

A decorative graphic in the top left corner consists of several overlapping circles of various colors (yellow, orange, red, purple, blue) that are divided into segments, resembling a stylized sunburst or a cluster of data points.

# **The Gold Standard for Enterprise Computing**

## **Mainframe Skills – The Myth and the Reality**

## There's a perception of a mainframe skills shortage...

- ... which might discourage companies from deploying new workload on the platform
- ... or lead others to consider moving off the mainframe altogether



**...Let's look at the facts  
and try to understand the real picture**

# See IBM Redbooks Point of View: “Mainframe Modernization and Skills: The Myth and the Reality”

<http://www.redbooks.ibm.com/abstracts/redp5115.html?Open>

## Mainframe Modernization and Skills: The Myth and the Reality

An IBM Redbooks Point-of-View publication

By **Emily Farmer**, Senior Software Engineer, and **Michael Casile**, Senior Software Engineer

### Highlights

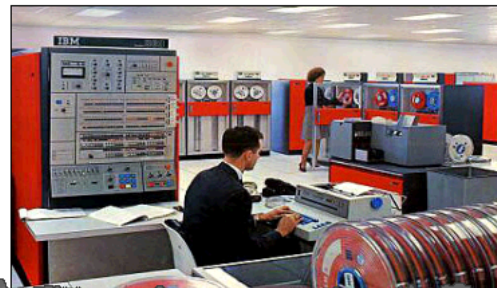
- ▶ Defying predictions, the IBM mainframe is not only alive today, running much of the world's business, but its usage continues to grow. So to prepare for future resource needs, mainframe customers must adopt plans to onboard the new developers and administrators that will be needed in the future.
- ▶ Attracting qualified talent to work on mainframes is not the challenge some might think. IBM has developed a wealth of modern, GUI-based mainframe tools, making the platform more interesting to a new generation and, just as important, more comfortable for those now working in distributed environments who are thinking of making a switch.
- ▶ IBM is investing heavily in training a new supply of mainframe resources. More than 360 companies are participating in these initiatives, with some 68,000 people, and counting, trained to date.



### Is the mainframe a *modern* platform?

In April 2014, IBM® celebrated the 50th anniversary of the first mainframe computer, the System/360 (see Figure 1). Growth over that time has been such that today, much of the world's business runs on IBM mainframes, including 97 of the world's top 100 banks<sup>1</sup>. Yet perhaps because it has been around as long as it has, the mainframe is seen by some as not modern enough for today's demands.

Many in business still assume that the only interface to mainframes is through the traditional *green screen*, that administration is cumbersome and difficult, and that the only people with the skills to administer and develop applications on mainframes are those who grew up with the platform, that is, post-World War II baby boomers. As these boomers approach retirement, some business leaders fear an impending skills shortage, and distributed server vendors have been known to use this fear to promote migrating off the mainframe to more “modern” platforms. A 2011 ComputerWorld study<sup>2</sup> even found that some younger IT professionals were reluctant to focus on the mainframe, seeing it as a stagnant environment.



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... *please  
distribute!*

## Three things to keep in mind

1

**Numerous indicators show mainframe usage continuing to grow for the foreseeable future**

2

IBM has made considerable investment in intuitive, GUI-based tools for mainframe administration and development

3

IBM continues to invest heavily in development of mainframe skills for the next generation

# Mainframe usage is growing and is projected to continue

Finally, despite regular declarations that “the mainframe is dead,” the research shows this has never been further from the truth. In reality, the mainframe is working harder than ever. Almost two-thirds of respondents (62 percent) are now using mainframe applications, which were initially designed to perform back-end functions, to now support external-facing services, such as e-commerce (chart 9). This is putting added pressure on the mainframe and, in turn, increasing MIPS. This is evidenced by the fact that 68 percent of respondents believe that the increase in mobile applications is driving higher MIPS usage (chart 10).

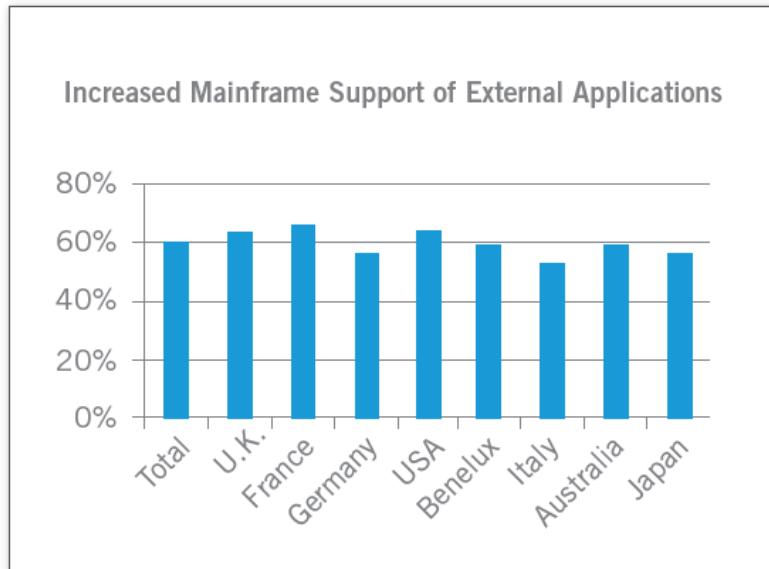


Chart 9: 62 percent of companies are using their mainframes to support external applications, such as online banking.

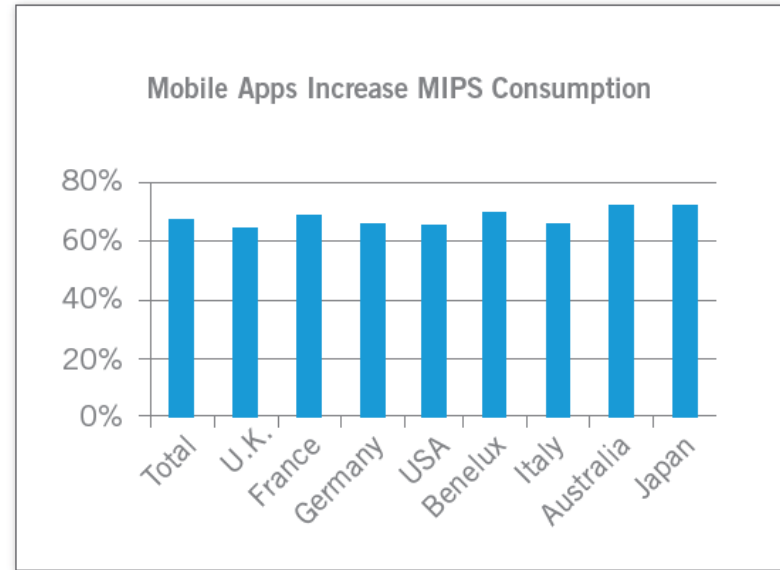
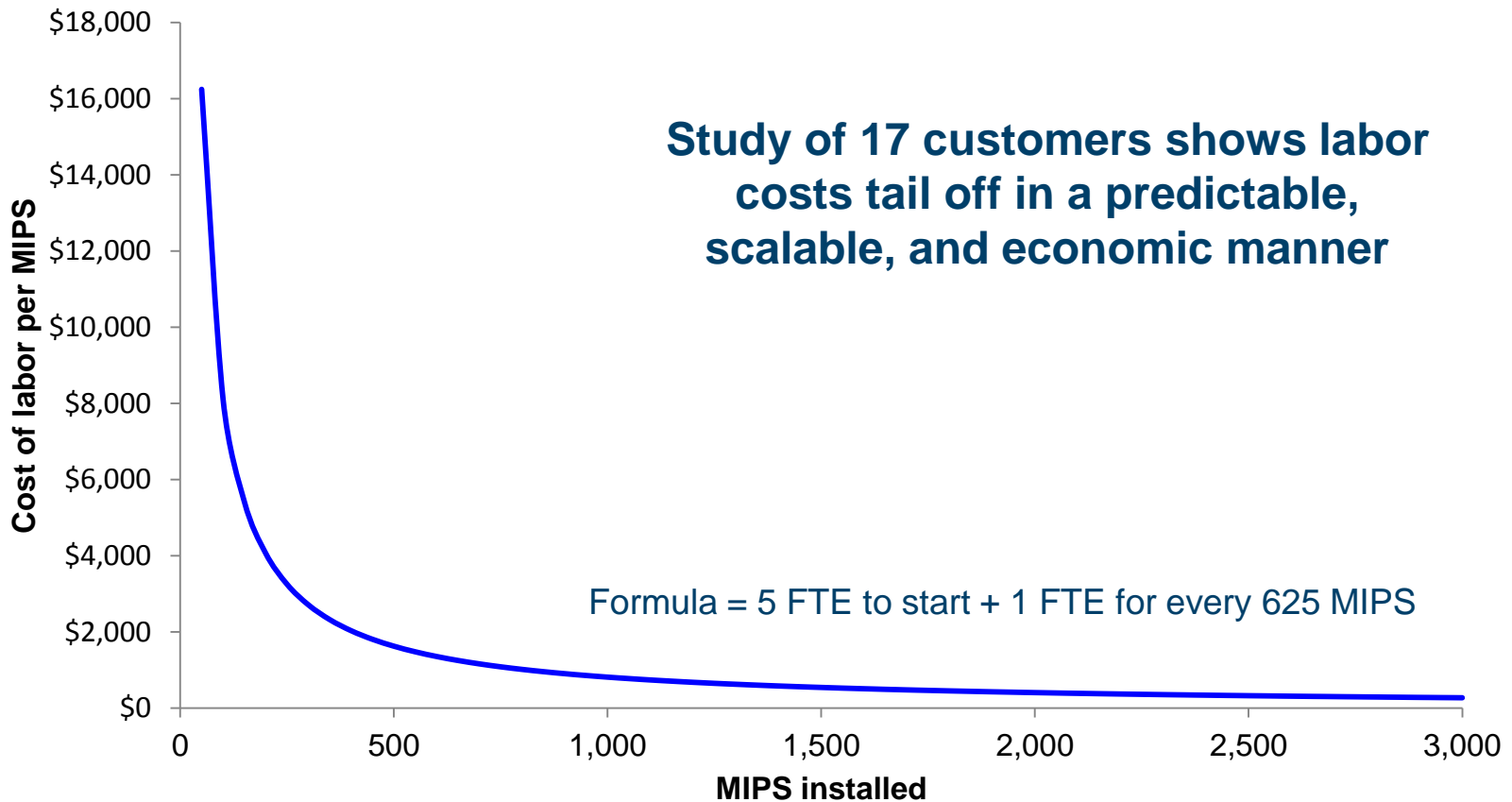


Chart 10: 68 percent of respondents believe that the increase in mobile applications is driving higher MIPS usage.

