

16733: Mainframe Skills – the Myth and the Reality

David Rhoderick, IBM



#SHAREorg



SHARE is an independent volunteer-run information technology association that provides **education, professional networking and industry influence.**



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**

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).

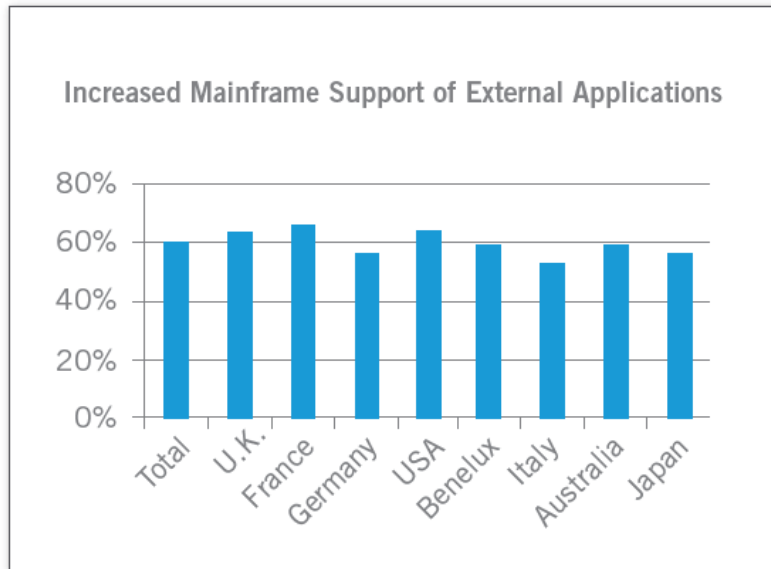


Chart 9: 62 percent of companies are using their mainframes to support external applications, such as online banking.

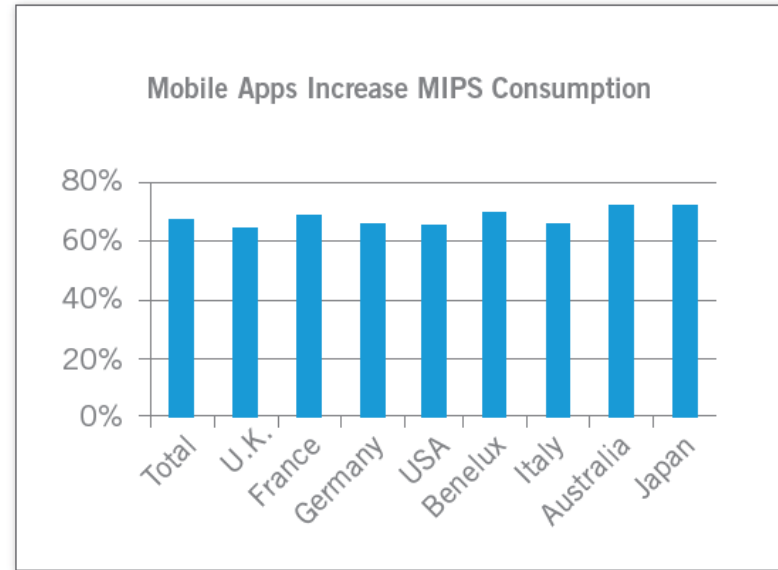
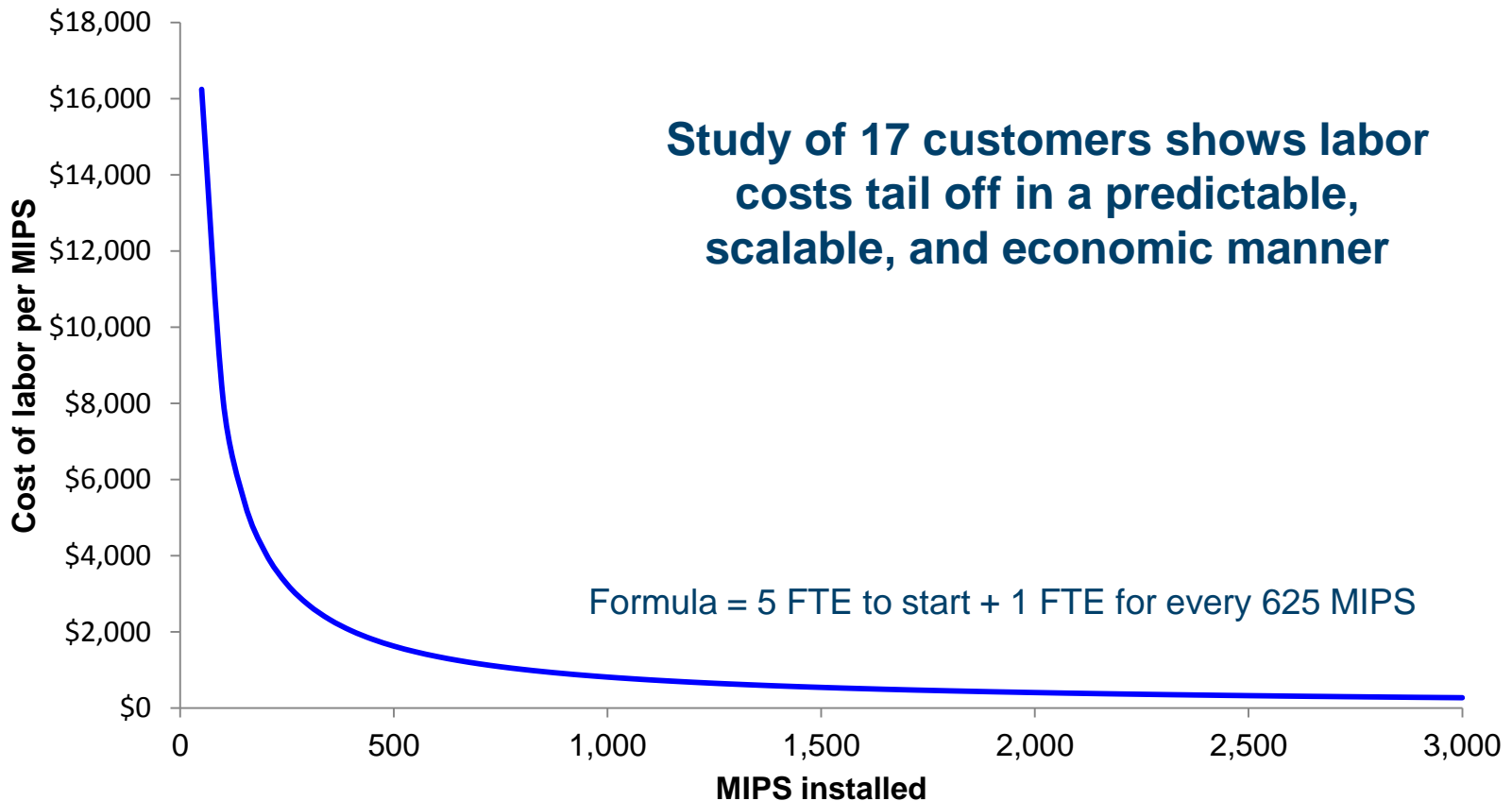


Chart 10: 68 percent of respondents believe that the increase in mobile applications is driving higher MIPS usage.

