Columbian Financial Group SMaRT Project

Z/VM, VSE and Linux on IBM zSeries Technical Conference

October 7-10, 2002

Fountainebleau Hilton Resort

Miami Beach, Florida

James P. Gross

Manager Technical Services

RETURN TO INDEX

SMART

- SALES
- MEASUREMENT
- and
- REPORTING
- TOOL

Columbian Financial Group

- The Columbian Financial Group of companies includes the parent company Columbian Mutual Life Insurance Company, along with Columbian Life Insurance Company, Columbian Family Life Insurance Company, Columbian Financial Services Corporation, New Vision Service Corporation of New York and other affiliated companies within our corporate family. We conduct operations from our administrative corporate offices located in Binghamton, New York.

Columbian Financial Group

- For over 115 years Columbian Mutual has been providing value through quality, affordable life insurance protection - protection through consumer-oriented products that are designed for family and business life insurance needs, protection through financial stability, and protection through prompt, accurate, and friendly service to our policyholders.

Current CFG Configuration

- IBM Multiprise 3000 H50
- 4 LPAR's
- 2 VSE/ESA 2.3 (Production and Test Systems)
- zVM 4.3 (Development System)
- 2 VSE/ESA 2.6 Guests
- 3 SuSe 7.0 Linux Guests
- 1 Suse 7.0 Linux

CFG Objectives

- EVALUATE FoxPro SALES REPORTING
- DESIGN NEW SALES REPORTING SYSTEM
- DESIGN REPOSITORY OF SALES INFORMATION
- DEFINE THE INFRASTRUCTURE TO SUPPORT THE REPOSITORY

CFG/IBM Goals

- DETERMINE REPORTING REQUIREMENTS TO SUPPORT NEW BUSINESS MODEL
- DIAGRAM TYPE, STRUCTURE AND ORGANIZATION OF DATA NEEDED TO SUPPORT NEW REPORTING
- DESIGN INFRASTRUCTURE TO SUPPORT OPERATION OF DATA WAREHOUSE

CFG Infrastructure Selections

- UDB DB2 - ROBUST PRODUCT
- LINUX - FLEXIBILITY/STABILITY
- S/390 - COST/RELIABILITY/POWER/SPEED
- zVM - MANAGING/IMPLEMENTING
- VSE/ESA 2.6 - e-BUSINESS CONNECTORS
- BRIO - PRESENTATION/EASE OF USE
- JAVA/JAVA SCRIPT - REUSABLE CODE
- ER/WIN - DATABASE DESIGN
- SUPPORT SUPPORT SUPPORT!!!!!!!!!!!!!!

PHYSICAL OPERATIONAL FLOW USING THE VSAM REDIRECTOR CONNECTOR

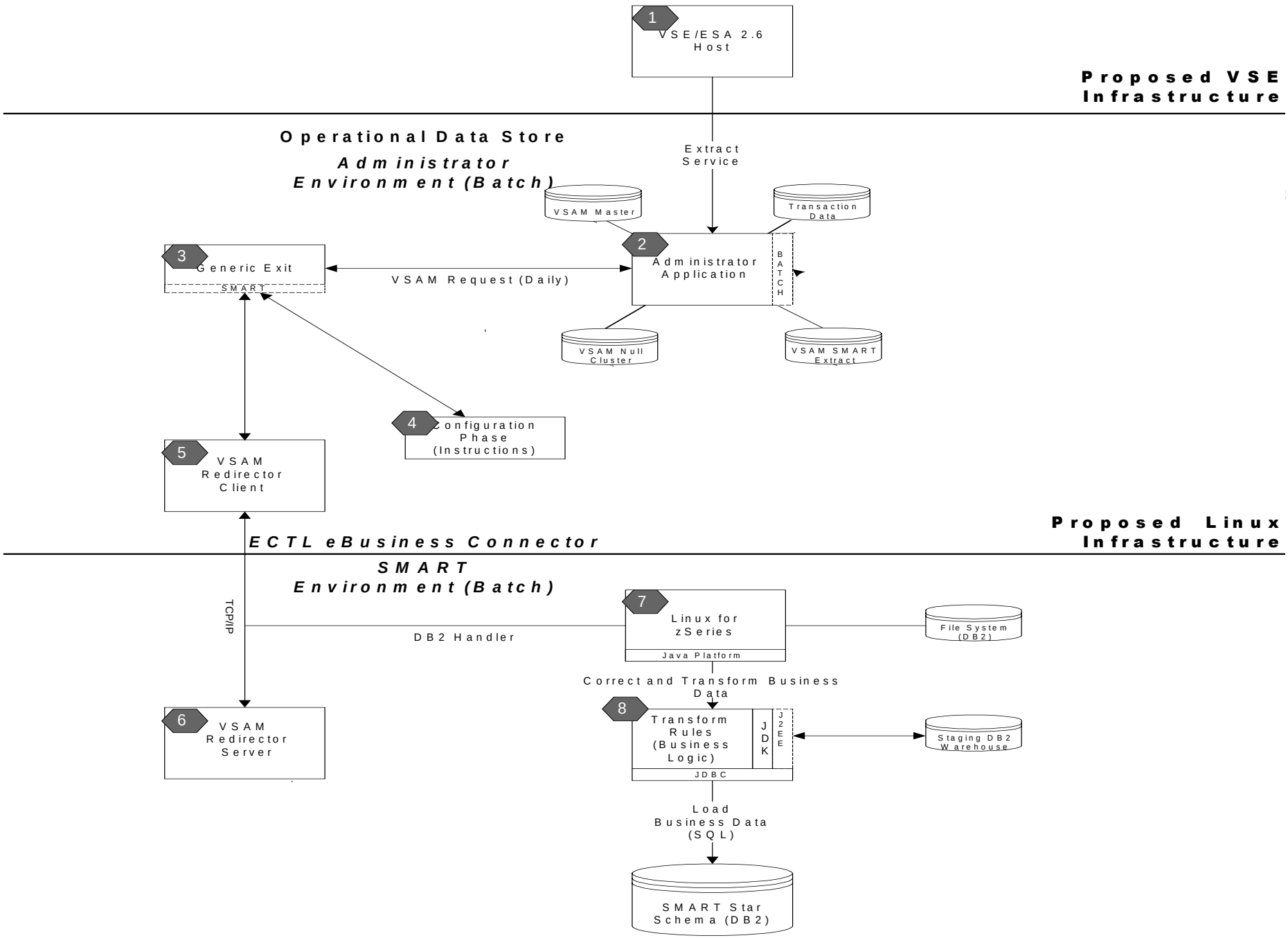
- **VSE/ESA 2.6;** The Administrator system, running on the VSE/ESA 2.6 LPAR host issues a scheduled VSAM command to initiate the daily transfer of the extracted SMART changed data to the Linux for zSeries Java Platform.
- **Administrator Application;** The extract batch job, running in the Administrator Application job flow, triggers a SMART generic exit to initiate the VSAM data transfer.
- **Generic Exit;** The Generic Exit checks the configuration phase for the instructions to redirect the extracted data to the LPAR Linux Host.

PHYSICAL OPERATIONAL FLOW USING THE VSAM REDIRECTOR CONNECTOR

- **Configuration Phase;** This component is configured with the redirection instructions for the SMART VSAM file.
- **VSAM Redirector Client;** This component, installed on the VSE/ESA side, uses TCP/IP socket to socket communication to establish communication with VSAM Redirector Server - residing on the Linux for zSeries Java Platform. The VSAM file request and its VSAM record content, for the daily batch data are redirected to the DB2 file system.
- **VSAM Redirector Server;** This component uses the DB2 Request handler, specified in the configuration phase, to access to the target DB2 database.

PHYSICAL OPERATIONAL FLOW USING THE VSAM REDIRECTOR CONNECTOR

- **Linux for zSeries;** This platform, equipped with JDK Tools as well as the Java Virtual Machine, is the host system used to Correct, Transform, and Load the daily data to the SMART Star Schema.
- **Transform Rules;** Java Scripts, provided with the DB2 Handlers, collaborate with a physical model of the staging DB2 tables, mirroring the Enterprise Warehouse Model, to transform and load the extracted data.