Compuware commissioned Vanson Bourne to study the impact of new IT trends and models. In September 2012, the independent research firm interviewed 520 CIOs from large enterprises across a range of industries in the U.S., Europe & Asia.

# Eagle studies validate that adding workload to mainframes *reduces* labor cost per unit of work

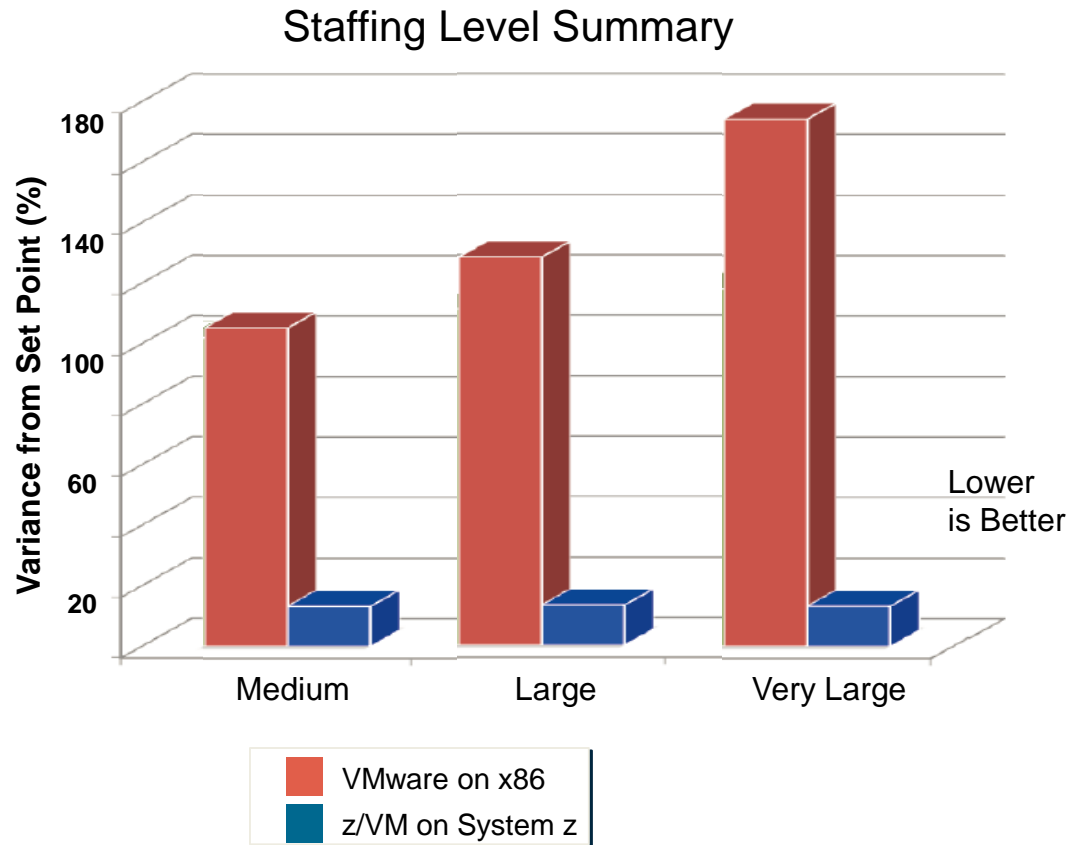
## Labor cost per mainframe MIPS



# Independent analysis shows that mainframe administration requirements are typically less than for distributed platforms

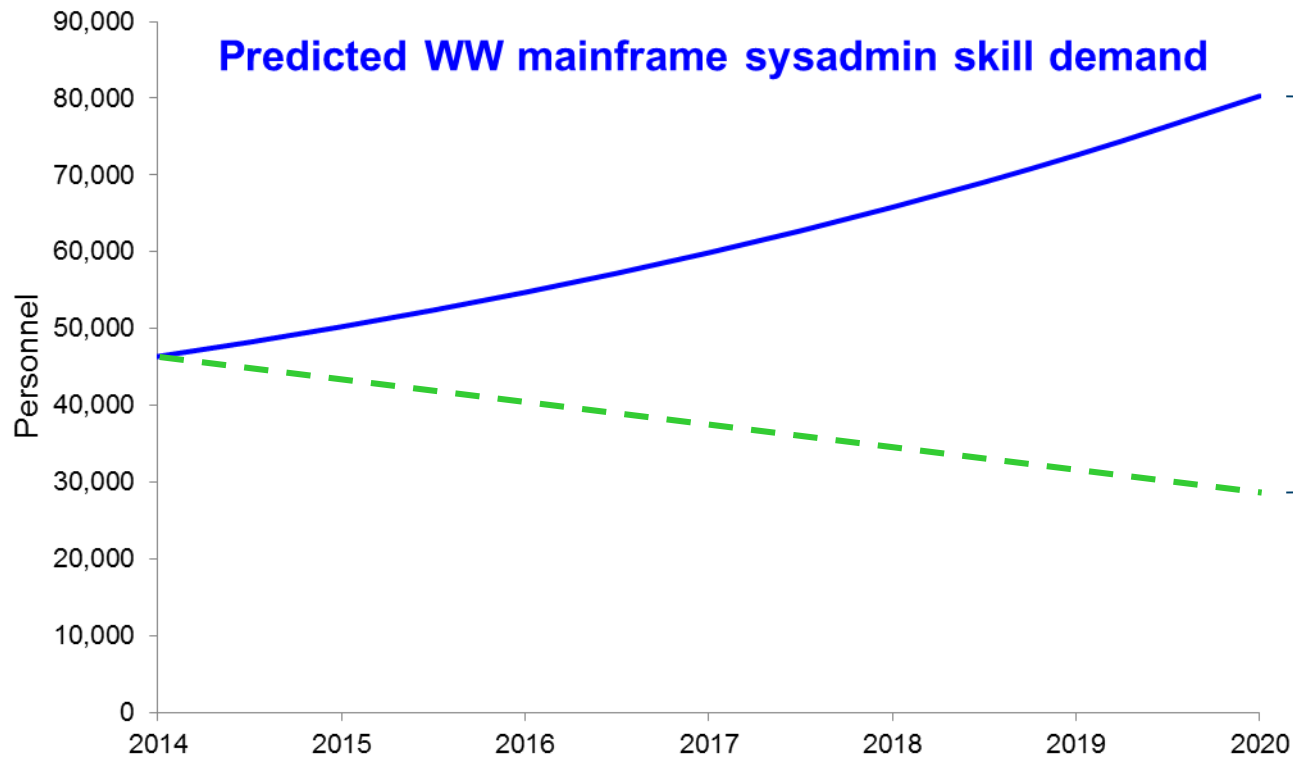
Staffing levels required to maintain a “gold standard”:

- Normalized to VMWare in Medium sized environment
- Staffing levels for z/VM was as much as 13x smaller



# Estimation of the potential mainframe skills demand over the next six years

- IBM CPO projects 37,200 additional mainframe positions needed WW by 2020
  - Projection based on mainframe MIPS growth from 2005-2013
- Some number of today's personnel will retire by 2020, increasing that demand



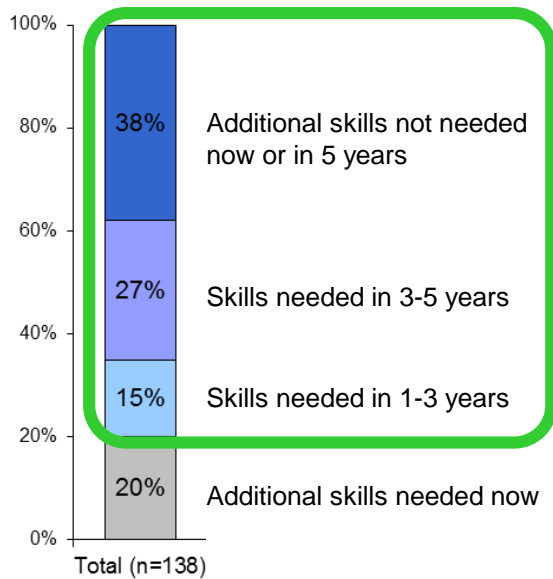
IBM programs such as the Academic Initiative are targeted to meet this demand

(Academic Initiative trains on average 6,400 annually)

