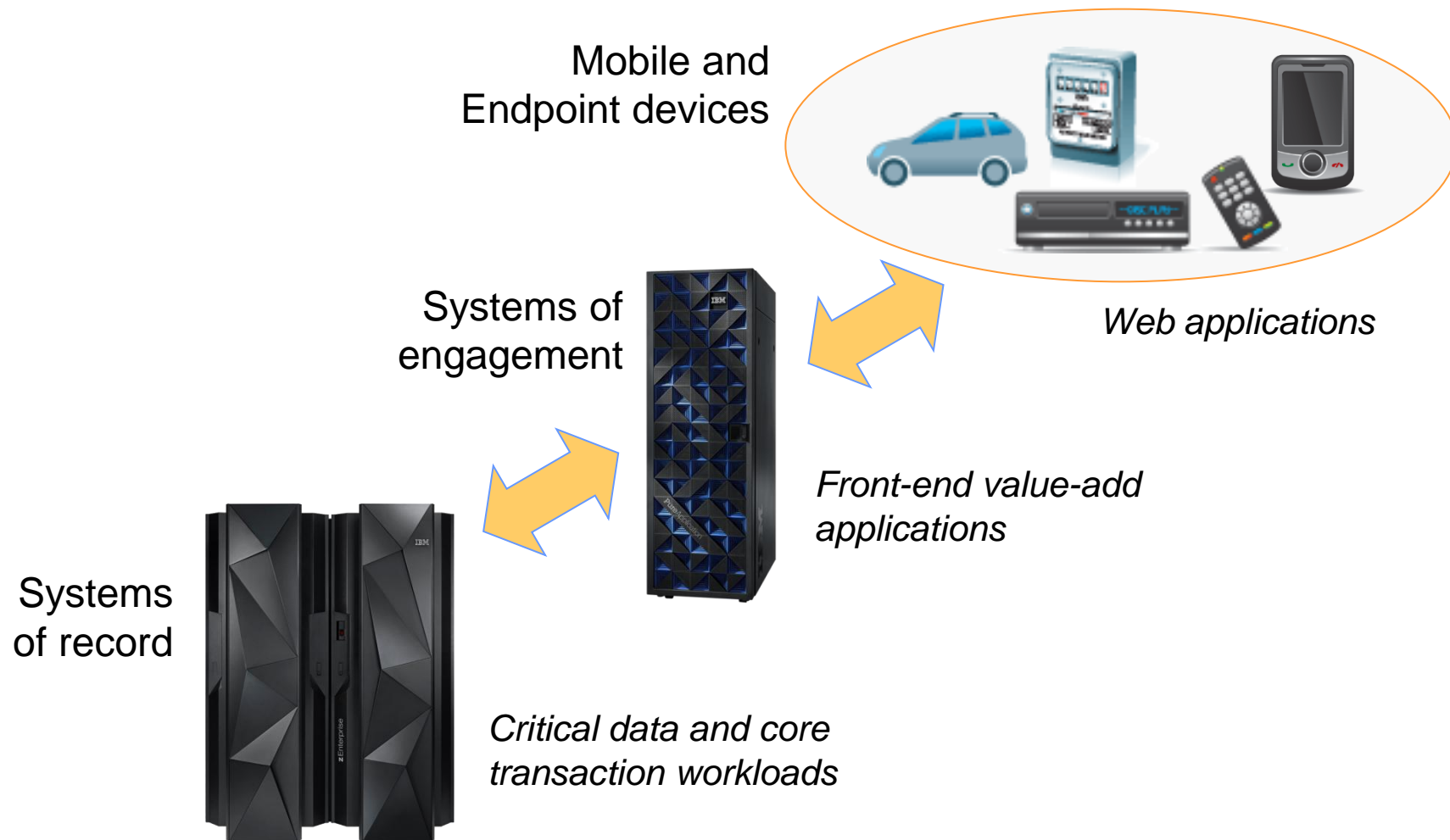# IBM zEnterprise Technology Summit

The New zEnterprise –
A Cost-Busting Platform

Smarter Solution Delivery On System z

Increasingly Today, Businesses Are Developing Cross-platform Hybrid Applications

Mobile and Endpoint devices

Web applications

Systems of engagement

Front-end value-add applications

Systems of record

Critical data and core transaction workloads

But A Typical Traditional Environment Is Not Set Up To Support These

HTML

WML

iOS

Android

Mobile and Endpoint devices
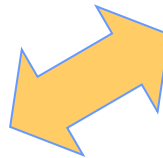
Different teams!

Systems of engagement

Different tools!

Systems of record

Unix

Windows

z/OS

Linux

Different schedules!

Different plans!

What's Needed?

HTML

WML

iOS

Android

Mobile and
Endpoint devices

Different tea...

Different t...

Cross-team collaboration!   Optimized tools!

Shared artifacts – requirements, schedules,
work items, tests and test plans, etc.

A common process and workflow!
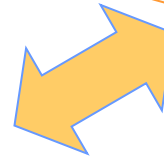
Unix
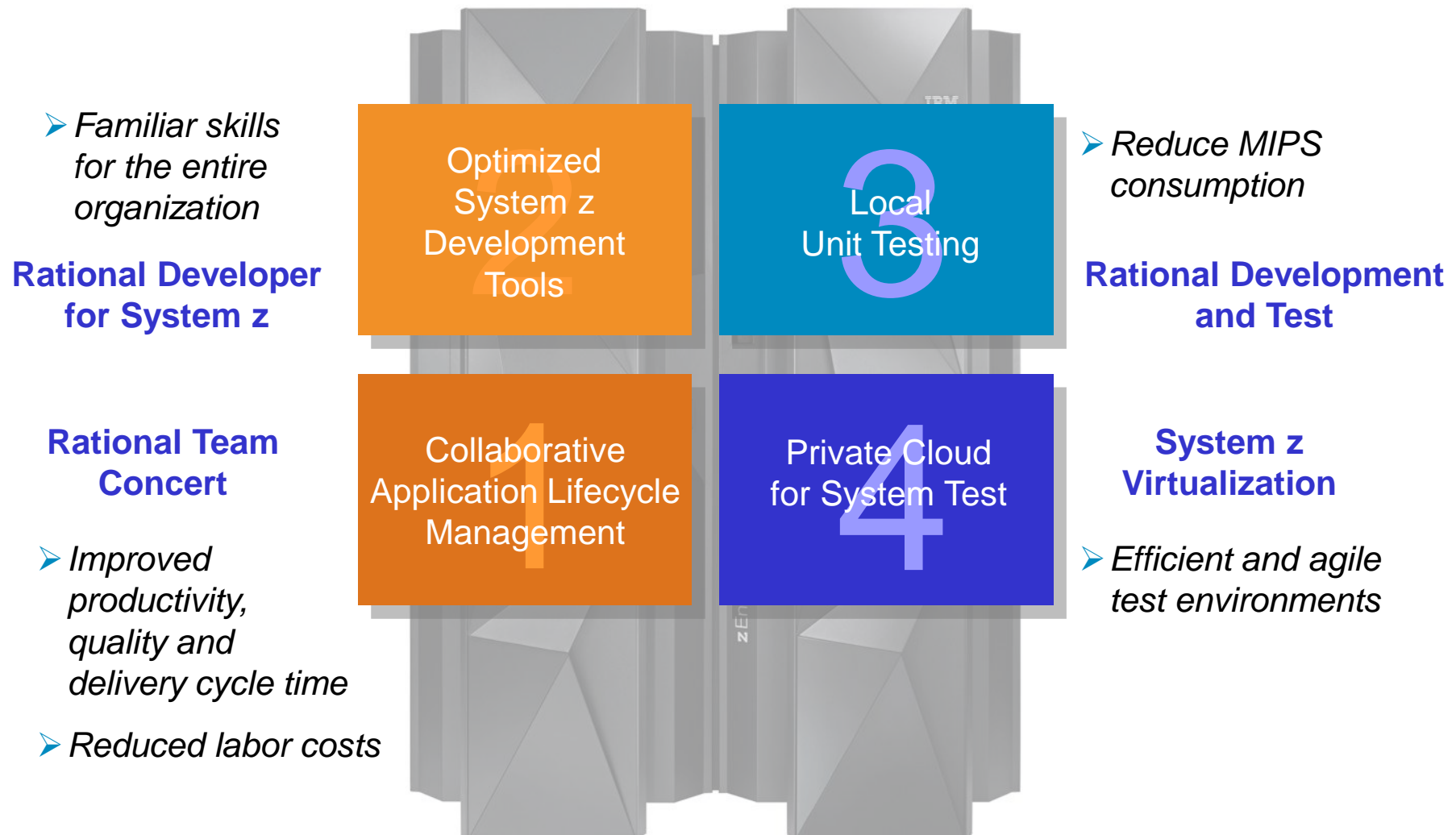
Windows

Systems
of record

z/OS

Linux

Different schedules!