1
VSE/ESA 2.6 Host
Proposed VSE Infrastructure
Operational Data Store
Administrator Environment (Batch)
Extract Service
VSAM Master
Transaction Data
2
Administrator Application
BATCH
3
Generic Exit
SMART
VSAM Request (Daily)
VSAM Null Cluster
VSAM SMART Extract
4
Configuration Phase (Instructions)
5
VSAM Redirector Client
ECTL eBusiness Connector
Proposed Linux Infrastructure
SMART Environment (Batch)
TCP/IP
DB2 Handler
7
Linux for zSeries
Java Platform
File System (DB2)
Correct and Transform Business Data
8
Transform Rules (Business Logic)
JDK
J2EE
JDBC
Staging DB2 Warehouse
6
VSAM Redirector Server
Load Business Data (SQL)
SMART Star Schema (DB2)

CFG Next Steps

- Phase 1 - FAT Client (Brio on the Desktop)
- Phase 2 - Thin Client (Citrix Connection)
- Phase 3 - Web Access (CFGLIFE.COM)

SMaRT Team Members

- BRUCE WILLIS - PROJECT MANAGER (CFG)
- DEBBIE RIHL - SUBJECT MATTER EXPERT (CFG)
- KATHY DUPREE - ECTL (CFG)
- BILL KILLEAN - SYSTEMS ANALYST (CFG)
- CLAUDIA SWEET - IBM PRINCIPLE (IBM)
- PAUL KAMINSKY - LEAD ARCHITECT (IBM)
- TONY CODRINGTON - BUSINESS ANALYST (IBM)
- PAT WINNIE - SR. LAN ADMINISTRATOR (CFG)
- STEVE KELLY - VSE SYSTEM PROGRAMMER (ENSCO)

SMaRT Team Members

- TERRY SPAULDING - VM/VSE LINUX ADMIN (IBM)
- PAUL WESTFALL - DB2 (IBM)
- JIM GROSS - TECHNICAL SERVICES (CFG)
- GARY LOLL - VM INSTALL (IBM)
- OLUKAYODE DOSUNMU -ADVISORY IT SPECIALIST (IBM)
- LIFE INSURANCE DATA PROCESSING - POLICY ADMINISTRATION SYSTEM (LIDP)

Linux on zSeries means Success to your Business

Session L05:

z/VM, VSE, and Linux on IBM zSeries Technical Conference

October 7-10, 2002 Miami, FL

Klaus Goebel
Linux Planning Mgr & VSE Program Mgr
IBM Lab in Boeblingen, Germany

Trademarks

The following are trademarks of the International Business Machines Corporation in the United States and/or other countries.

CICS*
DB2*
DB2 Connect
DB2 Universal Database
e-business logo*
eLiza
Enterprise Storage Server
HiperSockets
IBM*
IBM logo*
IMS
Intelligent Miner
Multiprise*
MQSeries*
OS/390*
PartnerWorld*
S/390*
Tivoli*
Tivoli Storage Manager
Virtual Image Facility
VM/ESA*
VSE/ESA
VTAM*
WebSphere*
z/Architecture
z/OS
z/VM
zSeries

* Registered trademarks of IBM Corporation

The following are trademarks or registered trademarks of other companies.

Lotus, Notes, and Domino are trademarks or registered trademarks of Lotus Development Corporation
LINUX is a registered trademark of Linus Torvalds
Penguin (Tux) compliments of Larry Ewing
Java and all Java-related trademarks and logos are trademarks of Sun Microsystems, Inc., in the United States and other countries
UNIX is a registered trademark of The Open Group in the United States and other countries.
Microsoft, Windows and Windows NT are registered trademarks of Microsoft Corporation.
SET and Secure Electronic Transaction are trademarks owned by SET Secure Electronic Transaction LLC.
Intel is a registered trademark of the Intel Corporation.

* All other products may be trademarks or registered trademarks of their respective companies.

Notes:

Performance is in Internal Throughput Rate (ITR) ratio based on measurements and projections using standard IBM benchmarks in a controlled environment. The actual throughput that any user will experience will vary depending upon considerations such as the amount of multiprogramming in the user's job stream, the I/O configuration, the storage configuration, and the workload processed. Therefore, no assurance can be given that an individual user will achieve throughput improvements equivalent to the performance ratios stated here.

IBM hardware products are manufactured from new parts, or new and serviceable used parts. Regardless, our warranty terms apply.

All customer examples cited or described in this presentation are presented as illustrations of the manner in which some customers have used IBM products and the results they may have achieved. Actual environmental costs and performance characteristics will vary depending on individual customer configurations and conditions.

This publication was produced in the United States. IBM may not offer the products, services or features discussed in this document in other countries, and the information may be subject to change without notice. Consult your local IBM business contact for information on the product or services available in your area.

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

Information about non-IBM products is obtained from the manufacturers of those products or their published announcements. IBM has not tested those products and cannot confirm the performance, compatibility, or any other claims related to non-IBM products. Questions on the capabilities of non-IBM products should be addressed to the suppliers of those products.

Prices subject to change without notice. Contact your IBM representative or Business Partner for the most current pricing in your geography.

The Linux Operating System

- **Growing Marketplace Acceptance**
  - Continued compound growth of Linux deployments and large, growing skill pool attests to the market acceptance.
- **Industry wide Initiative**
  - Linux is the first operating system the entire industry has rallied around. Not just selected vendors.
- **Multi-platform**
  - Linux runs on every platform. There is no other operating system with this characteristic.
- **Basis of Innovation**
  - Because of its open nature, Linux is the basis for new and innovative uses of technology.