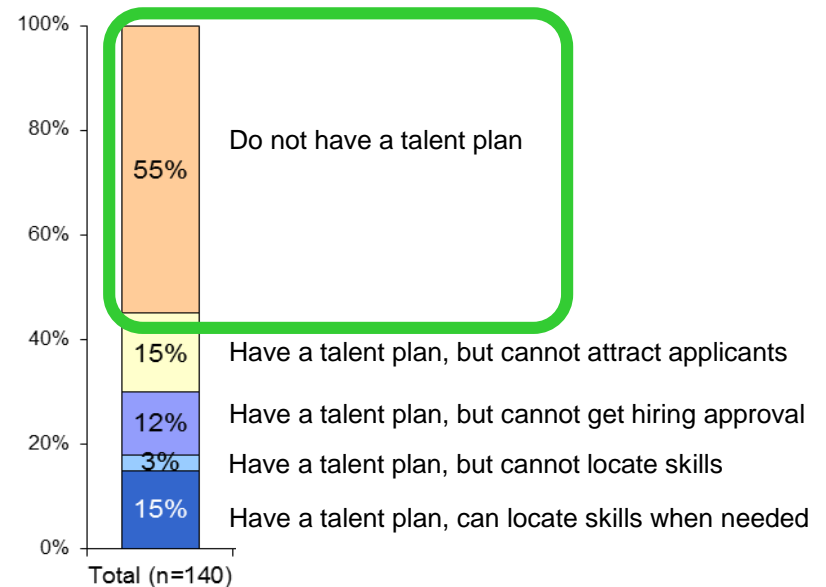


# Most companies say they are OK now, but many need a talent replenishment plan

**80% of System z customers don't have a skills issues now**



**55% of System z sites don't have a talent plan for mainframe skills**



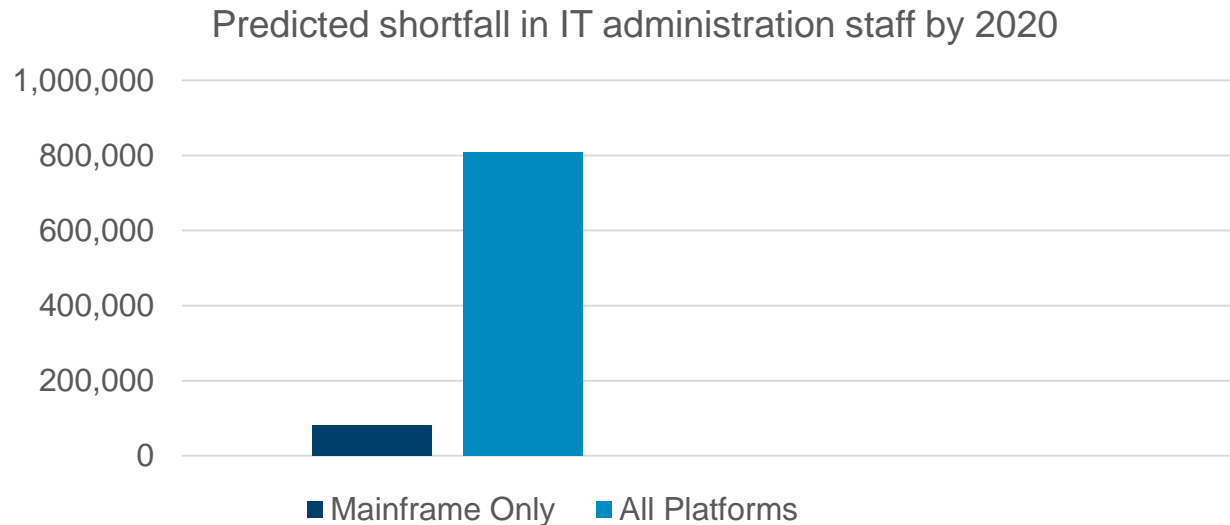
*“Right now, it's pretty easy to hire programmers, and if they understand Java I can bring them back to procedural languages like Cobol,”*

— David Brown, managing director of BNY Mellon's IT transformation group\*\*

Source: IBM's 2013 System z Tracker

\*\*[http://www.computerworld.com/s/article/9225099/Cobol\\_brain\\_drain\\_Survey\\_results?taxonomyId=154&pageNumber=1](http://www.computerworld.com/s/article/9225099/Cobol_brain_drain_Survey_results?taxonomyId=154&pageNumber=1)

# The shortage of mainframe skills projected is only about 10% of a greater problem...



- US government predicts that approximately **810,000** new and replacement administrative personnel will be needed across *all* platforms by 2020

***...the requirements for development of an aggressive talent plan should cover all platforms within the data center, and not just the mainframe***

## Don't panic — do *plan*

- .... mainframes are still a critical technology
  - Especially as back-end servers for mobile computing
  - Critical assets require resource planning
  - Enterprise computing is a different mind-set
  
- Mainframers often stay in their job their whole career
  - Baby-boomers retiring exacerbates the skills challenge
  - Many learned on the job – often without ANY formal technology-training
  - 10,000 hour rule-of-thumb → on-the-job learning can take 3-5 years
  
- Get good people
  - Be careful with skill specification
  - Cross-train existing technologists
  - Learn the business first
  - Hire in cohorts
  
- Modernize your tools and processes....



## Three things to keep in mind

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**IBM has made considerable investment in intuitive, GUI-based tools for mainframe administration and development**

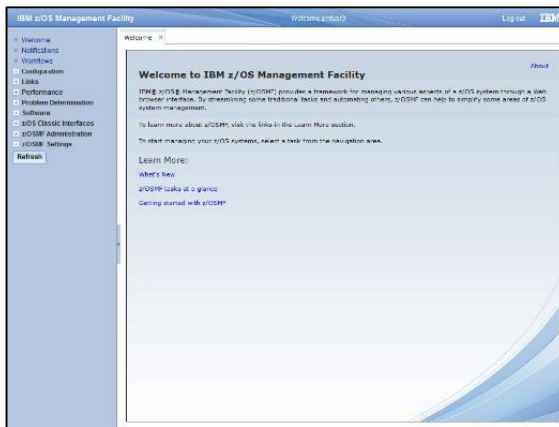
3

IBM continues to invest heavily in development of mainframe skills for the next generation

# Today, mainframe system administrators use the latest workstation-based tools

**IBM z/OS Management Facility (z/OSMF)** - a modern, browser-based console for management of day-to-day operations and administration

- Maximizes productivity of a diversified workforce
  - Simplification of tasks
  - Enhanced collaboration
  - Reduced learning curve
- Role-based, scenario-based
- Integrates with other tools



*z/OSMF*

*Browser  
(Windows IE  
Firefox)*



**HTTP(S)**



# z/OSMF (Jobs and Resources -> SDSF section)

**Active Jobs Statistics** Common and table filters applied

System: P03 (Local) [View text](#)

**System Activity Percent Busy**

LPAR 0%

MVS/SRM  3%

Demand Paging Rate: 0

**Top CPU Percentages**

Job Name	CPU Percentage
ZMFDEV1	1.33%
RMF	0.67%
XCFAS	0.33%
WLM	0.17%
OMPROUD	0.17%
PROUD	0.17%
S2MON	0.17%

**Active Jobs**

Common Filters

Actions	View	JOBNAME	StepName	ProcStep	JobID
<input type="checkbox"/>		DEBUG15	STEP1		S00002
<input type="checkbox"/>		IGVDGNMN	IGVDGNMN	IGVDGNMN	S00002
<input checked="" type="checkbox"/>		HZPENG	PROCDB	SP0TC001	T00002
<input type="checkbox"/>		P00SVR2S	P00SVR2S	STEP1	S00002
<input type="checkbox"/>		HZPENG	STEP1		S00012
<input type="checkbox"/>		DEBUG12	*OMVSEX		S00012
<input type="checkbox"/>		DEBUG12	STEP1		S00012

Total: 344, Selected: 1

Page 1 of 4 Rows 100

**Properties of HZPENG**

Properties are more current than table data.

Type to filter properties

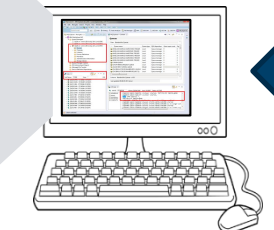
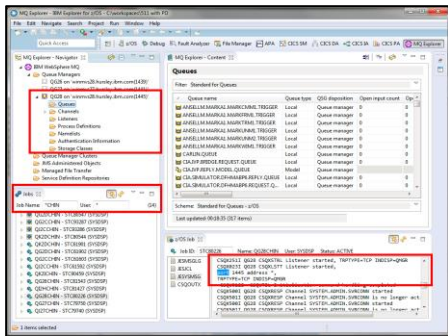
- General
- Advanced
- Performance
- Scheduling
  - C: DP: ResGroup: RptClass: SP: SrvClass: Workload:
  - FF TSOHIGH
  - 1 TSOHIGH
  - TSO\_WLD
- Security
- Status

# z/OS administrators work from an Eclipse-based integration platform

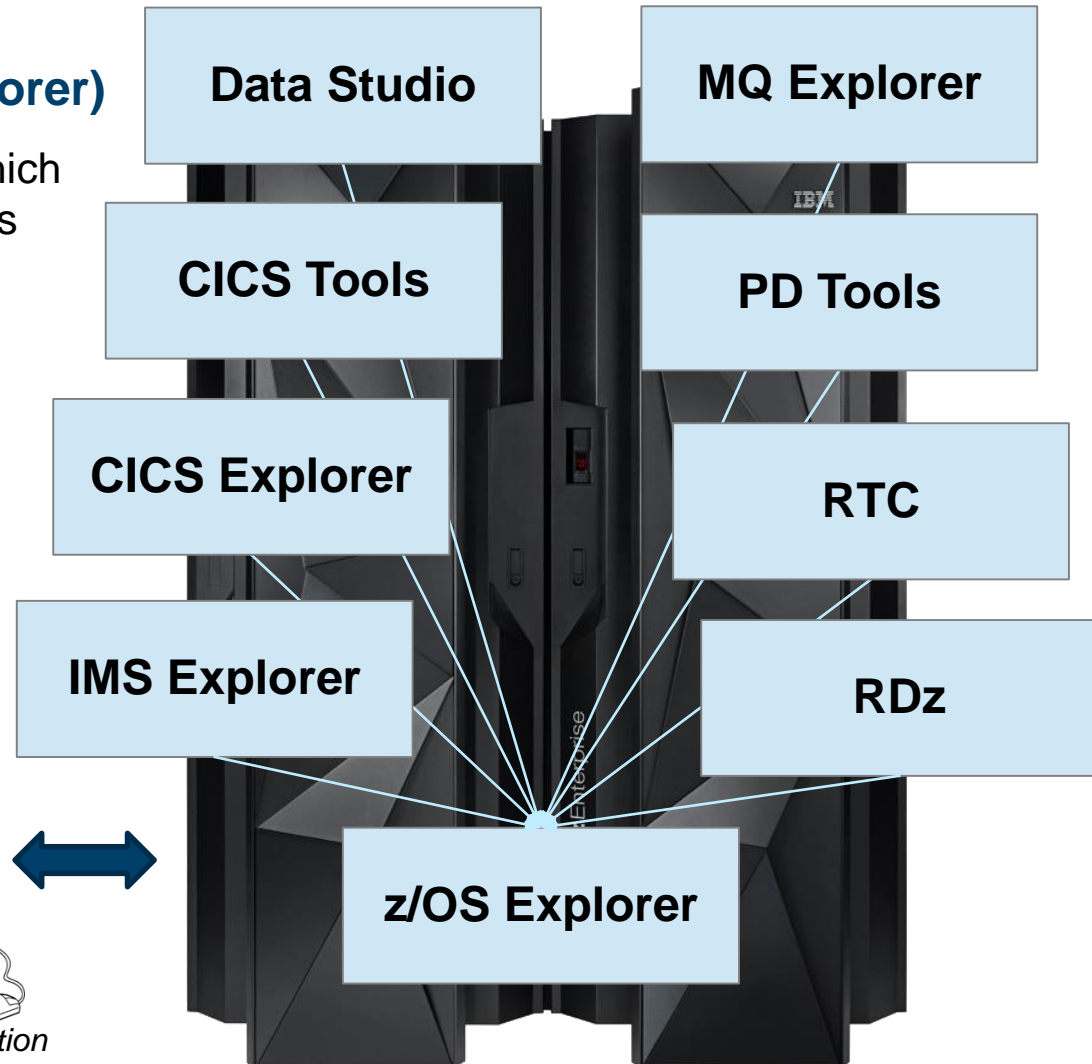
## IBM Explorer for z/OS (z/OS Explorer)

