System z Enterprise Software Strategy and Directions

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

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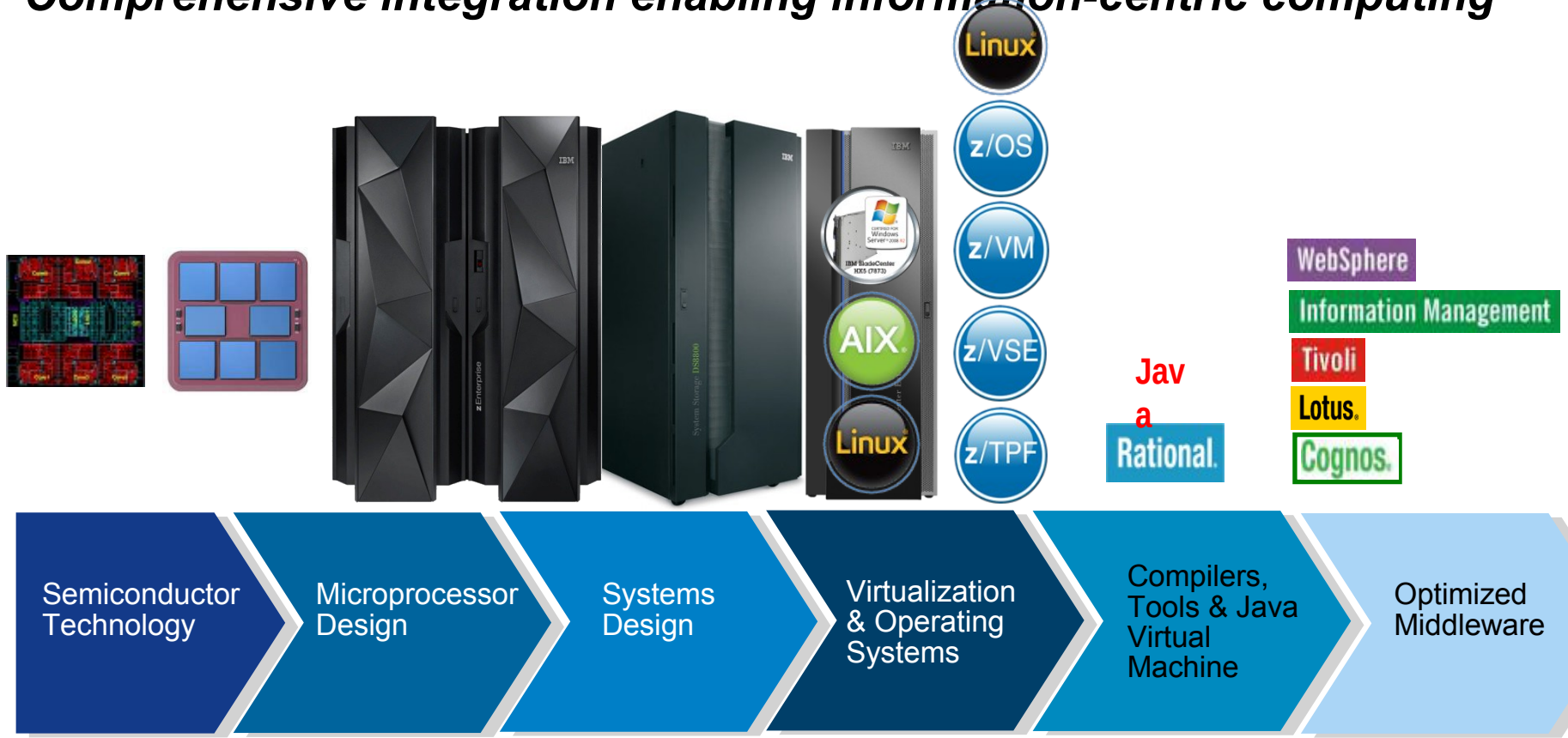2048 words RAM (16-bit word)-> ~4KB
36,864 words ROM

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

zEnterprise EC12: An optimized design which delivers unique value

Comprehensive integration enabling information-centric computing

| Semiconductor Technology | Microprocessor Design | Systems Design | Virtualization & Operating Systems | Compilers, Tools & Java Virtual Machine | Optimized Middleware |

A Journey to a Smarter Planet

New innovations available on zBC12 and zEC12

Do a Proof of Concept Today

NEW
Data Compression Acceleration

Reduce CP consumption, free up storage & speed cross platform data exchange to compress data

