IPL3219

Customer Experience with Linux on z Systems

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2015

IBM Systems Technical University

IBM z Systems • IBM Power Systems • IBM Storage

October 5–9 | Hilton Orlando, Florida
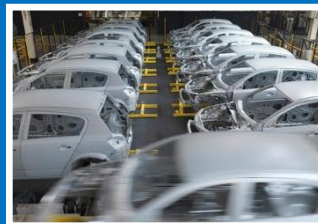
Customer references

Why Linux on z Systems

- Client quotes

- Client stories

- Going mobile

- Virtualization benefits

Easy Workload Integration	High Flexibility, Scalability and Manageability	High Productivity	High Resource Utilization	High levels of Quality of Service

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Clients run many workloads on Linux on z Systems

IBM

Databases

Virtualization Management

Hardware resources

WebSphere **Application Server**

WebSphere **MQ**

IBM **Integration Bus**

Virtualization Management

Hardware resources

SPSS

Cognos

Warehouse

BigInsights

Info.Server

Master Data Mgmt

Virtualization Management

Hardware resources

MobileFirst Platform Foundation

SAP

Content Mgt

Tivoli Storage Mg

Maximo

Connections / Notes

Virtualization Management

Hardware resources

Database deployment

Web application and SOA infrastructure

Real-time insights

… and much more

- EVERTEC (Oracle)
- L3C LLP (Oracle)
- Dundee City Council (Oracle)
- Met Office (Oracle)
- America First Credit Union (DB2)
- SinfoniaRx (DB2)
- Marist College (DB2)

- BTMU
- Nationwide
- Halkbank
- Renfe
- Bank of New Zealand

- Sicoob
- White Cube
- Bankia
- Miami-Dade County
- IBM

- ABK-Systeme GmbH (MobileFirst P.F.)
- Banca Carige (MobileFirst P.F.)
- German Pension Fund (Content Mgt)
- BCBS Minnesota (SAP)
- Baldor (SAP)
- Porto Alegre (Maximo)
- City a. County of Honolulu (Maximo)
- IBM (Connections/Notes)

More cases: **ibm.com**/systems/z/os/linux/success/index.html

IBM Systems Technical University, October 5-9 | Hilton Orlando

Flexibility, Scalability and Manageability

Flexible through virtualization
Scalable though server capacity
Manageable through intuitive interface

The whole architecture offers the traditional mainframe virtues of **massive scalability, very high reliability and availability, and centralised management**.

In addition to cost savings, consolidating in a single place simplifies management.

- The Met Office, UK

Easy Workload Integration

Integrating applications and data from silos allows to realize the full potential of your IT investment

*"DB2 running on Linux on z Systems [vs. existing distributed infrastructure] offers **more reliability and performance, and better integration** with our backup, monitoring and ETL tools."*

- Paulo Nassar, IT Processing and Storage Infrastructure Manager, Sicoob

High Resource Utilization

High resource utilization saves costs

*"IBM [Enterprise Linux Servers] have the ability to **operate even when resources are at 100% utilization**."*

- Kuniaki Nakajima, Systems Infrastructure No.1, Systems Division, Bank of Tokyo-Mitsubishi UFJ

Example:
Software costs, when priced per core, are the same for a low-utilized or a high-utilized core. Therefore the usage of fewer high utilized cores contributes to savings in software costs.

High Productivity

Responsive, agile and simple management techniques realize operational excellence

"Our overall maintenance and support effort

has been

reduced by at least 65 percent.

We needed six people …, now we have just two people."

- Rogério Okada, IT Manager,
Algar Telecom

High levels of Quality of Service

Meet stringent IT service delivery

"An [Enterprise Linux Server] hosting a virtualized Linux environment **differentiates in level of service and quality of service***."*

\- Lubo Cheytanov, founder and co-owner, L3C LLP

Quality of Service

Linux on IBM z Systems in 2Q2015
*Installed Linux MIPS at 45% CAGR**

- 26.7% of Total installed MIPS run Linux as of 2Q15

- Installed IFL MIPS increased by 16% YTY from 2Q14 to 2Q15

- 39% of System z Customers have IFL's installed as of 2Q15

- 79 of the top 100 System z Customers are running Linux on the mainframe as of 2Q15 **