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

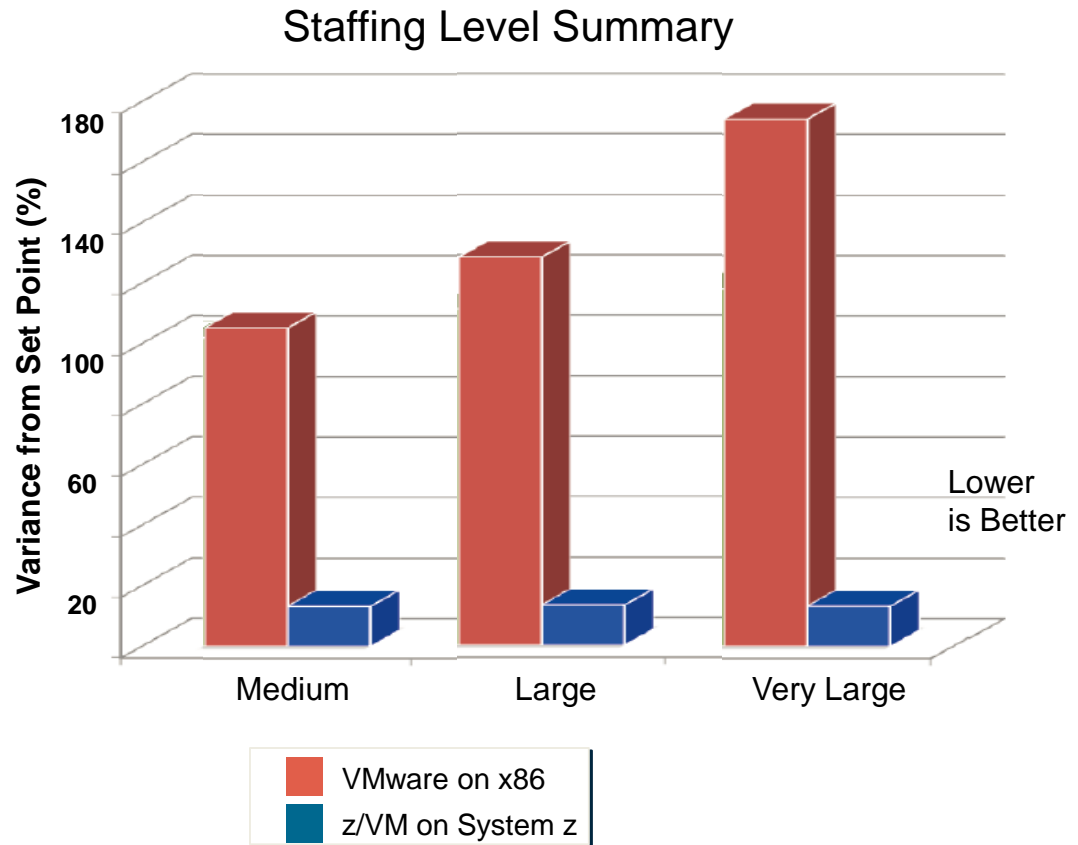
Labor cost per mainframe MIPS



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

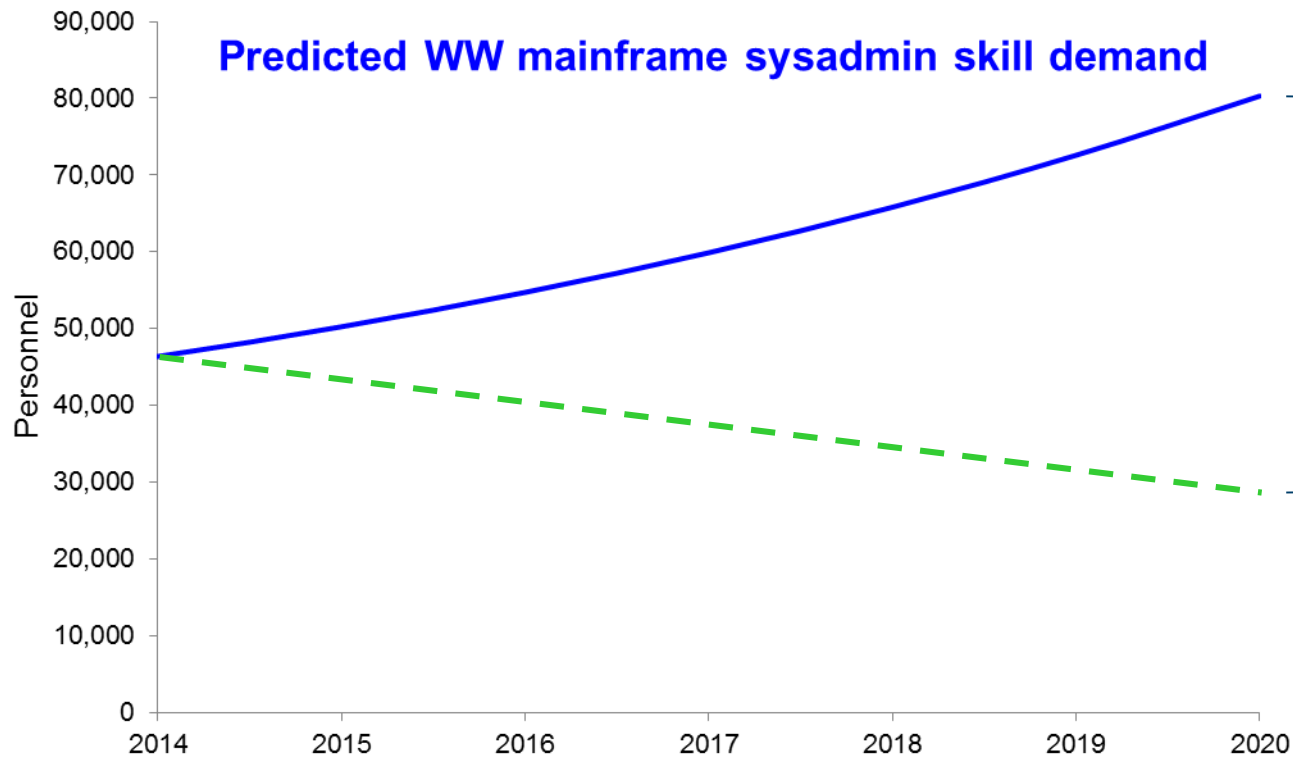
Staffing levels required to maintain a “gold standard”:

- 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 2005-13
- Some number of today's personnel will retire by 2020, increasing that demand



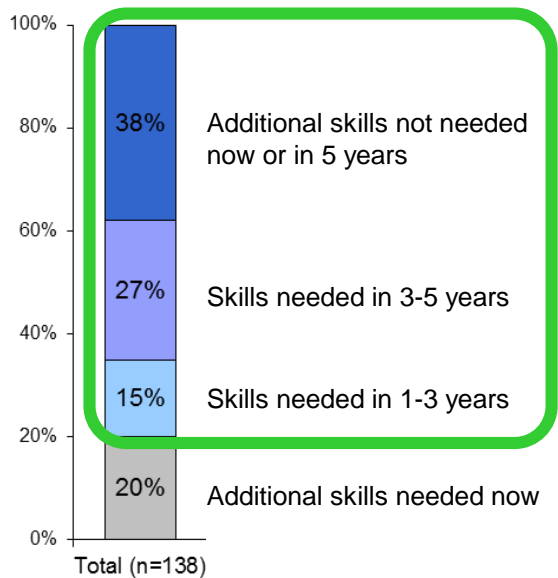
IBM programs such as the Academic Initiative are targeted to meet this demand

(Academic Initiative trains on average 6,400 annually)

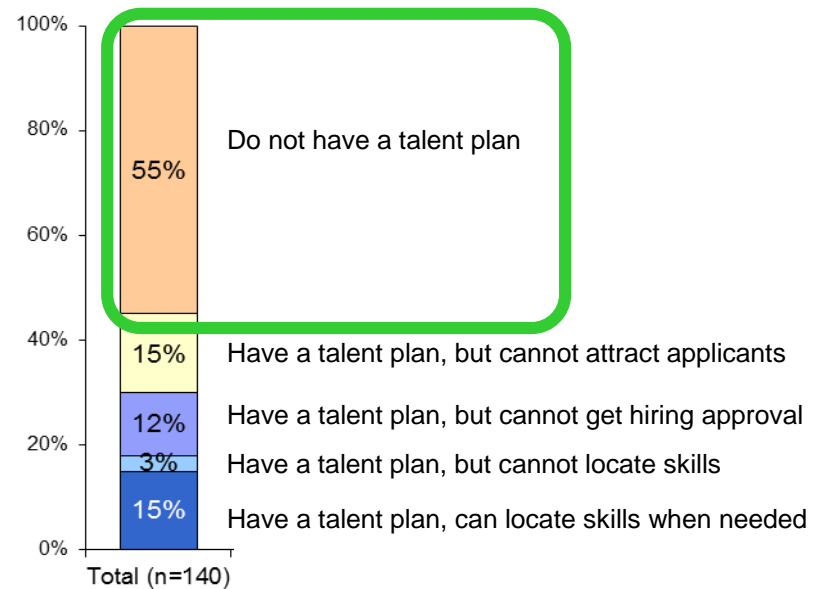
Source: IBM CPO estimations based on IBM data and assuming current productivity levels