- Provides a single workbench from which to develop, and test z/OS applications and manage related sub-systems
- Common base for many z/OS tools
- Extendable to accommodate user's roles and responsibilities

MQ Explorer plug-in in z/OS Explorer – showing Queues and Jobs



Eclipse workstation



# Business Connexion, Ltd. (South Africa) – Services company simplifies its IT to better meet customer requirements

**A committed CICS service provider looking to continue delivering strong value proposition**

## Business challenge:

- Customers consistently requesting “more for less”
- Required easier-to-use interfaces into its CICS systems

## Solution:

- Reinvented their IT with the CICS Explorer, CICSplex System Manager (CPSM), Events Processing and ATOM feeds features
- Enhanced CICS resources to populate a business operations dashboard – highlights all the CICS events in the system

## Benefits:

- Made system administration more intuitive and user friendly
- Provides greater control and monitoring, helping customers better react to situations

*"The CICS Explorer is a non-chargeable Eclipse based tool that provides our clients views of their resource state and information across multiple CICS Systems - it's simple to deploy and simple to use and should make it easier for our new staff to become competent on our CICS systems more quickly"*

*- Rob Loyd, data center services manager*

**Business  
Connexion**  
Creating value together



# An entire enterprise can be efficiently managed with intuitive, GUI-based capability

## Tivoli Enterprise Portal

The screenshot displays the Tivoli Enterprise Portal interface. At the top, a window titled 'TWS\_Job\_Detail (Prototype) - PFWOLVER - SYSADMIN \*ADMIN MODE\*' is open. The interface includes a navigation tree on the left, a central graph, and a detailed table at the bottom.

**Graph showing duration times for each job that has executed:** A 3D bar chart titled 'Job Duration' shows execution times in seconds for jobs HOR50005, HOR50007, and HOR50001. HOR50005 has the highest duration, followed by HOR50001, and HOR50007 has the lowest.

**Table: Tivoli Workload Scheduler Detailed Job Status**

Timestamp	Job Description	Application Identifier	Job Name	Operation Number	WS Identifier	Descriptive Text	Actual Start Time	Actual End Time	Duration	Error Code	Job Status
02/10/06 16:33:39	HOR50DAY	HOR50DAY	HOR50005	005	CPU	Operation 005	08:39:30	08:45:15	00:05:45	-	Complete
02/10/06 16:33:39	HOR50DAY	HOR50DAY	HOR50007	007	CPU	Operation 007	08:45:15	08:45:20	00:00:05	MCP	Error
02/10/06 16:33:39	HOR50DAY	HOR50DAY	HOR50006	006	CPU	Operation 006	08:45:20	00:00:00	00:00:00	-	Started
02/10/06 16:33:39	HOR50DAY	HOR50DAY	HOR50000	000	CPU	Operation 000	00:00:00	00:00:00	00:00:00	-	Waiting
02/10/06 16:33:39	HOR50DAY	HOR50DAY	HOR50001	001	CPU	Operation 001	08:36:40	08:38:20	00:01:40	-	Complete
02/10/06 16:33:39	HOR50DAY	HOR50DAY	HOR50004	004	CPU	Operation 004	08:38:20	00:00:00	00:00:00	-	Active
02/10/06 16:33:39	HOR50DAY	HOR50DAY	HOR50021	021	CPU	Operation 021	00:00:00	00:00:00	00:00:00	-	Waiting
02/10/06 16:33:39	HOR50DAY	HOR50DAY	HOR50012	012	CPU	Operation 012	00:00:00	00:00:00	00:00:00	-	Waiting
02/10/06 16:33:39	HOR50DAY	HOR50DAY	HOR50031	031	CPU	Operation 031	00:00:00	00:00:00	00:00:00	-	Waiting
02/10/06 16:33:39	HOR50DAY	HOR50DAY	HOR50022	022	CPU	Operation 022	00:00:00	00:00:00	00:00:00	-	Waiting

**Callouts:**

- Critical situation indicators:** Points to the 'Error' status in the table.
- Enterprise resources: hardware, virtual hardware, software:** Points to the 'Application Identifier' column.
- Thresholds on Status states:** Points to the 'Job Status' column.

(Tivoli Enterprise Portal was used in the demos in modules 1 and 4)

## COBOL continues to be alive and well!

### Is Cobol being used in your organization to develop new business applications?

Yes: 53%



No: 44%



Don't know: 3%



Base: 131 IT professionals

### To what extent do your organization or systems use these programming languages?

Language name	A lot	A little	None
Cobol	48%	16%	37%
JavaScript	41%	41%	19%
Java	39%	40%	22%
C#	26%	25%	50%
VB.net	25%	38%	38%
Visual Basic	22%	49%	30%

Base: 202 IT professionals.

Percentages may not add up to 100 because of rounding.

- See ***“Leaving the Myth business to the ancient Greeks and Romans: COBOL is dead ... seriously?”*** ([http://get.syr.edu/news\\_alt.aspx](http://get.syr.edu/news_alt.aspx))

## Languages should be selected using “fit-for-purpose”

### Use COBOL for:

- Building mission critical applications in the business logic and data management layers
- Where records are processed and calculated
- Where performance is important in delivering high service levels
  - Sub-second response time is needed
- Where programmers must learn a language quickly, and the resulting code needs to be readable by non-programmers

### Don't use COBOL for:

- The presentation layer where chasing a mouse around a screen is required

#### Compared to more modern programming languages such as Visual Basic, C#, C++ and Java, how does Cobol rate for these characteristics:

Function	Much better/ Somewhat better	About the same	Worse/ Much worse
Batch processing	82%	12%	4%
Transaction processing	65%	24%	9%
Handling business-oriented features	55%	21%	19%
Run-time efficiency	54%	33%	8%
Security	39%	38%	15%
Reporting	45%	37%	17%
Development cost	39%	32%	17%
Maintenance cost	43%	29%	18%
Ability to hire programmers	13%	25%	55%
Agility	15%	33%	45%

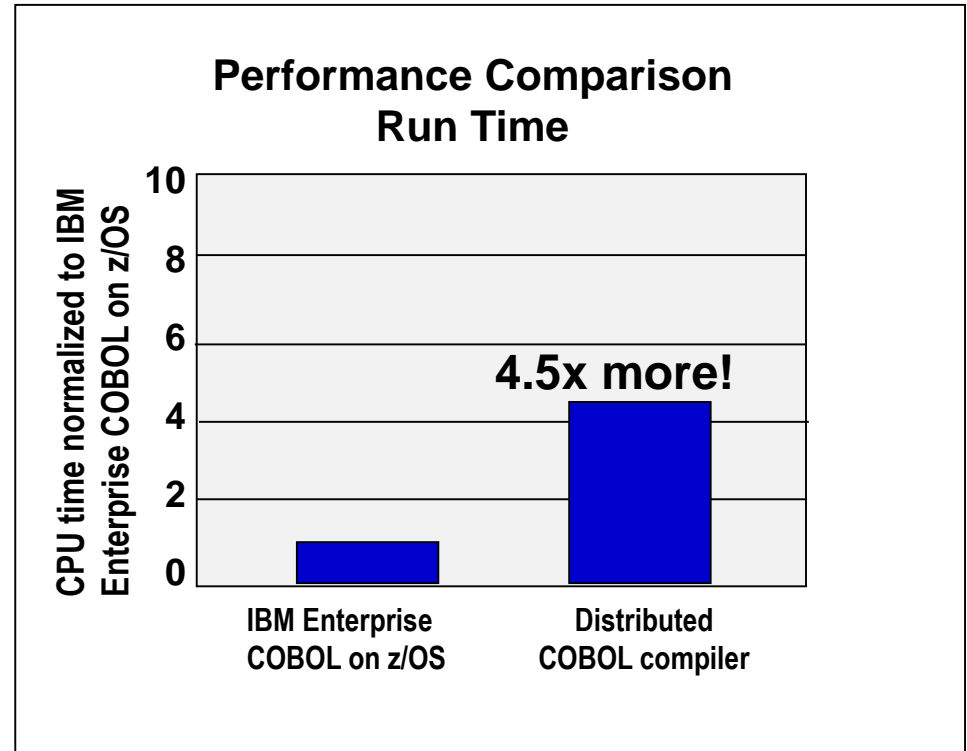
Base: 131 IT professionals

# Jettisoning CICS/COBOL can be problematic, risky and expensive

- Moving applications off the mainframe with a distributed compiler can lead to significant performance issues
- HP (a major rehosting competitor) estimates that 20% of COBOL lines will need to be rewritten when rehosting

“COBOL and the mainframe run well together, and that's where I want to keep it.”