Up to **4X** *system data compression*

NEW
High Speed Communication Fabric

Optimize server to server networking with reduced latency and lower CPU overhead

Up to **80%** *reduction in network latency*

ENHANCED
Flash Technology Exploitation

Improve availability and performance during critical workload transitions, now with dynamic reconfiguration; CF exploitation (SOD)

Up to **10X** *faster response time and* **37%** *increase in throughput vs. disk*

ENHANCED
Proactive Systems Health Analytics

Increase availability by detecting unusual application or system behaviors for faster problem resolution before they disrupt business

2 clicks *vs. hours to find difficult or unusual problems*

NEW
Hybrid Computing Enhancements

x86 blade resource optimization; Alert & notification for blade virtual servers; Latest x86 OS support; Expanding future roadmap; DataPower Virtual Appliance SoD

Up to **84%** *lower TCA with fit-for-purpose cloud architectures*

NEW
zIIP & zAAP Specialty Engines:
New 2:1 ratio for zIIP/zAAP to CP for improved new workload economics

Operating systems focused on exploiting zEnterprise Innovation

z/OS Version 2.1 & z/OSMF 2.1

NEW

- Fast memory to memory data transfers with SMC-R (like HiperSockets™ 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

z/VM® Version 6.3

openstack CLOUD SOFTWARE

- 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

60%
reduction in MIPS requirement for host system size

$1.00/day
for a virtual Linux server

520
Linux virtual servers on zBC12 with 40 virtual servers per IFL.

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

Continuous Availability over Unlimited Distances with Active Sites Technology

Expand System z continuous availability solution that provides time to recovery in seconds with automated query workload balancing across multiple data centers.

- New automated query workload balancing across data centers through the latest release of GDPS Active-Active Continuous Availability with **IBM Multi-site Workload Lifeline v2.0**

- Improved non-relational z/OS data integration and replication of data between IMS and VSAM databases with **InfoSphere Data Replication and Federation Solutions for z/OS**

- New network automation, and network and systems management among systems with **NetView Monitoring for GDPS**

NEW

Automated multi-site continuous availability and workload distribution

GDPS / Active-Active

Enhanced Resilience for zLinux/zVM

xDR

Storage CA solution

GDPS/ HyperSwap Manager

Zero dataloss Metro distance CA/DR solution

GDPS/PPRC

3-site solution

GDPS/MGM

GDPS/MzGM

GDPS/GM

GDPS/XRC

Disaster Recovery solution Unlimited distance

DB2 11

Unmatched availability, reliability, and security for business critical information

- **Up to 20% CPU reductions and performance improvements** for online transaction processing (OLTP), batch, and business analytics
- **Improved data sharing performance** and efficiency
- **Integration with InfoSphere BigInsights™ / Hadoop and noSQL support**
- **Improved utility performance** and additional zIIP eligible workload

IMS™ 13

Delivering the highest levels of performance, availability, security, and scalability in the industry

- **CPU reductions up to 15%** for Java applications, and additional SQL support
- **Improved efficiency** with native SQL access to IMS data from COBOL applications
- **Greater flexibility and faster deployment** for new applications with database versioning

BMW Group manages a mountain of data driven

Need:

Develop a sustainable and smarter driving strategies through mountain of data created by these innovations

Solution:

implemented IBM® DB2® 11 for z/OS® on zEnterprise eC12, which offers optimized management of information and workload and enhanced cost savings with capabilities for analytics, forecasting and reporting.

Up to **11%**
reduced workload processing

24/7

support for constant increase in workloads

Efficient

decompression algorithms

"With DB2 11 the combination of the ability to break into persistent threads and the enhanced dynamic schema change capabilities allow us to react to business requirements more quickly and with less operational impact...."

GAD upgrades database systems to boost power and productivity

GAD
IT für Banken

Need:

Address performance and capacity needs due to growing transaction volumes and 24/7 availability

Solution:

Upgraded to IMS 13 and DB2 11 to speed banking application rollouts while supporting peak transactions of 400 to 600 per second