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



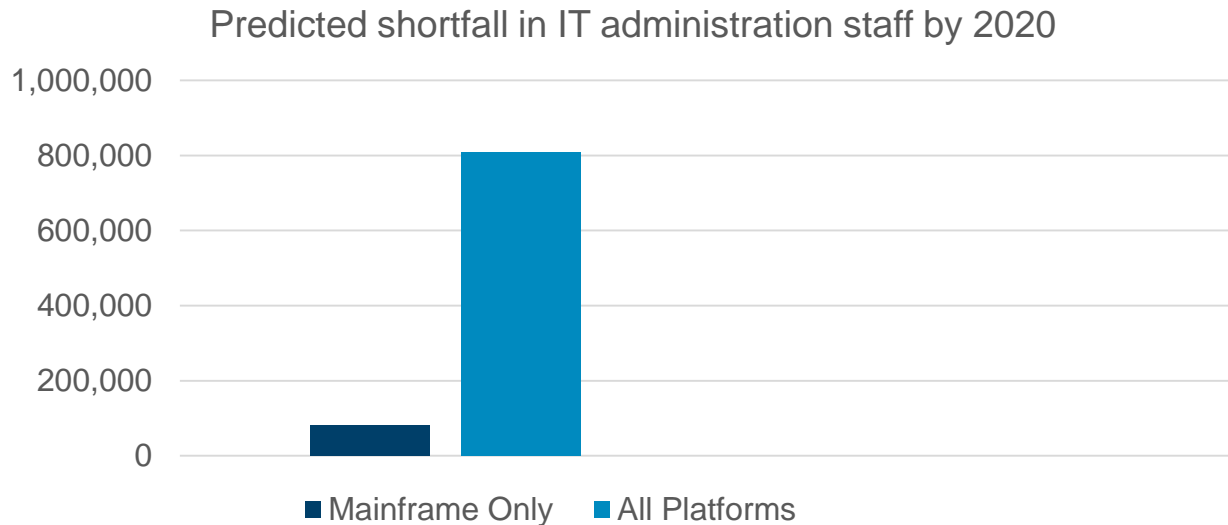
55% of System z sites don't have a talent plan for mainframe skills



Source: IBM's 2013 System z Tracker

**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 a talent plan should cover all platforms within the data center, and not just the mainframe

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, development and security

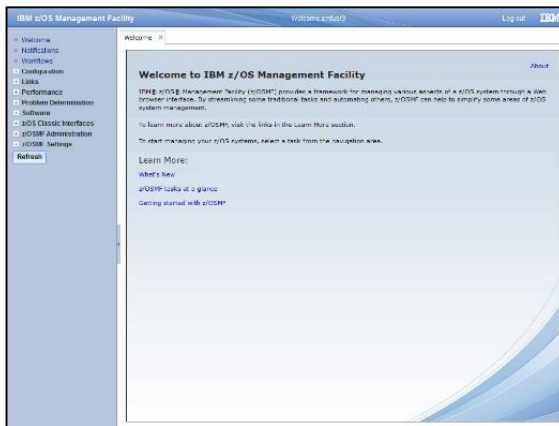
3

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



↔
HTTP(S)



z/OSMF (Jobs and Resources → SDSF section)

Active Jobs Statistics Common and table filters applied

System: [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%
PROUTES	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.

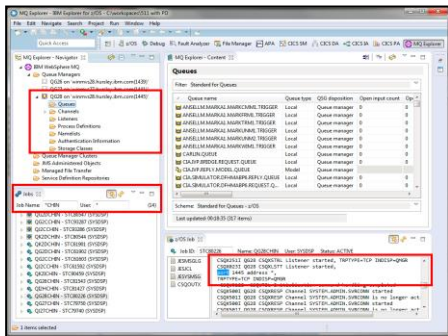
Type to filter properties

- General**
- Advanced**
- Performance**
- Scheduling**
 - C: FF
 - DP: TSOHIGH
 - ResGroup: TSOHIGH
 - RptClass:
 - SP: 1
 - SrvClass: TSOHIGH
 - Workload: TSO_WLD
- Security**
- Status**

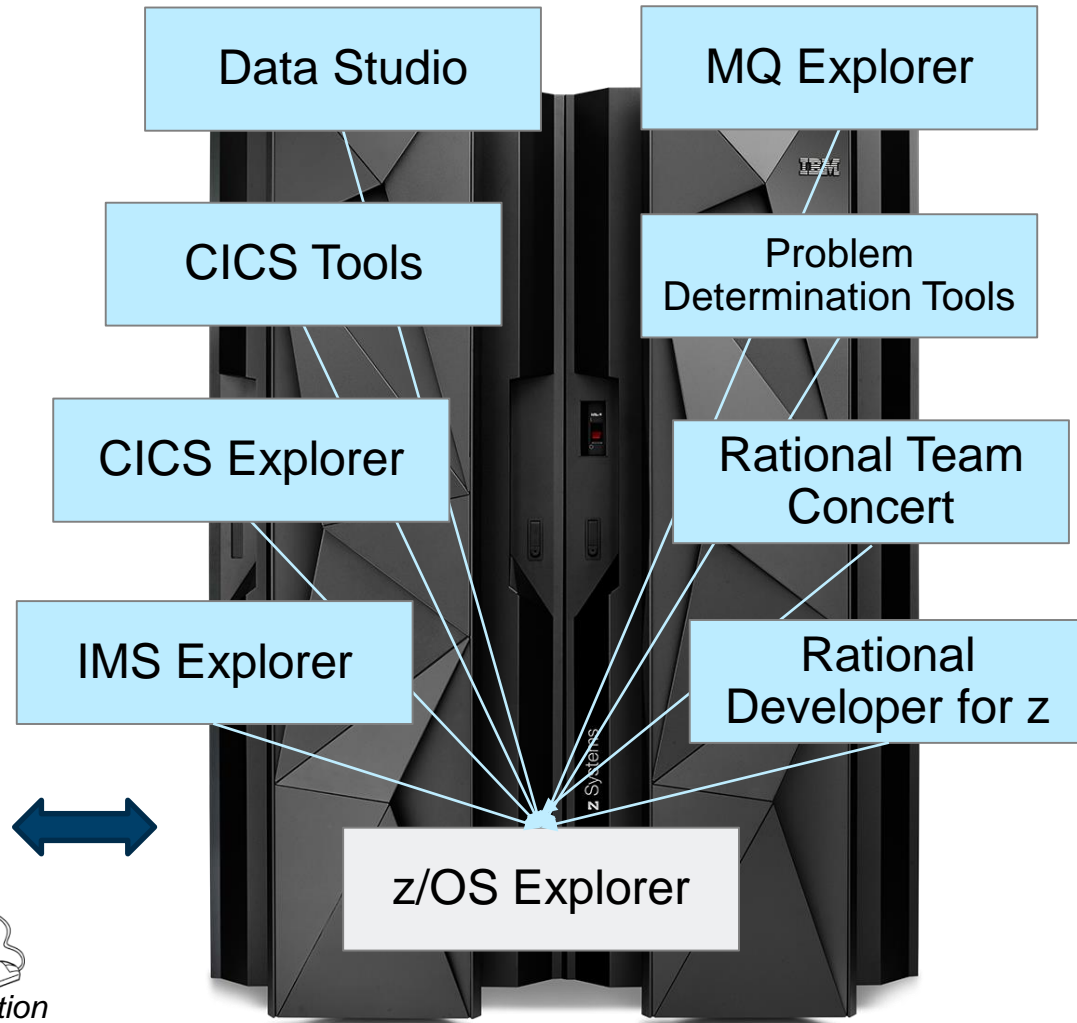
z/OS administrators can work on an Eclipse-based integration platform

- Runs on a workstation; common base for many z/OS tools
- Foundation for a workbench of plug-ins with which to develop/test z/OS applications and manage related sub-systems
- Extendable to accommodate user's roles and responsibilities using Eclipse-based plug-ins

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



Eclipse workstation



For example, CICS Explorer eases CICS management

- View and control the CICS runtime and its resource definitions
- Easily create and manage CICS regions, tasks, files, transactions, events, etc.

