Penguins and Black Suits: How Linux on System z is Used in Banking

Session 10521
Thursday, March 15, 2012: 3:00 PM-4:00 PM
International Ballroom F (Omni Hotel CNN Center)
Our vision is that we have just begun...
The growth and expansion of Linux as a mature, cost-effective alternative for business-critical workloads

Linux continues to enable new ways of doing business

**Edge and Web Infrastructure**
- Community Driven
- Internet Enabled
- Worldwide Volunteers

**Application and Data Serving**
- Open Industry Driven
- Open elements of IT industry join existing community
- Linux adoption in the enterprise accelerates

**Typical Applications**
- E-mail Servers
- Apache
- Lightweight database
- DHCP
- HPC
- e-Business Applications
- Application Servers
- Mission critical database
- Dynamic Business Models

**Business-Critical Enterprise Workloads**
- Competition Driven
- Accepted as mature, open, lower-cost alternative for hosting DB, BI, ERP, CRM in business-critical environments
- Linux is a permanent presence in the datacenter
- Next-generation workloads
- Virtualization / consolidation
- Cloud and dynamic infrastructure
- New business models

1991 – 2004

2005 – 2006

2007 – 2012

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Based on asset size, ....

10 out of the top 10 worldwide banks use System z
25 out of the top 25 worldwide banks use System z
50 out of the top 50 worldwide banks use System z
72 out of the top 75 worldwide banks use System z
96 out of the top 100 worldwide banks use System z

Source: Based on ‘The Banker’, System z install base and financial records
Customer Segmentation

- Installed IFL MIPS increased 24% from 4Q10 to 4Q11
- Linux % of Total installed MIPS: 4Q11: 20% of install base
- 35% of System z Customers have IFL’s installed
- 66 of the top 100 System z Customers are running Linux on the mainframe

Existing Mainframe Customer: Only traditional workload

Existing Mainframe Customer using Linux

First in Enterprise (FIE) New Accounts
FNB Namibia

Growth markets leapfrog to System z: Building IT infrastructures right from the start

IBM's first sale of a Mainframe in Namibia at the First National Bank of Namibia.

Company description:

First National Bank of Namibia operates as a financial services group. It offers cross-selling of banking and insurance products and services. The company was founded in 2003 and is based in Windhoek, Namibia. It has 400,000 Namibian accounts. FNB Namibia Holdings Limited operates as a subsidiary of FirstRand Bank Holdings Limited.

Business Challenge:

Meet regulatory requirements:

Directive from the central Bank of Namibia to localize all banking infrastructure and IT systems in Namibia before the end of 2009. This covers the core functional areas of banking institutions and includes all information technology systems

Support bank growth and improve services for customers

Ensure cost effectiveness and business continuity and deliver exceptional security and availability.

Solution:

Two System z10 BC, z/OS

"FNB Namibia's investment in the latest, industry-leading IBM mainframe systems and software has helped us to build a dynamic core banking platform as well as meet all regulatory requirements," said Advocate Vekuii Rukoro, Group Chief Executive Officer of FNB Namibia Holdings, at a media briefing today. "Importantly, the project to localize Namibia's banking infrastructure has brought technological advancement, knowledge transfer and created jobs for Namibian professionals."

Vietin Bank

Company description

Vietnam Joint Stock Bank for Industry and Trade (VietinBank) is one of the largest banking institutions in Vietnam. VietinBank was established in 1988. The bank's total asset accounts for over 20 percent of the entire Vietnamese banking industry. With headquarters in Hanoi Capital, the bank operates nearly 850 branches and transaction offices and nearly 1,200 Automatic Teller Machines (ATMs) throughout the 56 provinces and cities in Vietnam.

VietinBank selected an IBM mainframe to run a new operational risk management solution, which will enable the bank to deliver premium services to its customers.

Business Challenge

Scalability for business growth

Strengthen operational risk management

35% business growth past year (existing Sun distributed platform could not deliver)

Solution:

System z10 BC, Linux on System z

"The IBM System z10 Business Class™ (z10 BC™) offered us more options than competing products because the system was designed to provide the world's highest levels of security while managing the world's highest amounts of transactions. We are proud to have System z to help us achieve our objective of providing continuous banking services to our customers."