10%

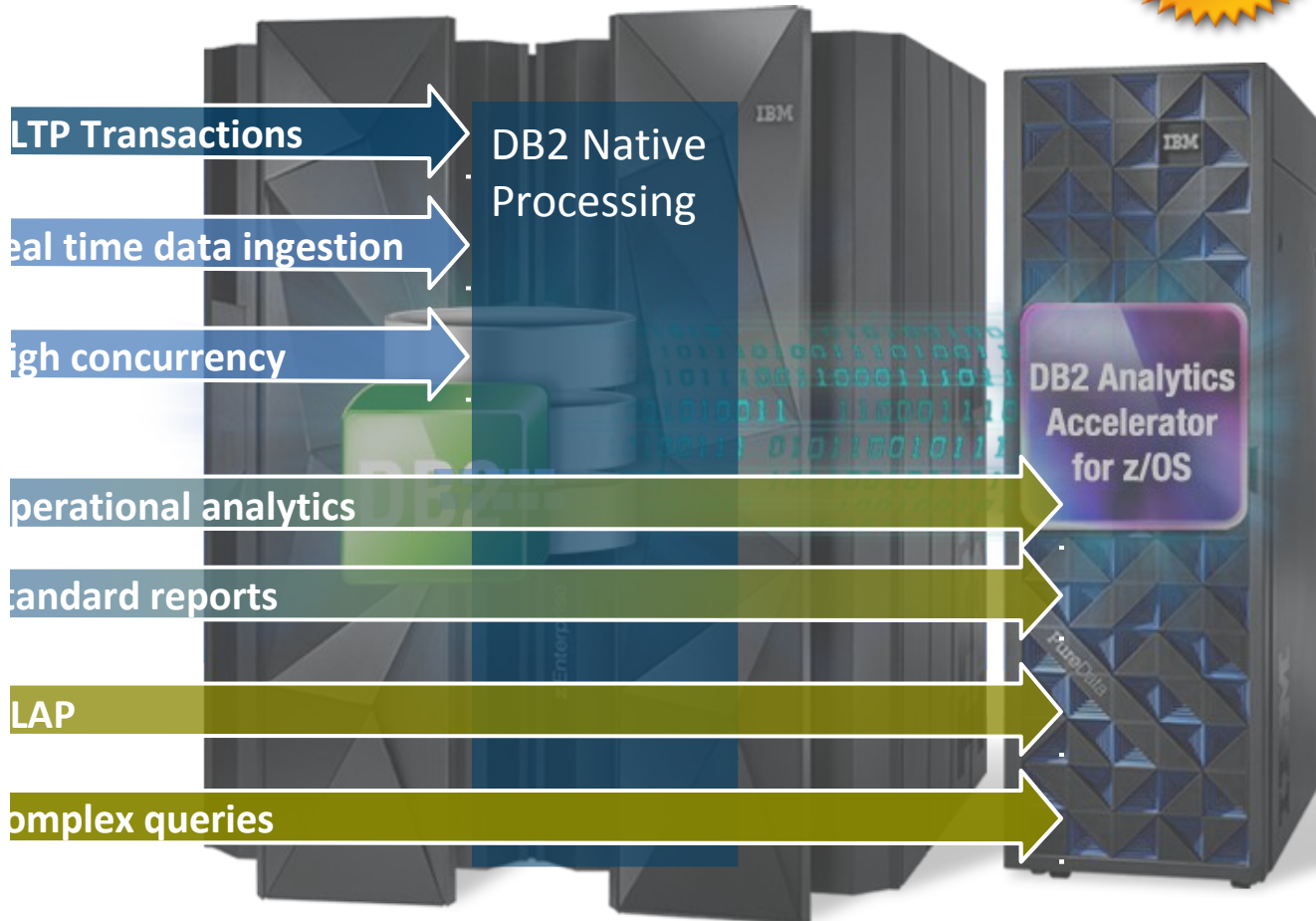higher annual transactions volumes with existing CPU capacity

24/7

system availability performance with increased staff productivity

Integrating diverse platforms, applications and technologies to deliver maximum customer value

An easy entry point into zEnterprise analytics

A single, workload-optimized system for both operations AND warehousing

- LTP Transactions
- eal time data ingestion
- igh concurrency

DB2 Native Processing

- perational analytics
- tandard reports
- LAP
- omplex queries

DB2 Analytics Accelerator for z/OS

- **CPU savings** for DB2 query workloads including short running operational analytics and reporting **now with static SQL, multi-row FETCH, and multiple encodings on the same Accelerator**

- **DB2 analytics accelerator benefits** data warehouse, OLAP and complex queries with **improved enterprise robustness, scalability and high performance storage saver**

Swiss Mobiliar deploys a new platform to

Swiss Mobiliar
Insurance & Pensions

Need:

Cost-effective way to deliver complex analysis for eligibility and excess requirements for insurance products

Solution:

Implemented DB2 Analytics Accelerator and zEnterprise to provide transaction processing and analytics workloads in a cost-effective solution

50%
of the queries performed 100 times faster

20 seconds
to complete queries that took 5 hours

> *"IBM DB2 Analytics Accelerator enables us to support the additional workloads that come with business growth without activating more cores on the mainframe."*