CICS Explorer is especially useful when managing across a CICSplex (CICS Parallel Sysplex)

The screenshot displays the IBM CICS Explorer interface with several key components:

- Left Panel:** Shows the CICSplex Explorer tree for server EGCM, listing CICSplex Repositories and TASKID(000049C) under TRANSID (MAIL) in Region IYDZEJ0B. It details TCB Modes Used and a list of commands (123).
- Top Center Panel:** A table listing CICS resources with columns for Name, Version, Create Time, Change Time, Description, and Status. Resources include PHIL, RLINK, RSLEEP, RSTART, and CSQ4VD0.
- Bottom Center Panel:** A bar chart titled 'Properties' showing 'Time (seconds)' on the y-axis and 'Transaction ID (number of transactions)' on the x-axis. The chart compares three transactions: PTS1 (196), PTS1 (804), and PTS1 (4).
- Right Panel:** The 'Queues' panel displays a list of queue names, types, and QSG details. An arrow points from the text box to this panel.

Because it's Eclipse-based, other tools can be integrated into the same view (MQ Explorer)

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

Additional GUI-based tools enable efficient management of the entire enterprise

Tivoli Enterprise Portal

Navigate among objects

The screenshot displays the Tivoli Enterprise Portal interface with several panels:

- Navigator:** A tree view on the left showing a hierarchy of system objects, with 'Address Space Overview' selected.
- CPU Usage:** A 3D bar chart titled 'Monitor CPU usage' showing usage for various jobs. A legend includes TCB Percent, SRB Percent, IFA Percent, zIIP Percent, and zIIP on CP Percent.
- Central Storage Frame Count:** A bar chart comparing 'Central Frame Count' (yellow) and 'Fixed Frame Count' (blue) across different jobs.
- Address Space Counts:** A table with columns: Address Space Count, Started Task Count, Batch Job Count, TSO User Count, APPC Count, Total Enclave Count, Active Enclave Count, and Inactive Enclave Count.
- Address Space CPU Utilization Summary:** A table with columns: Job Name, Step Name, Proc Step, Type, SvcClass, SvcClass Period, ASID, JESJOBID, CPU Percent, TCB Percent, and SRB Percent.
- Fixed Storage:** A bar chart showing storage usage categorized into 'Low Fixed (Mb)', 'Extended Fixed (Mb)', and 'Large Fixed (Mb)' for various jobs.

Monitor central storage frame count and fixed storage

View address space CPU utilization

Errors can be handled quickly and intelligently

Tivoli Enterprise Portal

The screenshot displays the Tivoli Enterprise Portal interface. At the top, a navigation pane shows a tree view of the system hierarchy, including 'Enterprise', 'New Tables for IMS Systems', 'PFWOLER', 'Windows OS', 'Prototype::TWS', and 'TWS_Error_States'. The main area is split into two sections. The upper section, titled 'Job Duration', features a 3D bar chart with the y-axis labeled 'Seconds' ranging from 0 to 400. Three bars represent jobs: HOR50005 (approx. 350s), HOR50007 (approx. 50s), and HOR50001 (approx. 150s). A callout box points to the chart with the text: 'Graph showing duration times for each job that has executed'. The lower section, titled 'Tivoli Workload Scheduler Detailed Job Status', contains a table with columns for Timestamp, Job Description, Application Identifier, Job Name, Operation Number, WS Identifier, Descriptive Text, Actual Start Time, Actual End Time, Duration, Error Code, and Job Status. A callout box points to the 'Job Status' column with the text: 'Thresholds on Status states'. The table shows various job statuses such as Complete, Error, Started, Waiting, Ready, and Active. The bottom status bar indicates 'Hub Time: Fri, 02/10/2006 04:33 PM' and 'Server Available'.

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	HOR50030	030	CPU	Operation 030	00:00:00	00:00:00	00:00:00	-	Waiting
02/10/06 16:33:39	HOR50DAY	HOR50DAY	HOR50010	010	CPU	Operation 010	00:00:00	00:00:00	00:00:00	-	Ready
02/10/06 16:33:39	HOR50DAY	HOR50DAY	HOR50035	035	CPU	Operation 035	00:00:00	00:00:00	00:00:00	-	Waiting
02/10/06 16:33:39	HOR50DAY	HOR50DAY	HOR50020	020	CPU	Operation 020	00:00:00	00:00:00	00:00:00	-	Waiting
02/10/06 16:33:39	HOR50DAY	HOR50DAY	HOR50025	025	CPU	Operation 025	00:00:00	00:00:00	00:00:00	-	Waiting
02/10/06 16:33:39	HOR50DAY	HOR50DAY	HOR50015	015	CPU	Operation 015	00:00:00	00:00:00	00:00:00	-	Ready
02/10/06 16:33:39	HOR50DAY	HOR50DAY	HOR50011	011	CPU	Operation 011	00:00:00	00:00:00	00:00:00	-	Waiting
02/10/06 16:33:39	HOR50DAY	HOR50DAY	HOR50001	001	CPU	Operation 001	00:00:00	00:01:40	00:01:40	-	Complete
02/10/06 16:33:39	HOR50DAY	HOR50DAY	HOR50004	004	CPU	Operation 004	00:00:00	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

(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)



YOUR IT CAREER

By Eric Bloom FOLLOW

College students learning COBOL make more money

ITworld | September 15, 2014

Yes, you read the title of this column correctly. College students who take COBOL as an elective course as part of their college studies were hired at a higher starting salary than their peers.

I had the great pleasure of speaking with Professor Leon Kappelman, Ph.D. He is the Director Emeritus, Information Systems Research Center in the Information Technology and Decision Sciences Department (ITDS) at the College of Business, University of North Texas (UNT).

Just by chance, Prof. Kappelman saw my ITworld blog titled [COBOL will Outlive Us All](#) and contacted me to tell me about a joint venture that UNT has with IBM and how his graduates get high-paying jobs with major US corporations that have COBOL based applications running within their data centers.

As funny as it sounds, if you are looking for a job in IT that will most likely exist for a very long time, learn to program in COBOL. The companies with these COBOL-based systems are very smart, well run IT shops. They know that this issue exists or will exist soon. As a result, some are outsourcing the maintenance of these systems to other companies in other countries. Some companies, at great expense, are once again trying to replace or rewrite them using newer technologies. Finally, other companies will make the decision to recruit and, if needed, train a new generation of programmers.

In the early 1980s, I was told that COBOL was going away and that I should quickly move toward other programming languages. Well, thirty years later, COBOL is alive and well and living in large companies everywhere.

Yes, more than 100 million COBOL programs are still running in the world.

