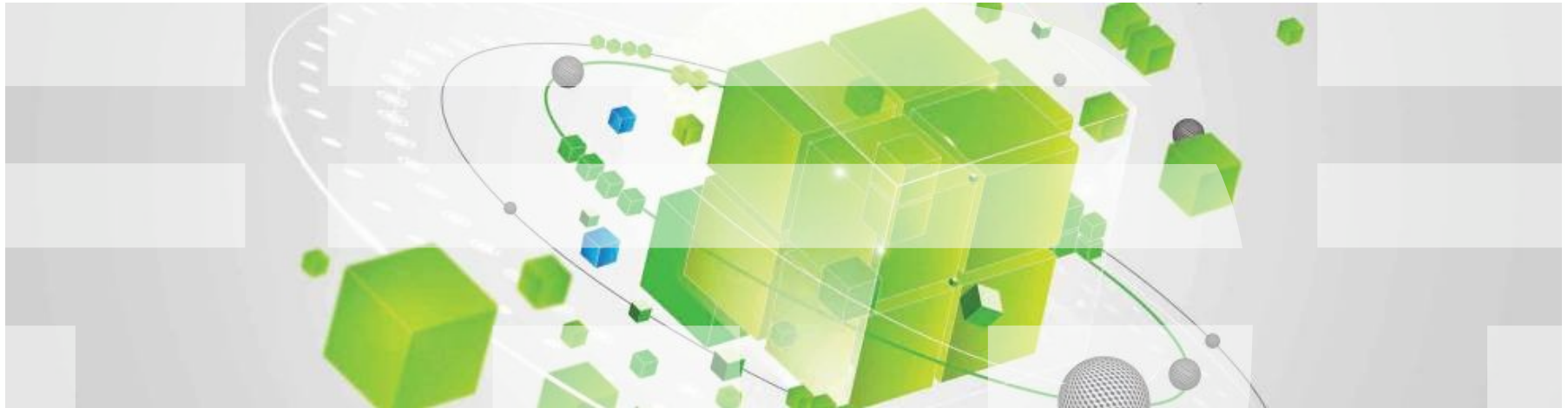


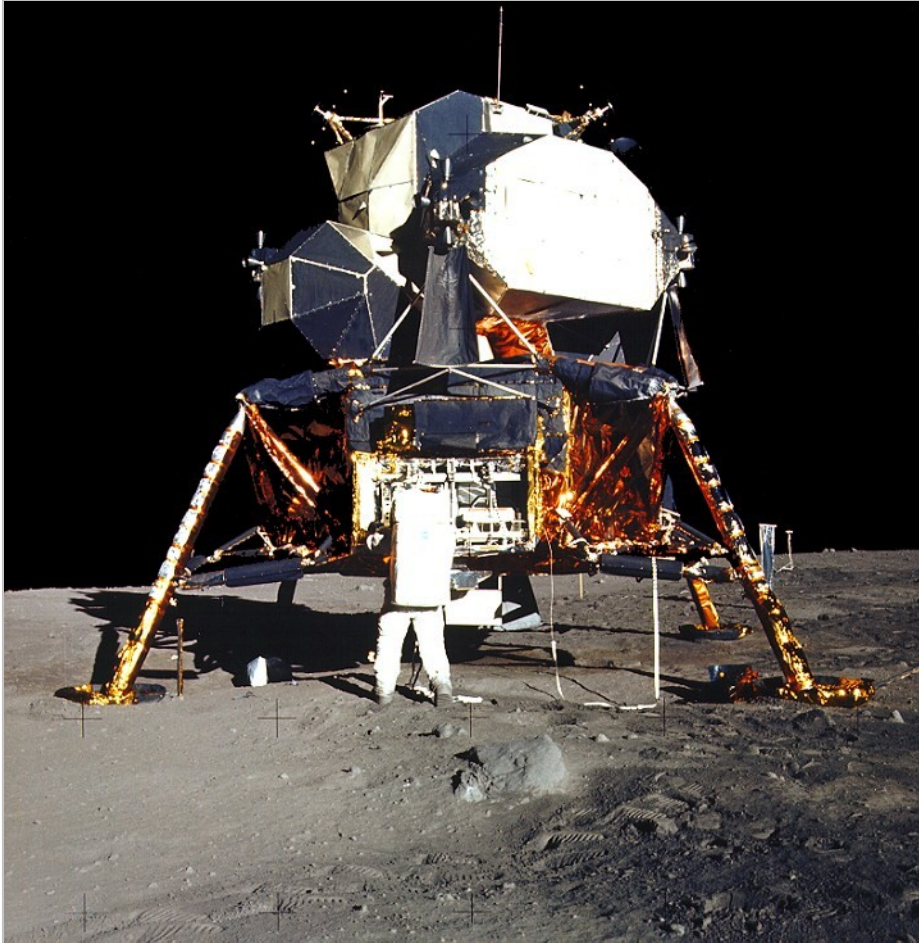
# zEnterprise

What we've done and where we are going

Ray Jones  
System z Software Vice President



**The Transformative Power of Technology Lives On;  
Every Generation of Technology Enables Remarkable Outcomes**



**Apollo 11:**  
2048 words RAM (16-bit word)-> ~4KB  
36,864 words ROM



**Avg. Smart Phone:**  
256 MB – 512 MB Cache  
2 GB – 64 GB RAM

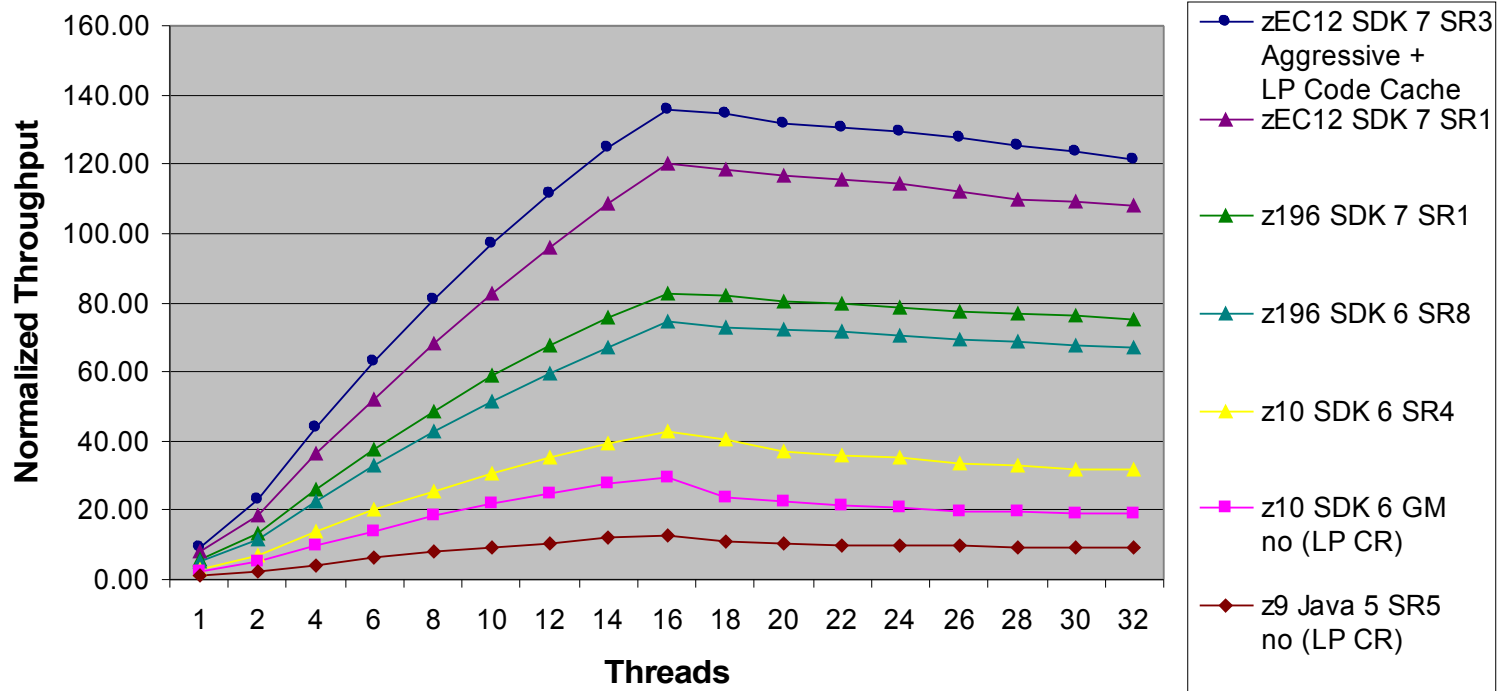
# System z: Integrated by design



# z/OS Java SDK 7: 16-Way Performance

Aggregate HW and SDK Improvement z9 Java 5 SR5 to zEC12 Java 7SR3

**z/OS Multi-Threaded 64 bit Java Workload 16-Way**  
**~12x Improvement in Hardware and Software**



**~12x aggregate hardware and software improvement comparing Java5SR5 on z9 to Java7SR3 on zEC12**

LP=Large Pages for Java heap CR= Java compressed references  
 Java7SR3 using -Xaggressive + Flash Express pageable 1Meg large pages

# IBM COBOL continues to power business critical applications

## *Enterprise COBOL for z/OS v5.1*

- Enterprise COBOL v5.1 delivers **performance improvements of greater than 15%<sup>1</sup> over v4** for CPU-intensive batch applications on System z **sub-capacity tracking, to reduce their administrative overhead**