Different plans!

How Can We Do This For System z?

> *Familiar skills for the entire organization*

Rational Developer for System z

Rational Team Concert

> *Improved productivity, quality and delivery cycle time*

> *Reduced labor costs*

Optimized System z Development Tools

2

Local Unit Testing

3

Collaborative Application Lifecycle Management

1

Private Cloud for System Test

4

> *Reduce MIPS consumption*

Rational Development and Test

System z Virtualization

> *Efficient and agile test environments*

Rational Jazz Provides The Foundation For Collaborative Lifecycle Management

A whole-team, whole-view approach for hybrid applications development:
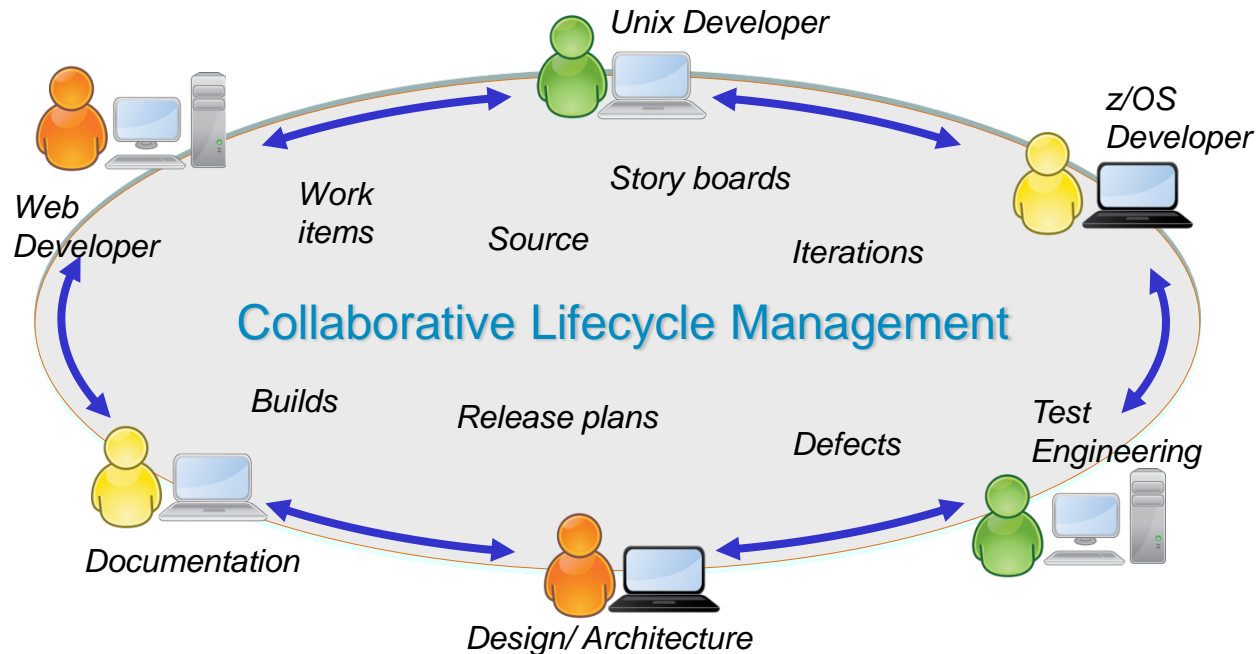
- Single, advanced graphical user interface used by all
- Enables all development teams to collaborate
- Based on a common agile process with shared and linked artifacts
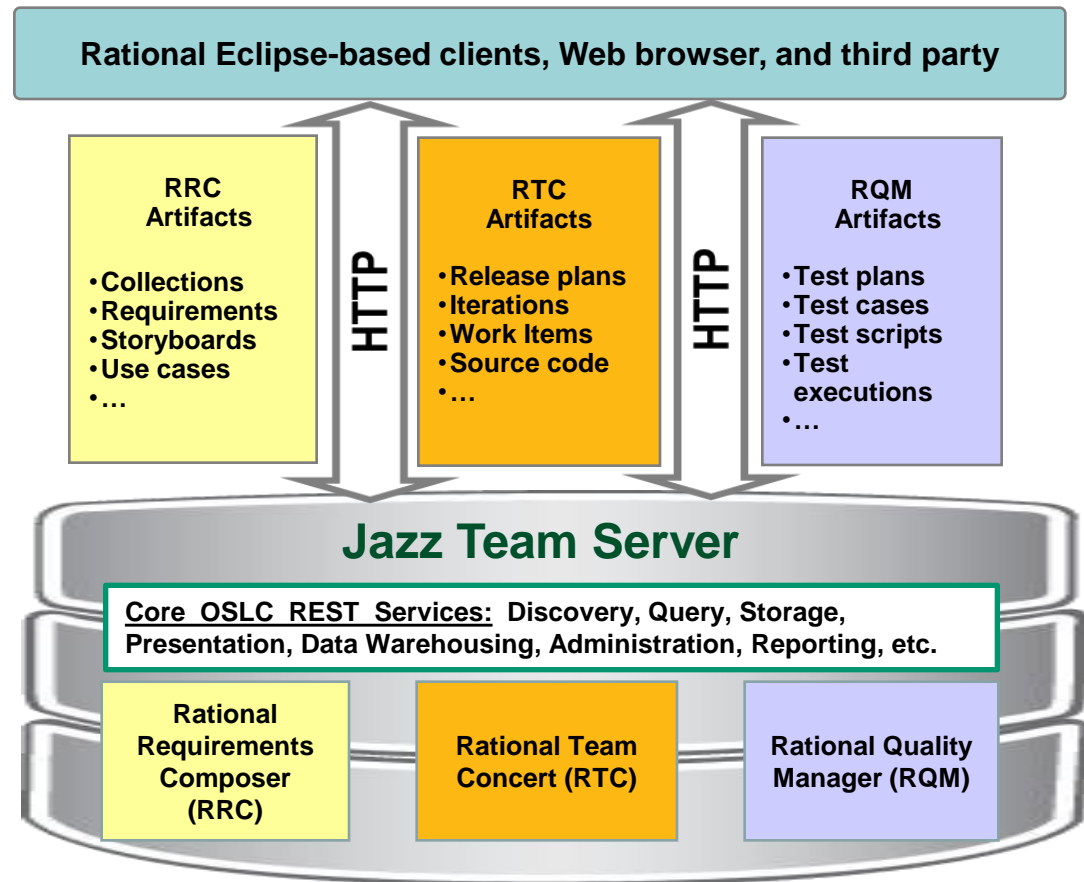- Transparent, with end-to-end governance

Collaborative Lifecycle Management Is Built On Proven Principles

1. Accelerated time to delivery with **Real-time Planning**

2. Improved quality with **Lifecycle Traceability**

3. Maximized product value with **In-Context Collaboration**

4. Refined predictability with **Development Intelligence**

5. Reduced costs with **Continuous Improvement**

Jazz Team Server Is The Heart Of Rational's Collaborative Lifecycle Management (CLM)

- Jazz Team Server provides a single, consolidated hub of information

  ▸ All artifacts are shared resources addressed by URLs

  ▸ Accessible via REST API

  ▸ Based on Open Services for Lifecycle Collaboration (OSLC)

- Supports three CLM applications

  ▸ Rational Requirements Composer to define requirements

  ▸ Rational Team Concert for team collaboration

  ▸ Rational Quality Manager for test management

Rational Eclipse-based clients, Web browser, and third party

RRC Artifacts
- Collections
- Requirements
- Storyboards
- Use cases
- ...

HTTP

RTC Artifacts
- Release plans
- Iterations
- Work Items
- Source code
- ...

HTTP

RQM Artifacts
- Test plans
- Test cases
- Test scripts
- Test executions
- ...

Jazz Team Server

Core OSLC REST Services: Discovery, Query, Storage, Presentation, Data Warehousing, Administration, Reporting, etc.