FEATURED RESOURCE



Presented by PC Connection | EMC

10 Reasons: VSPEX End User Computing with XtremIO

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

COBOL's use

- 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 you need to get programmers to learn a language quickly and that the resulting code needs to be readable by non-programmers
- not 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

“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**

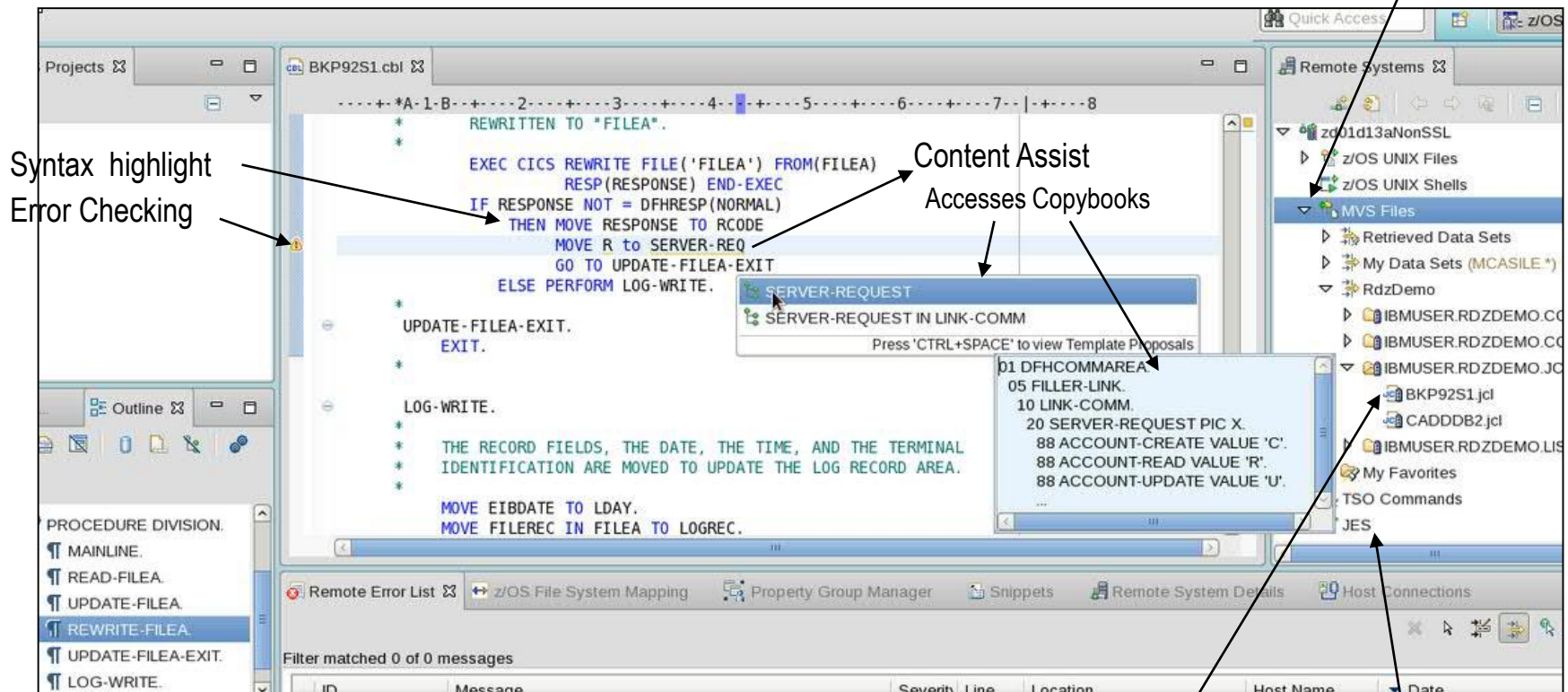
From: http://get.syr.edu/news_alt.aspx?recid=269

http://www.computerworld.com/s/article/9225099/Cobol_brain_drain_Survey_results?taxonomyId=154&pageNumber=2

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

- Supports all major languages (COBOL, PL/I, ASM, C/C++, Java)
- Supports all major runtimes (IMS, CICS, Batch, USS, DB2, WAS, Linux, Cloud)
- Web Services/JSON functionality, plugins for code analysis, debugging, and more

Edit host files and members, filtered file sets, or work disconnected



Syntax highlight
Error Checking

Content Assist
Accesses Copybooks

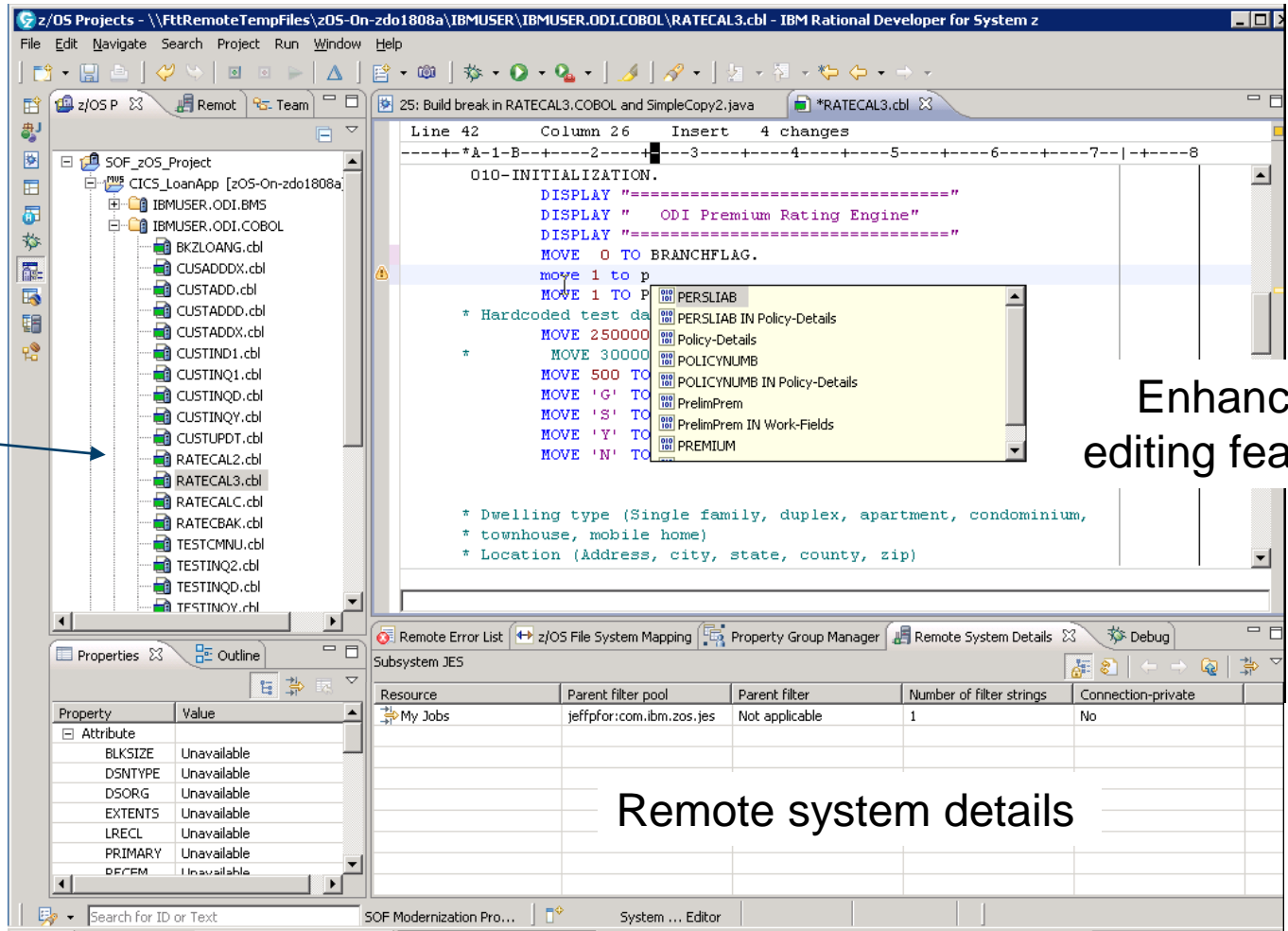
Outline view presents COBOL structure

Edit/Submit JCL

View JES output

COBOL development using state-of-the-art Eclipse-based tools

COBOL files



Enhanced editing features

Remote system details

Use a single, rich, integrated interface for all zEnterprise development

Rational Developer for System z

- 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 RDz Eclipse interface with several key components highlighted by blue arrows and text:

- Disconnected -vs- Connected:** A label in the top-left pane indicating the connection status of the remote system.
- Configurable Editor:** A label pointing to the main code editor window displaying JCL code.
- USS Command Shell:** A label pointing to the USS shell interface at the bottom of the editor.
- TSO Command Shell:** A label pointing to the TSO shell interface at the bottom of the editor.
- JES sub-system view:** A label pointing to the JES job status window at the bottom right.
- MVS PDS members:** A label pointing to the tree view of PDS members in the left-hand pane.
- Data set characteristics:** A label pointing to the Properties view at the bottom left, which shows details for a specific data set.