Pham Anh Tuan,
Deputy Director, VietinBank

With this new IBM System z mainframe server, optimized for high transaction banking workloads, VietinBank will benefit from advanced systems management features including capacity management and security to protect the bank's data from potential risks as the country's appetite for traditional and more advanced banking services continues to grow.
SMARTER BANKING
Smarter Banking - Core Services

Infrastructure Management
- Fundamentals on managing and monitoring online, batch and hybrid workloads across the zEnterprise System

Development
- Development, testing and deployment of applications across new and existing channels

Back-Office
- Transformation of traditional components to leverage web services, event processing and enterprise service bus technologies
Payments and Analytics

Smarter Banking Analytics
- Utilisation of DB2 data warehousing, data federation and analytics services across platforms can enable a wide variety of business and technical reports to be supported

Risk & Fraud Management
- Focusing on Basel II/III regulations, the use of advanced analytics to monitor the financial health of the Bank in real-time is key to risk assessment and in conjunction with the in-flight profiling and scoring of transactions is essential in fraud prevention

Retail Payments
- The use of ACI BASE24-eps for ATM and POS acquiring and issuing transactions, along with the ACI PRM fraud detection product, all running on zEnterprise 196. Includes KPI executive reporting with Cognos
zEnterprise Hybrid Workloads

**Datapower XI50z**
- Value of the XI50z being deployed within the zEnterprise: simplification of XML parsing, integrated security and optimised web services

**Multi-Tier Web Application**
- Value of deploying hybrid web applications across various zEnterprise system components, applying the Fit-for-Purpose workload assessment process to identify the most efficient location for CPU, I/O and mixed workload requirements

**Collaborative Banking Solutions**
- Pervasive computing is leading Banks to incorporate social computing and mobile device services to attract the digitally conscious customers. This demonstration covers a number of the latest technologies incorporated into our showcase using hybrid systems
APPLICATIONS & SOLUTIONS
Latest Customer Survey: Previous Platform for Consolidated Workloads (cross industry)

- Windows based platforms: 63%
- UNIX based platforms: 50%
- Linux (not on) mainframes: 43%
Workload share on utilized IFLs

*Primary applications in the past*

- **60%** Application serving for z/OS
  - e.g. WebSphere, SAP, CICS TG, DB2 Connect
- **30%** Data serving
  - e.g. Oracle DB, DB2 UDB
- **5%** Workplace serving
  - e.g. Domino, Scalix, other e-mail
- **5%** Infrastructure serving
  - e.g. Apache, Samba, NFS, etc.
- **<1%** Linux application development/deployment
Communication Controller for Linux on System z

Communication Controller for Linux (CCL) on System z is a solution that allows NCP software to run within Linux on System z processors to provide a migration path for customers who use traditional SNA.

This solution lets them continue using traditional SNA without a dependency on IBM 3745 and 3746 Communication Controller hardware.

CCL can help customers remove the dependency on an IBM 37xx for the majority of configurations where customers currently use 37xx environment. In particular, CCL can support NCP SNI connectivity and some NCP Boundary Function connectivity.
BANK #1

7x z196, total MIPS 65.000, 3 IFLs + Linux running on CP‘s
Mobile SMS Service

- In 2004 the bank launched as a service which enables customers to receive txt messages (sms) upon account activity (savings, cheques, credit card, ..)
- It was designed to cater for a maximum of approximately 250 000 customers.
- Today, 940 000 customers are and the number is growing at a rate of 6% per month (with no advertising).
- **Projection: 8.500.000 Users**
- As a result the original infrastructure and design cannot cope with the demand (Sun Solaris on SPARC)
- The customer has identified the following challenges that need to be addressed in the redesign of the new system:
  - Lack of capacity: the current system cannot cater for the current demand
  - Lack of scalability and robustness: the current system cannot be enhanced to cater for a significant increase in volumes
  - Balances: balances that are sent are delayed which often results in inaccurate information being relayed to customers
  - Lack of registration platforms: Internet and Cellphone Banking customers cannot leverage the convenience of these
  - Current product offering: whether customers are dissatisfied, merely satisfied or delighted by the current product offering is unknown
Solution Stack

**Computing Platforms**
- The Java message processing on Linux on System z (IFL engines) & z/VM
- DB2 will run under z/OS
- COBOL filter running on CICS Plex

**Communication**
- MQ Client

**Storage**
- DASD via Ficon Channels

**Database**
- The Database will be DB2 Version 8

**Middleware**
- WAS v7
- MQ Client v7.0.1.0
- Websphere

**Security**
- Access to the Message Processor is via the ESB which resides within the Firewall.
- Existing Top Secret Database will be shared via z/OS
Current Project SAP Implementation: Two very different paradigms – The BASIC BUSINESS differences

**Distributed deployment**
- Multiple footprints/domains “OS Images” to run the BUSINESS
- Typically, non-Shared Resources