Rational Requirements Composer (RRC)

Rational Team Concert (RTC)

Rational Quality Manager (RQM)

Runs on Linux for System z, as well as other platforms

Rational Team Concert (RTC) Enables Team Collaboration
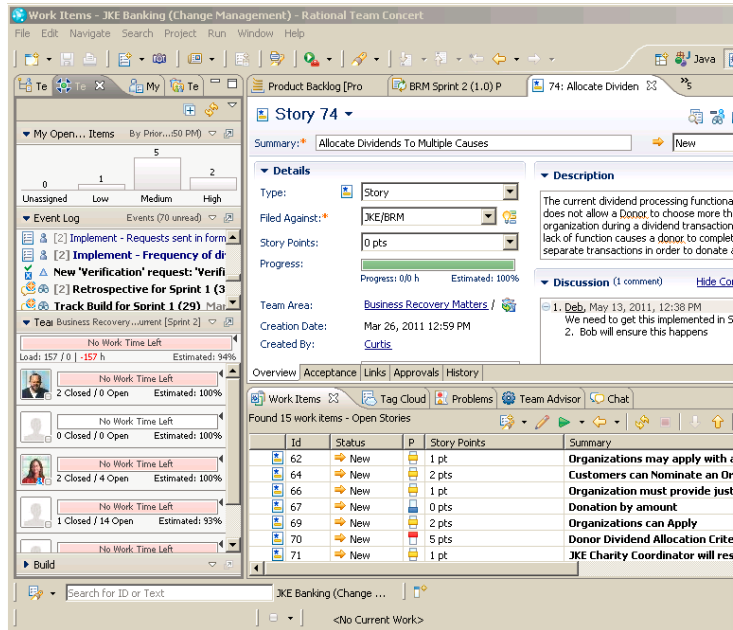
RTC Eclipse interface

Rational Team Concert

Work Items

- Planning and execution items link project artifacts
- Easy wizard-driven creation interface
- Includes full, in-context collaboration features

Project Management

- Iteration process tracking
- Easy work load balancing
- Planning at daily, iteration and release levels
- Reporting and dashboards

Configuration Mgmt

- Secure storage of processes and methodologies
- Versioning, tracking, baselining for milestones
- Simultaneous editing by multiple developers

Build System

- Automated build process
- Continuous build status updates
- Build results link to change sets and work items

Jazz Team Server

DEMO: Rational Team Concert

- Intuitive Eclipse-based graphical interface

- Easy to view and manage all project work items,
  and current team activity

- Project Manager can quickly determine who is the best person to fix a defect…
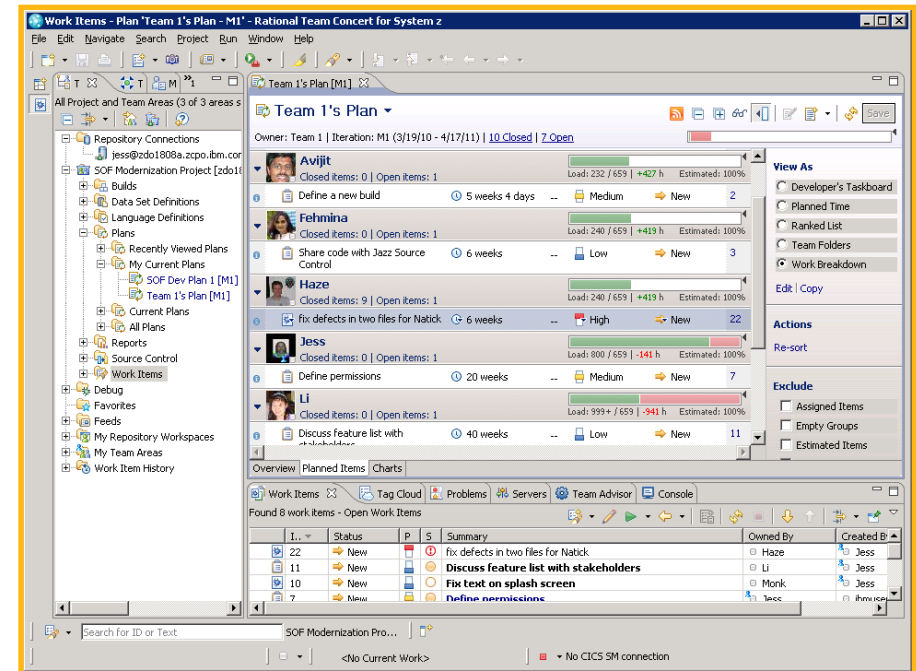
Rational Team Concert

Rational Team Concert Brings Unity And Consistency Across The Entire Team

z/OS Developer

Document requirements using textual and visual techniques

Project Manager

Leverage real-time planning techniques to make plans instantly executable and resilient to change

Unix Developer

Assign development tasks and address team's technical concerns

- Analysts, Managers, Developers, and Testers working on the same project collaborate from within the context of their tools

- All work items are linked and visible to everyone on the team, enabling instant and dynamic communication

- RTC includes project-wide planning capability and governance

Architect

Automate software delivery tasks and accelerate handoff to Operations

Test Engineer

Achieve quality by design with an integrated, automated testing process

Web Developer

Collaborate across diverse disciplines and teams to meet business requirements

CACEIS Boosts Collaboration With Rational Team Concert

…Driving down development costs and speeding time to market

Disconnected teams

To minimize bugs and reduce time to market, Caceis needed to establish more effective communication between its open platform and mainframe teams, which were spread out in three separate countries.

Comprehensive collaboration

Caceis implemented IBM Rational Team Concert software to support its teams with features such as communication in context, event feeds, integrated chat and automated traceability.

Benefits

▪ Improves communication and collaboration between development teams, resulting in greater productivity and reduced costs

▪ Reduces the time required to debug applications through a common communication platform, improving operational efficiency

▪ Helps increase revenue potential with shortened time to market for new product development

"Thanks to Rational Team Concert software, our teams can collaborate and develop programs that are increasingly robust in a minimum of time, helping us meet the needs of our clients at a lower cost."

—Bertrand Avé, architect, open programs, CACEIS

Solution components:

▪ IBM Rational Team Concert
▪ IBM System z platform

RAP14206-USEN-00

If Desired, Mainframe Programmers Can Develop With ISPF And Integrate With RTC

Rational Team Concert ISPF Client

- For users familiar with TSO/ISPF green screen interfaces

- Has a subset of the Eclipse client function tailored to SCM interaction

- Uses RTC repository workspaces, change sets, links to work items, build requests, etc.

- Provides an interface to edit, check-in/out, deliver, and build ISPF code that is stored in a RTC repository

- Facilitates phased implementation of Eclipse-based tools for mainframe developers

See: http://www.youtube.com/watch?v=DFbNQNa13y0
and http://www.youtube.com/watch?v=g3l-pF4osbc

When Ready, Rational Developer For System z Offers A Graphical IDE That Moves Beyond ISPF

Rational Developer for System z

- Fully supports development and reuse of all mainframe assets

- Supports mainframe languages and runtimes

- Includes interactive access to z/OS for debug, job generation, submission, monitoring, command execution, etc.

Presents a mainframe development platform that is fully consistent with the distributed environment

RDz Eclipse interface

Mainframe Problem Determination Tools Are Integrated Into The RDz Environment

- Easily debug and step through multi-tier applications
  - Across distributed *and* mainframe
  - With the same debugger

Displaying Fault Analyzer report

Editing data with File Manager

Debugging application with Debug Tool
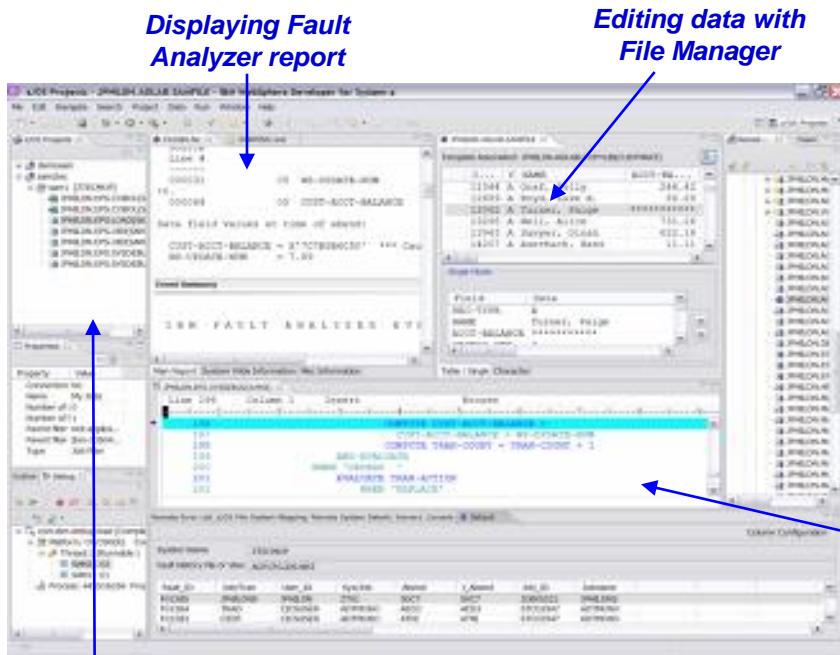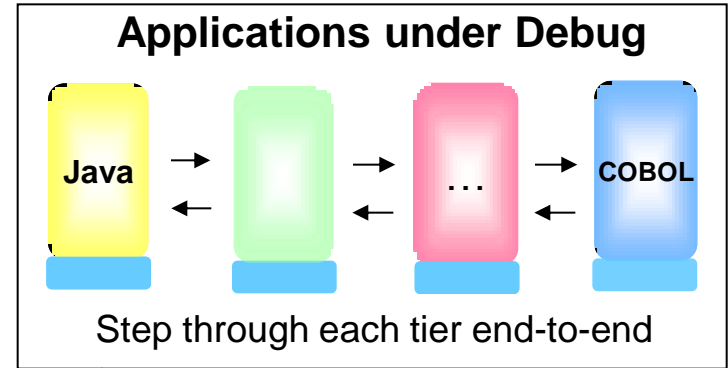
Developing System z application with RDz