Open Source

No single vendor

Coexistence

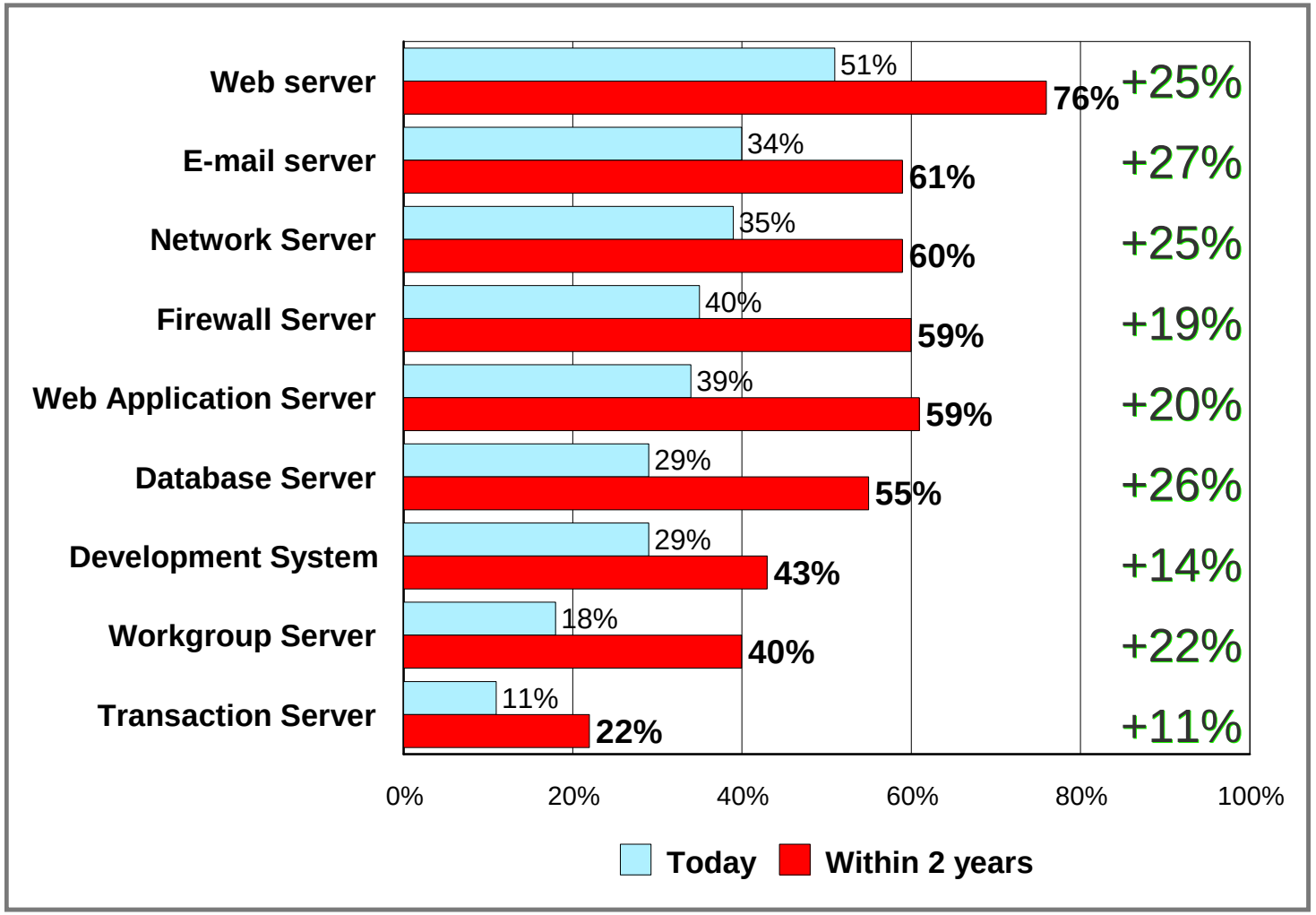
Born on the web

Small and modular

Community developed and owned

Unix heritage

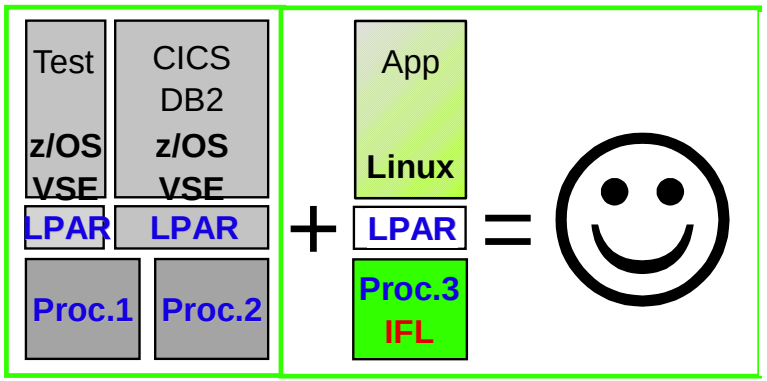
Linux Application Deployment



IBM Market Research, February 2001

IFL for Linux on zSeries

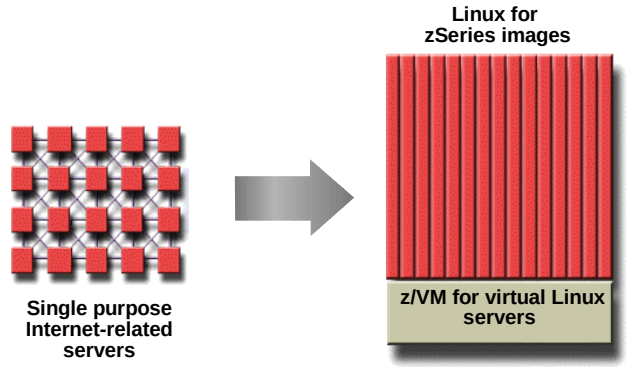
- **Additional processing capacity *exclusively* for Linux workloads**
  - For zSeries: z900, z800, IBM 9672 G5/G6, Multiprise 3000 (Mod H30+H50)
- **Lower price than standard engine**
- **Pricing concept supported by**
  - IBM S/390 and zSeries Operating System Software and Middleware
    e.g. z/VM, DB2, WebSphere, Tivoli, ...
  - Independent Software Vendors (ISVs)
    e.g. BMC, CA, Compuware, ...
- **Integrated Facility for Linux (IFL) is based on PR/SM LPAR technology**
  - No sharing with regular (i.e. traditional workload) processors



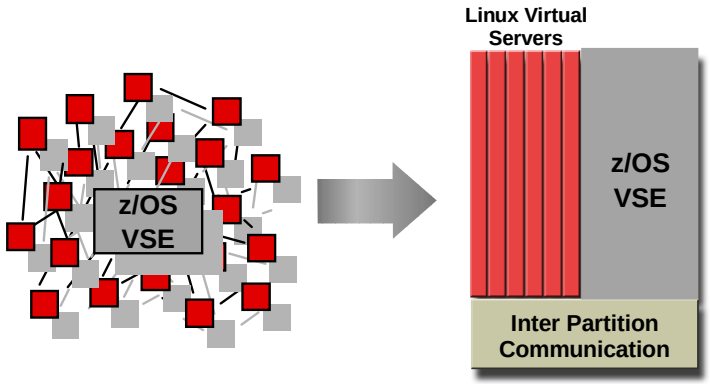
Traditional S/390 software charges unaffected

Server Consolidation and Application Integration

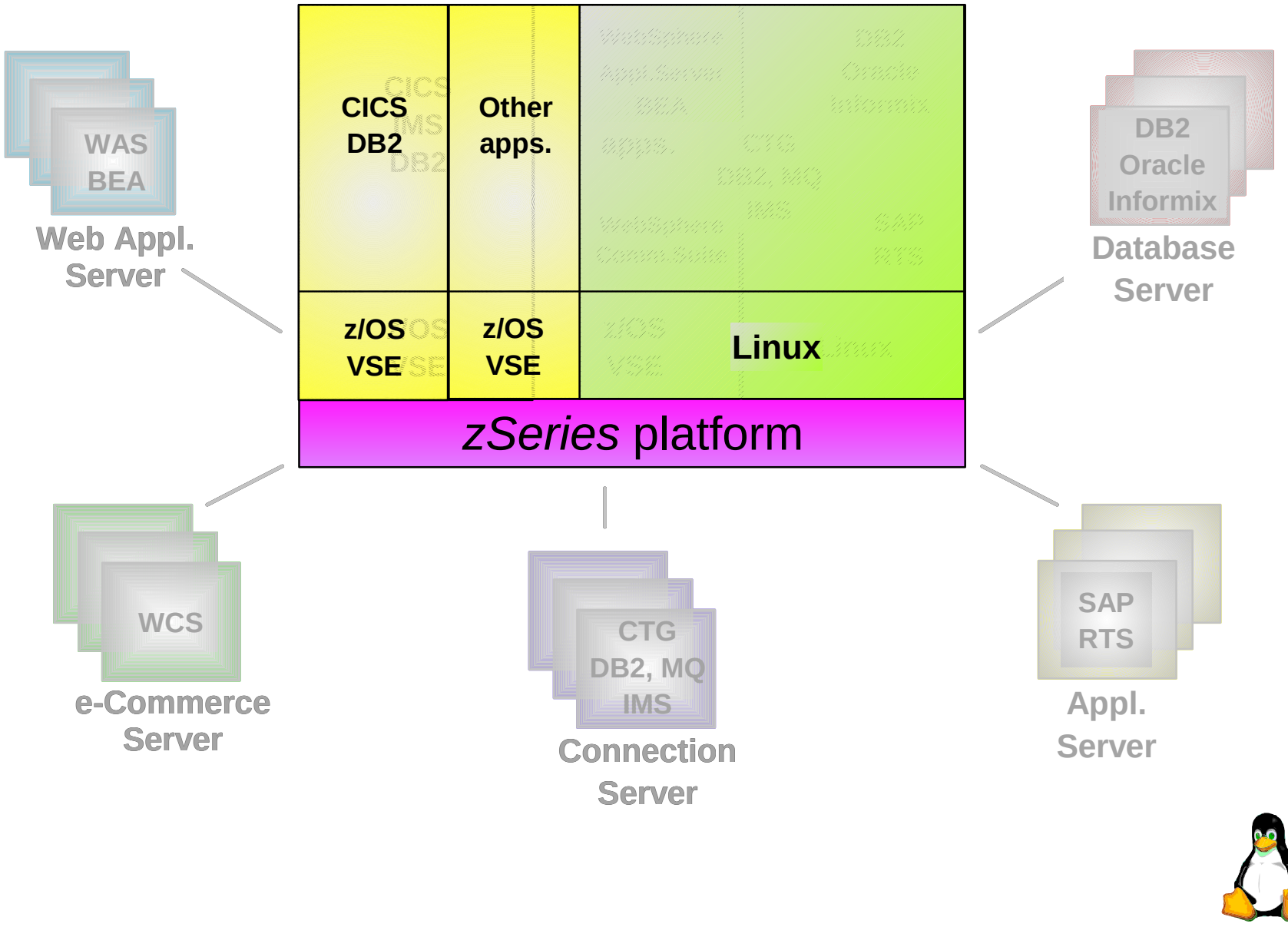
- **Common Goals**
  - Consolidate independent application server farms in a centralized mainframe environment
    - Standardize multi-platform environments
  - Integrate new applications with existing business applications and data