- Separate view of the data
- Low resource utilization
- Complex systems management
- High overall cost

**System z**
- Single footprint (Single resource space)
- Shared everything

- Single view of the data
- System z platform strengths
- Higher resource utilization
- Lower overall costs

**Complex to integrate**

**Faster to market**
Lower risk

What about disaster recovery?
2x z196, 1 z10BC, 18.000 MIPS, 6 IFLS

BANK #2
Oracle Database for one Application (Current Environment)

SOFTWARE
- Sun Solaris
- Oracle Std Ed (no advanced features)
- DR is Active/Passive
- Sync with DR using TrueCopy (SAN level byte copy)

PRODUCTION
- Sun M5000 (1 yr HW support left)

DISASTER/RECOVERY –site1
- Sun V440 (lower spec than Prod, end of HW support)

DISASTER/RECOVERY –site2
- Sun V440 (lower spec than Prod, end of HW support)
Customer Assessment

RISKS

- not of sufficient D/R capacity (limited to about 50 users at normal speed, more users leads to degraded performance)
- [....]
- Cost of out of warrant support

OPPORTUNITIES

- General direction at is to go Linux
- Need to significantly invest in existing architecture (would need at the very least about 4 boxes equal or better than the M5000)
- Difficult decision (flawless record of stability)

PROPOSED ARCHITECTURE

HARDWARE (upgrade of the existing System z10 systems)
- 5 x z10 EC Integrated Facility for Linux (IFL)
- 5 x z10 EC IFL Capacity Backup Upgrade (CBU)
- 80 GB z10 EC memory
- 5 x z/VM
- 5 x Enterprise Linux Support
Proposed Architecture

SITE 1

SITE 2

Oracle Data Guard

Oracle Data Guard
Customer Assessment: General Advantages

- Protected investment
  - Features previously purchased are carried over on upgrade

- Green solution
  - Reductions in power consumption - 40W/IFL
  - Lowest carbon footprint

- Centralised data can be easier to manage
  - Backup/recovery, new deployment, fewer operational mistakes

- Shared capacity can smooth out peaks
  - Real reduction in IT footprint
  - MEASURABLE reduction in Servers, storage, backup, network, licences

- Rapid deployment
  - A new LINUX VM including Oracle can be created in < 15 minutes
  - Standby / test & development systems occupy zero footprint until required

- Server memory
  - z/VM, LINUX and Oracle support shared executables and very efficient memory usage
  - Low overall memory footprint

- Stability
  - No need for disruptive swap out in the future.
Customer Assessment: TCO over 5 Years

- **Initial investment**
  - 772,251 EUR

- **Annual costs** (starting Year 2)
  - 201,606 EUR

- **5 Years total**
  - 1,578,675 EUR
2x z196, 22.000 MIPS, 8 IFLs + CPU

BANK #3
Customer Requirements: Internet Banking

Deployment of the following SW stack on zLinux:

- WebSphere Portal Server (Portal)
- WebSphere Process Server (Process)
- WebSphere Message Broker (Broker)
- WebSphere Message Queue (MQ)
- WebSphere Application Server (WAS)
- Database is Oracle DBMS and will be deployed outside of zLinux (on Solaris) for now

- Support Continuous Availability to various extent:
  - Portal = Continuous Operations (service without shutting system down)
    - Ability to perform infrastructure maintenance
    - Ability to deploy application changes
  - Process + Broker + MQ + WAS = High Availability

- Support a “Security Zones” concept with a combination of security mechanisms on System z and the actual physical network

- Support different environments; production, operational test, acceptance test, functional test, infrastructure test

- Maximize virtualization while keeping to the principles above

- Minimize operational and license costs while keeping to the principles above

- Distance between sites is 19km and 14km, respectively (two fiber paths)
Multiple Environments

- **z/VM DEV LPAR**
  - "Development"
  - Intermittent
  - Many
  - IFL's Shared (Share all the IFLs between all the Linux LPARs)
  - 30%

- **z/VM TEST LPAR**
  - "Test"
  - Constant
  - Few
  - Z196, # CP's, # IFL's, # GB Memory

- **z/VM PROD LPAR**
  - "Production"
  - 70%

- **z/OS LPAR**
Multiple Environments
High availability and continuous operations
3x z196, 56.000 MIPS, 24 IFLS

BANK #4
High level overview of the mainframe environment

Production + Test at two Sites (MF)