Applications under Debug

Java → ... → COBOL

Step through each tier end-to-end

IBM Debug Tool	IBM File Manager	IBM Fault Analyzer

z/OS
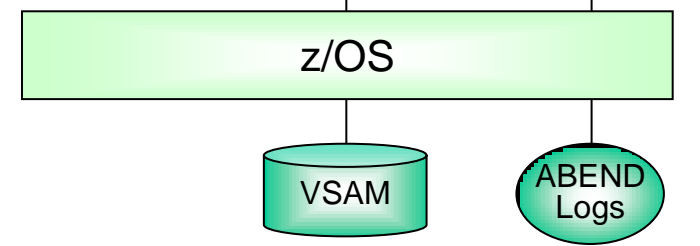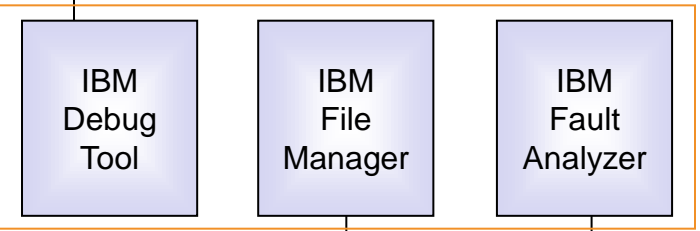
VSAM   ABEND Logs

- End-to-end debug
- Edit VSAM data
- Analyze ABEND logs!

DEMO: Rational Developer For System z

- Automatic notification of pending work items

- Easy to move between different development tasks using Eclipse perspectives

- Breeds familiarity for all developers

- A Java developer can easily edit and fix a COBOL defect…
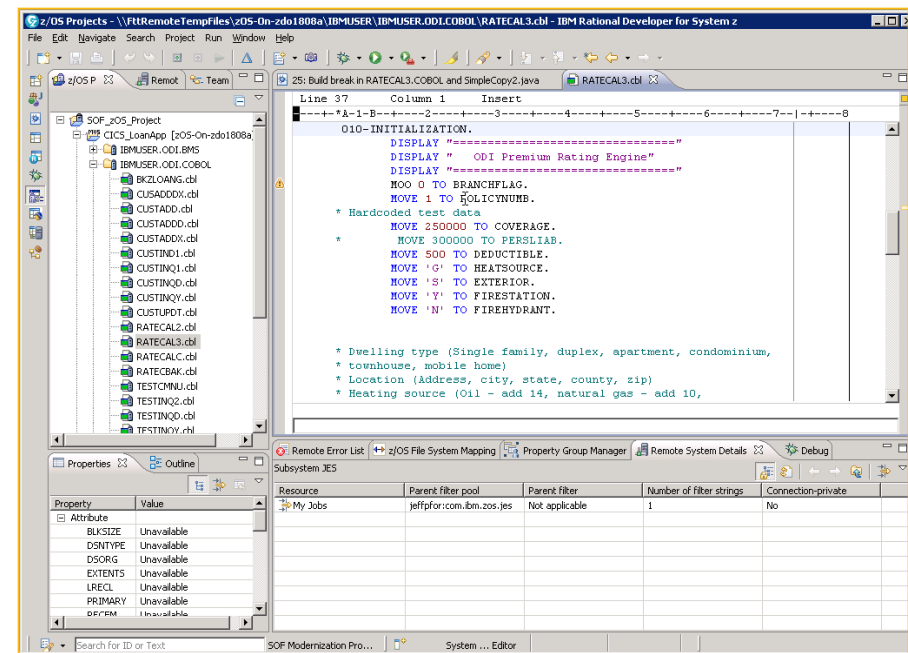
Rational Developer for z

Rational Packages A Solution For Integrated Development Of zEnterprise Hybrid Applications

Rational Developer for zEnterprise

- A comprehensive, integrated development environment for heterogeneous enterprise application development

- Spans zEnterprise architectures (z/OS, Linux for System z, x86 and Power)

- Languages supported: Java, COBOL, PL/I, Assembler, EGL, C/C++ and JCL

- Runtimes supported: AIX, Linux for System z, Linux on Power, x86 Linux, CICS, IMS, DB2 and Batch

Work with artifacts on multiple platforms in one GUI
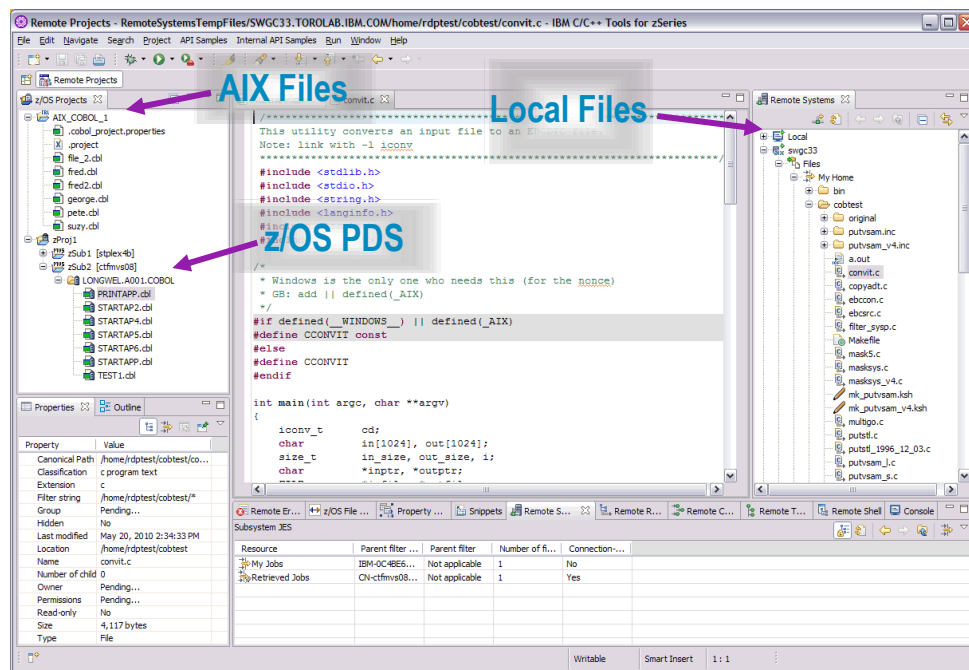
Research And Case Studies Show Rational Team Concert Improves Collaboration

Task = Collaborate
Tool = Rational Team Concert

Legend
- ☐ IBM internal case study 1
- △ IBM internal case study 2
- ○ IBM internal case study 3