System z delivers an Open Cloud infrastructure

	Integrate	Automate	Orchestrate

IBM Products & Offerings

Integrate
- IBM zEnterprise®: zEC12, z196, zBC12, z114
- Linux® on System z
- CSL Wave – hypervisor manager (new acquisition)
- xCAT – services offering to support z/VM

Automate
- Tivoli® Provisioning Manager
- Cloud Ready for Linux on System z
- Tivoli Application Management for zEnterprise
- Tivoli Asset and Financial Management for zEnterprise

Orchestrate
- Tivoli Application Resilience for zEnterprise
- Tivoli Security for zEnterprise

NEW

z/VM® 6.3

SmartCloud Entry
SmartCloud Provisioning

SmartCloud Orchestrator
System z support currently in development

openstack™
CLOUD SOFTWARE

OpenStack®
- Being enabled for z/VM first and eventually zManager
- Being used as a code base for SCE / SCP / SCO

15

Nationwide cuts costs in the cloud

Nationwide®
On Your Side℠

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
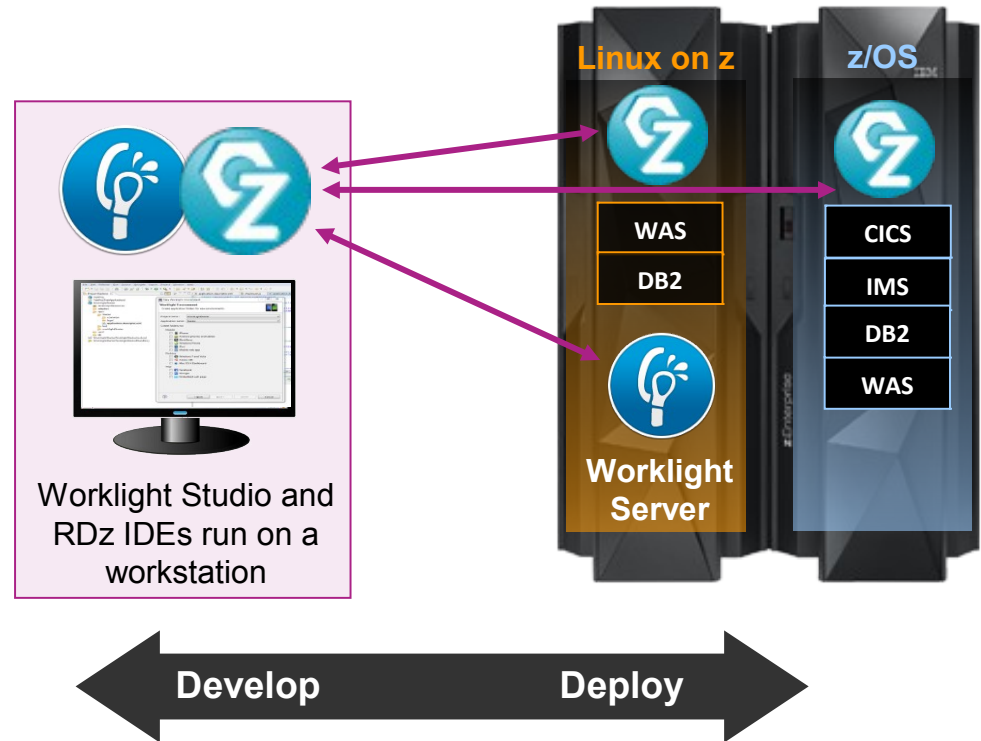Reversed expenditure on distributed server landscape over three years

" *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.*

Building and deploying mobile apps on Linux on z

- **Eclipse-based IDE for creating and deploying mobile applications** with IBM Worklight® Studio integrated with Rational® Developer for System z (RDz) and IBM Worklight® Server on Linux on z

- **Developer mobile tools with programming models** and web support with WAS Developer Tools for Eclipse (WDT)

- **Enterprise mobile application development for WebSphere®** Application Server with Rational Application Developer (RAD)

- **Determine which apps need to be modified to support mobile** with Rational Asset Analyzer

Linux on z   z/OS

WAS
DB2

CICS
IMS
DB2
WAS

Worklight Server

Worklight Studio and RDz IDEs run on a workstation

Develop   Deploy

IBM Worklight - an open, comprehensive and advanced mobile application platform to build, run and manage mobile applications

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

Application deployment and integration solutions for greater business agility

New CICS feature packs to enhance CICS applications

NEW

- **Rapidly create and deploy situational applications based on the popular PHP scripting language** with **CICS Transaction Server feature pack for Dynamic Scripting**