Datacenter 1

8 CP
15 zAAP
6 IFL

Datacenter 2

8 CP
15 zAAP
6 IFL

DR-Configuration (MF) – Capacity Backup

16 CP
30 zAAP
12 IFL
(3 ICF)

Total: 61 (from 80)
BANK #5
- Increased capacity on Linux on System z from 3 to 5 processors
- Web applications, DB2, Data Warehousing

Environment:
- 2 CPs with z/VSE with COBOL applications, core banking software
- 5 IFLs with Linux
  - 3 IFLs with DB2 data warehouse
  - 2 IFLs with WebSphere products
- Approx 50 SQL servers with consolidation potential

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BANK #6
Production Site Layout for SOA and Domino

PROD₁  PROD₂  DEV₁  PROD₃  PROD₄  PROD₅  PROD₆  PROD₇

- zVSE
- CICS
- Cobol

- VSE Core Bank
- VSAM
- VTAMT CP/IP
- 6GB

zLinux PROD
- Domino
- 4GB
- 1 IFL
- WBM
- 4GB
- DB
- 6GB
- 1 IFL

- zLinux PROD
- WPS
- 6GB
- 1 IFL

- zLinux PROD
- BTT
- 4GB
- 1 IFL

2CPs 15GB memory  1GB HS  5 IFLs 32GB memory

z10-Y02

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DR Site Layout for SOA and Domino

PROD₁

TEST₁

zLinux
zLinux
zLinux
zLinux
zLinux

TST/DEV
TST/DEV
TST/DEV
TST/DEV
TST/DEV

PROD₁

TEST₁

zVSE
zVSE
zVSE
zLinux
zLinux
zLinux

zVSE
zLusz
zLinux
zLinux
zLinux
zLinux

CICS
Cobol
VSE
Connector
Server
VSAM
VTAMT
CP/IP

WMB
MQ
VSE
Connector
4GB
4GB
4GB
4GB

1 IFL
1 IFL
1 IFL
1 IFL

WPS
Domino
BTT
WMB

4GB
4GB
4GB
4GB

6GB
5GB
6GB
6GB

6GB
5GB
6GB
6GB

zVM

2CPs 11GB
1GB HS

4 IFLs 28GB memory

z10-L01

HS - Hipersockets

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BANK #7
z/VSE Core Banking Solution

LPAR Configuration Summary
Linux on System z as a Backup Hup

**Distributed Servers**
- UNIX, Windows
- Application Data, Data Bases, Mail Servers, etc.

**IBM 3592-E06**
- 4 drives

**IBM 3592-E07**
- 12 drives

**TS7650G**
- 2 x DS3500 – 100TB

**TS3500**
- 1020 Cartridges

**IBM 3592-E06**
- 4 drives

**SAN**

**TSM for VE servers FASTBACK Server**
- DS3500 – 35TB

**Virtual Tape**

**Linux on System z**

**z/VSE**

**z/VM**

**TSM Server**

**TSM Agent**

**Back-Up & Restore Mgr**

**Tape Library**

**IBM 3592-E07**

**FAST BACK**

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The strategy of transformation of applications to higher levels of N1 architecture across an enterprise bus allows the flexibility to aggregate and disaggregate services, use of strong platform, centralized monitoring and SOA Governance.

- An event infrastructure based on robust and reliable service-oriented architecture.
- Strong use of Web Services
- Operating platform independence
- Supports transaction volume
- It has security features
- Uses standard for integration with "legacy"
Summary

Common Workloads

- Oracle
- WAS
- ESB
- SAP
- Lotus Domino
- TSM

Where to start

- Internal Application/Infrastructure
  - CCL
  - Oracle
  - Domino
  - ESB
  - WAS

- External „customer facing application“
  - WAS, Portal,....
Your Questions ?
Appendix:

OFFICIAL CUSTOMER REFERENCES
Bank of New Zealand
Reduces carbon footprint with RedHat on the Mainframe

Background
For the last 150 years, **BNZ (BANK OF NEW ZEALAND)**, a subsidiary of the National Australia Bank Group, has helped individuals, farmers, and businesses with their financial pursuits. Throughout this time, BNZ has evolved to meet changing customer needs and expectations, while continuing to deliver innovative new products and services.

BNZ is focused on empowering its customers and prides itself on its flexibility, innovation, and corporate responsibility. It is also leading the New Zealand banking and finance industry in developing, and benefiting from, a more energy efficient, “green” IT operation.

Challenge
Like a large number of businesses in New Zealand and around the world, BNZ was close to reaching capacity in its data center and needed to determine how to maximise space while keeping costs down.

The bank’s corporate values also have a carbon neutral focus, which it was keen to put into practice across all aspects of its business operations.