- 35% of all z Systems servers have IFLs

Installed Capacity Over Time
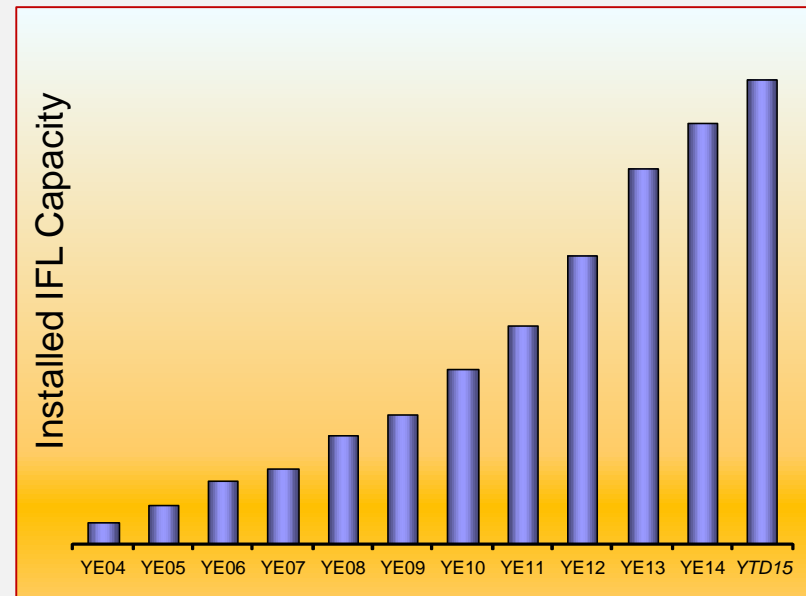
- 67% of new FIE/FIC z Systems accounts run Linux

* Based on YE 2003 to YE 2014   **Top 100 is based on total installed MIPS

Offers high performance

and near-total availability to support transaction processing

Reduces costs,

space, and energy use by consolidating from multiple physical servers to a virtualized environment

Takes hours, not days

to provision new workloads, improving responsiveness to business demands

Solution components

Hardware
• IBM® zEnterprise® EC12

Software
• IBM z/OS®
• IBM z/VM®
• IBM z/VSE®
• Oracle Database 11g Release 2
• SUSE Linux Enterprise Server for System z

The transformation:
EVERTEC migrated core Oracle databases supporting its transaction processing systems to a virtualized SUSE Linux Enterprise Server environment, running on an IBM® zEnterprise® EC12 (zEC12) mainframe server. The company has currently migrated approximately 40 databases to the zEC12, with plans to make IBM System z® the strategic platform for all Oracle databases.

"IBM System z offers the lowest cost for processing large amounts of data, hands-down."

—Eduardo Camargo, Executive Vice-President and CIO, EVERTEC Inc.

NWK

After evaluating the different distributions of Linux available on the mainframe, NWK chose to deploy SUSE Linux Enterprise Server for IBM System z—a decision that was strongly guided by the platform's reliability and the close collaboration between SUSE and IBM.

"We have been running SUSE Linux Enterprise Server on the IBM zEnterprise 114 (z114) for a few months now and everything has been operating very smoothly," says Eddie Leighton.

"We support around 450 users on one IFL with an average CPU usage of 60 to 70 percent, and so far performance has been excellent, even when running at 100 percent utilization."

The z114 running SUSE Linux Enterprise Server for System z offers 600 MIPS versus the 172 MIPS of NWK's previous mainframe, which translates into significantly faster processing for a number of key tasks.

SUSE Linux Enterprise Server provides NWK with solid performance, and a reliable platform for running its most important workloads.

"The IBM z114 is a fantastic server and SUSE Linux Enterprise Server for System z really helps us to get the most out of it. The solution has met all of our requirements in terms of performance and stability."
- EDDIE LEIGHTON, Technology Manager, NWK

www.suse.com/success/stories/nwk.html

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SAP Application Server Deployment and Consolidation on System z
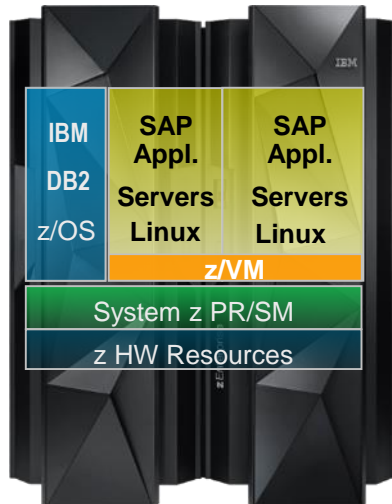
Business Continuity
- DB on z/OS
- Data Sharing in Parallel Sysplex®
- HA with Tivoli System Automation