Productivity Improvement (y-axis): 0, 0.2, 0.4, 0.6, 0.8, 1, 1.2, 1.4

Role (x-axis): Mgmt, Arch, Dev, Test, Doc

- ■ Productivity benefits range from 1% – 30%
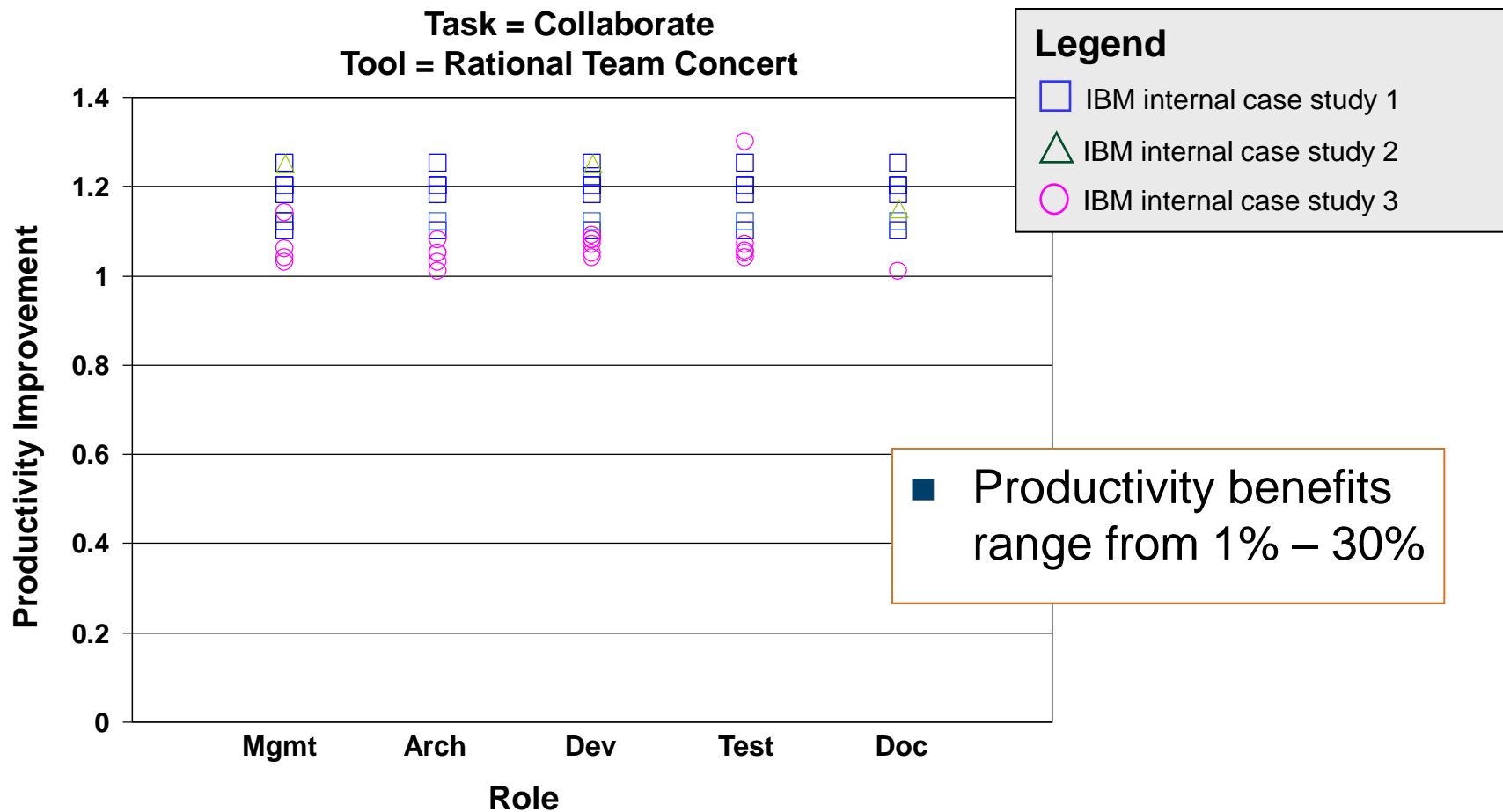
Research And Case Studies Show Rational Developer For System z Improves Development

Task = Code
Tool = Rational Developer for z

Legend

◆ Branham Group Study*

☐ IBM internal research

△ IBM internal case study 1

○ IBM internal case study 2

■ Productivity benefits range from 3% – 47%
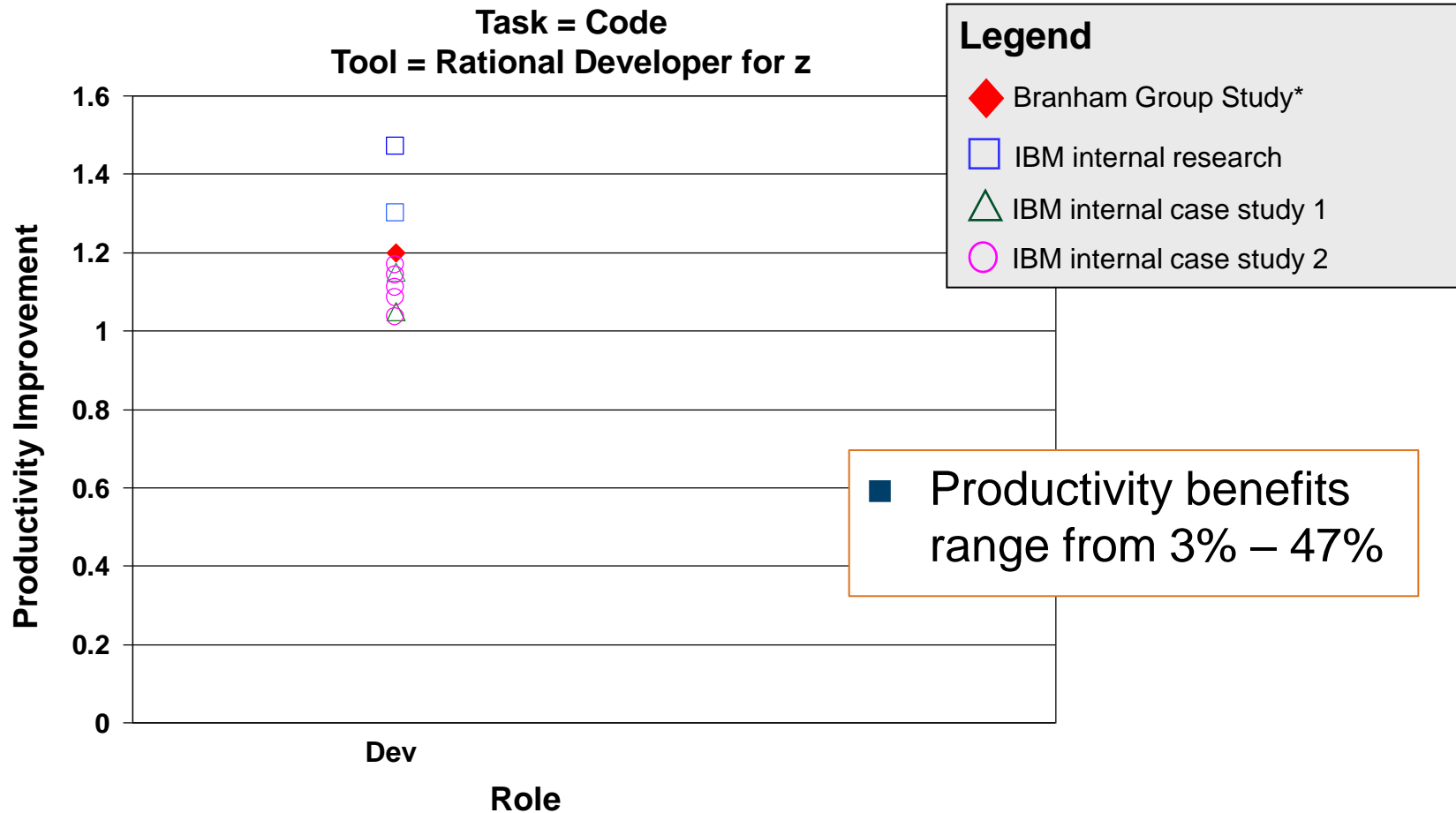
Research And Case Studies Show Rational Quality Manager Improves Product Quality

Task = Test
Tool = Rational Quality Manager

Legend
- ◇ IBM internal research
- ○ IBM internal case study

Productivity Improvement (y-axis: 0 to 1.2)