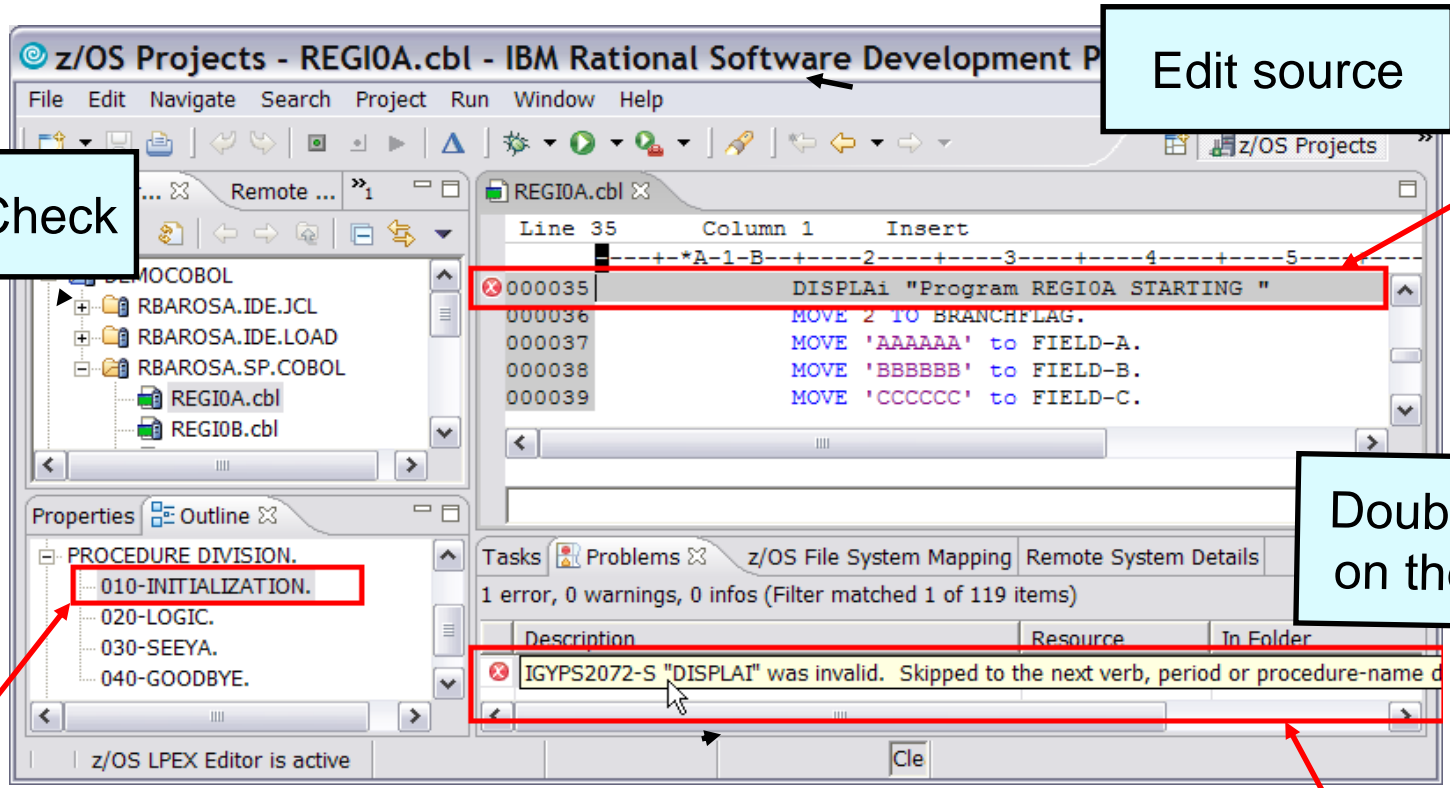
*David Brown managing director  
of the IT transformation group  
at BNY Mellon*



“Millions of users unknowingly activate CICS every day, and if it were to disappear the world economy would grind to a halt.”

*Phil Manchester, Personal Computer Magazine*

# Today, COBOL application development is simplified using Eclipse-based graphical editing tools



Syntax Check

Edit source

Statement in error

Double click on the error

Outline view presents COBOL structure

Rational Developer for System z (RDz)

Error list in Tasks view

# Rational Developer for System z is a single, rich, integrated interface for all zEnterprise development

- Supports all mainframe languages (COBOL, PL/I, C/C++, ASM, Java, etc.) and runtimes (CICS, IMS, Batch, USS, DB2, WAS, etc.)
- Fully supports development and reuse of all mainframe assets
- Connected and disconnected modes
  - Connect to z/OS for debug, job generation, etc.
  - Disconnect and reduce mainframe MIPS usage and costs
- Includes Web Services and JSON wrappers



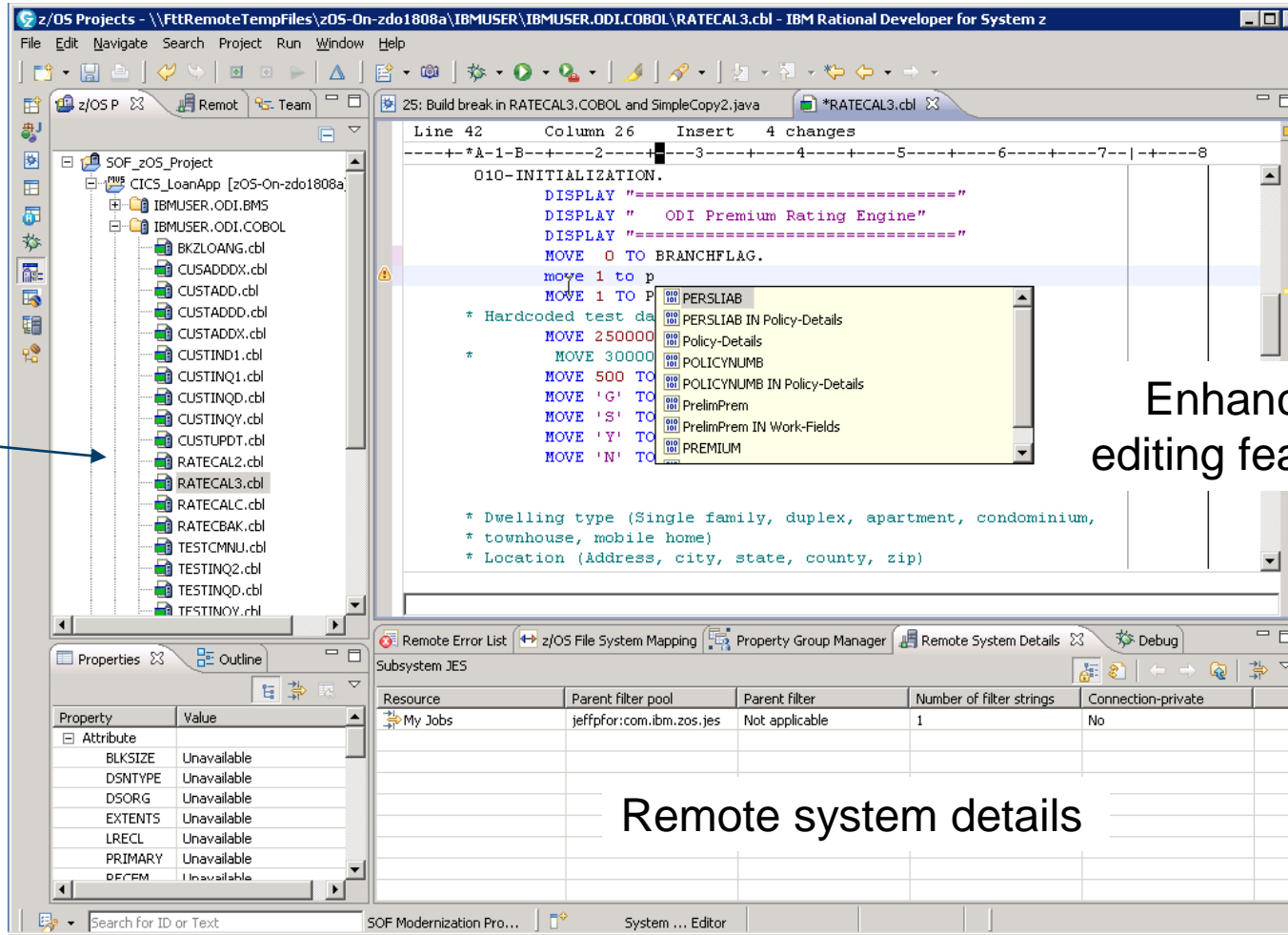
The screenshot displays the IBM Rational Developer for System z interface with several key components highlighted by blue arrows and text:

- Disconnected -vs- Connected:** A label with arrows pointing to the 'Remote Systems' tree on the left, which shows a tree structure of local and remote systems.
- MVS PDS members:** A label pointing to a specific folder in the 'Remote Systems' tree.
- Data set characteristics:** A label pointing to the 'Properties' window at the bottom left, which shows a table of system properties.
- Configurable Editor:** A label pointing to the main code editor window displaying JCL code.
- USS Command Shell:** A label pointing to the 'Remote Shell' window at the bottom right, which shows a command prompt.
- TSO Command Shell:** A label pointing to the 'Remote Shell' window at the bottom right, which shows a TSO command prompt.
- JES sub-system view:** A label pointing to the 'Remote System Details' window at the bottom right, which shows a table of job details.

*RDz Eclipse interface*

# DEMO: COBOL development using state-of-the-art Eclipse-based tools

COBOL files



Enhanced editing features

Remote system details

# Grow and enhance the skills set of development teams through use of multi-faceted, integrated tools

- Features in RDz enable cross-fertilization of development skills
- RDz makes it easy for Java developers to also contribute to COBOL applications

The screenshot displays three overlapping windows from IBM Rational Developer for System z:

- Remote System Explorer:** Shows a tree view of remote systems. A red arrow points to the 'z/OS UNIX Files' folder with the annotation: "Use the Remote System Explorer to see PDS".
- z/OS Projects:** Shows a project tree for 'SOF\_zOS\_Project'. A red arrow points to the 'RATECAL3.cbl' file with the annotation: "Switch to the z/OS Projects to edit COBOL files".
- Java Editor:** Shows the source code for 'SimpleCopy2.java'. A red arrow points to the 'SimpleCopy2.java' file in the project tree with the annotation: "Switch to the Java perspective to edit Java files".

```

package sof;
import java.io.File;

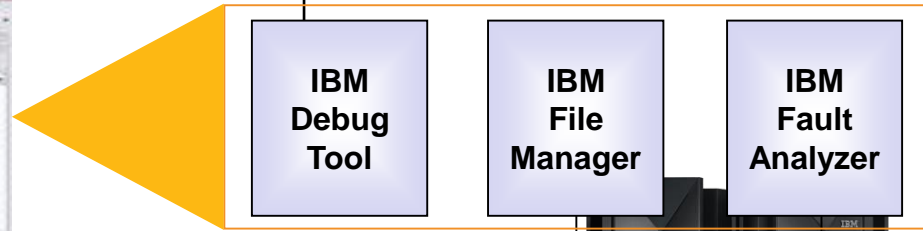
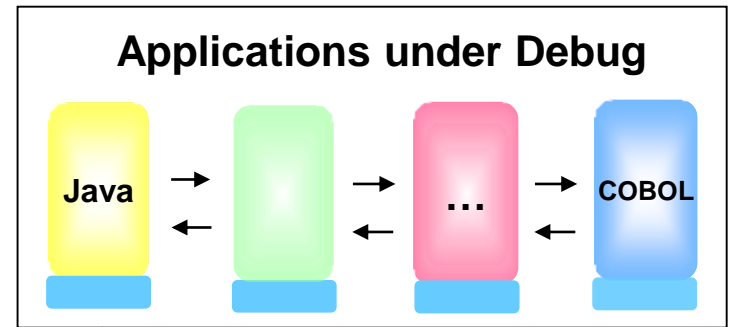
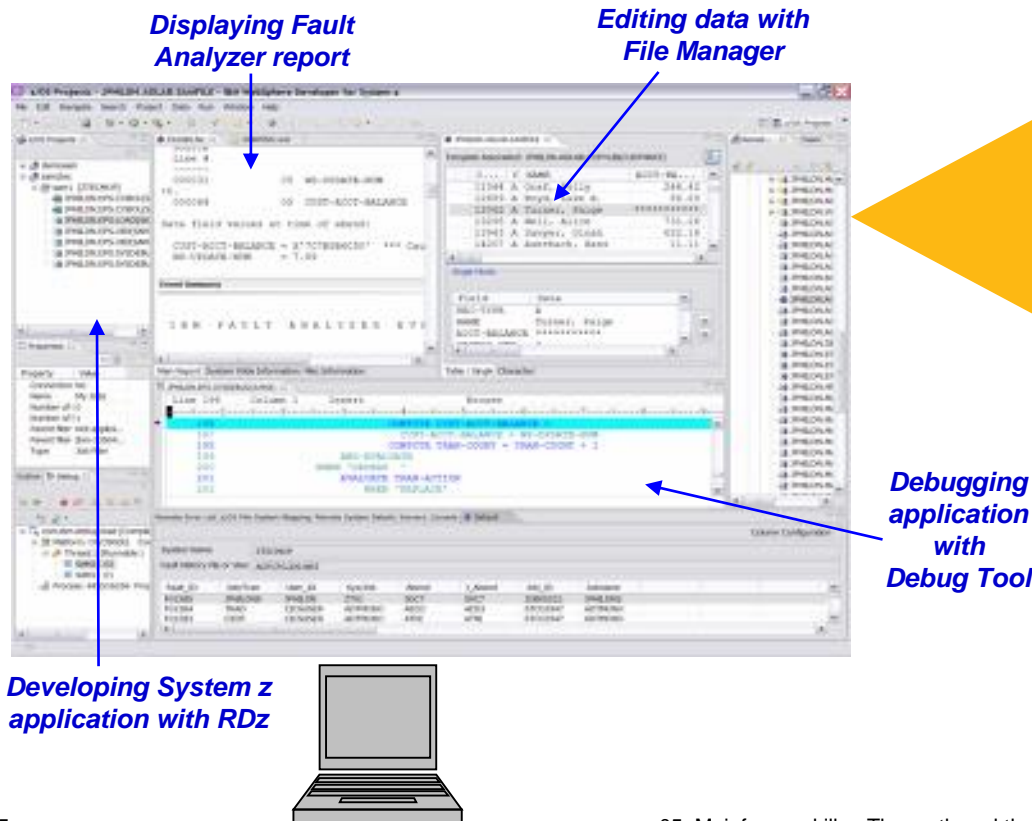
public class SimpleCopy2 {
    public static final String TEMP_FILE = "io.tmp";
    public static final int BUFFER_SIZE = 4096;

    public static void main(String[] args) throws IOException {
        // ...
        start = System.currentTimeMillis();
        transfer(new FileInputStream(args[0]), new
        FileOutputStream(TEMP_FILE));
    }
}
    
```



# Mainframe Problem Determination Tools (PDT) are integrated into the workstation development environment

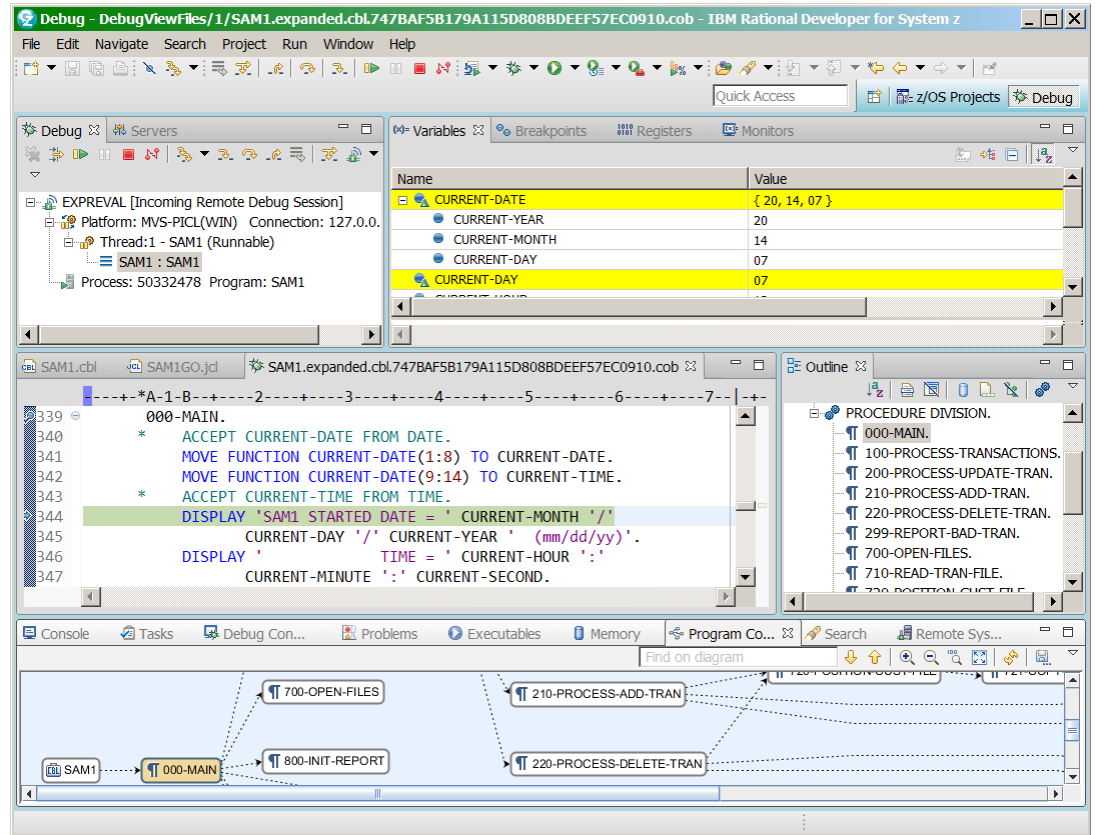
- Easily debug and step through multi-tier applications



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

## DEMO: New RDz v9.1 Integrated Debugger

- Leverages the workstation CPU with smaller mainframe footprint
- Has tighter integration with other views
- Multi-language support
- New breakpoints types can be saved across debugging sessions
- View memory in different formats
- Watch complex variables and see all occurrences of a variable in the code
- New Code Coverage analysis to see what's executed and what's not



## Businesses reap the benefits of modernizing with RDz



By implementing IBM Rational Developer for System z software, UBS produced better quality code that led to fewer deployments into test environments. UBS also gained standard interfaces that allowed them to follow a DevOps strategy toward continuous testing.

---



By implementing an array of IBM Rational software (including RDz, Enterprise COBOL, and Enterprise PL/1), Citigroup significantly raised developer productivity – and can now plan, budget and forecast in a much more efficient way.

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By deploying IBM Rational Solution for Collaborative Lifecycle Management (including RDz), TSYS successfully moved to agile software development and accelerated the delivery of business value while reducing the risks associated with software development