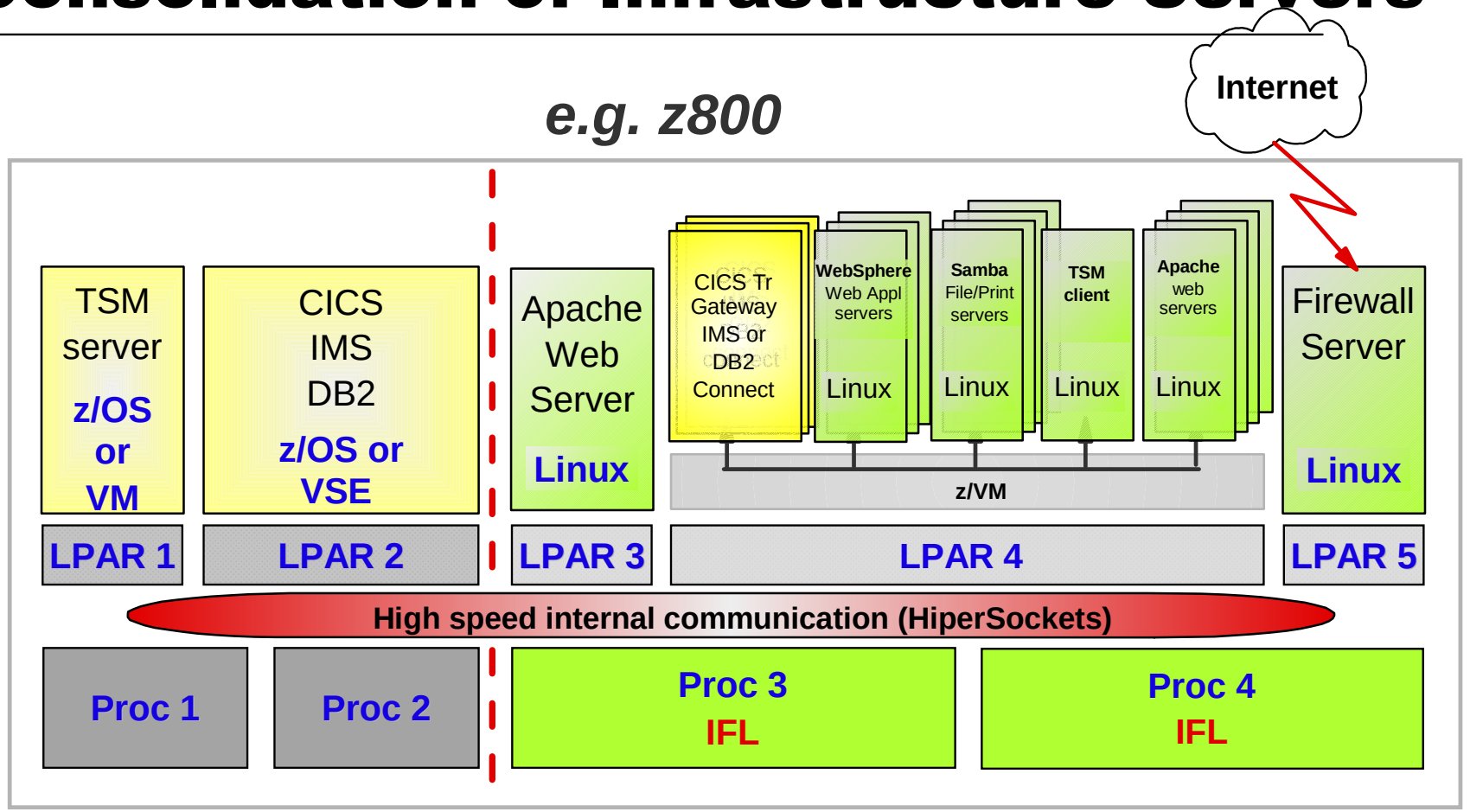
- **Customer Advantages**
  - TCO - cost reduction, management efforts, administration efforts, floor space, ...
  - Application portfolio
  - Time to market
  - Performance, scalability
  - Availability
  - Skill



Integration of Application Servers

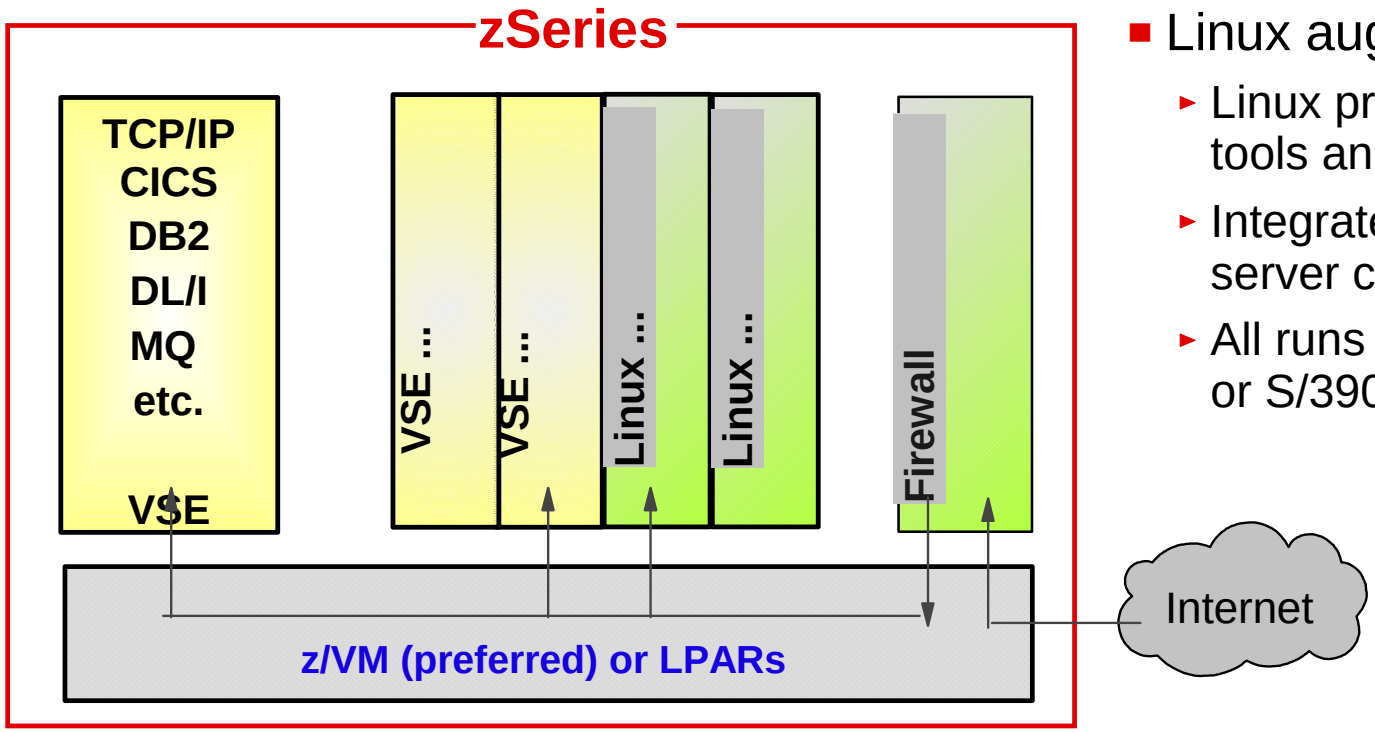


Consolidation of Infrastructure Servers



- **Consolidate servers based on low TCO**
- **Create robust integrated solutions**
  - Linux applications can use existing DB2, CICS, IMS apps and data
  - Logical 3-tier architecture in economical 2-tier hardware environment
  - High speed communication between virtual servers

Complementary Linux & VSE Solutions



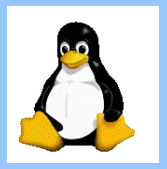
- Linux augments VSE
  - Linux provides key e-business tools and applications
  - Integrated applications and/or server consolidation
  - All runs on the same zSeries or S/390 server

.... a perfect fit to IBM's strategy for VSE

Protect existing core VSE investments
World-class Linux e-business technology
TCO advantages from server consolidation