Role: Test

- ■ Productivity benefits range from 7% – 11%
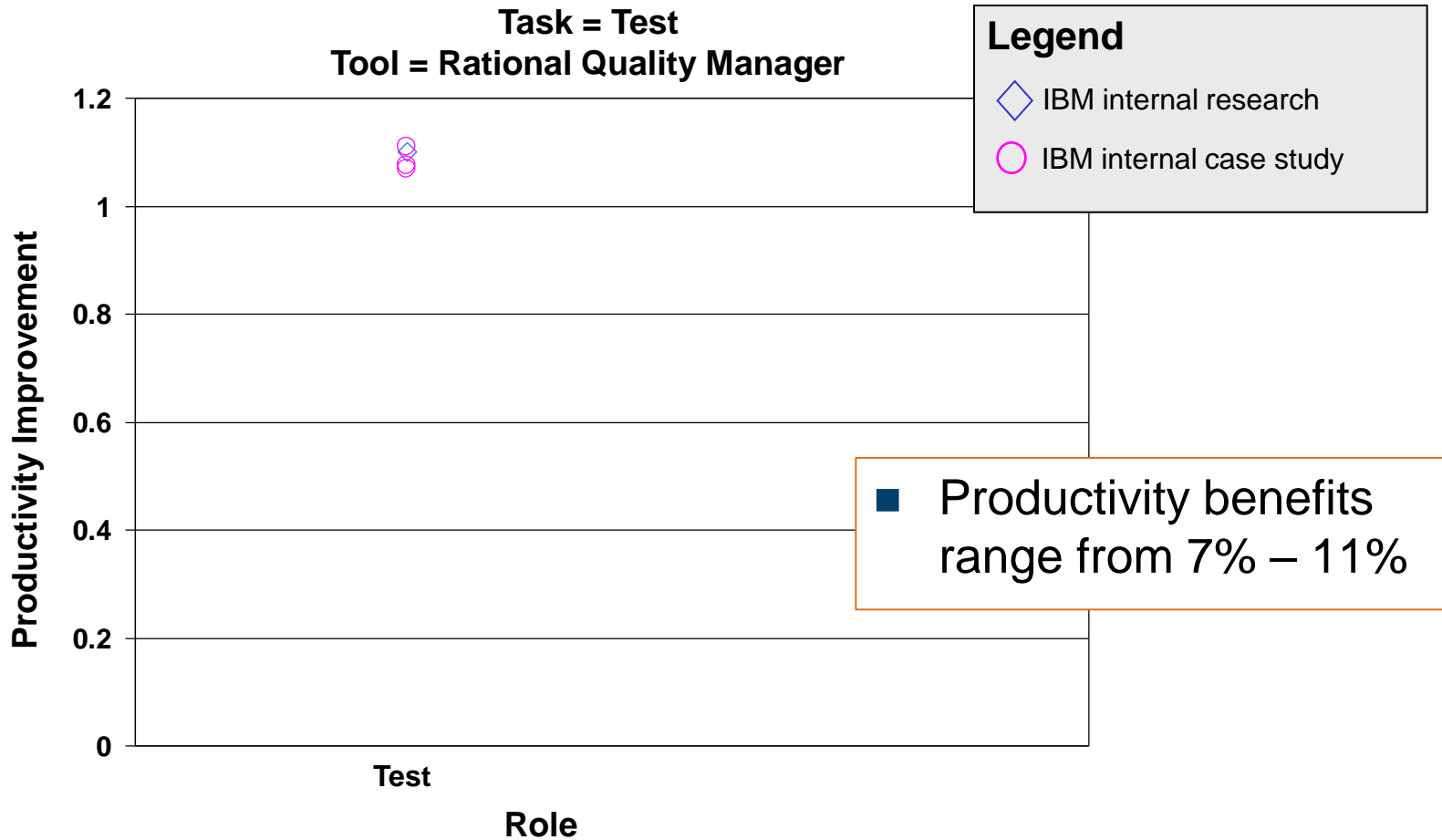
When Data Is Best Fit To A Model, Rational Tools Shown To Reduce Total Labor By 17%

Task
- Design
- Code
- Test
- Build
- Document
- Collaborate

Pie chart segments:
- Reduced by 21% — 8% (Design)
- 38% Reduced by 20% (Code)
- 24% Reduced by 10% (Test)
- 2% Reduced by 19% (Build)
- 3% Reduced by 10% (Document)
- 25% Reduced by 18% (Collaborate)
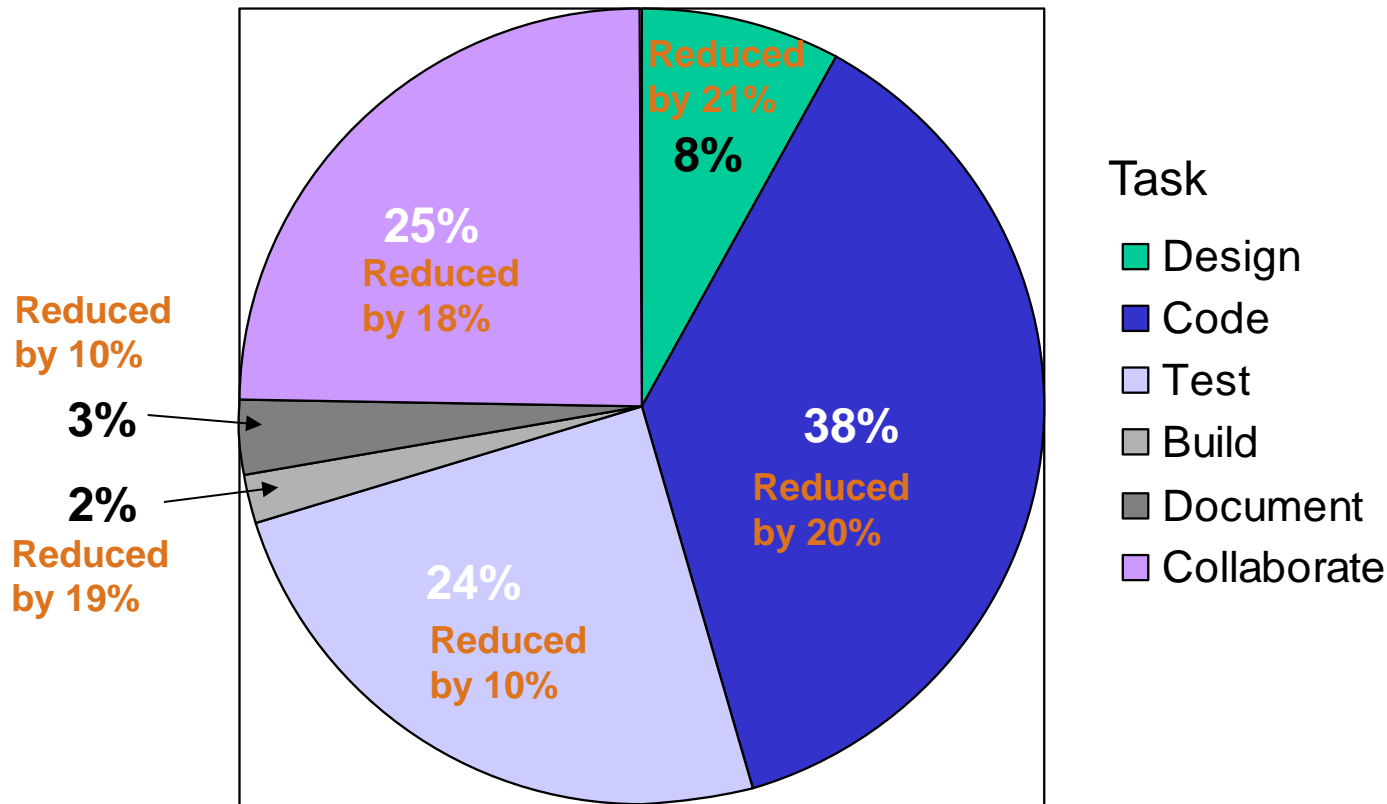
Rational Tools
Rational Software Architect
Rational Developer for z
Rational Quality Manager
Rational Functional Tester
Rational Performance Tester
Rational Team Concert

Baseline Tools
ISPF
Microsoft Word
Microsoft Excel
Microsoft Project
Microsoft Visio

May vary with customer.