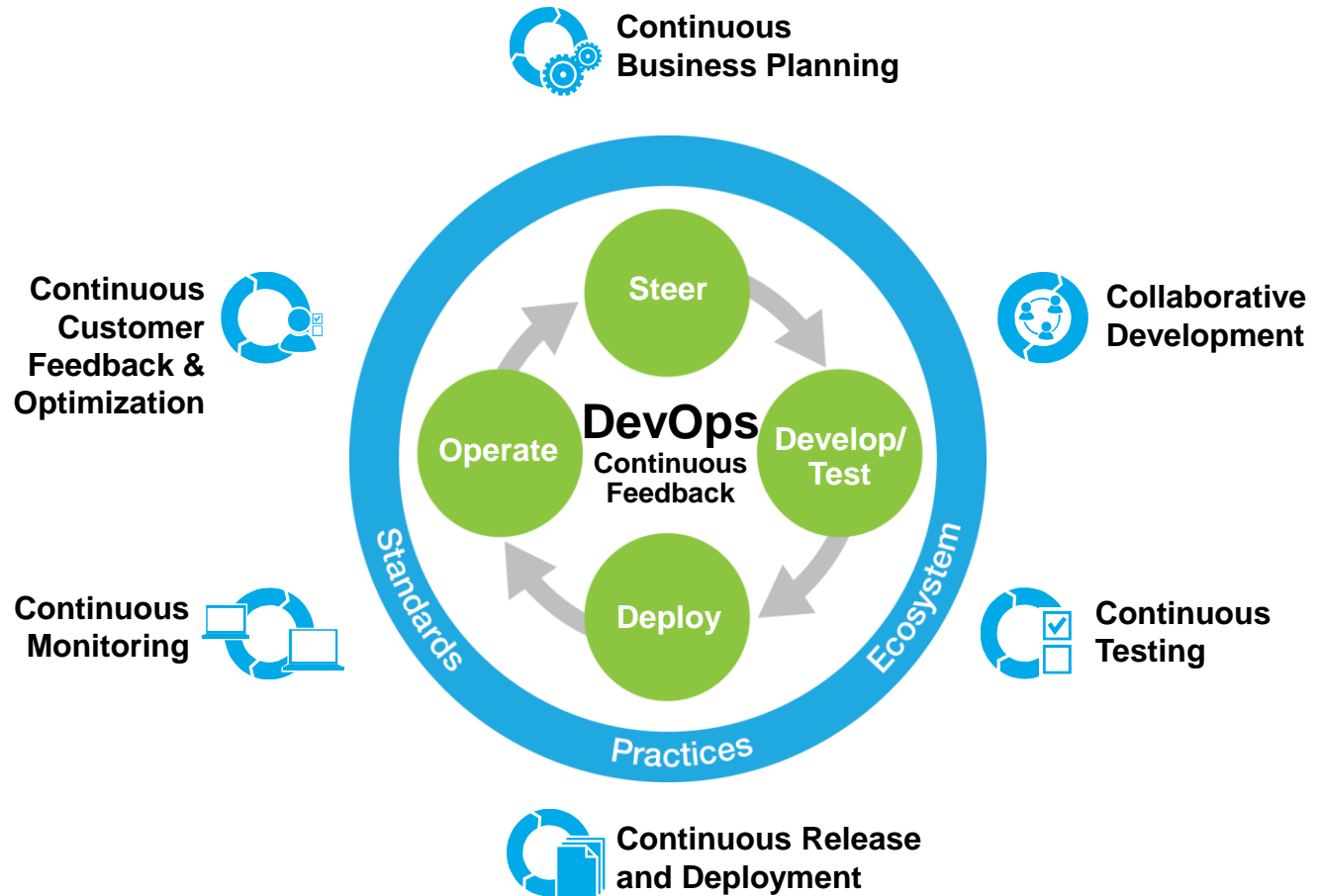
# IBM DevOps point of view

## Enterprise capability to improve efficiency and effectiveness

**Accelerate software delivery – for faster time to value**

**Balance speed, cost, quality and risk – for increased capacity to innovate**

**Reduce time to customer feedback – for improved customer experience**

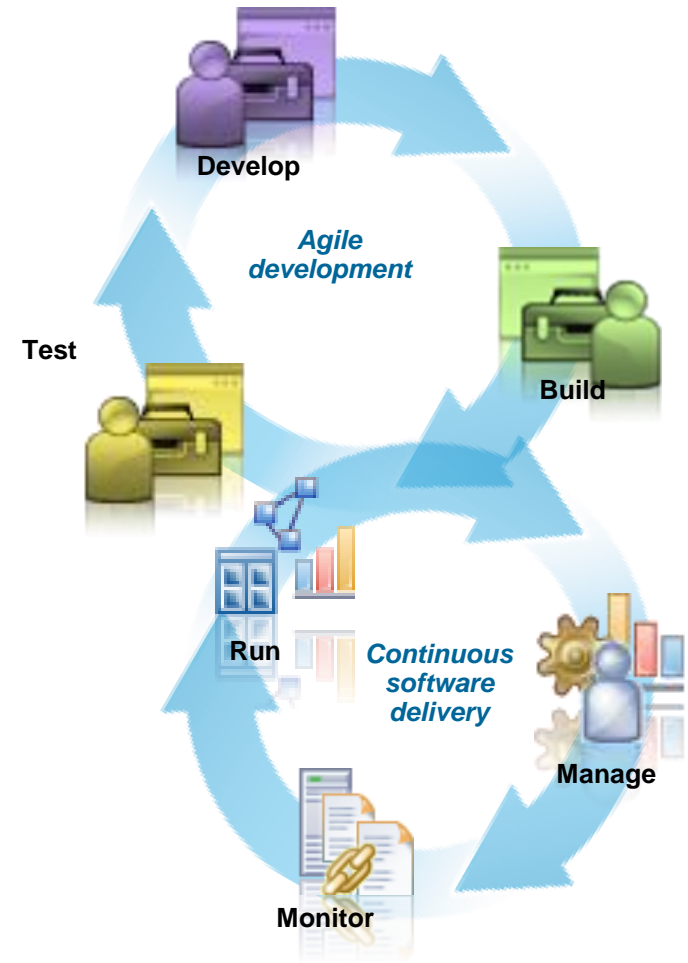


# Tools enable a DevOps approach for continuous development and operations on zEnterprise

Today, customers expect **better product quality** and **shorter release cycles**. Businesses must meet this challenge, while **keeping costs low**

## DevOps:

- A process that addresses this challenge
- Unites Development and Operations around a continuous and agile delivery model
- Enables Testers to have production-like environments
- Ensures an integrated view to govern and manage end-to-end delivery pipeline



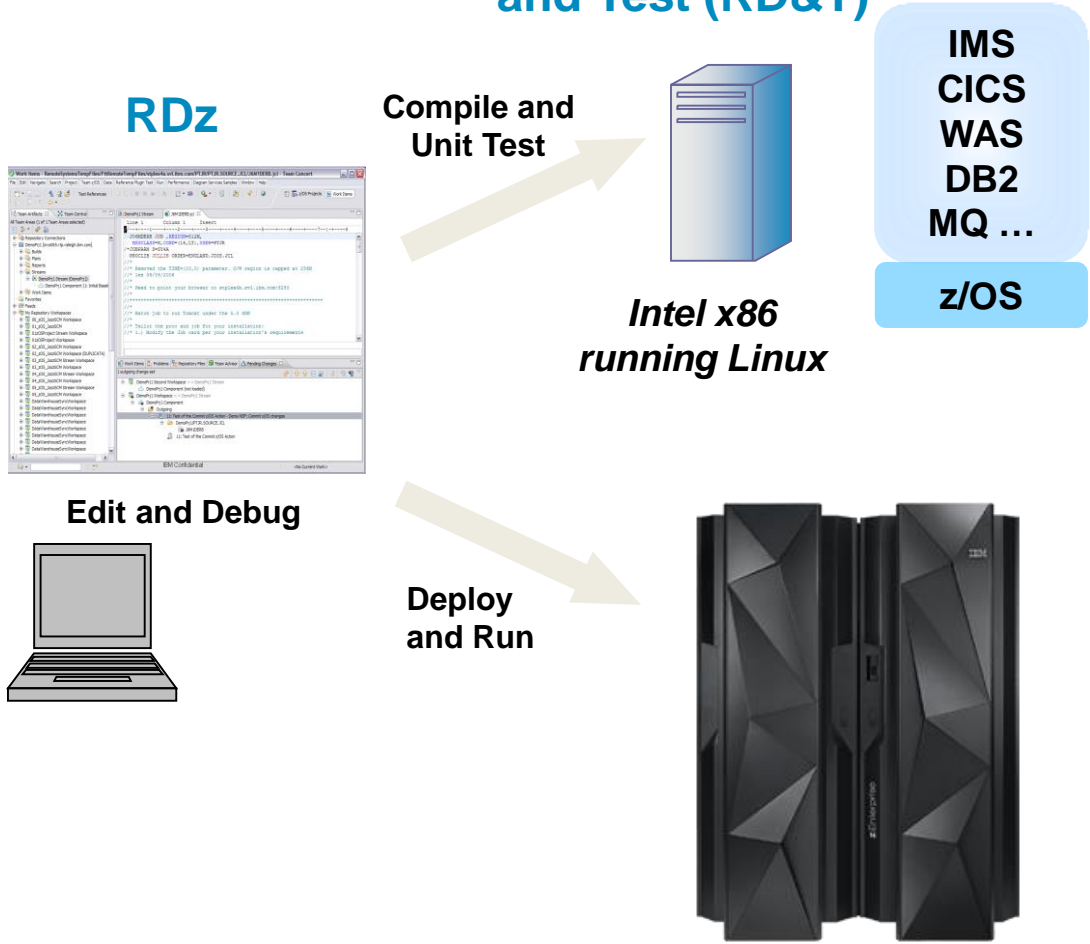
# Integrate Systems of Engagement with Systems of Record

*By bringing together the culture, processes, and tools across the entire software delivery lifecycle – spanning mobile to mainframe platforms*



# Agile compilation and unit test can be done off-platform to reduce costs and simplify operations

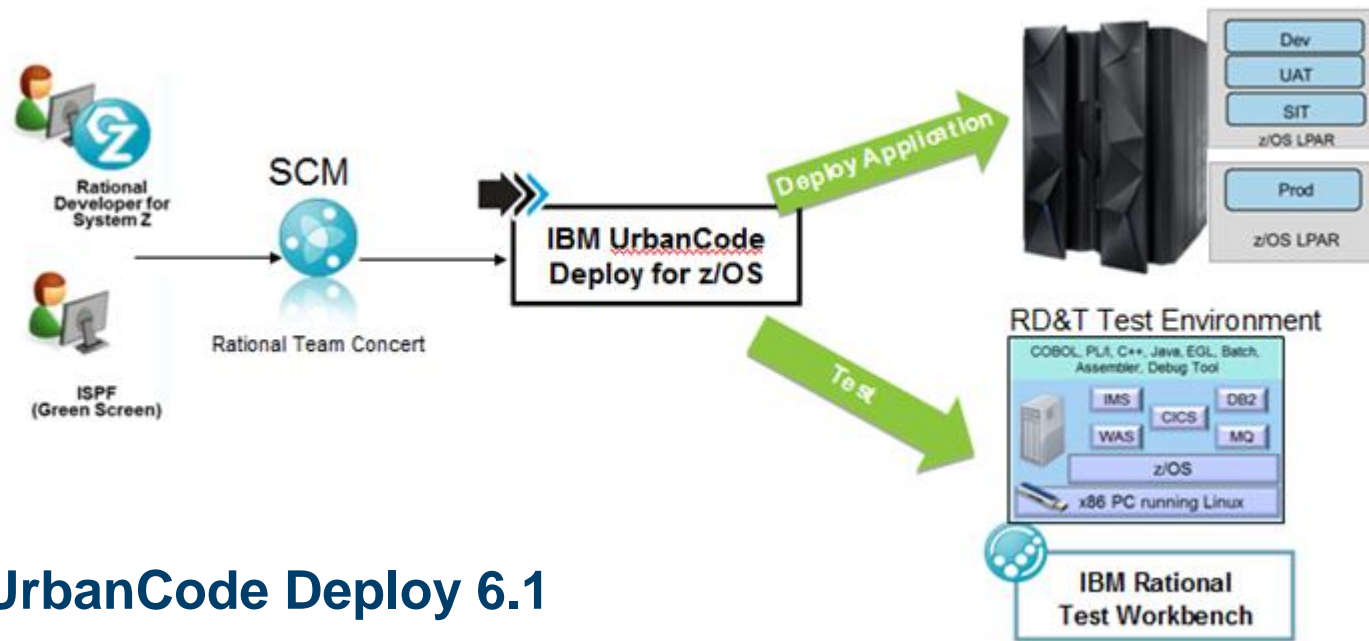
## Rational Development and Test (RD&T)