“The issues we were dealing with were not necessarily unique, but a reflection of the current business climate,” said Lyle Johnston, infrastructure architect for BNZ.

“BNZ had defined two important goals for the future, both of which relied heavily on IT. The first was for the organisation to become carbon neutral by 2010 and the second was to explore open source opportunities though the adoption of Linux.”

Another challenge BNZ faced was to create a disaster recovery solution. Its data centers—one in Auckland, New Zealand and the other in East Melbourne, Australia—are separated by the Tasman Sea.

Bank of New Zealand
Reduces carbon footprint with RedHat on the Mainframe

Solution

In mid 2007, BNZ embarked on a bold mission to realize its corporate objectives. It overhauled its mission-critical front-end IT environment, including its Internet banking and bank teller functions through to core backend data. It migrated its systems to Red Hat Enterprise Linux 5 running under z/VM on the mainframe.

BNZ purchased one IBM z10 system for use in production, as well as one IBM z9 system for use as a disaster recovery machine. Both mainframes exclusively run Red Hat Enterprise Linux 5, IBM WebSphere application and IBM Process server, along with customised JAVA applications written by BNZ. Combined, these power BNZ’s customer facing banking systems, including Internet banking and teller platforms.

The combination of z/VM and Red Hat Enterprise Linux 5 enabled BNZ to virtualise and consolidate a largely distributed SUN environment, which incorporates all of its front-end systems, down to just one box and run it in a manner that didn’t present a significant change for administration staff.

A critical component in the successful deployment and ongoing management of its new systems, BNZ also incorporated Red Hat Network (RHN) Satellite. RHN Satellite provides BNZ with the ability to combine provisioning, updating, patching, and maintenance into a single function for greater simplification. By utilising RHN Satellite, the bank was able to re-provision its entire teller platform development environment in approximately two hours.

BNZ’s first production load on the new system went live in August 2008, with high visibility across the organisation.

“Deploying IBM mainframes with Red Hat Enterprise Linux to address our carbon footprint and cost saving concerns was a very big deal, especially at the senior management level. It provided us with the opportunity to take a very serious leap into Linux, and that was exciting for everyone in IT and beyond,” said Johnston.

To date, the bank has consolidated 131 SUN SPARC systems to Red Hat Enterprise Linux on IBM System z. These systems include v440s, v280Rs, and E10Ks on the high-end.
Bank of New Zealand
Reduces carbon footprint with RedHat on the Mainframe

Benefits

While a move to Linux on the mainframe represented a major shift from traditional banking systems, for BNZ the migration to Red Hat Enterprise Linux on IBM System z platforms produced impressive returns and exceeded expectations.

After just three months the project was ahead of schedule and on budget, and BNZ was already able to consolidate its servers and reduce its front-end systems data center footprint by 30 percent. Even in the project’s early days, the bank noted significant cost advantages with approximately 20 percent ROI expected over the life of the platform.

According to Johnston, “We have also managed to substantially reduce our front-end power consumption by nearly 40 percent, which means we were well and truly on our way to becoming carbon neutral by our 2010 goal.”

In fact, since migrating to Red Hat Enterprise Linux on IBM mainframes, BNZ has recorded a 33 percent reduction in heat output and a 39 percent reduction in carbon dioxide emissions for its front-end systems.

The new virtualised platform has also boosted the speed and simplicity of new deployments. Instead of taking days, a new environment can be deployed in just minutes.

Furthermore, with just one administrator needed per 100 virtual servers, BNZ can save on resources traditionally used to manage the platform, freeing them up to work on new innovative projects.

BNZ’s industry-leading move to Red Hat Enterprise Linux has attracted plenty of attention, with a number of banking counterparts monitoring BNZ’s performance benchmarks with great interest.

“The choice to invest in Red Hat was largely based on its commitment to the ongoing development of the platform and its strong support capabilities, particularly in reference to supporting Red Hat Enterprise Linux on the mainframe.”

—Lyle Johnston, infrastructure architect for BNZ
Bank of New Zealand
Reduces carbon footprint with RedHat on the Mainframe

“The fact is there are a lot of reasons to consolidate with Red Hat on the mainframe and as we were the first in New Zealand to do it, it has attracted a lot of interest from the banking world,” said Johnston.

Looking forward, BNZ has adopted a long-term, strategic view of how Red Hat Enterprise Linux will continue to deliver value.

“What’s been truly remarkable has been the fact that introducing Red Hat Enterprise Linux into the organization has breathed new enthusiasm and new life into the business and the people behind it,” said Johnston.

