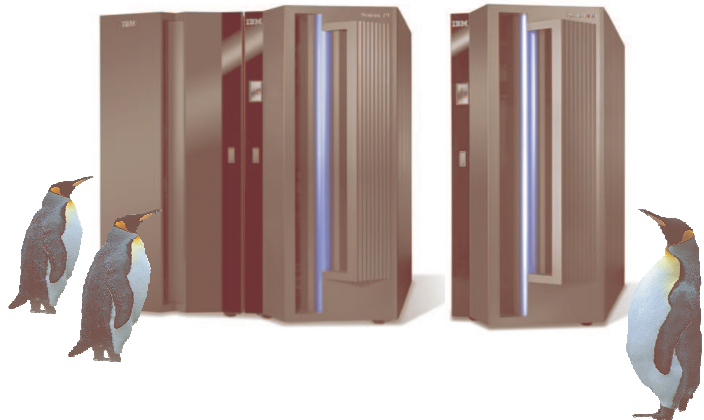# SUSE Linux Enterprise Server 10 on IBM System z:
The Core of the Datacenter
Large Systems Update

Lars Hermind
Director Alliances
lhermind@novell.com

Novell.

after the following...

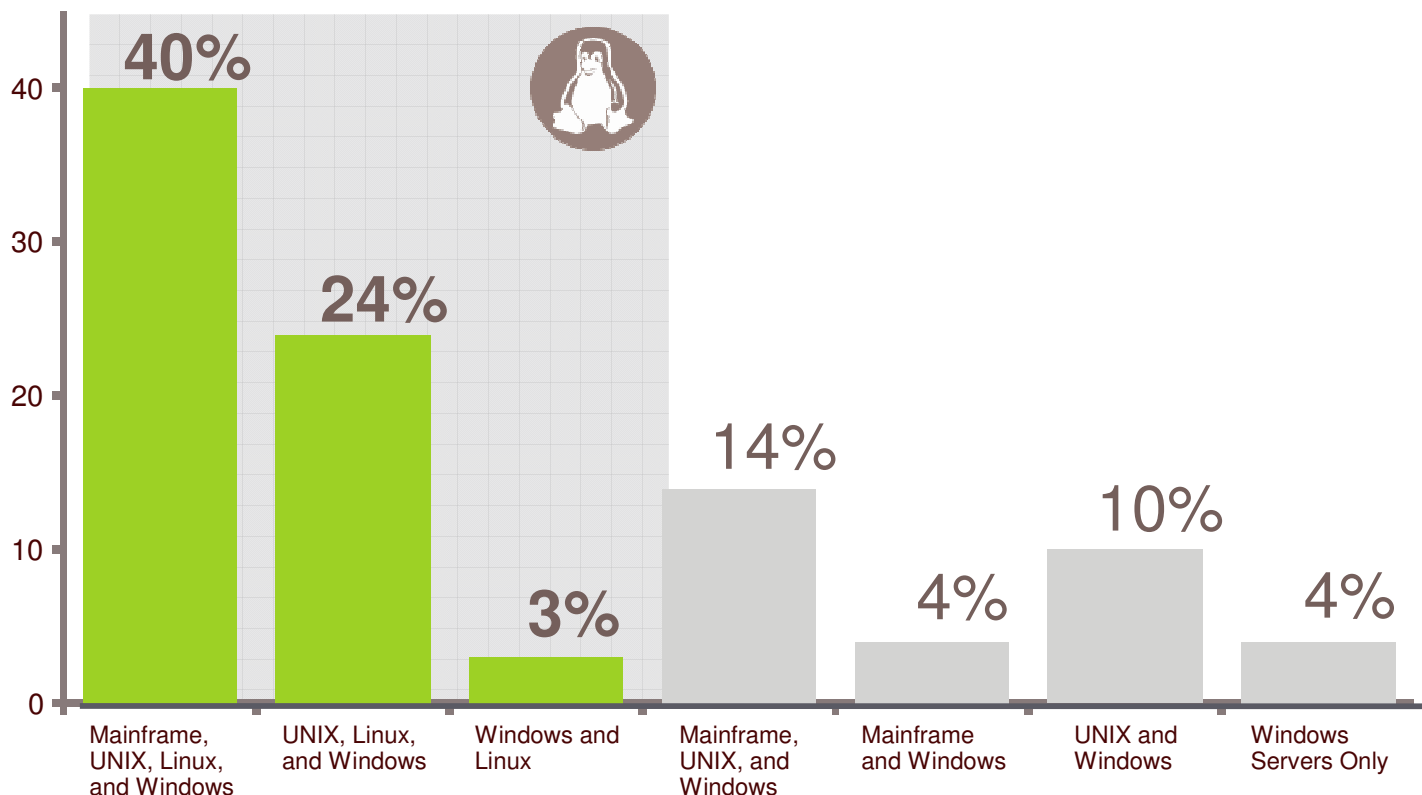- you will know:

  – some more numbers and abbreviations

  – some more about Novell

  – how IBM and Novell work together

  – some cool things about SUSE Linux Enterprise 10

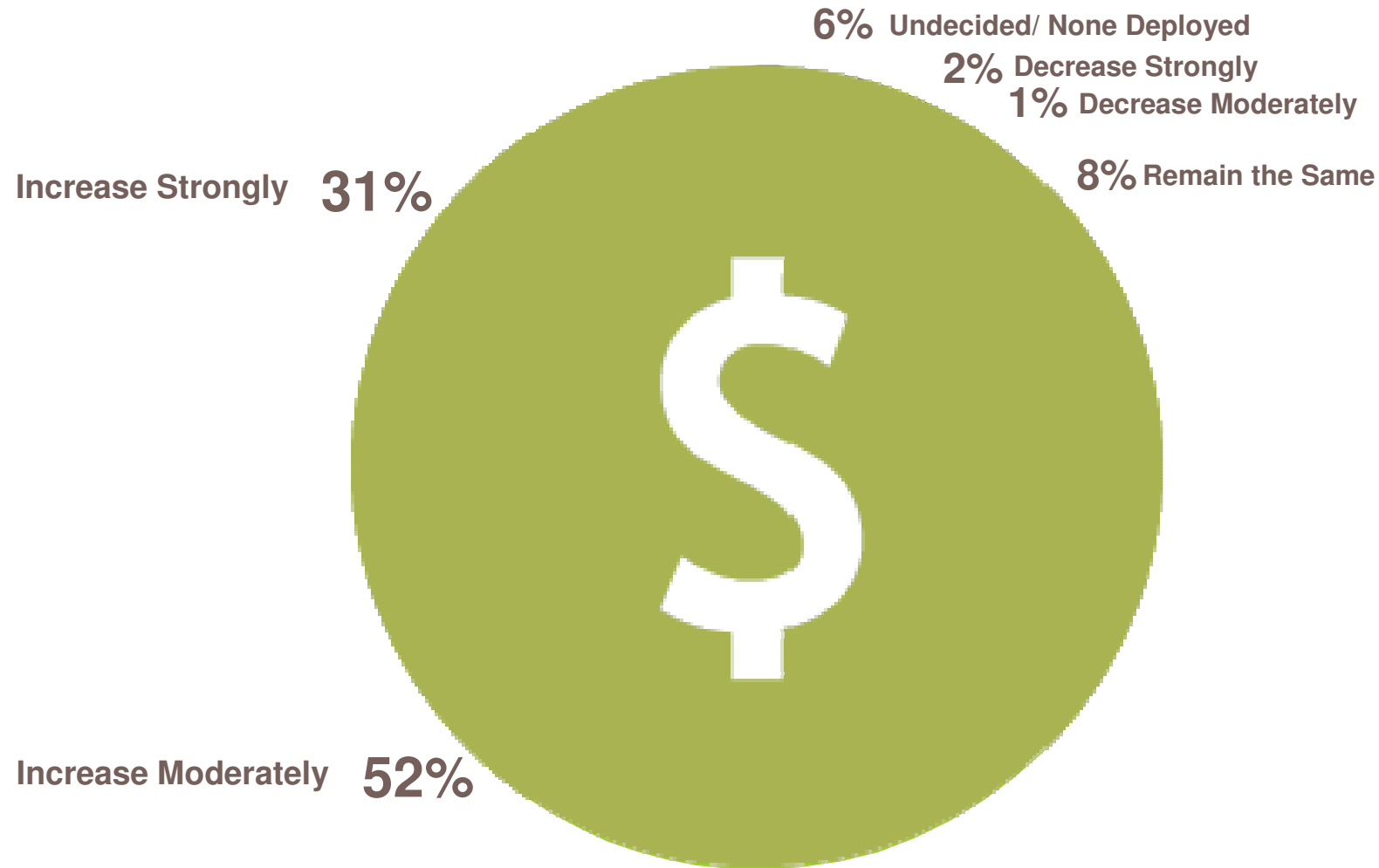 – why SLES 10 on System z – even cooler indeed!

  – some references

67% of All Data Centers Run Linux

Q: What is the makeup of major enterprise data centers?