## No interruptions to mainframe operations

- Compile and Unit Test on an Intel x86 server running Linux
- RD&T server runs z/OS and all mainframe software
- Continuously updated to emulate the latest releases of zEnterprise hardware and software
- Enables developers to rapidly prototype new applications
- Eliminates costly delays by reducing dependencies on operations staff

# Extend DevOps support to back-end Systems of Record



## IBM UrbanCode Deploy 6.1

- Deploy component to IBM z/OS data sets with enhancements to display partitioned data set members in component versions
- Set up artifact repositories in agent relays that cache downloaded artifacts

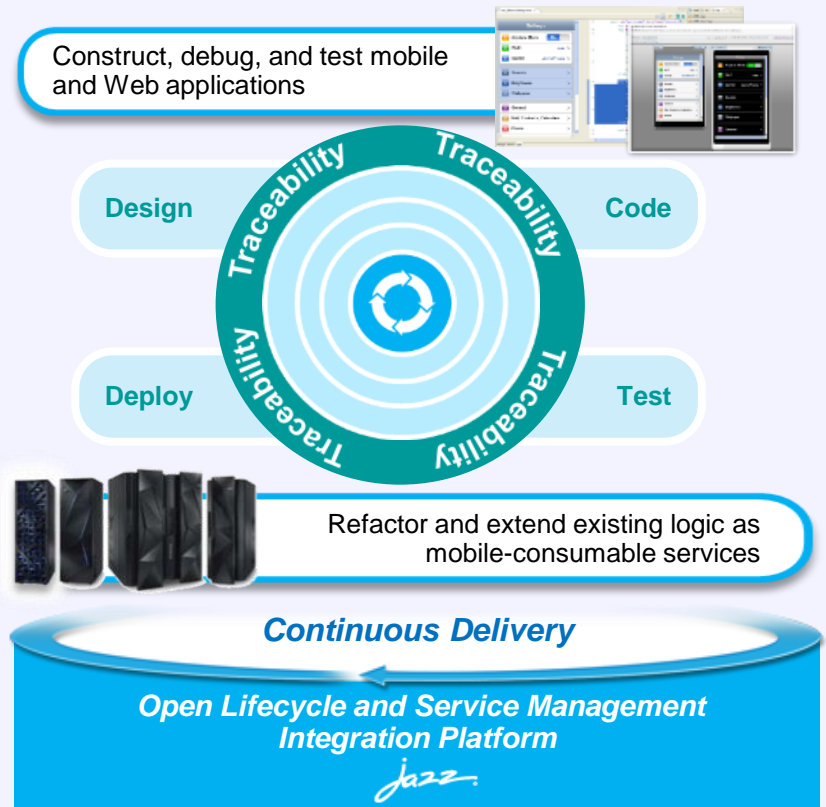
## IBM Rational Test Workbench 8.6

- New Application Topology Discovery feature to quickly discover services used by the system under test
- Full range of features aimed at service testing and virtualization in SAP environments



# DevOps capabilities for mobile applications with enterprise systems

## Accelerate mobile application development



- Rational Test Workbench
- IBM Worklight Platform
- IBM DevOps services for Bluemix
- Rational Application Developer
- IBM UrbanCode Deploy
- Rational Developer for the Enterprise
- CICS Interdependency Analyzer
- CICS Performance Analyzer

### Enabling you to...

- Quickly design, code, build, test, and deploy mobile apps that run on wide variety of mobile platforms
- Refactor and extend existing back-end services to provide optimal mobile experience
- Stub out back-ends to simplify test and development
- Automate testing for native and hybrid mobile apps

## Nationwide embraces DevOps to drive continuous delivery across platforms and improve speed to market

**50% increase**  
in software **quality**  
over the last three years

**90% on-time delivery**  
vs. 60% previously

**70% decrease**  
in user downtime

**58% of developers** moved  
to industry top quartile  
in **productivity measures**



***“We’re more agile as a business and more responsive to our customers. Collaboration has become an expected part of our culture.”***

— Steve Farley, Vice President,  
Application Development Center, Nationwide



## Three things to keep in mind

1

Numerous indicators show mainframe usage continuing to grow for the foreseeable future

2

IBM has made considerable investment in intuitive, GUI-based tools for mainframe administration and development

3

**IBM continues to invest heavily in development of mainframe skills for the next generation**

# Through the Academic Initiative, IBM is working to train new mainframe developers and administrators

- Since its inception in 2003, the program has grown significantly benefiting schools, students, and clients
- Market place demand for enterprise systems resources over the last decade has remained strong
- Our clients have expressed continued interest in expanding the program to ensure a healthy ecosystem

<http://www.ibm.com/university/systemz>

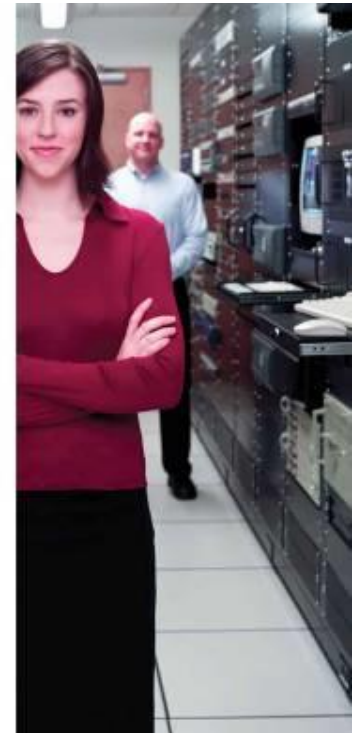
**Corporate Engagement**  
360+ companies actively recruiting

**Professional Connections**  
9 Communities

**Job Candidates**  
Over 4,200 Job Seekers

**Growth**  
64K+ Students  
1,000+ Schools  
in 70 countries

**Program Investment**  
\$10M+ over  
in 10 years



# IBM zEnterprise Academic Initiative

## Major Academic Institutions and Key Recruiters



UNIVERSITY OF  
ARKANSAS

EBERHARD KARLS  
UNIVERSITÄT  
TÜBINGEN



### Recruiters

Cigna  
Compuware  
EMC  
Fidelity  
JP Morgan Chase

### Recruiters

CROC  
Lusoft  
Rosoboronexport



### Recruiters

HSBC  
Tivit

### Recruiters

China Construction  
Bank

### Recruiters

Citi



l'École  
d'ingénierie  
informatique

### Recruiters

Bull  
Groupama

# Master the Mainframe competition is helping a new generation find opportunity in the mainframe

A three-part contest of increasing difficulty, open to high school and college students and offered around the world



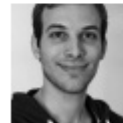
**43** students from **23** countries



**Yong-Siang Shih - 1**  
Score: 3407  
National Taiwan University  
Taiwan



**Rijnard van Tonder - 2**  
Score: 3329  
Stellenbosch University  
South Africa



**Philipp Egli - 3**  
Score: 3186  
University of Brighton  
United Kingdom



**Mugdha Kadam - 4**  
Score: 3031  
University of South Florida  
United States

**GENERATION Z.**  
*They will create the future.*

# Use the Job Board to find needed skills



## Welcome to the System z Job Board

**Are you looking to hire talented System z professionals?**  
**Are you seeking a career with System z technology?**

Then you've found the right place! This web site connects IBM System z clients, partners and businesses with students and professionals seeking System z job opportunities.

**Special limited-time offer!** Employers who hire a candidate through Systemzjobs.com and agree to publicize their hiring success can receive a voucher to send an employee to an instructor-led [online System z course](#) (valued at \$1,200). Once you make a connection through Systemzjobs.com, simply send an email to [zskills@us.ibm.com](mailto:zskills@us.ibm.com) to request your voucher. First-come, first-served!

### Job Seekers

- **View Job Opportunities**  
Browse the hottest new jobs in the enterprise computing industry.
- **Receive job alerts**  
Set up a job agent so that jobs matching your search will be emailed to you.
- **Create a free account**  
Store job openings and manage your job search through your My Career account.
- **Access your account**  
Log in to your free My Career account.

### Employers/Recruiters

- **Post a job**  
Post your System z job here to attract the most qualified candidates from universities and industry.
- **Create a free account**  
Manage your job posts through your My Recruiting account.
- **Access your account**  
Log in to your free My Recruiting account.

<http://systemzjobs.com>

# Every mainframe IT manager should know...


## The Academic Initiative!

- Locate schools **teaching enterprise systems to recruit new talent**
- Partner with IBM **to build new skills for your business**  
[zskills@us.ibm.com](mailto:zskills@us.ibm.com)
- Advertise job opportunities **to students and experienced professionals**  
[systemzjobs.com](http://systemzjobs.com)
- Use resources **to assist with building employees skills (internal training programs)**  
[www.ibm.com/systems/z/education/skills\\_coursematerials.html](http://www.ibm.com/systems/z/education/skills_coursematerials.html)
- Build credentials **through the Mastery Test**  
[www.ibm.com/certify/mastery\\_tests/ovrZ05.shtml](http://www.ibm.com/certify/mastery_tests/ovrZ05.shtml)
- *Online mainframe education (certificates)*  
[www.idcp.org/learnzos.html](http://www.idcp.org/learnzos.html)
- Stay connected **with through communities and social media. “Like” us on Facebook.**



# Career opportunities abound!

<https://synapse.metlife.com/>



## Explore(**Jobs, MetLife**);

### MetLife

#### MetLife Technology Transforming Business [Watch >](#)

Learn more about how mainframe and emerging technologies are shaping innovation at MetLife - as told by our own MetLife technology associates.

#### SYNAPSE [Begin >](#)

We're looking for the best and brightest technologists to join our MetLife team, people who share our passion for moving quickly and using the latest tools and technologies. Technologies like what powers this site, built in less than two weeks using **NodeJS**, hosted in **Microsoft Azure Cloud**, and leveraging **MongoDB**.

If you're interested in exploring, please click Begin above and proceed to the next page. Depending on how you describe your interests, you will be presented with a scheme that will survey your ability to think critically and provide solutions for our day-to-day tech challenges. This is a way to have some