“This project has been a type of gateway for us, and working with Red Hat has opened our eyes to what’s possible with open source. From our perspective, the best is yet to come.”

—Lyle Johnston
Svenska Handelsbanken

Building a modern data center on mainframe technology

SVENSKA HANDELSBANKEN is one of Sweden’s largest and best-known banks. Founded in 1871, it is the oldest company on the Swedish Stock Exchange. Today, it provides a comprehensive range of banking services to customers in Sweden and 17 other countries in Europe, Asia and North America. The bank has more than 10,000 employees and 700 branches worldwide.

Handelsbanken’s main strategic goal is to be more profitable than its competitors in the Swedish banking sector. It aims to achieve this goal by two main methods: first, to maintain and increase its customer base by delivering excellent customer service, and second, to reduce operational costs and increase efficiency.

“Good customer service is all about personal contact, so at the branch level, we operate on a ‘church tower’ principle,” says Håkan Sandström, senior vice president, Sourcing and vendor management, Handelsbanken. “If one of our branch managers goes to their nearest church and climbs the tower, they should be able to see the houses of all their customers. In all areas that relate to customer service, we try to run a decentralized organization, giving our branch employees a lot of responsibility and expecting them to make the right decisions based on their knowledge of their customers and the local economy.”

“On the other hand, there are also areas of the business that benefit from centralization—not only because of the cost benefits, but also because it is important to provide a consistent level of service to customers in all areas and across all channels. As a result, our IT strategy is to centralize as much as possible, giving all our branches a standard set of IT tools and maintaining a single ‘corporate identity’ for online banking and other services.”

Svenska Handelsbanken
Building a modern data center on mainframe technology

Challenge
With the growth of both Internet banking and core banking systems, Svenska Handelsbanken wanted to consolidate as many systems as possible to a simple centralized infrastructure.

Solution
By running Linux, Java, and database workload alongside core banking systems on an IBM System z10, Handelsbanken benefits from a single easy-to-manage platform with rapid disaster recovery capabilities.

Benefits
- Runs hundreds of systems on a single physical machine
- Cuts Java workload costs by 15 percent per year
- Enables disaster recovery within seconds

Scalable infrastructure
Like most banks, Handelsbanken is a long-term user of IBM’s mainframe technologies, which provide high availability and performance for its core banking services. Over the years—and particularly with the advent of Internet banking—Handelsbanken had also built a landscape of smaller, distributed servers, mostly running Microsoft Windows or Linux operating systems.

“We probably have about 2,500 servers in the distributed landscape, but we only need two IBM System z mainframes—one at each of our main data centers,” says Roger Rydberg, manager of System z Platform. “The team that manages the mainframe environment can just log in to one server and work on all the systems running on it, while the team responsible for the distributed servers has to spend a lot more time on hardware maintenance, network management, and other low-level tasks.”

Handelsbanken’s first Internet banking solution was built in the distributed environment. The service was an instant success with customers, and user numbers grew much more quickly than Handelsbanken had anticipated.

“Scalability was a real challenge, because we had to keep buying more physical machines to act as Web servers,” explains Sandström. “This was not only expensive, it also posed physical problems in terms of space in the data center, cabling, electricity, and air-conditioning requirements. So we immediately started thinking about the next generation of online banking, and whether we could create a more scalable infrastructure.”
Leveraging specialty engines

The Handelsbanken team realized that by taking advantage of IBM System z Application Assist Processors (zAAPs), it would be able to run the Java online banking applications on IBM WebSphere Application Server in a virtualized environment on System z.

“The capacity and the virtualization capabilities of System z are a huge advantage for fast-growing environments like our online banking system,” says Rydberg. “When we need a new Java server, we can provision one very quickly, with no need to buy any new hardware. Moreover, the use of zAAP specialty engines keeps the licensing costs low, so the solution is very cost effective. As we increase the proportion of WebSphere servers that are running on System z, we reduce the operational cost of the environment by about 15 percent per year.”

Handelsbanken also uses System z Integrated Information Processors (zIIPs) to handle database workload for its distributed data warehouse, and is increasingly turning to the System z environment to host its Linux servers too, running on Integrated Facility for Linux (IFL) engines.

The growth of Linux

“We are currently running two main Red Hat Enterprise Linux systems on System z—StreamServe for printing, and Todos for online authentication,” says Rydberg. “This has been very successful, and we are now considering moving some of our other applications onto the System z as well, particularly if they use Oracle or IBM DB2 databases. The licensing for these databases on Linux on System z is much more cost effective than on Microsoft Windows servers, so it would be a sensible move. I expect the Linux on z environment to grow very rapidly in the next few years.”