Rational Labor Savings Far Outweigh The Cost Of The Tools

Case Study

Y-axis: Fractional Total Cost Per LoC ($), from $0.00 to $20.00

15% less

Legend:
- ☐ MIPS
- ☐ Workstation
- ☐ Tools
- ☐ Labor

X-axis categories: Using Baseline tools, Using Rational tools — System z
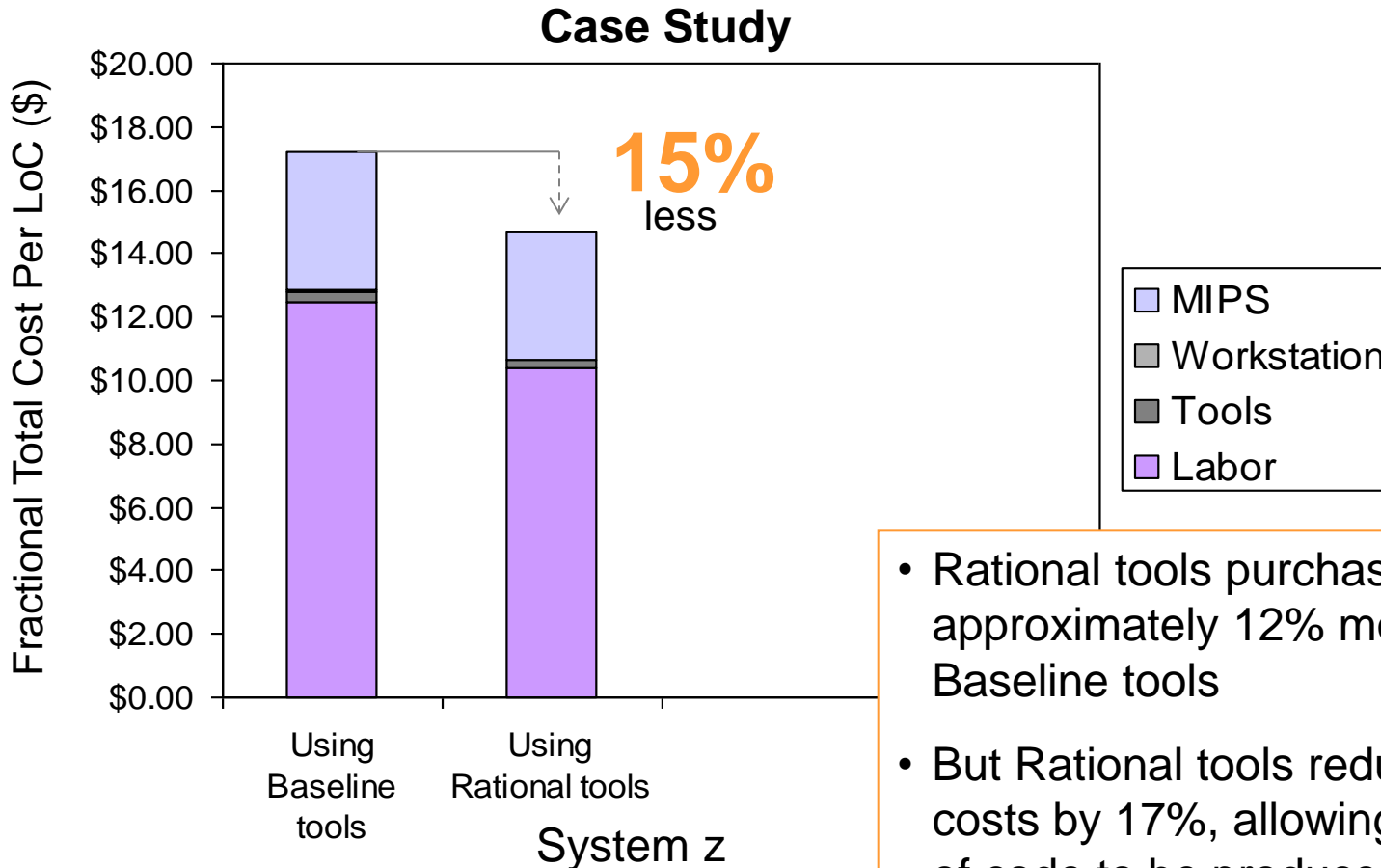
- Rational tools purchase cost is approximately 12% more than Baseline tools

- But Rational tools reduce labor costs by 17%, allowing more lines of code to be produced over the tool lifetime, so tool cost per line of code is actually less for Rational

Costs include labor, cost of individual workstations, development software tools, and system test environment. Testing software included Rational Functional Tester and Rational Performance Tester. Labor calculated at rate of $150,000 per year for all contributors. Cost of 1 MIPS per year = $1,750. Base rate of 1000 LoC per person per month

IBM CICS Internal Development Team Uses Rational Tools To Improve Productivity

IBMSystems
magazine

Rational Team Concert Energizes the CICS Development Process

November 2011 | by Ian Hodges, Kevin Bowkett, Nigel Hopper,

The introduction of Rational Team Concert (RTC) into the portfolio of IBM software products has enhanced the agility of IBM software development practices. Over the past two years, CICS Transaction Server for z/OS has adopted RTC, Rational Quality Manager (RQM) and Rational Developer for System z to modernize its development and service environment. This resulting success story proves it's possible for established products to adopt the Rational tool set.

http://www.ibmsystemsmag.com/mainframe/administrator/cics/CICS_RTC/

- CICS team had operated with largely the same specialized, proprietary and isolated environment for more than 30 years

- Skills were diminishing, tools were disparate and incompatible, understanding project status and traceability of work was complex and time-consuming

- The needs and demands of the business required a more flexible environment

Rational tools provided agility through a more open, transparent, integrated and collaborative environment

For Further Savings, Offload Unit Testing From The Mainframe To "z/OS-on-Intel"

Rational Development and Test (RD&T)

RDz

Edit and Debug

Compile and Unit Test

IMS CICS WAS DB2 MQ …

z/OS

Intel x86 running Linux

Deploy and Run

zEnterprise EC12
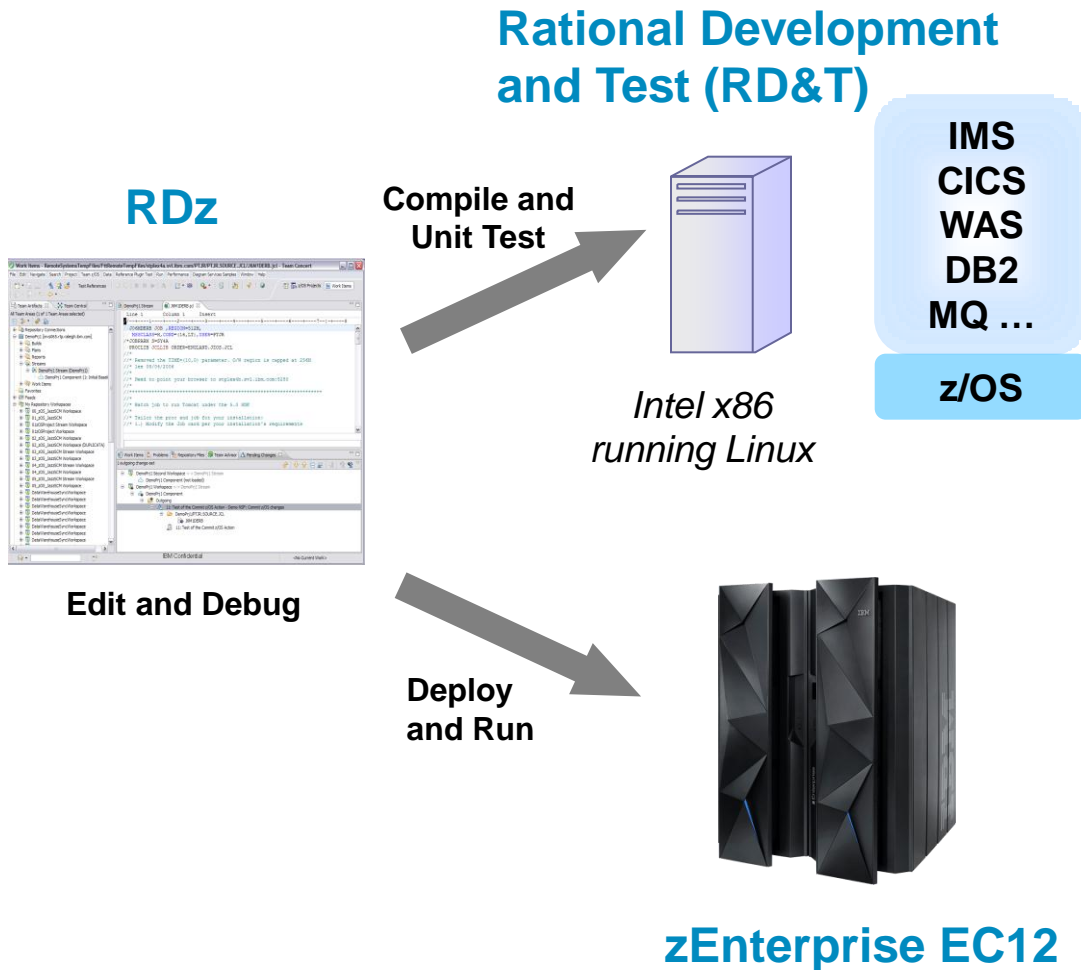
- Compile and Unit Test on an Intel x86 server running Linux

- RD&T server runs z/OS and all mainframe software

- Enables developers to rapidly prototype new applications

- Can significantly reduce MIPS consumption

- Eliminates costly delays by reducing dependencies on operations staff

Rational Developer For System z Plus Rational Development And Test Can Reduce MIPS

BEFORE

zEC12

z/OS
CICS
IMS, DB2
MQ Series

Production LPARS

Dev/Test LPARS

Analyze, Edit, Compile

Unit Test

Systems Test

ISPF Editor

AFTER

zEC12

z/OS
CICS
IMS, DB2
MQ Series

Production LPARS

New Capacity Availability

Systems Test

Analyze, Edit, Compile

z/OS
CICS
IMS, DB2
MQ Series

Unit Test

RDz

RD&T

- ➢ Reduce MSU capacity and subsequently MLC usage

- ➢ Continue to clone production LPARS for highest reliable system test

- ➢ Newly available capacity on the mainframe can help defer System z upgrades

Customer Savings From Combined Use Of Rational Developer For z And Rational Development And Test