**new programming and application modernization capabilities. Users can deliver enhancements to business critical applications quicker with less cost and lower risk**

### What's new:

- Advanced optimization technology designed to optimize COBOL programs and fully exploits System z hardware (z10, z196, zEC12).
- New features to improve application modernization capabilities and programmer productivity
- Support latest Middleware (CICS, DB2, IMS)
- Supports the ecosystem of COBOL development tools supplied by IBM and ISVs.



*"Our testing of COBOL V5 shows a significant performance improvement for math. As a financial services company with a continually narrowing batch window, that improvement is very important to us. It will help us meet our Service Level Agreements and reduce cost driven by CPU utilization."*

*Michael A Todd, Software Architect, a multi-national financial services company*

<sup>1</sup> Performance measures vary from customer to customer



# Optimize server to server networking – transparently

## “HyperSockets™ -like” capability across systems

Up to **50%** CPU savings  
for FTP file transfers  
across z/OS systems  
versus standard TCP/IP \*\*

Up to **48%** reduction in  
response time and  
**10%** CPU savings for a  
sample CICS workload  
exploiting IPIC using  
SMC-R versus TCP/IP \*\*\*

Up to **40%** reduction in  
overall transaction  
response time for WAS  
workload accessing z/OS  
DB2 \*\*\*\*

Up to **3X** increase in  
WebSphere MQ messages  
delivered across z/OS  
systems \*\*\*\*\*



### Shared Memory Communications (SMC-R):

Exploit RDMA over Converged Ethernet (RoCE) with qualities of service support for dynamic failover to redundant hardware

### Typical Client Use Cases:

Help to reduce both latency and CPU resource consumption over traditional TCP/IP for communications across z/OS systems

Any z/OS TCP sockets based workload can **seamlessly** use SMC-R without requiring any application changes



**z/OS V2.1  
SMC-R**



**z/VM 6.3 support  
for guests\***



**10GbE RoCE  
Express**

\* All statements regarding IBM's future direction and intent are subject to change or withdrawal without notice, and represent goals and objectives only.

\*\* Based on internal IBM benchmarks in a controlled environment using z/OS V2R1 Communications Server: FTP client and FTP server, transferring a 1.2GB binary file using SMC-R (10GbE RoCE Express feature) vs standard TCP/IP (10GbE OSA Express4 feature). The actual CPU savings any user will experience may vary.