Server Consolidation
- Internal near memory-speed communication
- Scale-up and scale-out capabilities
- Fabulous performance throughout

Embasa - Brazil	Endress+Hauser – Germany
• **Manages one of the largest water treatment services**	• **Specialist in measurement technology; 89 companies across 42 countries**
• **Needed a high-performance, cost-effective way to introduce SAP software while continuing with the tried and trusted database solution**	• **Detailed cost-benefit analysis compared Linux on System z to Power/x86 servers. z/OS, z/VM and a total of 80 IFLs**
• **Commercially attractive "Solution Edition" gave confidence to go ahead**	• **Simple and intuitive user management tools make it possible for just 1.5 FTEs to administer the entire Linux landscape**

Oracle on z Systems

" System z is the most cost-effective platform for large Oracle workloads. Whether our customers need to consolidate or isolate processes, our Oracle services would be impossible without it. "

- Lubo Cheytanov, founder and co-owner, L3C LLP

Read the full story ZSC03285USEN
http://www-03.ibm.com/software/businesscasestudies/us/en/corp?synkey=W133353R73108L21

Business need
L3C LLP needed to bring the robust reliability, security and affordability of the mainframe to its cloud customers, while also using the platform as a key differentiator for its managed services.

Solution
L3C deployed IBM® System z® servers running Linux to provide companies of any size—including small, midsized and very large enterprises—with scalable, cost-effective, high-performance cloud services.

Benefits
L3C can now provide Infrastructure-as-a-Service (IaaS) options, with differentiated qualities of service and price performance, to help expand its reach and reduce costs for customers.

Delivers extreme reliability and cost savings to cloud customers using IBM z Systems

Dundee City Council

City government discovers the outstanding reliability of Linux on System z

The need

"We were facing major problems. We had an overflowing data center, so we could not physically get any more power into the building without spending significant sums of money, and the air conditioning was grossly overloaded."

The solution

IBM zEnterprise BC12-based Enterprise Linux Server is dedicated to running the council's business-critical Oracle Database environment on SUSE Linux Enterprise Server, supporting a range of critical services.

- Linux on System z cost less than replacing existing servers

- Recovery in just 20 minutes in the event of a disaster

- Consolidation has alleviated concerns around data center space and cooling

"You can sum up moving to System z in one sentence: it's easy and cost-effective, so go ahead."

Tim Simpson, IT Infrastructure Manager, Dundee City Council

IBM Systems Technical University, October 5-9 | Hilton Orlando

Sparda-Datenverarbeitung eG

Offers excellent availability
by providing automated failover within seconds

Reduces total cost of ownership by about 50%, cuts administration effort and enables a team of three to manage 120 servers

Accelerates deployment of new systems

Solution components
Hardware
• IBM® zEnterprise® EC12
Software
• IBM z/OS®
• IBM z/VM®
• DB2 for Linux
• WebSphere Application Server
• Tivoli Storage Manager
• Tivoli System Automation for Multiplatforms
• Tivoli System Automation for z/OS
• Oracle Database
• SUSE Linux Enterprise Server for System z

Leveraging a world-class enterprise computing system to ensure 24x7 customer service

Sparda-Datenverarbeitung eG (SDV) is the IT service provider for the Sparda-Bank Group in Germany. SDV develops secure and innovative IT solutions for retail banking, payment, distribution and financing to improve the products and services of Sparda-Bank Group.

The group's 12 banks employ over 7,300 people and operate more than 400 branches, serving 3.5 million customers and a total of 23 million accounts.

"The great thing about IBM Geographically Dispersed Parallel Sysplex in combination with SUSE Linux Enterprise Server for System z and all Linux workloads including Oracle Database software is that it just works reliably."

—Oliver Röthinger, System Programmer and Administrator z/VM and Linux on System z, Sparda-Datenverarbeitung eG

The Met Office forecasts a bright outlook

Company Overview

- United Kingdom, Government, 1,800 people at 60 locations around the world

- UK's national weather service, providing >3,000 weather forecasts for public, government and other businesses, as well as conducting weather- and climate-related research

- 10 million daily weather observations are processed by a supercomputer; results need post-processing handled by an array of database-driven applications, most of which run on Linux®

Situation before

- **A mixture of IBM System z® and distributed landscape of commodity x86 servers**

    – 120 Oracle instances on 204 x86-cores

- **Heterogeneous infrastructure was becoming large, complex and difficult to manage**

    – Due to increased I/O and processing

- "Commodity x86-based systems do cost far less to acquire per unit of capability, … But the longer-term costs, including support, infrastructure, environmental issues and mirroring for resilience, quickly add up."