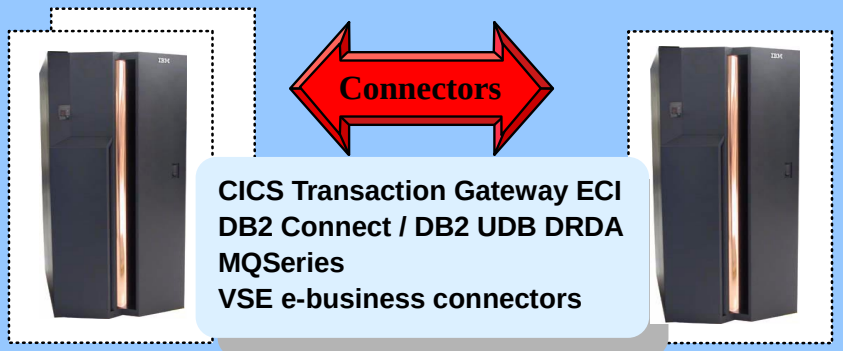
VSE/ESA and Linux on zSeries

Web



Linux on zSeries
(IFL engines)

VSE/ESA V2.6+
(Standard engines)



Connectors

CICS Transaction Gateway ECI
DB2 Connect / DB2 UDB DRDA
MQSeries
VSE e-business connectors

z/VM V4.2+
(IFL and Standard engines)

Multiprise 3000, S/390 G5/G6, zSeries 800 and 900

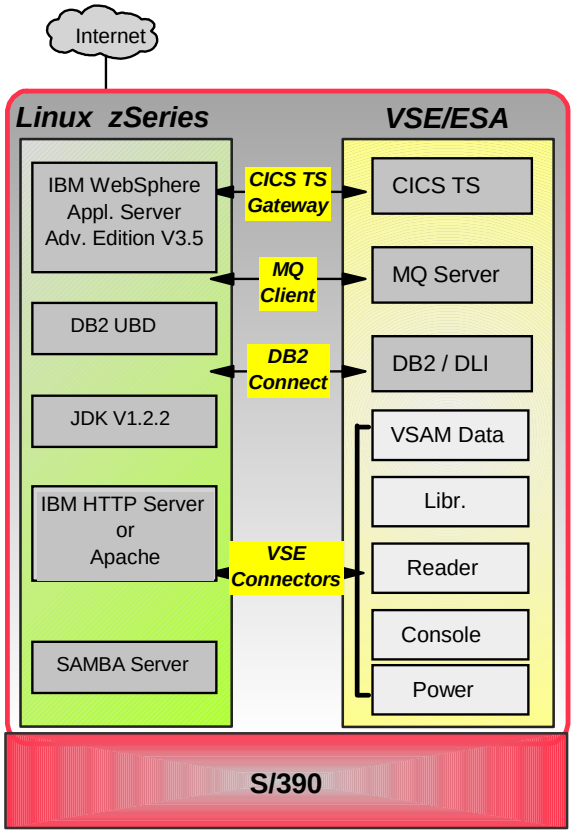
Clients

Business Services

Tran/Data Services

Linux & VSE Connectors

- **VSE Connectors**
  - **Java-based connector**
    - Connectivity via TCP/IP
    - Implemented as long running partition
    - JavaBeans on Web Application Server
    - Access to: VSAM, POWER, Librarian, ICCF, console
  - **DB2-based connector (using DRDA)**
    - Connectivity via TCP/IP or SNA
    - Implemented as DB2 stored procedures
    - Standard JDBC/ODBC calls on Web Application Server
    - Access to VSAM and DL/I - as well as DB2
- **Java-based Solution Examples**
  - VSE Navigator
  - JConVSE (Java console for VSE)
  - JDataMig (Java data migration)

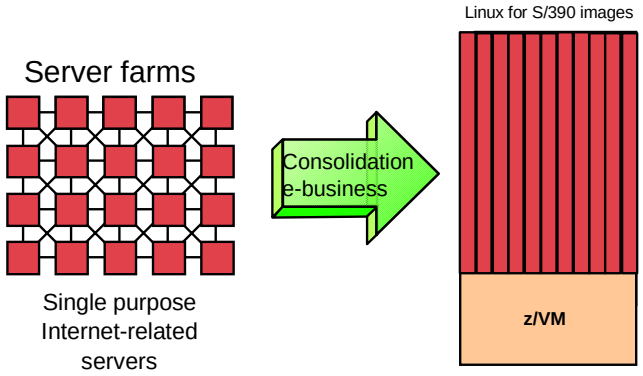


VSE is an excellent back-end partner.

Linux on zSeries Customer References

Telia Connect

Linux on zSeries - Server hosting



In ASP/ISP environments Linux provides:
- The operating system of choice for many new dot com's and Internet startups
- Highly stable Open Source operating system
- Large selection of applications
- Large numbers of trained administrators & programmers

S/390 provides Linux with
- The ability to run many Linux instances on a single S/390
- Secure isolation of user workload and data
- Upgradability without repurchase
- Reliability and availability

- **Operates independently of other Telia companies in Denmark**
- **Started w/ G6 (12-way) and ESS (Shark), meanwhile grew to z900 to run 1.500+ virtual Linux servers to host customer web sites**
  - **Displaced 70 Sun servers**
- **Able to set up a Linux for S/390 server in less than 5 minutes as opposed to 5 hours with Sun**
- **TCO for Mail Hosting & Messaging Services per user, per year, over a 3-year period, with 20.000 users:**
  - **MS Exchange: USD 217,93**
  - **Telia Connect / Bynari: USD 156,11**

"This new S/390 ZZ7 running Linux allows us to rethink our total pricing structure for Internet services and to offer customers a more affordable web application service than ever before"

- Henrik Wulff Riedl, CFO, Telia Net

Other References for Computer Services

- **ALEOS**
  - French ISP specializing in hosting services for professional internet users
  - Selected G5, Shark, and z/VM as an alternative to traditional server farm
  - Key zSeries attributes include:
    - Legendary reliability
    - Virtual network replaces complex and costly physical network
    - Time to bring a server on line measured in minutes - not days
- **Deutsche Telekom (T-Systems)**
  - Replaced 25 Sun servers
  - Transferred mail and intranet web sites
  - Saved 25% staff, 40% space, 50% power
- **Sonera Entrum Oyi**
  - Leading broadband internet provider in Finland
  - Runs 500 virtual Linux servers on a z900
  - Replaced 40 NT servers
  - Use both Redhat and SuSE

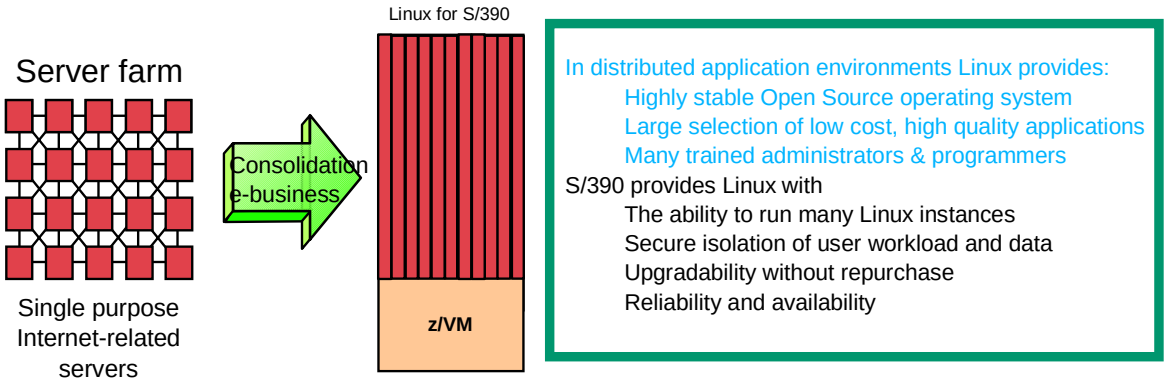
sonera®
Make things click.