Customer	Percentage of Total MIPS Offloaded with RDz and/or RD&T	Annual Savings
1. Insurance	17	$510,000
2. Communications	100	$2,721,600
3. Financial	14.3	$1,124,479
4. Healthcare Services	9.4	$582,511
5. Financial	12.4	$851,200
6. Banking	9	$540,000
7. Healthcare Services	8	$1,765,029

Dev and Unit Test accounted for 17% of total MIPS used. Moving it off saved $510,000

Dev and Unit Test accounted for 100% of this dedicated System z. Moving it off recovered 945 MIPS for new production

Moved only 50% of Dev and 50% of Unit Test, but still saved almost $1.8M

All customers anticipated payback from RDz and RD&T investments within 8-20 months

The Mainframe Is An Extremely Cost Effective Platform For System Testing

- Development + Unit Test + System Test typically consumes ONLY about 20% - 30% of total capacity*

- Virtualization makes it easy to clone and synchronize LPARs

- Exact clones reduce errors in system testing
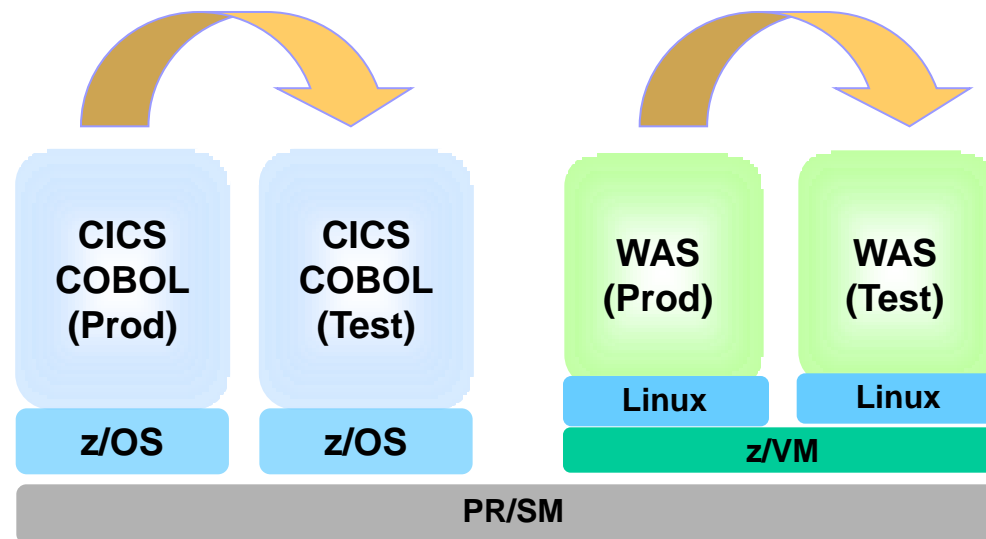
* Before offload to RDz and RD&T. Source: Internal
IBM customer assessments and Eagle Team studies

Rational Solution Packages Make Adoption Easy And Complete

For development teams…

For test teams…

Integrated Solution for System z Development

Rational Developer for System z

Rational Asset Analyzer

Rational Team Concert

Rational Development and Test

Continuous Integration Solution for System z

Rational Team Concert

Rational Development and Test

Rational Quality Manager

Rational Test Workbench

Academic Initiative for System z Skills

The New zEnterprise

2013 Update

IBM Academic Initiative >

IBM Academic Initiative

Building skills for a Smarter Planet

Membership in the IBM Academic Initiative is free and open to individual faculty members.

A skills initiative –
An IBM program that partners
with academic institutions worldwide
to build a pipeline of skilled students for the
IT jobs of tomorrow and
for a smarter planet.

ibm.com/university/systemz

Take advantage of our offerings

Explore our teaching topics
Resources to enhance IT, computer science, and business curricula

Use our courseware
Teaching materials for IBM products, open source technologies, tools

Access IBM software and systems
Hundreds of IBM products, virtual access to IBM systems and solutions

Program goals and overview

- Assist and enable the Mainframe community with skills (Mainframe access, courses, training, certification, etc.)

- Explore enterprise systems education alternatives

- Not selling IBM products

- Not asking educators to teach a predefined training program

- Resources available at no charge

- Build important relationships with educators, clients, and partners

- Participation continues to increase

- Wide variety of schools in the program

- Different level of participation

- All programs are unique

- Designed to provide flexibility to the school to meet their requirements and capabilities

IBM Academic Initiative
Open standards, open source and IBM resources for academia

I'd like to bring critical thinking on global issues into my classroom.

→ How can IBM help?

Bring critical thinking into the classroom   Help students gain real-world experience   Get course material to teach competitive skills

Program Resources To Assist And Enable Educators

Remote access to mainframes worldwide for teaching

Full software stack available

Program membership takes 10 minutes

Courses and z/OS Mastery Exams
to validate z knowledge

z Skills Help Desk
to assist the community
zskills@us.ibm.com

Student Mainframe Contests
to generate interest

Faculty skills development and education

Roundtables on Campus
to get industry input

Locate schools teaching Enterprise Systems

System z
Academic Initiative program

| US & Canada | Europe, Middle East, Africa | Latin America | Asia Pac |

Educators from all over the world are currently investigating or actively teaching mainframe technologies. This is a partial listing of the most active schools in the United States and Canada. The schools are listed alphabetically by state or province.

If you are interested in locating and recruiting new talent for internship and job opportunities, reach out to the educator listed as the school contact.

For general inquires about the IBM Academic Initiative program or if you're an educator that would like to be included in this list, contact the System z Academic Initiative team at zskills@us.ibm.com.

States and provinces with participating schools

↓ Multiple U.S. locations	↓ Illinois	↓ New York
↓ Alabama	↓ Indiana	↓ North Carolina
↓ Arkansas	↓ Iowa	↓ Ohio
↓ California	↓ Louisiana	↓ Pennsylvania
↓ Colorado	↓ Maryland	↓ South Carolina
↓ Delaware	↓ Massachusetts	↓ South Dakota
↓ Florida	↓ Minnesota	↓ Texas
	↓ Missouri	↓ Utah

www.ibm.com/systems/z/education/academic/schools_na.html

We Want Every Mainframe Client to Know…

Use the Academic Initiative to build and locate skills

- **Locate schools** teaching enterprise systems to recruit new talent

- **Partner with IBM** to build new skills for your business
  zskills@us.ibm.com

- **Advertise job opportunities** to students and experienced professionals
  systemzjobs.com

- **Use resources** to assist with building employees skills (internal training programs)
  www.ibm.com/systems/z/education/skills_coursematerials.html

- **Build credentials** through the Mastery Test
  www.ibm.com/certify/mastery_tests/ovrZ05.shtml

- ***Online mainframe education*** (certificates)
  www.idcp.org/learnzos.html

- **Stay connected** with through communities and social media. "Like" us on Facebook.

Partner with IBM to build new skills for your business

IBM will assist and enable a school of your choice to teach enterprise systems

Follow these steps:

1. Identify a school of your choice and ask yourself these questions:

   - Where does your company recruit new talent today?

   - Do you have an existing relationship with someone at a college
     or university?

   - Don't limit your thinking to Computer Science.
     Consider IT, MIS, IS, CSE and Business majors.
     IBM has courses and modules that can be included in various majors
     to expose students to enterprise systems thinking

2. Contact IBM at zSkills@us.ibm.com.

Use IBM's Job Board - SystemzJobs.com

Lets employers post detailed job requirements for job seekers of all experience levels to review and apply

Global pool of talent specializing in mainframe technology, including both students and experienced professionals

Benefits of using SystemzJobs.com

- Free, secure, and easy to use
- Fast access to mainframe jobs and talent
- Global

Getting started

Follow these steps at SystemzJobs.com to get started:

1. Create a secure account
2. Post or Search for jobs
3. Connects students and industry

**Sponsored by the
IBM Academic Initiative, System z**
Visit: **ibm.com**/university/systemz

Questions? Contact zSkills @us.ibm.com

IBM can assist **you** with Enterprise Systems Skills

Contact us at zskills@us.ibm.com

Important Web Sites And Contacts

- **Academic Initiative for the Mainframe**
  ibm.com/university/systemz

- **Locate participating schools**
  www.ibm.com/systems/z/education/academic/schools_na.html

- **IBM System z Mastery Exam**
  ibm.com/certify/mastery_tests/ovrZ05.shtml

- **System z Job Board**
  SystemzJobs.com

- **Stay connected and "like" the IBM System z Academic Initiative on Facebook**

Academic Initiative System z program manager: Kathy Pfeiffer, pfeiff@us.ibm.com

Questions? Contact zskills@us.ibm.com

THANK YOU