The Met Office forecasts a bright outlook

Considerations

- Did an extremely rigorous process of putting the Enterprise Linux Server technology up against commodity technology in terms of total lifecycle management and business benefit
- Develop a total cost model for their environment
- IT Infrastructure team analyzed the full-lifecycle costs
- Looked at the many different aspects in terms of:
  - Hardware,
  - Infrastructure support,
  - Environmental,
  - Software-licensing costs

Solution

- **Benchmark showed that consolidating on an Enterprise Linux Server based on IBM zEnterprise 196 (z196) would be more cost-effective than the commodity alternative**
  - Considerably better performance, particularly for I/O-intensive workloads including Oracle databases
- **Oracle workload from 204 x86-cores run on just 17 Enterprise Linux Server-cores** (IFLs[1])
  - Ratio of 12:1
- **Very significant difference in TCO, approx. to 75% reduction in licensing costs**
- **Consolidating environment in a single place simplifies management**
- **IT team can focus on delivering more effective services**

[1] IFL = Integrated Facility for Linux = dedicated Linux core on Enterprise Linux Server

University of Florida goes mobile

Enabling 50,000 students, 5,400 faculty members and staff access to online features anytime, anywhere

Data provided to students real time
Mobile formatted information of class schedules, textbooks, academic dates, grades, emergency information and campus map

IBM Solution
Accessing CICS with System z information via smartphones

Up to 1M transactions/day

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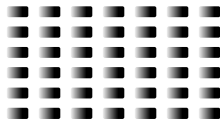
Client drivers for mobile solutions span all industries

Finance & Banking
Manage their investment portfolios and accounts from anywhere for complete bank transactions

Construction & Manufacturing
Manage complex projects and operations on site and streamline survey and work order processes

Insurance
File, process and manage claims and document damages

Retail
Engage shoppers in new ways and intelligently target personalized and location sensitive marketing offers

Travel & Transportation
Provide up to date information specific to their itineraries and location and enable customer self-service

Cross-Industry CIO's Office
Empower employees with anytime, anyplace access to dashboards and critical information

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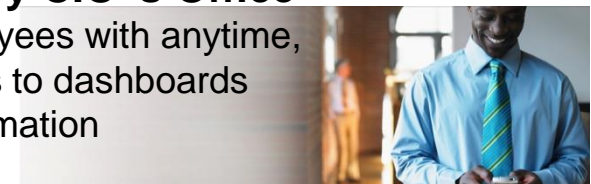
2nd Largest Retailer Worldwide

MobileFirst environment deployed on Linux on z in 7 days

- 2 day software Installation on site
- 5 day Worklight App development (2 days) and integration with CICS (3 days)