- 40% — Mainframe, UNIX, Linux, and Windows
- 24% — UNIX, Linux, and Windows
- 3% — Windows and Linux
- 14% — Mainframe, UNIX, and Windows
- 4% — Mainframe and Windows
- 10% — UNIX and Windows
- 4% — Windows Servers Only

Source: Gartner report, #G00138277, *Linux Continues to Advance into the Data Center*, George J. Weiss

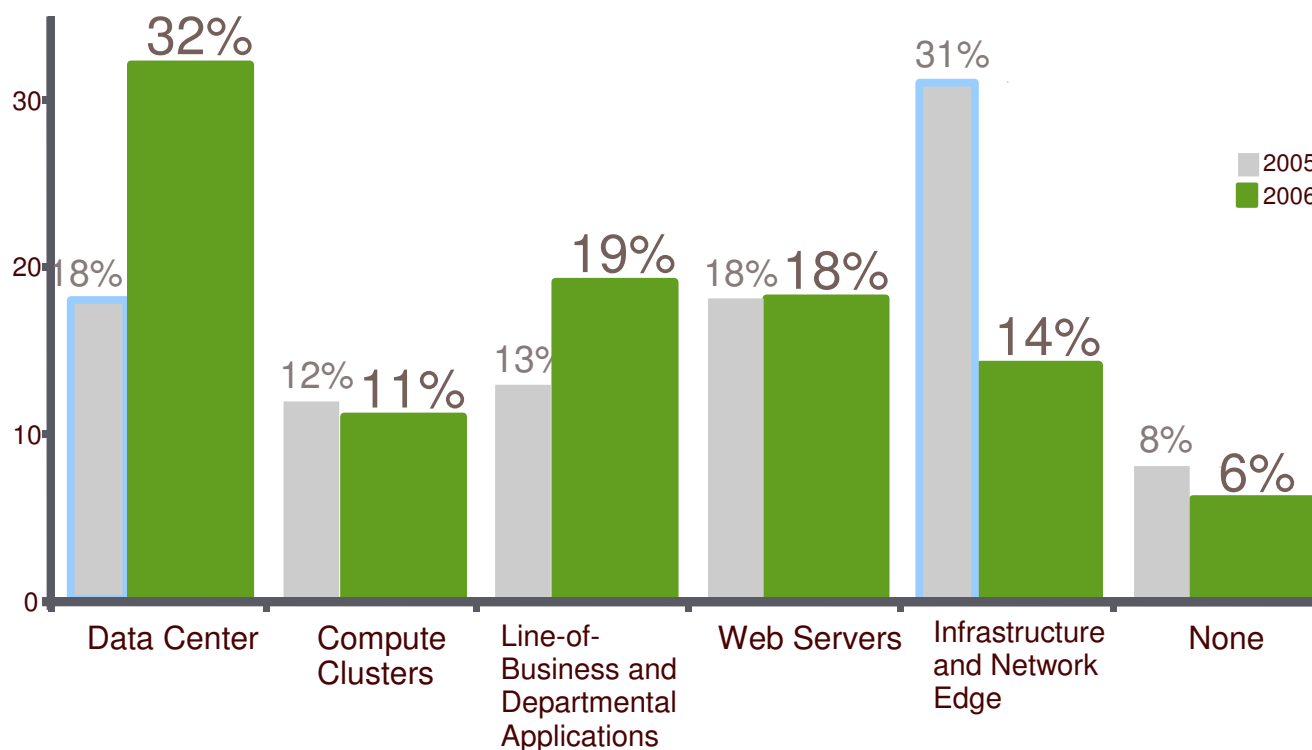# 83% of Data Center Managers Expect to Increase Spending on Linux

6% Undecided/ None Deployed

2% Decrease Strongly

1% Decrease Moderately

8% Remain the Same

Increase Strongly **31%**

Increase Moderately **52%**

Source: Gartner report, #G00138277, *Linux Continues to Advance into the Data Center*, George J. Weiss

4

Linux Deployment in Data Center

Q: Where will the major focus and expenditure be for Linux server deployments?