“The capacity and the virtualization capabilities of System z are a huge advantage for fast-growing environments like our online banking system... As we increase the proportion of WebSphere servers that are running on System z, we reduce the operational cost of the environment by about 15 percent per year.”

—Roger Rydberg, manager of System z platform, Svenska Handelsbanken
Investing in System z

For all these reasons, Handelsbanken considers IBM System z as a strategic platform, and plans to use it to support its core banking systems and online services for the future. The company invests significant resources in the “12 Program,” an initiative that takes 12 employees from across the business and gives them a year’s training in working with the System z environment. Handelsbanken is also one of IBM’s longest-standing System z customers, and has a long history of involvement in the development and testing of new System z technologies.

Sandström concludes, “I’ll tell you a story, which I think sums up the way we think of System z at Handelsbanken. Last year we had some students from Linköping University working with us on a project, and they were surprised when I told them that we had a mainframe. They thought mainframes were old fashioned. So I took them on a tour of our data centers.”

“We went into the room with the System z first, and they were amazed that it was so quiet and small—not much bigger than a standard server rack. I explained that the mainframe and the discs took much more space before, but technology has advanced so much that we now only need this one machine. Then we went to see our Intel installation—a much larger room, full of racks and cables and hundreds of servers with fans whirring and blowing out hot air.”

“When we left, I asked the students which of those data centers is old fashioned, and which is state of the art? The reality of System z is much more attractive than people perceive, and our installation at Handelsbanken proves that it is a practical, manageable, resilient, and cost-effective platform for business systems of all kinds.”

Keeping systems online

Aside from the cost advantages and the ease of provisioning new virtual servers on System z, it is also much easier to protect data and ensure high availability in the System z environment. IBM Metro Mirror is used to synchronously replicate all data from the IBM System Storage DS8700 storage system at the production data center to a remote location, and the two System z machines are clustered using IBM Geographically Dispersed Parallel Sysplex (GDPS) technology. As a result, if there is a major outage at one of the data centers, the other can take over the full workload within a matter of seconds.
Svenska Handelsbanken
http://www.youtube.com/watch?v=t670upF1p9Y
EFiS EDI Finance Service AG
supporting mission-critical applications and services

Business need:
EFiS EDI Finance Service AG had been using a collection of x86-based servers running Linux software to support its mission-critical applications and processes. However, the servers were not meeting the company’s performance or scalability requirements.

Solution:
PROFI Engineering Systems AG helped the company migrate its mission-critical applications from x86-based servers onto a single IBM Enterprise Linux Server (ELS) – an IBM System z9 Business Class platform running Novell SUSE Linux Enterprise Server for System z. The company then saw an opportunity to expand its IBM and Linux investments and improve the company’s overall services by updating its data center and installing a new ELS, based on IBM System z10 Business Class hardware.

Benefits:
- Successfully consolidated IT environment while deploying hundreds of Linux instances to support its performance requirements.
- By retiring unnecessary and underperforming hardware, the company was able to double processing speeds and optimize its data center.
- The implementation of the SUSE Linux Enterprise Server software and System z technology enabled the company to optimize its fully realized disaster recovery plan.

The consolidated IBM System z9 BC and IBM System z10 BC servers successfully streamlined the data center to optimize maintenance and management processes and effectively reduce costs.

The virtualized IBM System z environment offers much higher than average processor utilization levels, so a single IFL processor is able to handle workloads equivalent to a large number of x86 servers. This is particularly significant for software which is licensed on a per-processor basis, as is the case for many of the company’s business-critical applications.

As a result, the company was able to enjoy instant savings by migrating these applications to the SUSE Linux Enterprise Server solution.
Efficient Data Center with IBM Mainframe Technologies at EFiS
http://www.youtube.com/watch?v=jK4_VFA99oU
SDV runs a number of very large databases within the virtualized Linux environments … The company also relies on SUSE Linux Enterprise Server to support online banking services for the Sparda Banking Group’s 4.2 million customers.

Working with IBM, SDV deployed an IBM z196 at each of its two data centers, activating six Integrated Facility for Linux (IFL) engines on each box.

“Our online banking services process approximately 1,200 online transactions per second, so we simply cannot afford them to fail. SUSE Linux Enterprise Server, which is involved in a significant part of this workload, makes us confident that this will not happen.

Since deploying SUSE Linux Enterprise Server on the IBM z196 we have experienced over 99 percent availability.

This proves that Linux’s reputation for stability and reliability is well and truly deserved.