Application is currently deployed on a Linux on z server on z/VM

New Mobile Banking Architecture

Customer Reference - Banca Carige

Linux on System z

IBM MobileFirst Server

SOAP Adapter

SOAP XML

Custom Web Services on WebSphere Application Server

Mobile Banking
Hybrid Apps

Internet Banking

Authentication Data

z/OS

CICS TS

CICS Transaction Gateway

CICS Core Banking

DB2 Data
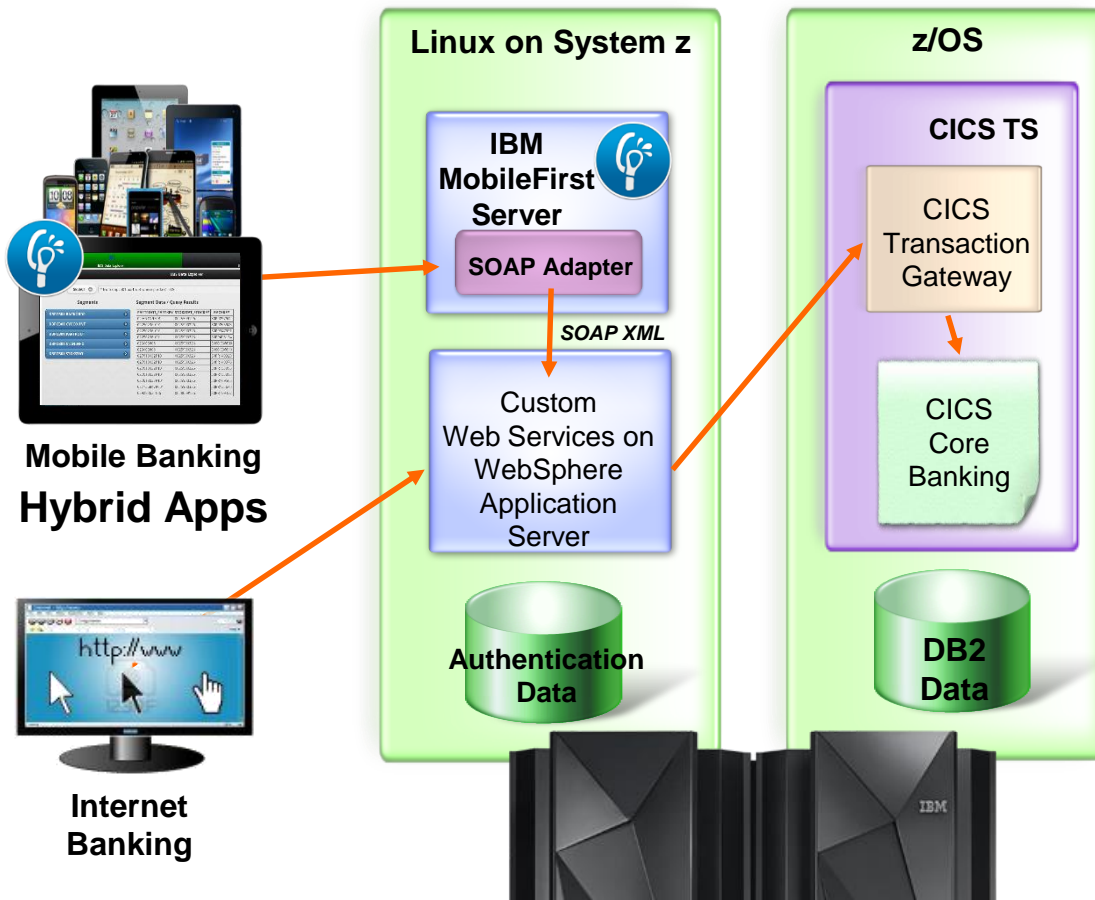
"Running our mobile banking service on Linux on zEnterprise is another step forward in our continual evolution on the mainframe.
*The key value for our business is that **the most important services can be managed together on a consistent, stable and highly secure platform that offers enormous scalability and performance**."*

Daniele Cericola,
CT Governance Manager, Banca Carige

Mobile, social, cloud, big data and analytics are changing how we live, work and interact

63% of people
expect to be doing more shopping on their mobile devices over the next couple of years

40% of people
socialize more online than they do face-to-face

57% of companies
using cloud to drive competitive and cost advantages

300x growth
of digital content between 2005-2020

80% of all data
is unstructured and growing 15x the rate of structured data

Sicoob
Supporting rapid business growth

The need:

To meet its strategic objective of being the primary provider of financial services to its members, Brazilian credit union system Sicoob needs to ensure that it can meet members' needs for 24/7 service and mobile access to information. The existing distributed infrastructure could not scale to provide the necessary performance and availability, or to enable the data consolidation required for analytics.

The solution:

Virtualized its distributed servers on SUSE Linux Enterprise Server for IBM® System z®—making this its strategic platform for all new servers. Initially, the bank ran **more than 300 virtual servers on two IBM zEnterprise® 196 servers**. The solution includes IBM DB2® software supporting 50 major databases, IBM InfoSphere® DataStage® software for data transformation, and IBM Cognos® software for business analytics.

The benefits:

- Enabled 600 percent growth in mobile solutions and 200 percent growth in internet banking
- Supported 60 percent increase in in-branch transactions, while avoiding R$ 3 million [USD 1.5 million] a year in electricity costs
- Transformed the speed, reliability and efficiency of service delivery to members, with rapid deployment of new resources

"Compared with databases on our previous distributed landscape, DB2 running on Linux on the IBM System z platform offers more reliability and performance, and better integration with our backup, monitoring and ETL tools."