- **Support for the Open standard SAML data format for exchanging authentication and authorization data between CICS TS and other parties** with **CICS Transaction Server feature pack for Security Token Extensions**

Enhanced functional application performance analysis , code quality, and problem identification with **Problem Determination Tools (PDT) V13**

Enhanced interactive and batch capabilities for working with partitioned data sets (PDSs) and PDS extended (PDSEs) and their members with **IBM Data Set Commander for z/OS, V8.1**

New developers edition to evaluators, enabling them to develop and functionally test solutions ahead of deployment to the z/OS platform with **IBM Integration Bus for Developers V9**

Solution Packs for CICS and z/OS – convenience and affordability

NEW

Quickly optimize performance of CICS systems and applications with **CICS Interdependency Analyzer, CICS Deployment, CICS Performance Analyzer, CICS Configuration Manager**

Understand deployed CICS application and system resources, connect from non-mainframe devices, and create CICS infrastructure to support the increased workload with **CICS Interdependency Analyzer, CICS Deployment Assistant, CICS Transaction Gateway for z/OS**

Cost effective problem analysis for z/OS sub-systems and languages with both GUI & 3270 interface with **File Manager for z/OS, Fault Analyzer for z/OS, Debug Tool for z/OS, Workload Simulator for z/OS and OS/390, Hour Glass, Data Set Commander**

Reduce testing time, improve application reliability and user diagnosis capabilities, and improving user's ability to regulate and monitor testing activities with **Debug Tool for z/OS , Workload Simulator for z/OS and OS/390, Hour Glass**

Upgrade from standalone products using trade-ups

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
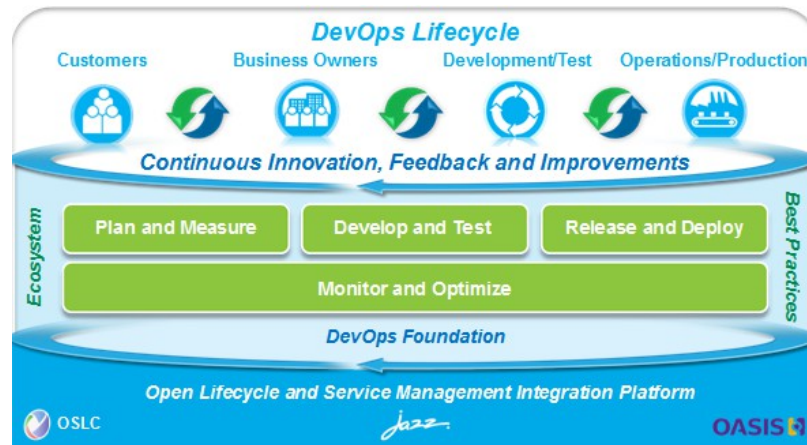
One place
to upgrade security landscape

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* "

Development solutions to improve productivity

Rapidly transform the end user experience of 3270 applications for new use on mobile devices with **Rational Host Access Transformation Services (HATS) V9.0**

DevOps Lifecycle

Customers — Business Owners — Development/Test — Operations/Production

Continuous Innovation, Feedback and Improvements

Ecosystem | Best Practices

Plan and Measure | Develop and Test | Release and Deploy

Monitor and Optimize

DevOps Foundation

Open Lifecycle and Service Management Integration Platform

OSLC | Jazz | OASIS

Exploitation of latest z/Architecture to reduce CPU utilization; Extend business logic written in COBOL and PL/I to work with web and mobile applications. New Enterprise COBOL Developer Trial for z/OS V5.1, Enterprise PL/I for z/OS V4.4 and z/OS 2.1 XL C/C++ are now available.

New capabilities to deliver high quality code that include automated batch code review and code coverage with **IBM Integrated Solution for System z Development**

NEW

"The more agile we can be, from an IT perspective, the more agile I think the business can be, in terms of going from idea development to actually being able to deploy a product that's in use by our customers."

—*Carmen DeArdo, director, application development leader, Nationwide*

Nationwide®
On Your Side℠

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"

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.

Enabling new workloads at attractive pricing

WebSphere MQ for z/OS Value Unit Edition	**CICS Transaction Server for z/OS Value Unit Edition**	**IMS Database Value Unit Edition**	**DB2 for z/OS Value Unit Edition**
NEW		Enhanced	Enhanced

Ability to develop and support new workloads with one-time-charge (OTC) price metric for eligible workloads that are deployed in qualified System z New Application License Charge (zNALC) logical partitions (LPARs)

Achieve competitive advantage and cost savings by leveraging the unique capabilities of software and zEnterprise

Consolidate and grow various workloads onto a single zEnterprise