RDz Eclipse interface

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

- Features in RDz enable cross-pollination of development skills
- RDz makes it easy for Java developers to also contribute to COBOL applications
- Build for z/OS, for Linux on z, for a cloud of Linux on z servers

Use the Remote System Explorer to see Projects on z Systems

Switch to Projects to edit COBOL files

Switch to the Java perspective to edit Java files

```

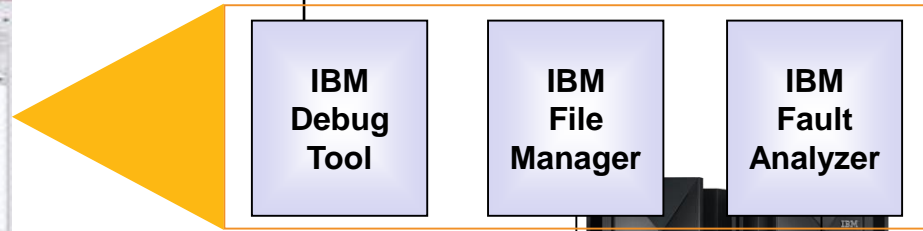
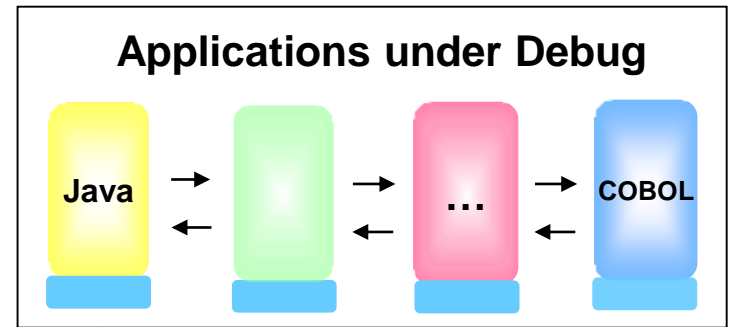
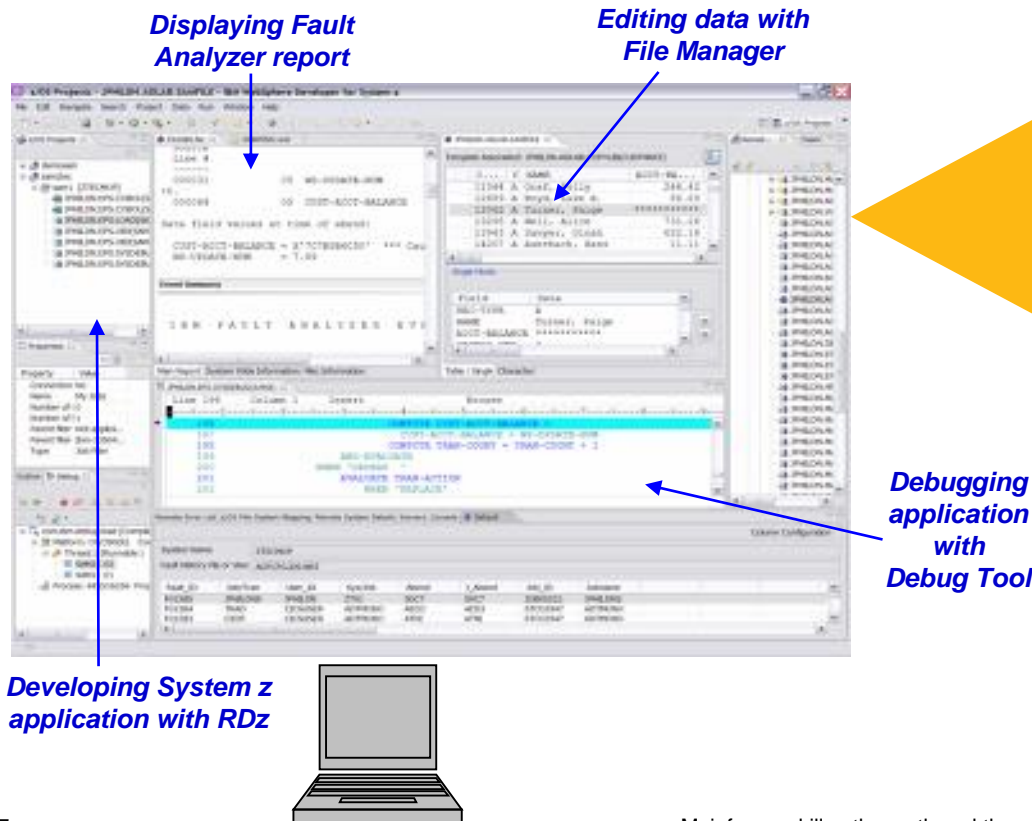
package sof;
import java.io.File;

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 {
        // ...
    }
}
    
```


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

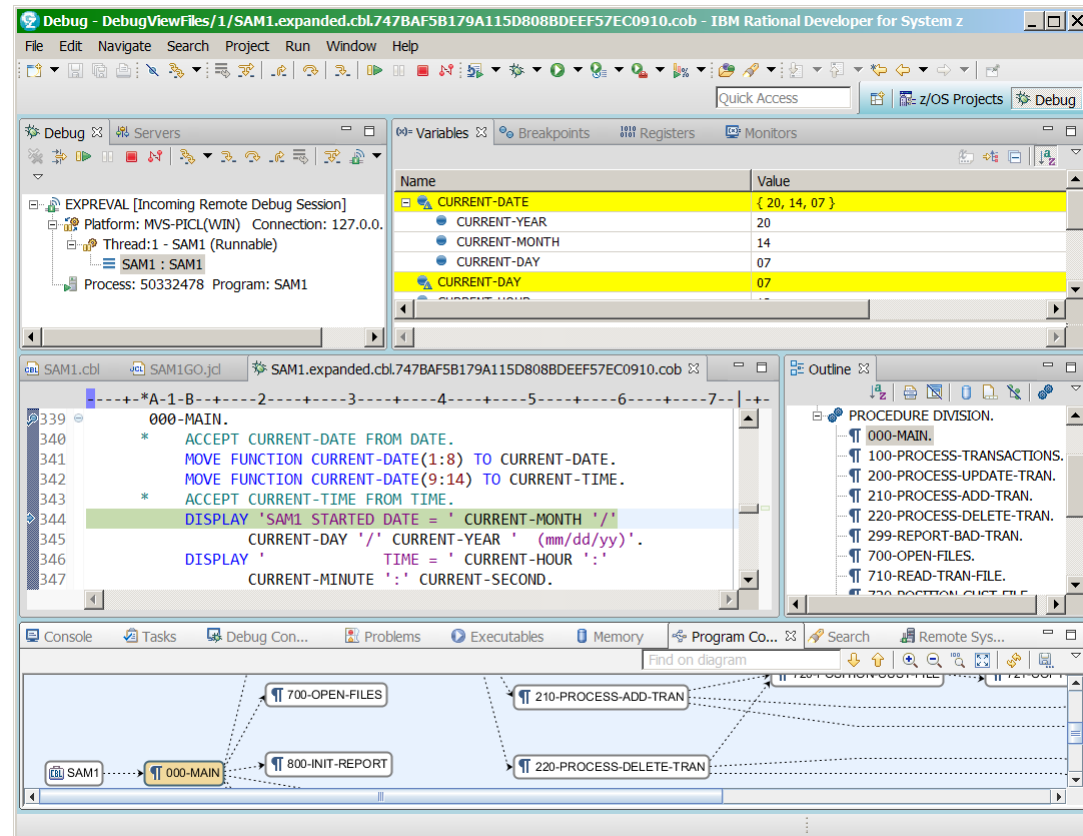
- Easily debug and step through multi-tier applications