\*\*\* Based on internal IBM benchmarks using a modeled CICS workload driving a CICS transaction that performs 5 DPL (Distributed Program Link) calls to a CICS region on a remote z/OS system via CICS IP:interconnectivity (IPIC), using 32K input/output containers. Response times and CPU savings measured on z/OS system initiating the DPL calls. The actual response times and CPU savings any user will experience will vary.

\*\*\*\* Based on projections and measurements completed in a controlled environment. Results may vary by customer based on individual workload, configuration and software levels.

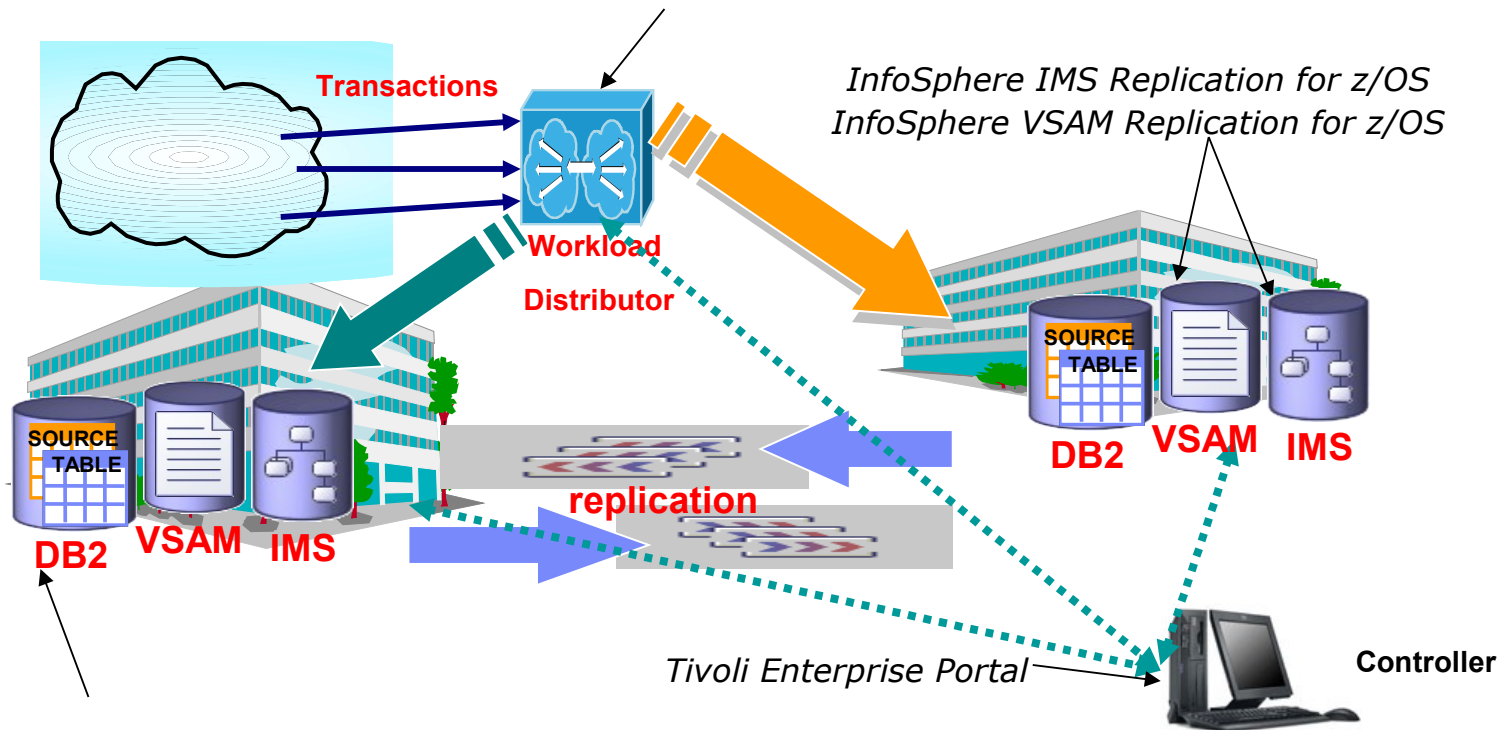
\*\*\*\*\* Based on internal IBM benchmarks using a modeled WebSphere MQ for z/OS workload driving non-persistent messages across z/OS systems in a request/response pattern. The benchmarks included various data sizes and number of channel pairs. The actual throughput and CPU savings users will experience may vary based on the user workload and configuration.