We imagine the solution will play an integral role in SDV’s infrastructure for some time to come.”

- Bernd Bohne, Department Head, Central Systems Technology, Sparda-Datenverarbeitung eG

www.novell.com/success/sparda.html
“Over the years, the mainframe transformed from traditional workloads, quite simple, to a universal platform for new workloads as well. And we see a lot of new applications that are coming to this platform. Especially for Linux, it's perfect. The z/Enterprise platform is perfect for consolidating Linux workloads because of the high I/O bandwidth, business continuity with capacity backup features.”

“Oracle has been consolidated on this platform we are using right now only Oracle on the z196 platform,”
Bernd Bohne, Sparda-Datenverarbeitung e.G., Manager, Central Systems

Watch and listen to
- Bernd Bohne, Sparda-Datenverarbeitung e.G., Manager, Central Systems
- Marie Wieck, IBM, General Manager, Application Integration Middleware
- Steve Mills, IBM, Senior Vice President & Group Executive, Software & Systems

ibm.com/systems/z/resources/sparda_bank_video.html
Banco Pastor …
slashes costs and boosts efficiency with SAP, Lotus Notes and IBM

Business need:
Banco Pastor was using heavily customized and modular software for its HR functions including its payroll, benefits administration, HR management information system, recruitment, career and training systems and employee Self-Service systems. This highly tailored system required a significant maintenance effort, representing a substantial cost in upkeep. Introducing changes required by new Spanish or EU labor regulations was costly and slow. Banco Pastor wanted to reduce operational costs and cut the time taken to respond to new business regulations.

Solution:
Banco Pastor implemented SAP ERP Human Capital Management, with SAP NetWeaver Portal providing simple browser-based access for employee self-service. The system runs on two IBM System z10 servers, supporting Linux operating system partitions and IBM DB2 running natively on z/OS. The z10 servers also host IBM Lotus Domino and IBM Lotus Notes services in additional logical partitions.

Benefits:
• A hugely complex and modular HR system has been consolidated and simplified using the SAP ERP Human Capital Management solution.
• The new system has cut administrative processes, reduced complexities and minimized the workload for both the IT and HR departments by 30 percent respectively, translating to significant savings and labor efficiencies.
• The newly introduced IBM and SAP solution also enables staff to process personnel issues through a web portal quickly and easily, reducing bureaucratic processes by between 30 to 70 percent.

"The employee portal has been particularly successful as it is much easier for staff to process requests for vacations and training, and for HR to manage these requests. It allows employees to manage their vacations more easily, reducing bureaucratic processes by between 30 to 70 percent…

- Montserrat Torres Torres, Computer Systems Manager, Banco Pastor

SAP Banking Services 7 on DB2 10 and zEnterprise
150 Million Accounts Measurements

- Record-setting performance for SAP core banking workloads
  - Bank postings
  - Balancing

- Number of accounts processed larger than ever before: **150 million**
  - Previously: 40 million

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Large-scale project run in Poughkeepsie in 1H 2011 – see

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Postings / hour [mio]

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<th>DB2 Configuration</th>
<th>Throughput [mio]</th>
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<td>40 mio</td>
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Balancing Throughput [mio]

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DB2 9 on z9 with older SAP TRBK4 banking release
This paper will attempt to answer the question: “Does it make sense for me to run WebSphere® Application Server in a z/VM® DCSS for my IBM System z® Linux® guests?” This paper will help you decide whether running WebSphere in a DCSS is right for you.

Answering this question involves several factors that we address in this paper:

What is a DCSS?
How difficult is it to setup WebSphere in a DCSS?
How much memory and spool space will this consume?
How much memory is saved for each Linux guest?
Are there performance advantages?
How do you add fixes to WebSphere when it’s in a DCSS
IBM announced that Primerica, Inc., the largest independent financial services marketing company in North America with more than 2.4 million client accounts, has selected the new IBM zEnterprise 196 to run its core business applications. The new zEnterprise—which runs both Linux and the z operating system—helps reduce the time it takes Primerica agents to open insurance and other types of financial accounts from days to minutes by enabling smart phones to upload client records directly to the mainframe server.


The Cameroon Ministry of Finance has turned to IBM (NYSE: IBM) and CFAO Technologies, an IBM Business Partner in West Africa, to help modernize the payroll processes for government employees in the country. "IBM System z running on Linux provides the Ministry with an open platform to help standardize the use of ICT and increase levels of connectivity between government departments," said Bernard Beyokol, General Director of CFAO Technologies in Cameroon.

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Notes:

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