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

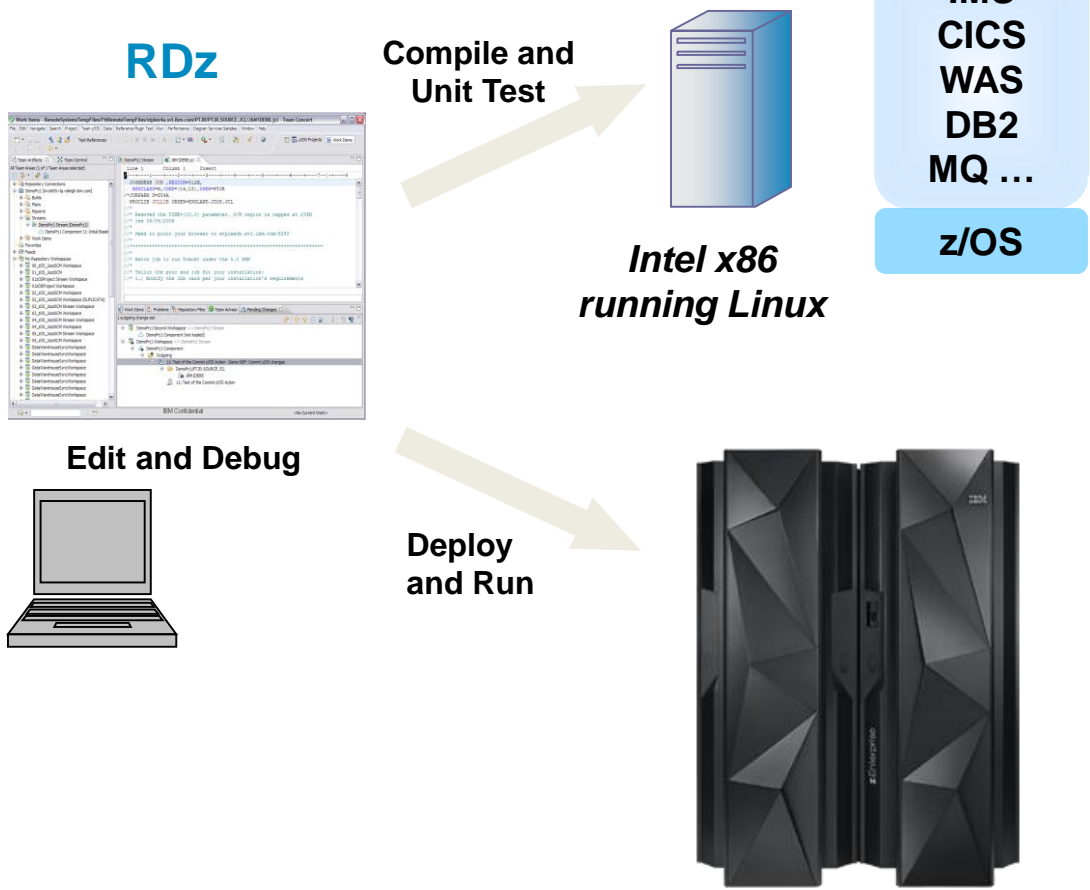
RDz v9.1 new Integrated Debugger

- 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



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

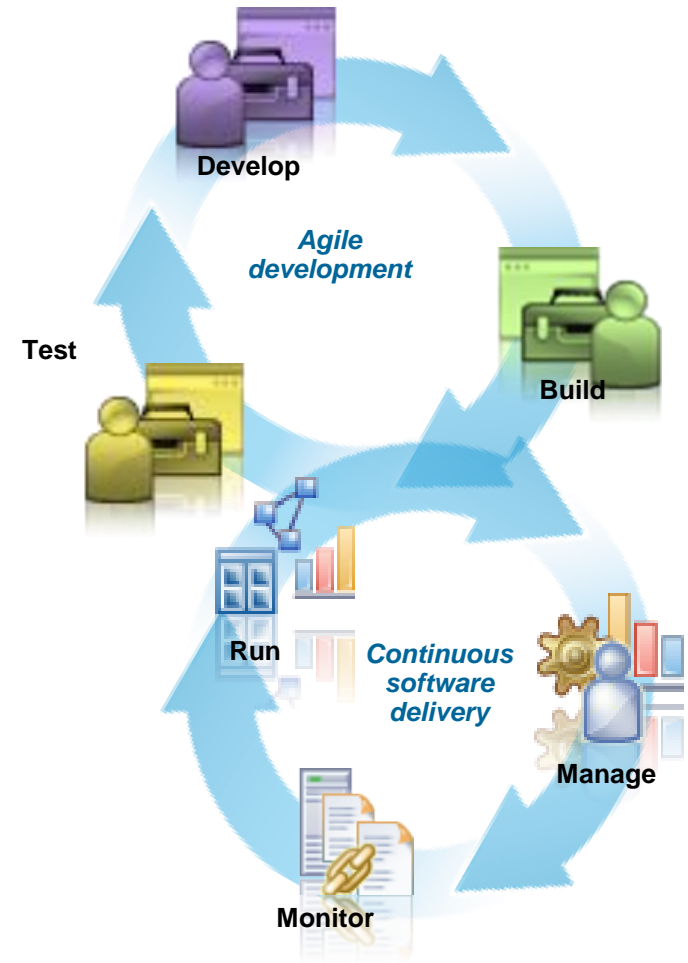
- Compile and Unit Test on an Intel x86 server running Linux
- RD&T server runs z/OS and all mainframe software
- Continuously updated to emulate the latest releases of zEnterprise hardware and software
- Enables developers to rapidly prototype new applications
- Eliminates costly delays by reducing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

Tools enable a DevOps approach for continuous development, operations and integration across the enterprise

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



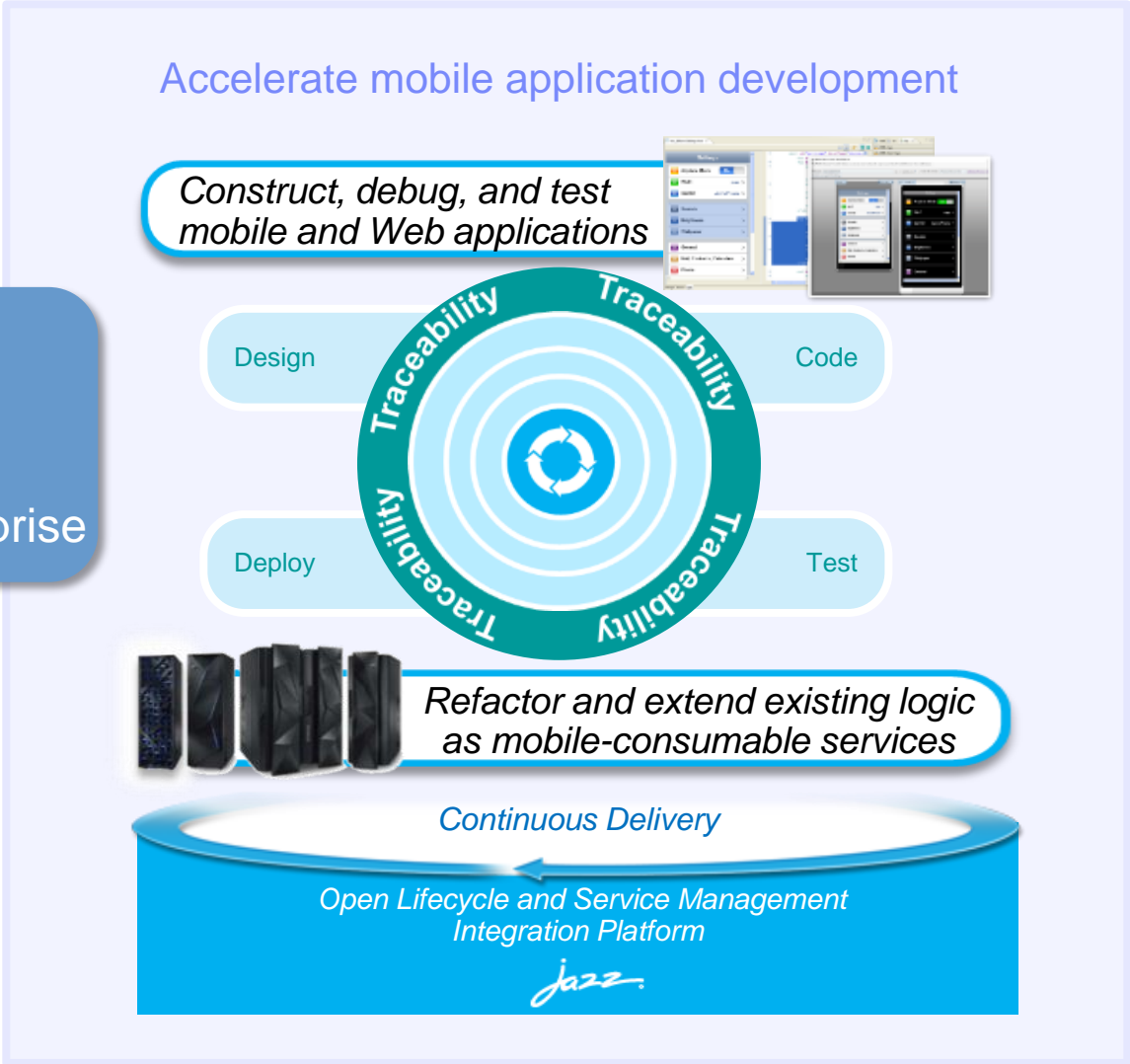
Integrate systems of engagement with systems of record