## System z – Surviving even the most devastating 2011 Japan earthquake!



# IBM GDPS/Active-Active for Continuous Availability

- Provides continuous availability for two or more sites separated by unlimited distances
- Planned workload switch - 20 seconds from active site to standby site
- Unplanned workload switch - 120 seconds from active site to standby site
- Planned site switch - (9 \* CICS-DB2 and 1 \* IMS workloads) 20 seconds
- Unplanned workload switch - 107 seconds





# Operating systems focused on exploiting zEnterprise Innovation



## z/OS Version 2.1 & z/OSMF 2.1



- Fast memory to memory data transfers with SMC-R (like HyperSockets™ between processors)
- Handle huge volumes of data with 100-way (SMP) support in a single LPAR
- Shorten batch windows with 40% shorter file recall time
- Improve SAP workload performance with 175x faster zFS V5 directory lookup
- Leverage Crypto-as-a-service for Linux® to extend IBM System z® reach as a crypto hub

60%

reduction in MIPS requirement  
for host system size

## z/VM® Version 6.3



- Supports more virtual servers than any other platform in a single footprint with support for 1TB of real memory,
- Increased performance for large VMs with a 4x increase in memory scalability while maintaining greater than 90% resource utilization
- More efficient use of CPU resources for better price performance

\$1.00/day

for a virtual Linux server

520

Linux virtual servers on zBC12 with  
40 virtual servers per IFL.

# DB2 11 Major Themes

## *Building on the Success of DB2*

- **Performance Improvements**
  - Improving efficiency, reducing costs, no application changes
  - 0-5% for OLTP, 5-15% for update intensive batch
  - 5-20% for query workloads
  - Exploitation of new zEC12 hardware features
- **Continuous Availability Features**
  - Improved autonomies which reduces costs and improves availability
  - Making online changes without affecting applications
  - Online REORG improvements, less disruption
- **Enhanced business analytics**
  - Faster, more efficient performance for query workloads
  - SQL improvements and IDAA enhancements
  - Temporal and SQLPL enhancements
  - Transparent archiving
- **Simpler, faster DB2 version upgrades**
  - No application changes required for DB2 upgrade
  - Access path stability improvements
  - Product stability: support pre GA customer production



# IBM DB2 Analytics Accelerator V3.1 - Highlights

## Building on the Core Values

### Fast

Complex queries run up to 2000x faster while retaining single record lookup speed

### Cost Saving

Eliminate costly query tuning while offloading complex query processing

### Appliance

No applications to change, just plug it in, load the data, and gain the value

## Reducing the Cost of High Speed Analytics

Choice of historical data location – High Performance Storage Saver  
Reduces host data warehouse storage usage by over 95%  
Significantly reduces cost of host storage resources and administration

Real time analytics – Incremental Update  
Data changes are propagated for high-speed use as they occur  
Current information is available for right-time decisions  
Extends the accelerator use to reporting on operational data

Faster data refresh – Unload Lite  
Data available for analytics faster  
Refresh of tables or partitions is much faster and more efficient  
More optimized version of unloading data from DB2

New capacity – Full range of Netezza models supported  
Now expandable to 960 cores and 1.28 petabytes

New queries  
More queries eligible for acceleration



Banca Carige created a secure and scalable platform for



*Offering high-speed analytics on real-time data to up to 1,000 business users simultaneously*

### **Deliver data-driven insights**

Created a secure analytics platform enabling better decisions about everything from product development to special offers and promotions

### **IBM Solution**

IBM zEnterprise EC12

IBM DB2 Analytics Accelerator

***“DB2 Analytics Accelerator enables us to bring analytics to our customer-facing employees on the front line, and our product development teams behind the scenes.....attracting more business, and driving growth.”***