—Paulo Nassar, IT Processing and Storage Infrastructure Manager, Sicoob

Solution components:

- IBM® DB2® for Linux on System z®
- IBM Cognos® for Linux on System z

SICOOB

ZSP03735-USEN-00

RADIXX International

Ron Peri CEO Radixx International on Hybrid Cloud & z Economics

- **SaaS Hosting of Core Airline Reservations System**
  - All airline business models
  - Optimized for developing world

- **Mission critical application**
  - One hour down = $ 1,000,000 loss

Hybrid Cloud

- **Systems of Record move to z Systems**
  - Database
  - Big Data Apps/Cognos/Data Warehouse
  - MQ
  - APIs
  - Payment processing
  - 172 x86 cores move to 10 z Systems cores

- **Systems of Engagement move to SoftLayer Cloud**
  - Client facing IBE*
  - Travel agency portal

*) Integrated Business Environment

Reasons to Change
- Scalability
  - Mobile demand
  - Online Travel Agencies demand
- Security
  - Constant Hacking attempts
- Reliability
  - Adding servers increased complexity and risk
- Reducing TCO

Ronald Peri
CEO, Radixx International

https://www.youtube.com/watch?v=yIBy6aNTqhQ
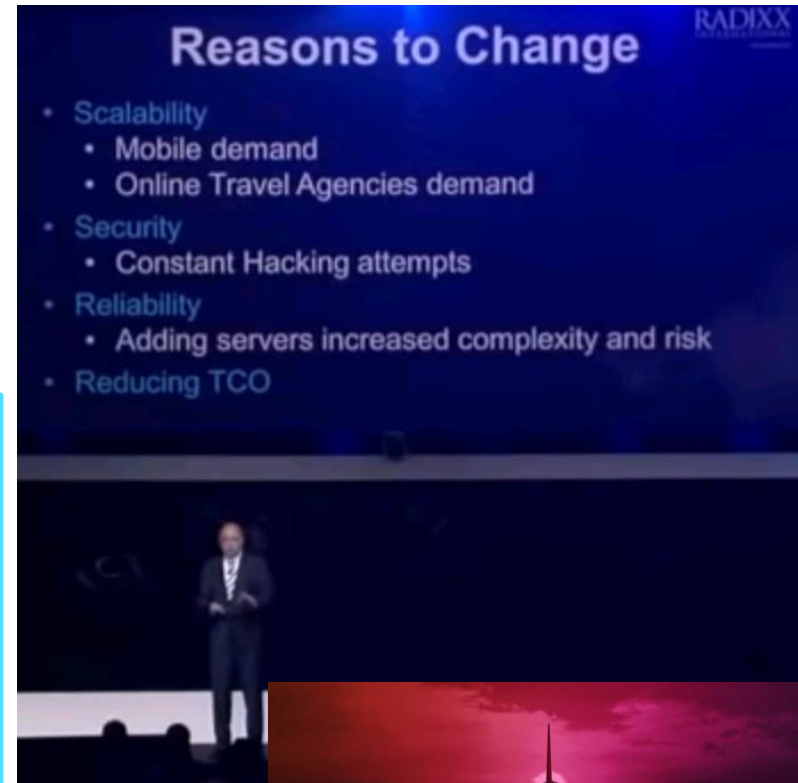
Optimized Computing:
Nationwide's Linux on System z Virtualization

Reduces TCO and Time to Deploy

Nationwide was already experiencing serious technology pain points from the continuous growth of its business. Among these were:

- *Too many distributed physical servers with low utilization*
- *A lengthy provisioning process that delayed the implementation of new applications for headquarters and agencies, and for new customers for Nationwide's human resources outsourcing business*
- *Limitations in data center power and floor space*
- *High Total Cost of Ownership (TCO)*
- *Difficulty allocating processing power for a dynamic environment.*

"Our goal was server optimization and our approach was virtualization."

— Guru Vasudeva, Nationwide vice president and CTO

TCO results that Nationwide has experienced:

- Monthly Web hosting fees have gone down by 50 percent.
- Hardware and operating system **support needs have decremented by 50 percent**.
- CPU utilization is up an average of 70 percent, with the elimination of many physical servers with below average utilization.
- **Middleware licensing costs for WebSphere, Oracle, and UDB have dramatically fallen.**
- There has been an **80 percent reduction in data center floor space** needs, and **power consumption is down**.
- The net of the effort is a **$15 million savings for Nationwide IT over the past three years**.