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



DevOps capabilities for mobile applications with enterprise systems

Rational Test Workbench
IBM MobileFirst Platform
IBM UrbanCode Deploy
Rational Developer for the Enterprise



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



Nationwide®
On Your Side™

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 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>

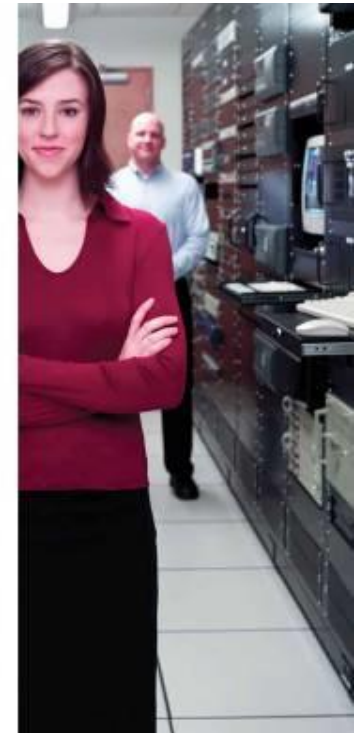
Professional Connections
9 Communities

Corporate Engagement
360+ companies actively recruiting

Job Candidates
Over 4,200 Job Seekers

Program Investment
\$10M+ over in 10 years

Growth
68K+ Students
Over 1K Schools
in 67 countries



IBM Academic Initiative

Major Academic Institutions and Key Recruiters



Recruiters

**Cigna
Compuware
EMC
Fidelity
JP Morgan Chase**



**UNIVERSITY OF
ARKANSAS**

Recruiters

**Baldor
BB&T
Dillards
JB Hunt
Walmart**

**EBERHARD KARLS
UNIVERSITÄT
TÜBINGEN**



Recruiters

**Daimler
Dt. Bank
SAP**



Recruiters

**CROC
Lusoft
Rosoboronexport**



Recruiters

**HSBC
Tivit**



Recruiters

**China Construction
Bank**



Recruiters

Citi



EPSSI
l'École
d'ingénierie
informatique

Recruiters

**Bull
Groupama**

The Solution

- Develop cohesive recruiting strategy
- Develop compelling and consistent messaging
- Partner with universities
- Think fun
- Select tools that students recognize
- Leverage their strengths



Source: Dave Dischiave, Syracuse University

Reach Millennials Where they Live



- Adopt the new tools
- Sell the value of your organization
- Sell the value of the mainframe
- Join the IBM Academic Initiative
- Develop strong and lasting relationships with universities
- Most of all think “fun”



Teaching Mainframe since 2007 and learned students ...

- Hate Java
- Love COBOL
- Love the mainframe

Let's capitalize on the momentum

The Academic Initiative is also partnering to offer mainframe-focused Massive Open Online Courses (MOOCs)



“An Introduction to Enterprise Computing”

<https://mooc.marist.edu/web/ecc>



SYRACUSE UNIVERSITY

“Enterprise Computing Strategies”

<http://ischool.syr.edu/contact/forms/ecsmooc.aspx>



“Introduction to Linux”

<https://www.edx.org/course/introduction-linux-linuxfoundationx-lfs101x-2>

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

A three-part contest of increasing difficulty offered to students around the world



Coming soon, the
"2016 z Systems
Master the
Mainframe World
Championship"

2014 Master the Mainframe
World Championship
New York City

Participants from **23** countries



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



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



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

68,000+ Participants since 2005!

<http://www.ibm.com/systems/z/education/academic/masterthemainframe/>

Use the IBM z Systems Job Connector to find needed skills



<http://systemzjobs.com>

Welcome to the IBM z Systems Job Connector!

The IBM z Systems platform is at the heart of what organizations everywhere depend upon to drive enterprise level cloud, mobile, and analytic solutions - all with unmatched security. The IBM z Systems Job Connector website has been designed to support employers and candidates interested in filling/finding enterprise computing jobs that require skills and familiarity with IBM z Systems mainframe technology. Start your z connections right here today!

<p>Employers</p> <ul style="list-style-type: none"> ▶ Post a Job ▶ View Resumes ▶ Products and Pricing ▶ Access Your Recruiter Account 	<p>Job Seekers</p> <ul style="list-style-type: none"> ▶ Search Jobs ▶ Post a Resume ▶ Set up an Email Job Alert ▶ Access Your Job Seeker Account
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Keyword Search:

[Advanced Search](#)

Featured Jobs

Office Manager/EA

New York, NY
MarketShare

Mainframe Systems Programmer

Harrisburg, PA
PHEAA



See “Mainframe Modernization and Skills: The Myth and the Reality message... *please distribute!*”

<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 banks¹. 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 study² even found that some younger IT professionals were reluctant to focus on the mainframe, seeing it as a stagnant environment.



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There are many myths and realities regarding mainframe skills

Myth

- Only the mainframe has a skills issue
- New hires are 100% productive immediately
- Schools should know our skills requirements
- It's best just to backfill as required
- Newhires should use old tools
- Newhires should learn on-the-job
- Mainframe tools are archaic and arcane
- "Mainframes are going away!"
- Lack of skills disqualifies adoption of superior technology
- "Skills development are not our problem"
- GUI-based tools are always better
- The most important skill is mastery of a computer language
- No one is interested in learning the mainframe
- "Not my problem!"

Reality

- Skills is a **universal** issue in STEM
- May take years (~10,000 hours?)
- **Teaming** with universities is more effective
- **Planned** hiring in "**cohorts**" is more successful
- Newer tools help faster **time-to-market, retention**
- **Planned programs** are more effective
- IBM + ISVs have modern **easy-to-use** tooling
- Still critical, continuing technology for many
- Innovative technologies often require **in-house investment** in skills
- Forward-thinking companies do talent plans, training
- ISPF is very productive in the right hands
- Critical thinking, analysis and learning methodologies are more important
- A properly functioning market economy should fix
- The best approach involves **teaming** of customers, schools and IBM



SHARE is an independent volunteer-run information technology association that provides **education, professional networking and industry influence.**