# IMS 13 on IBM zEC12

## Rich Function and Capability

IMS 13 on zEC12 provides  
Enhanced communications to CICS, DB2, & WebSphere  
More vertical room for easy capacity growth  
More system resiliency  
Expanded integration

- ✓ .NET SQL access to IMS data
- ✓ Native SQL support for COBOL
- ✓ Dynamic change for HALDB & DEDB
- ✓ Database Versioning for greater availability
- ✓ zIIP support for IMS Connect and Open Database Manager processing
- ✓ Pervasive enhancements that reduce TCO
- ✓ A complete portfolio of IMS database and performance management tools
- ✓ .....and much more!

## Superior Performance

- ✓ **10% CPU reduction**, per transaction, from IMS 12 to IMS 13 for Full Function-IMS Connect workload  $\geq$  10K clients
- ✓ Multiple concurrent BMP jobs on IMS 13 complete in **up to 29% lower** elapsed time compared with IMS 12
- ✓ **80% reduction** in log latch contention on IMS 13; can improve your overall throughput, lowering cost per transaction even more
- ✓ Cost-effective zIIP solutions for some IMS workloads lower CPU consumption **by up to 15%**
- ✓ IMS Java on zEC12 uses **4% less CPU** to perform **35% more transactions**.



# CICS Tomorrow. Beyond V5.1...

## CICS TS strategic development focus areas:

IBM is committed to enhancing CICS capabilities based on new technology innovation and customer requirements. Below are some key roadmap focus areas based on CICS TS V5.1 customer feedback:

### Cloud Roadmap

- Cloud Multi-versioning
- WLM cloud integration
- More Policy thresholds

### Performance

- Roadmap optimizations
- Hardware specific focus

### Java/Liberty Roadmap

- Expanding Liberty API's
- Further Liberty Integration
- Optimize for CICS

### CICS Explorer Roadmap

- Increased coverage
- Enhanced integration

### Service Enablement Roadmap

- Mobile Services Integration
- Web Services Enhancements
- Standard Security Services

### And much, much more

- Please get involved via RFE or one of our early programs below.

## Please join one of our CICS TS Early Programs for more details.

- Basic Disclosure and Discussions, face to face or remote
- Beta programs, with varying levels of involvement available
- Customer Architecture Forum, remote and on-site at the Hursley, UK Lab
- Design Partnerships - a close relationship on a specific area of technology

## CICS TS Early Programs

*Be a part of the Future*



## Forward Looking Statements Disclaimer

**IBM's statements regarding its plans, directions, and intent are subject to change or withdrawal at IBM's sole discretion.**

Information regarding potential future products is intended to outline our general product direction and it should not be relied on in making a purchasing decision. The information mentioned regarding potential future products is not a commitment, promise, or legal obligation to deliver any material, code or functionality. Information about potential future products may not be incorporated into any contract.

# zEnterprise BC12 software solutions for Cloud



- **Detect performance problems and increase analytics visibility in the cloud** to minimize, or preclude business impact with **ENHANCED! IBM OMEGAMON for z/OS Family**



- **Automate, plan and control** the processing of System z workloads with **NEW! Tivoli® Workload Automation for z/OS V9.1**
- **React to events** as a human would, but much faster, more efficiently and effectively with **IBM Automation Control for z/OS**
- **Keep systems available** by identifying the root cause of network failures in the cloud with **IBM NetView®**

Up to **80%**

Reduced power, cooling, and floor space requirements with a zEnterprise cloud infrastructure

Up to **90%**

Capacity utilization with zEnterprise and cloud

Greater than **50%**

Economies of scale through consolidation of workloads from distributed to Linux on System z



***Develop a private cloud with the zEnterprise for maximum utilization, superior reliability and availability***

# Nationwide cuts costs in the cloud



## Need:

3,000 distributed servers were inefficient and costly. 80-90% capacity unused, software licenses on every server

## Solution:

Consolidated its distributed servers to Linux virtual servers running WebSphere® application server, DB2, and z/VM on System z, creating a multi-platform private cloud optimized for all its different workloads.