"Combining zSeries with Linux allows us to benefit from the most reliable infrastructure available today and also lets us offer customers the most cost effective services on the market."
- Mathieu Chambon-Cartier - Chairman, Aleos

"By consolidating all of our services onto one high availability IBM zSeries server running Linux we are saving resources, space and energy. It also makes systems management and maintenance significantly easier"
- Jukka Kämäri, Managing Director, Sonera Entrum

Securities Industry Automation Corp. (SIAC)

Linux on S/390 - Distributed application server



In distributed application environments Linux provides:
- Highly stable Open Source operating system
- Large selection of low cost, high quality applications
- Many trained administrators & programmers

S/390 provides Linux with
- The ability to run many Linux instances
- Secure isolation of user workload and data
- Upgradability without repurchase
- Reliability and availability

- **Technology partner of the New York Stock Exchange (NYSE) and the American Stock Exchange**
- **Moved ARTMAIL application to Linux for S/390**
- **Delivers daily activity reports to brokers and member firms**
- **Application was moved from Sun servers**
- **Started moving other applications to Linux on zSeries (Sendmail, DB2 UDB)**

"All US stock exchanges and markets depend on SIAC to process their trades, which total approximately 4 to 5 billion shares per day, resulting in 15 to 20 million buy/sell side transactions that have to be processed, examined and reported."

- Steve Romano, Senior Vice President, SIAC

Other References in Banking/Finance

- **Banco Mercantil**
  - Over 375 branches in Venezuela
  - Used Linux for S/390 on G6 to replace 30+ Microsoft NT servers
    - File servers, DNS servers, firewall
  - Adding customer online account inquiry
  - Use SuSE distribution

"Linux on the IBM mainframe allows us to consolidate in a very cost effective way. In addition to these applications running on the mainframe, we have higher availability and reliability, and better performance. Consolidation also means that we have far fewer individual servers to administer."

- Isaac Arismendi, IT Infrastructure Manager, Banco Mercantil

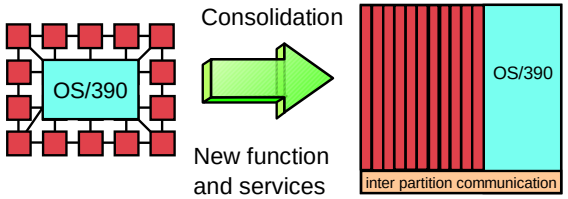
- **Shenzhen Development Bank**
  - Over 180 branches, first Chinese retail bank to go public
  - Adding internet banking to traditional products and services on G5
  - Installed WebSphere Application Server
  - Use Turbolinux as distribution provider
  - Use CICS Transaction Gateway to access core OS/390 applications and DB2 data

"The consolidation of the workload of several servers onto Linux for S/390 is cost effective. Linux is booming quickly in China and we are proud to become the first batch. We are glad to share our experience with more potential users."

- Dr. Liu Zhengquan, Shenzhen Development Bank

Boscov's Department Stores

Linux for zSeries - Infrastructure servers consolidation



Linux provides OS/390 users with the ability to extend and enhance their S/390 infrastructure by providing utility functions and rapidly deployable applications that run on S/390

S/390 provides Linux with

- Fast connection to OS/390 managed data
- Reliability and availability
- An economical alternative to stand alone servers
- Simplified systems management

- 37 Department Store Chain in Eastern U.S.A.
- Runs file/print servers on Linux for zSeries
- Currently working toward Websphere Commerce Suite on Linux for zSeries to improve web site capabilities
- Boscov's can consolidate up to 44 servers in their NT server farm without increasing **z900** capacity or increasing z/OS & ISV software costs
- Uses SuSE distribution

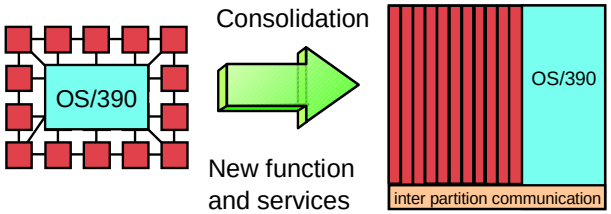
Boscov's
The Country's Largest Family Owned
DEPARTMENT STORE!
Serving Customers for over 75 Years!

"Boscov's Department Stores chose to move ahead with the z900 processor because it provided the business with a robust platform that could meet our expected growth in S/390 transactions, as well as an unparalleled platform for consolidation of our server farm on Linux virtual servers."

- Harry Roberts, Chief Information Officer, Boscov's Department Stores LLC

L.L. Bean

Linux for zSeries - Infrastructure servers consolidation



Linux provides OS/390 users with the ability to extend and enhance their S/390 infrastructure by providing utility functions and rapidly deployable applications that run on S/390

S/390 provides Linux with

- Fast connection to OS/390 managed data
- Reliability and availability
- An economical alternative to stand alone servers
- Simplified systems management

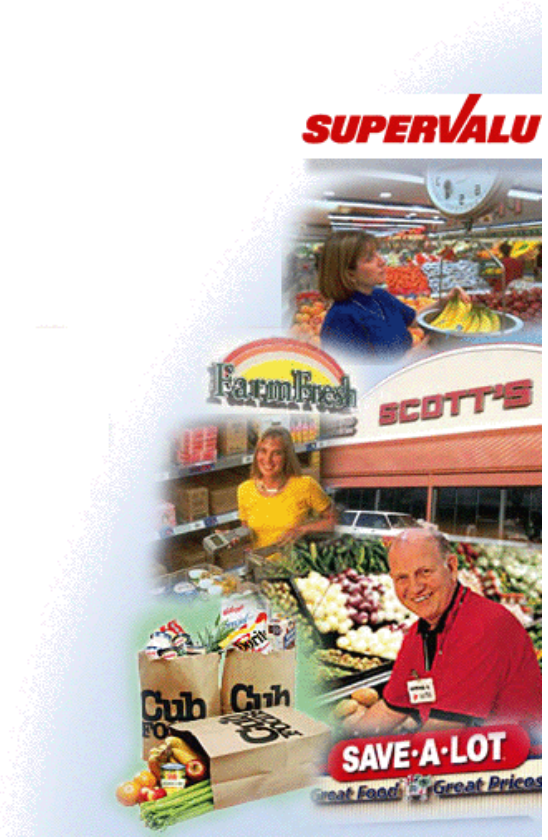
- Direct merchant with over $1 billion yearly sales
- Replaced e-mail system for high priority applications with Sendmail / SuSE solution on G5
- 5x performance improvement over older system
- Sendmail is easier to use and more flexible than older system
- Mainframe reliability and scalability come to high priority e-mail application
- Software costs for traditional software running on same system unaffected due to use of IFL

"We've seen a dramatic increase in the volume of Internet e-mail as well as an increase in the criticality of that e-mail. Sendmail running on Linux for S/390 provided the increased performance and reliability we needed to meet the ever increasing importance of Internet e-mail."

- Donna Lamberth, Senior Manager for IS at LL Bean

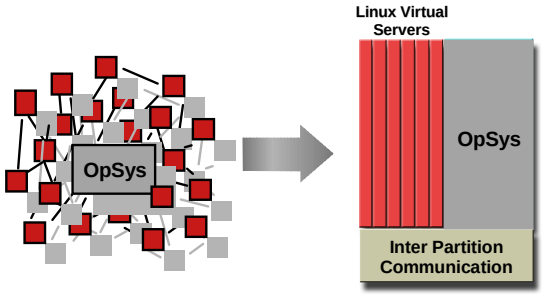
Other References in Retail

- **SUPERVALU**
  - Tenth largest supermarket retailer in U.S.A.
  - Needed to implement an easier and more cost effective system for member stores to place orders
  - On z900 running z/OS and z/VM, they implemented
    - a development LPAR w/ two IFLs to host 8 Linux'es
    - a production LPAR w/ one IFL to run 4 Linux guests
    - WebSphere Commerce Suite as e-commerce platform
  - Consolidated 40 Compaq servers to 2 Linux LPARs
  - Reached significant cost savings
  - Plans to develop numerous WebSphere-only applications on Linux
- **Sumisho-Otto**
  - Mail order clothing company in Tokyo with a majority stock hold by Otto Versand, Germany
  - Changed order processing from phone/fax to internet
  - Added an IFL w/ TurboLinux to existing G5
  - Consolidated 2 Dell servers, resulting in 10% cost savings due to reduced systems mgmt and increased availability



University of Geneva

Linux for S/390 - Infrastucture servers consolidation



Business needs:

- Emergence in academic and research environment of Linux and open source as driving force of innovative computing
- Need to enhance teaching at CUI, leveraging computing trends such as Linux
- Desire to continue a mainframe platform, while controlling maintenance costs

- Expanded UNIX/Linux computer science capabilities
- Linux virtual machines are potentially accessible to all students
- Small Fortran benchmark test result:
  - Compiler generates code twice as fast on Linux on zSeries
- Runs on Multiprise 3000

The University of Geneva is one of the largest university campuses in Switzerland, with more than 12,000 students of all disciplines. It is one of the oldest universities in Europe, founded in 1559. Computing resources required for teaching and learning activities are distributed among all faculties. Computing Sciences are grouped into the Centre Universitaire d'Informatique (CUI), which belongs to the Faculty of Sciences and the Faculty of Economics.