enterprisesystemsmedia.com/article/optimized-computing-nationwides-linux-on-system-z-virtualization-reduces-tc
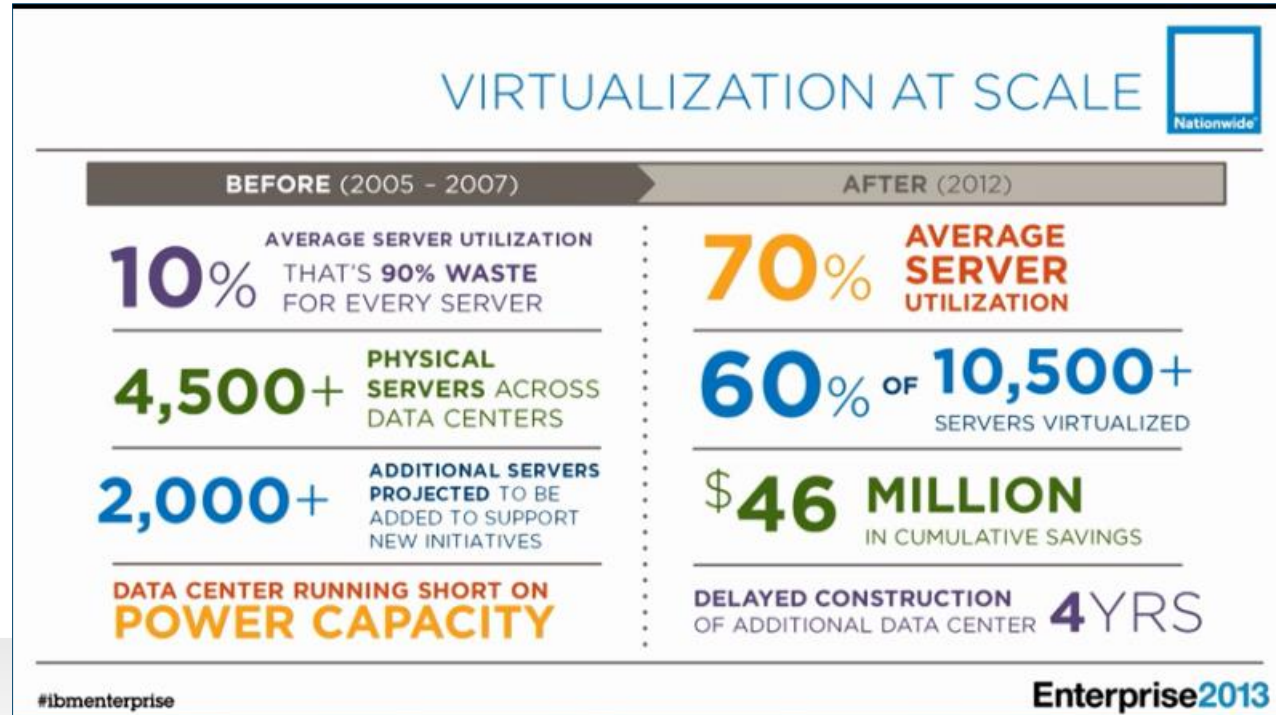
Nationwide Mutual Insurance

With cloud, IBM helped Nationwide Insurance save $46 million
„Nationwide's mission is to protect what matters most for our members."