**80%**

Reduced power, cooling and floor space requirements

**80 – 90%**

Capacity utilization

**Military level Security**

Protection from unauthorized users

**\$15 million**

Reversed expenditure on distributed server landscape over three years

“

***It [Linux] effectively makes the mainframe into a private cloud – a single set of resources, managed with the same tools, but optimized for a variety of very different workloads.***

# zEnterprise BC12 software solutions for Mobile

## Build and Connect



- **Native JSON support** and conversion between JSON and data structures with **NEW! CICS® Transaction Server Feature Pack for Mobile Extensions V1.0** and **NEW! DB2 11 for z/OS**
- **Development of multiplatform mobile applications** with **NEW! IBM Worklight V6** and **NEW! Rational® Developer for the Enterprise v9**

## Manage and Secure



- **Secure access to System z data on mobile devices and integration with LDAP on zEnterprise BC12** with **IBM Endpoint Manager**
- **Easy-to-use security enhanced integration and IMS integration for mobile devices** with **NEW! IBM WebSphere® DataPower® Gateway Appliances V6**

## Extend and Transform



- **Extend mobile devices to WebSphere MQ on z/OS** with **NEW! IBM Mobile Messaging client pack updates**
- **View of dashboards, reports, etc on mobile devices** with **NEW! Cognos Mobile**



1.7M+

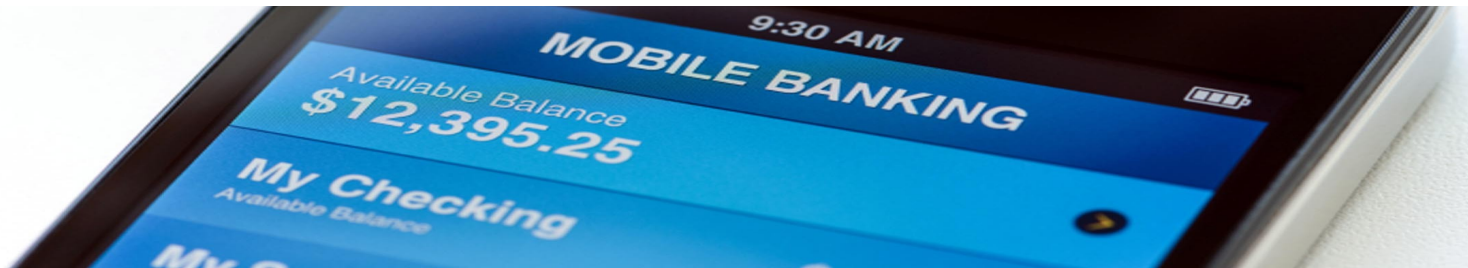
apps in the world today with 70B apps downloaded in 2013

6x and 3x

the number of Android and iOS versions Google and Apple respectively have released compared to Microsoft®

*Building, connecting, and securing zEnterprise data to mobile devices to provide information instantaneously*

# First National Bank goes mobile



*Shifting to self-service mobile banking to grow business and reduce IT costs*

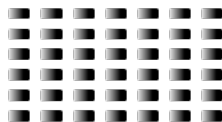
## Opening a new channel with mobile

Easy Mobile Channel integration with core z/OS IMS applications to improve customer experience and add new revenue opportunities at low implementation cost

## IBM Solution

Accessing IMS 11 with System z information via smartphones

Up to **920M** transactions/month





# zEnterprise BC12 software solutions for DevOps



- Accelerate and Continuously Deliver Multiplatform Applications with **NEW!** IBM UrbanCode Deploy and IBM UrbanCode Release on Linux on z



- Low cost, high fidelity off host mainframe application development and test with parallel sysplex support in **NEW!** Rational Development and Test Environment for System z V9.0



- Simplify testing with virtual CICS programs with **NEW!** IBM Rational Test Automation Solution (Green Hat)



- Exploitation of zEnterprise BC12 hardware for optimal performance with **NEW!** IBM zEnterprise COBOL for z/OS V5.1, **NEW!** Enterprise PL/I for z/OS v4.4, and **NEW!** z/OS v2.1 XL C/C++