Other References in Education/Academic

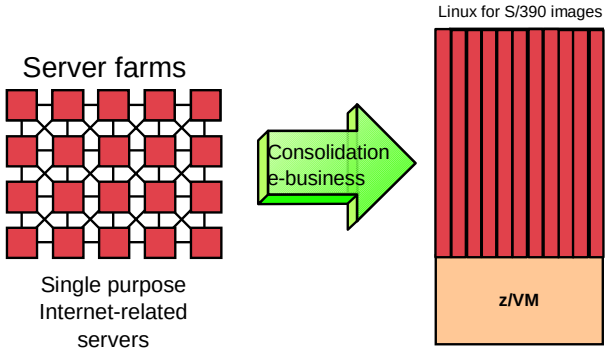
- **Tamkang University**
  - Leading private university in Taiwan
  - Used Linux for S/390 to consolidate campus storage
    - Tivoli Storage Mgr for Linux
    - ESS
    - IBM 3583 Ultrium Scalable Tape Library
  - Eightfold growth in performance
  - More capacity with significant reduction in power and floor space

"Tamkang University is committed to keeping Taiwan at the forefront of technological and academic excellence. The comprehensive Linux solution we are implementing with IBM will be vital to fulfilling that dual challenge."
--Dr. Ming-Dar Hwang

- **University of Nebraska**
  - This customer story from the University of Nebraska is a three minute video available from IBM web site
  - http://www-1.ibm.com/servers/eserver/zseries/os/linux/css/unebraska.html

Korean Air

Linux for S/390 - Distributed application server



In distributed application environments Linux provides:
- Highly stable Open Source operating system
- Large selection of low cost, high quality applications
- Large numbers of trained administrators & programmers

S/390 provides Linux with
- The ability to run many Linux instances on a single S/390
- Secure isolation of user workload and data
- Upgradability without repurchase
- Reliability and availability

- South-Korean airline
  - Serves 77 cities in 29 countries with 111 airplanes
- Flight crew scheduling application on Linux for zSeries
- Under development:
  - Accounting system
  - Daily revenue Accounting System using Websphere and Java
- Runs on z900 server

"A single IBM ^ z900 running Linux can do the work of an entire server farm. Multiple copies of Linux can run side by side on a server allowing for highly scalable and manageable environments that can handle unpredictable spikes in internet activity"

- Yong-Seung Hwang - Chief Information Officer, Korean Air

Other References in Transportation

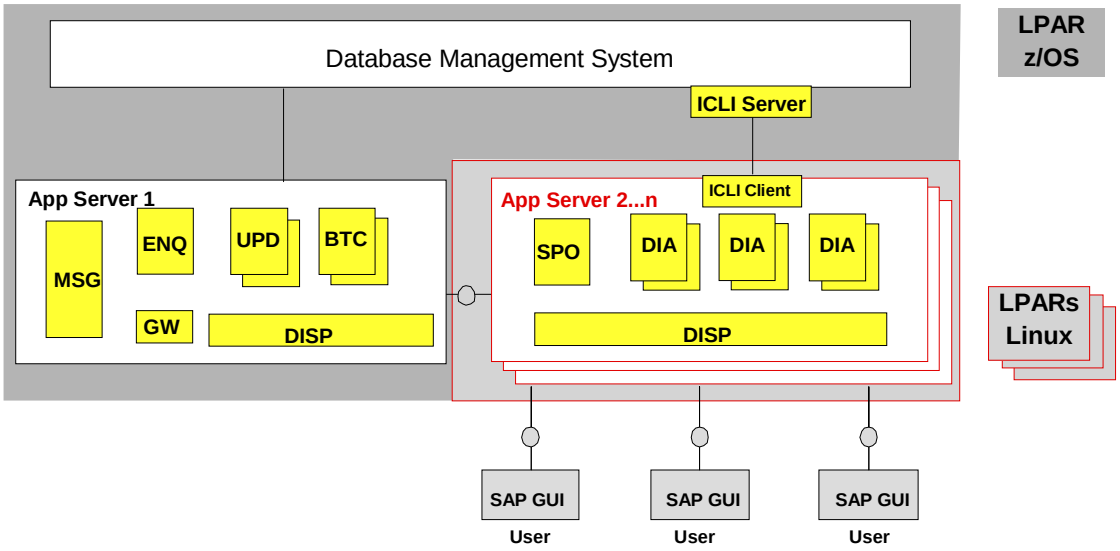
- **Air New Zealand**
  - Airline industry leader in Asia Pacific
  - Signed strategic outsourcing agreement with IBM Global Services
  - Replaced 150 Compaq servers with z800 running
    - Tivoli Storage Manager
    - WebSphere Application Server
    - DB2 UDB
  - Saved NZ$600.000 of license fees
  - Will replace 4.000 Microsoft Exchange email and file/print clients with Bynari

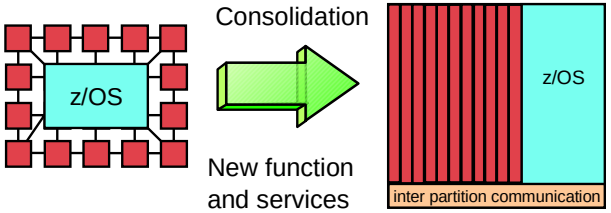
"The company is replacing 150 existing Compaq Computer Windows servers and a 150 more that would been purchased in the next 12 to 15 months with an IBM mainframe running Linux. The overall cost of ownership of the mainframe is more than 30 percent less."
- Andrew Care - Chief Information Officer, Air New Zealand

Eberspächer

Linux on zSeries - Application Integration

- On z/OS:
  - batch / update / enqueue
- On Linux for zSeries:
  - dialog / spool





"Our goal is to cut the S/390 SW costs from currently 120 MSUs down to 40 MSUs via reduction of S/390 processor workload."
- Theo Krämer - IS Director, Eberspächer

- Manufacturer of car exhaust systems (DC, VW, Audi, BMW, Renault, John Deere, Iveco)
- Synchronized production lines between Eberspächer and e.g. DaimlerChrysler
- SAP R/3 Application Server on Linux for zSeries with SAP R/3 Data Base Server on z/OS
- z900 (3-way) with SuSE SLES7 (64-bit)
- Additional Linux on zSeries usage for:
  - Boot server for network stations
  - Samba server to replace Novell and NT

Other References in Manufacturing

- **Lawson Products**
  - Manufacturer of equipment for automotive, aerospace, construction, and transportation
  - Implemented an e-commerce solution based on WebSphere Commerce Suite on G5 with access to DB2 based data on z/OS on a z900
  - Lawson's business partners use standard browsers to access the 400.000+ parts catalog
  - Saved NZ$600.000 of license fees
  - Will replace 4.000 Microsoft Exchange email and file/print clients with Bynari
- **TDK Corp.**
  - Japanese manufacturer of magnetic recording media
  - Consolidated 12 DNS servers on G6 w/ Linux
- **Newell Rubbermaid**
  - Manufacturer of home hardware, cooking utensils, and office supplies
  - Runs (open source) Multi Router Traffic Gather (MRTG) network traffic monitoring program on Linux to monitor traffic on 160 of their worldwide network of 230 routers
  - New application was up and running in <5 hours on G5

Lawson Products, Inc.

""By running Linux and WebSphere Commerce Suite on our existing mainframe hardware, we have a robust and extremely reliable development and deployment platform that enhances our e-commerce initiatives...The combination of tools and functions built into WebSphere Commerce Suite lets us build an e-commerce site that will satisfy our customers' needs. WebSphere Commerce Suite will also allow us to integrate our back end systems already in place, saving us both time and money."