Jim Tussing
Infrastructure CTO
Nationwide Insurance

http://www.youtube.com/watch?v=ku9HELtbxvA

VIRTUALIZATION AT SCALE

BEFORE (2005 – 2007) | **AFTER (2012)**

10% AVERAGE SERVER UTILIZATION THAT'S **90% WASTE** FOR EVERY SERVER

70% AVERAGE SERVER UTILIZATION

4,500+ PHYSICAL SERVERS ACROSS DATA CENTERS

60% OF **10,500+** SERVERS VIRTUALIZED

2,000+ ADDITIONAL SERVERS PROJECTED TO BE ADDED TO SUPPORT NEW INITIATIVES

$46 MILLION IN CUMULATIVE SAVINGS

DATA CENTER RUNNING SHORT ON **POWER CAPACITY**

DELAYED CONSTRUCTION OF ADDITIONAL DATA CENTER **4YRS**
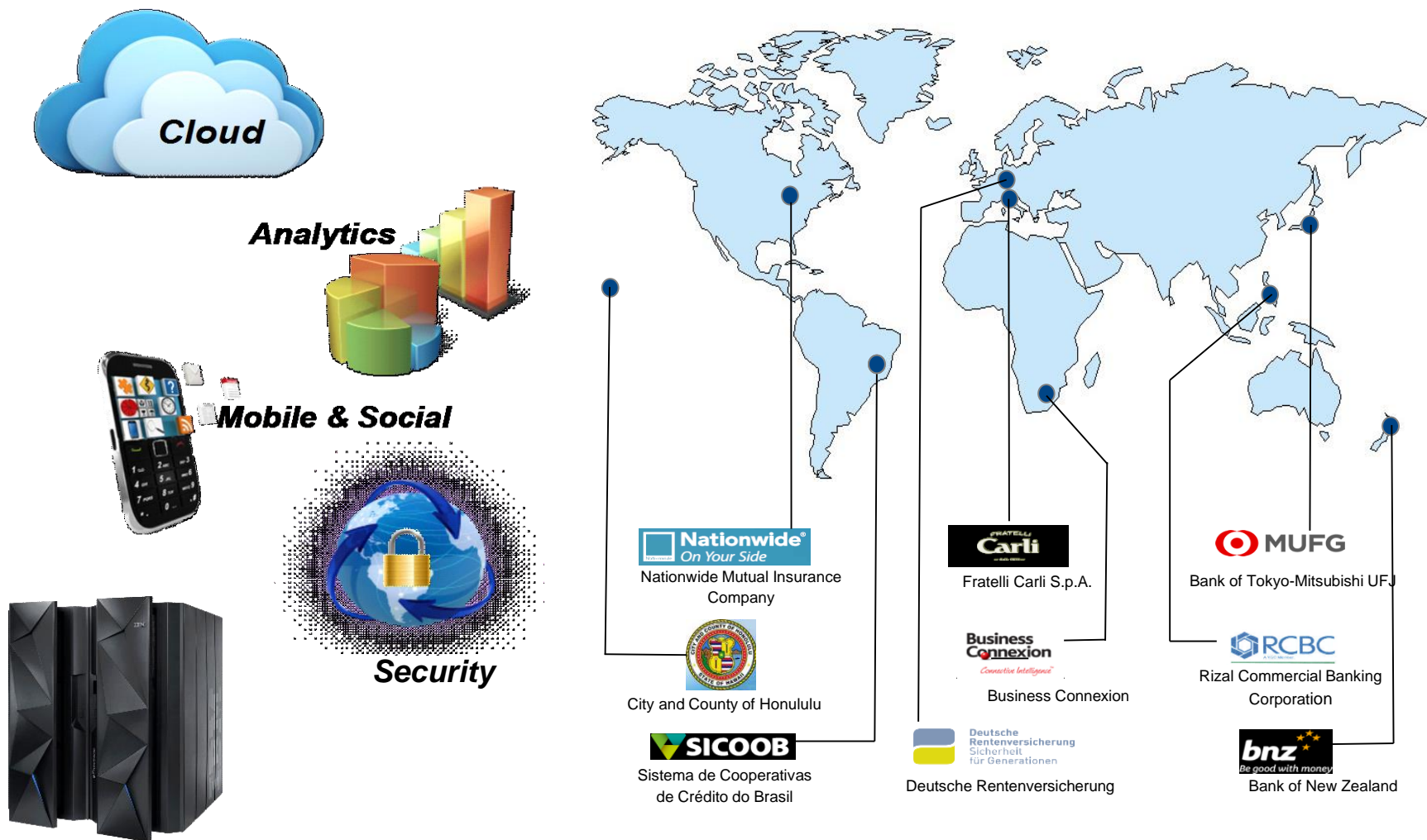
#ibmenterprise

Enterprise2013

"For a financial services company we make promises, in order for us to make and keep them our information systems have to be available and secure, they have to be cost-effective and agile.

We need that so that we can fulfill our promise to be on your side. "   **– Jim Tussing**

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Linux provides the common infrastructure for growing workloads on System z

Cloud

Analytics

Mobile & Social

Security

Nationwide
On Your Side
Nationwide Mutual Insurance Company

City and County of Honululu

SICOOB
Sistema de Cooperativas de Crédito do Brasil

Carli
FRATELLI
Fratelli Carli S.p.A.

Business Connexion
Connective Intelligence
Business Connexion

Deutsche Rentenversicherung
Sicherheit für Generationen
Deutsche Rentenversicherung

MUFG
Bank of Tokyo-Mitsubishi UFJ

RCBC
Rizal Commercial Banking Corporation

bnz
Be good with money
Bank of New Zealand

The Enterprise Grade Linux Solution

The **enterprise grade Linux solution** on **z Systems** is designed to bring unique business value in the areas of *operational efficiency*, *scalability*, *workload management*, *reliability*, *disaster recovery* and *security*.

"I consider IBM System z to be more cost-effective than any other platform. Having worked with both the mainframe and a number of distributed systems, I can say that when it comes to the cost of computing, IBM System z offers the lowest cost of processing large amounts of data, hands-down," says Eduardo Camargo, Executive Vice-President and CIO, EVERTEC.

Questions

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z/VSE & Linux on System z

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ARROW

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technology solutions

Global Knowledge.

INGRAM MICRO®

LearnQuest

Global Skills Initiative