41%

experience delays  
in integration, configuration and  
testing of applications

34%

applications are rolled back  
due to quality issues  
escaping into production

45%

experience delays due  
to troubleshooting and fine-  
tuning issues in production

*“New, optimization technology in COBOL v5 provided significant performance improvements to our CPU-intensive applications. We did not have to make any code changes or recompile the entire application to take advantage of the new COBOL compiler.”*

# INTER Versicherungsgruppe increased productivity in application development



## Need:

Motivate young developers to embrace the world of the mainframe and match development capabilities of large companies with fewer staff

## Solution:

Deployed Rational Developer for System z as a modern toolset for supporting mainframe processes in an Eclipse development environment

## Consistent

integration and automation in software development

## Collaboration

between IT team and technical departments

## Modern tools

for young developers

“ **An efficient software development environment is in many ways similar to a good manufacturing plant** ”

## zEnterprise BC12 software solutions for Security



- **Administer mainframe security**, monitor for threats, enforce policy compliance, audit usage and configurations, and assist in compliance management and audit reporting with **NEW! IBM Security zSecure Suite V2.1**
- **Assure the privacy and integrity of trusted information** in the data center, and reduce costs by automating the entire compliance auditing process with **IBM InfoSphere Guardium® Solutions**

Up to **70%**

in security audit savings with zSecure Suite

**63%**

reduction in Total Cost of Information (TCI) when using zEnterprise security

**74%**

staff savings for security administration personnel on zEnterprise system



*Making zEnterprise BC12 the enterprise security hub for mission critical data*

# Blue Cross and Blue Shield of Kansas upgrades its security



## Need:

Lower cost and consolidate security software to make it easier to administer

## Solution:

Replaced its previous security with a combination of RACF and zSecure suite to control security access to datasets and resources, define access rules and detect and analyze security exposures

One place

to upgrade security landscape

Integration

between RACF, DB2, and zSecure

“ **IBM is embedding more security code in z/OS, and integrating RACF more tightly with DB2, so we can now take advantage of things that we couldn't before...we no longer need to separately upgrade our security landscape when we upgrade z/OS** ”

# zEnterprise BC12 software solutions for Application Infrastructure, Connectivity, and Business Process Management



- **Rapidly deploy new Java workloads** with **NEW! CICS Transaction Server 5.1**



- **Deliver high scalability, transactional integrity and business agility** for transactional and batch decisions as well as automated straight through processing supporting thousands of transactions per second with **ENHANCED! IBM ODM for z/OS** and **IBM BPM Advanced for z/OS V8.5**



- **Build solutions addressing diverse integration requirements** including application integration for Java developers with **NEW! IBM Integration Bus for z/OS V9.0**



- **Highly composable and dynamic application server runtime environment beyond web applications suited for developers** with **WebSphere Application Server for z/OS, V8.5.5 Liberty Profile**

Up to **25%**

performance improvement with CICS and zBC12

Up to **30%**

performance improvement with WebSphere Operational Decision Management and zBC12

Up to **90%**

Throughput improvement of Java multi-threaded workloads



**Industrial-strength online transaction management for mission critical applications on zEnterprise**



## Visiting Nurse Service of New York (VNSNY) positions staff to better serve patients



### Need:

Securely move information including patients' health information between systems from a variety of locations

### Solution:

Implemented WebSphere MQ and System z to move data from one system to another using tablets and other devices. Sensitive data triggers transactions to update financial systems, medical records and medication databases

Any location

has access to sensitive data

40,000

home visits per day

**“At the end of the day, people get their visiting nurse knocking on the door and take care of the people, and that’s good”**

## zEnterprise software – Open and Advanced Technology

- Most reliable and fastest system for mission critical workloads
- Most secure system with 99.999% reliability
- Most sophisticated data warehousing and analytics solutions with the fastest query performance in the market
- Unified platform for rapid development of applications
- Only system to enable x86, POWER, and System z applications under a centralized management system
- Ideal platform for a “cloud in a box” and mobile

Thank You