-- Frank Snyder, Manager of Technical Support at Lawson Products

VSE References of Linux on zSeries

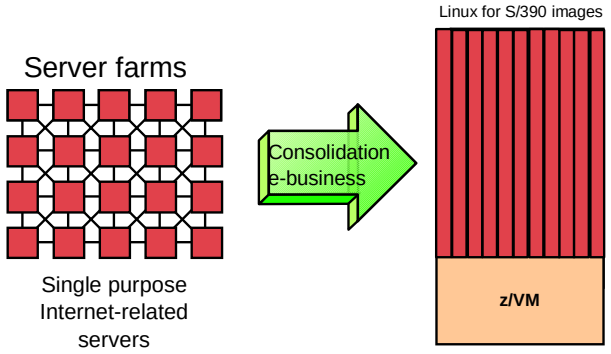
Customers have found that Linux on zSeries complements VSE, including

- **cost-effective Integrated Solutions**
  - **access to existing VSE applications and data**
- **lower TCO through Server Consolidation**

... a perfect fit to VSE's strategy.

Winnebago Industries

Linux for zSeries - Distributed application server



In distributed application environments Linux provides:
- Highly stable Open Source operating system
- Large selection of low cost, high quality applications
- Large numbers of trained administrators & programmers

S/390 provides Linux with
- The ability to run many Linux instances on a single S/390
- Secure isolation of user workload and data
- Upgradability without repurchase
- Reliability and availability

- Recreational Vehicle Manufacturer
- Replaced Microsoft Mail and Novell servers with Bynari Insight Server
- Users can still use Microsoft Outlook e-mail client
- 'Traditional' applications run on VSE/ESA
- Run VSE, Linux, and VM on Multiprise 3000

"Upgrading to Microsoft Exchange or Novell GroupWise would cost Winnebago about $100,000. We expect Bynari Insight Server to cost a third or even a quarter of that, because Winnebago will be able to make use of excess capacity on the company's IBM Multiprise 3000 mainframe. The mainframe is our industrial-strength system that stays up, and that's where our expertise is."

- Dave Ennen - Technical Support Manager, Winnebago Industries

Grede Foundries

Linux for S/390 - Infrastucture servers consolidation

- Milwaukee-based manufacturer of iron and steel castings for the auto and heavy equipment industry
- Reduced server, software, and administration costs
- Improved performance
- DNS servers, mail servers, Apache web server, SAMBA file/print servers
- IBM DB2 UDB for Linux, DB2 Connect
  - Moving to WebSphere Application Server
- VSE, Linux, and VM on a Multiprise 3000
- Uses SuSE distribution

Grede's quality metal castings are a standard for the industry, just like the IBM S/390 server and the Linux operating system.

"By running Linux on our S/390 and leveraging our existing VM environment, we can consolidate most of our Web applications on the mainframe and reduce the need for costly Windows NT® servers."
Rich Smrcina, Data Center Manager, Grede Foundries, Inc.

Other Examples of VSE Users running Linux

- **Consumer Finance - Switzerland**
  - Evaluating consolidation of UNIX servers under Linux on zSeries
  - VSE/ESA, Linux, and VM/ESA on IBM 9672-G6

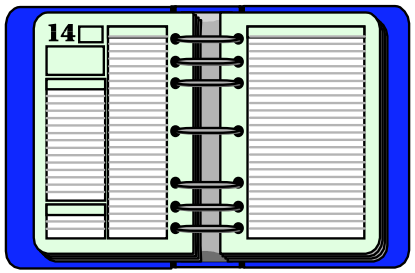
- **Distribution - Mid Atlantic USA**
  - Evaluating web-based catalog sales
  - VSE/ESA and Linux on Multiprise 3000
- **Healthcare Provider - SE USA**
  - Acquires and operates hospitals
    - Exploits IT to increase efficiency and reduce cost
    - Needs to integrate existing IT infrastructures
  - WebSphere Application Server
  - VSE/ESA and Linux (under LPAR) on Multiprise 3000

- **Retail - NE USA**
  - Wanted an attractive web site
    - Online catalog shopping
    - Used Linux-based web technology
  - VSE/ESA, Linux, and VM/ESA on Multiprise 3000

Columbian Financial Group - Session E31

- VSE Connectors and Linux - A User Experience
  - Session E31

James Gross, Manager of Technical Services, will discuss how and why his company is using the VSE connectors and Linux on zSeries. Using z/VM, VSE/ESA V2.6, DB2 UDB, and writing Java programs, they are leveraging their VSE system and exploiting Linux. Mr Gross will discuss future plans as well.



- Choice of times
  - Tuesday, 1:00 - 2:15 PM Lafayette Room
  - Wednesday, 2:35 - 3:50 PM Lafayette Room

Observations from these References

with running Linux applications on zSeries

- **Customer examples of a wide variety of Solutions**
  - Server consolidation (hosting, file/print servers, infrastructure, mail servers, etc.)
  - Integrated solutions (web application servers, database servers, etc., including some that share existing (VSE or z/OS) applications and data)
- **Customer examples in various Industries**
  - Telecom, banking, retail, manufacturing, education/academic, utilities, etc.
- **Customer examples in various Geographies**
  - North America, Europe, Asia Pacific, Latin America
- **Customer examples of various Sizes**
  - Solutions range from medium-sized customers using Multiprise 3000 'white space' to larger customers with z900 and one or more IFLs
- **Common Justification and Advantages**
  - Lower Total Cost of Ownership (TCO) than traditional server farms
    - Hardware and software costs
    - Management, administration, and support
    - Space, power
  - Superior zSeries availability and scalability
  - Robust and flexible z/VM virtualization technology
  - World-class e-business technology and choice of applications
  - Skills

Getting Started

with running Linux applications on zSeries

- **Pick a Linux distributor**
- **Install Linux on zSeries**
- **Start with an independent, non-critical business application**
  - File / Print serving
  - e-mail serving
  - News / Discussion Group serving
  - Web serving
  - Domain Name serving, etc.
- **Consolidate other servers on Linux on zSeries**
  - Initiate a Server Consolidation study
  - Select candidates for consolidation based on apps
  - Consolidate for simplicity and scalability
- **Port a specific Linux or Unix application**
  - Porting UNIX applications to Linux - Hints and Tips (GM13-0115-00)
- **Add e-business applications that access zSeries applications/data**
  - ISV software
  - IBM middleware

Linux Community Dev System (LCDS)

- **LCDS is a "Service" provided by IBM**
  - The Service provides you with access to a Linux on S/390 environment for the purpose of providing the Open Source community with a platform to develop, port and/or test drive your products or applications on this platform.

  - **The LCDS started up in May 2001**
    - Hardware - 9672 G6 Model ZX7 (10 way processor) is located at an IBM site in Endicott, NY
    - DASD - Shark 2105-F20 (2.1 terabytes)
    - Network - Network configuration is a direct Internet connection with open access to the Linux guest machines from the WWW
    - Software - The LCDS mainframe is supported by an IBM Virtual Machine, z/VM, established to support a large number of guest systems. With registration approval, you are given access to a guest system to accommodate your Linux project.
- **To register or review the terms and conditions:**
  - **http://ibm.com/eserver/zseries/os/linux/lcds/**

For additional information ...

Linux Success Stories	www.ibm.com/servers/eserver/zseries/os/linux/stories.html
Aberdeen Group	InSight, July 2001: "Linux is on the move - Up!" www.aberdeen.com/2001/research/07010008.asp
Gartner Group	Carl Claunch & John Phelps, March 2002: "Gaining the Non-TCO Benefits of Server Consolidation"
Giga Group	Tony Nievera, July 2002: "Mainframe Linux: What's now, what's next, where to"
IBM zSeries White Paper	White paper on Linux on zSeries TCO: www.ibm.com/zseries/library/whitepapers/linux_trilogy.html
IBM ITSO Red Books	SG24-6294 "e-business Intelligence: Data Mart Solutions with DB2 on Linux for zSeries"
	SG24-6807 "Linux on zSeries: Application Development"
	June 2002 "Linux on zSeries: High Availability for z/VM and Linux"
	June 2002 "Linux on zSeries: Securing Linux with RACF"
	July 2002 "Linux on zSeries: Server Consolidation"
	July 2002 "Linux on zSeries: Systems Management"
	August 2002 "Getting started with zSeries Fibre Channel Protocol"

Linux on zSeries - Summary

Linux on zSeries and ...

- its flexible design,
- IBM's support and services,
- IBM's distribution alliances,
- IBM's middleware,
- ISV's applications, and
- Open Source applications

... mean Success to your Business.

RETURN TO INDEX