Legend:
- 2005
- 2006

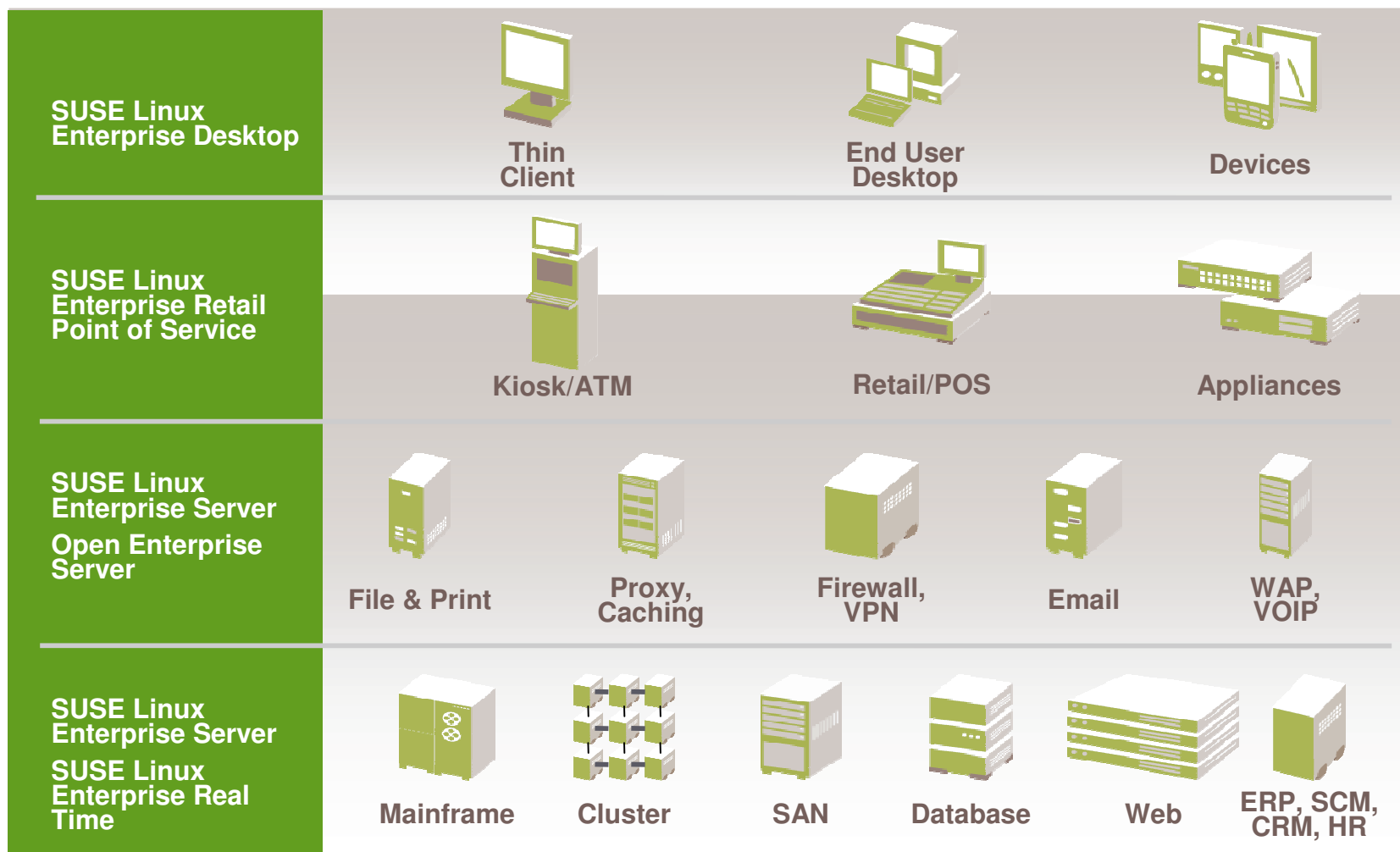| Category	2005	2006
Data Center	18%	32%
Compute Clusters	12%	11%
Line-of-Business and Departmental Applications	13%	19%
Web Servers	18%	18%
Infrastructure and Network Edge	31%	14%
None	8%	6%

Source: Gartner report, #G00138277, *Linux Continues to Advance into the Data Center*, George J. Weiss

SUSE Linux Enterprise on Mainframe

An open enterprise platform - From Desktop to Data Center

SUSE Linux Enterprise Desktop	**Thin Client**		**End User Desktop**		**Devices**
SUSE Linux Enterprise Retail Point of Service	**Kiosk/ATM**		**Retail/POS**		**Appliances**
SUSE Linux Enterprise Server **Open Enterprise Server**	**File & Print**	**Proxy, Caching**	**Firewall, VPN**	**Email**	**WAP, VOIP**
SUSE Linux Enterprise Server **SUSE Linux Enterprise Real Time**	**Mainframe** **Cluster** **SAN**	**Database**	**Web**	**ERP, SCM, CRM, HR**	

Ready to win

IBM Systems Family – Ready for Linux

- **System z™**
  - Industry leading virtual partitioning for z/OS and Linux

- **BladeCenter®**
  - Windows, AIX, and Linux

- **eServer xSeries**
  - Windows and Linux

- **System i™**
  - i5OS, OS/400, AIX, Linux, and Windows

- **System p™**
  - Uncompromising AIX and Linux enablement

- **eServer 3nn**

- **Clusters**
  - Price and performance leadership in UNIX and especially Linux

Why customers use Linux on System z?

- Mainframe qualities of service

- The ability to scale up and out

- System z virtualization for consolidation and control

- The ability to add processing power quickly, when it's needed

- Benefit from established processes and disciplines

- Proximity to data running on other operating systems on the same System z

- To help reduce the cost of operation
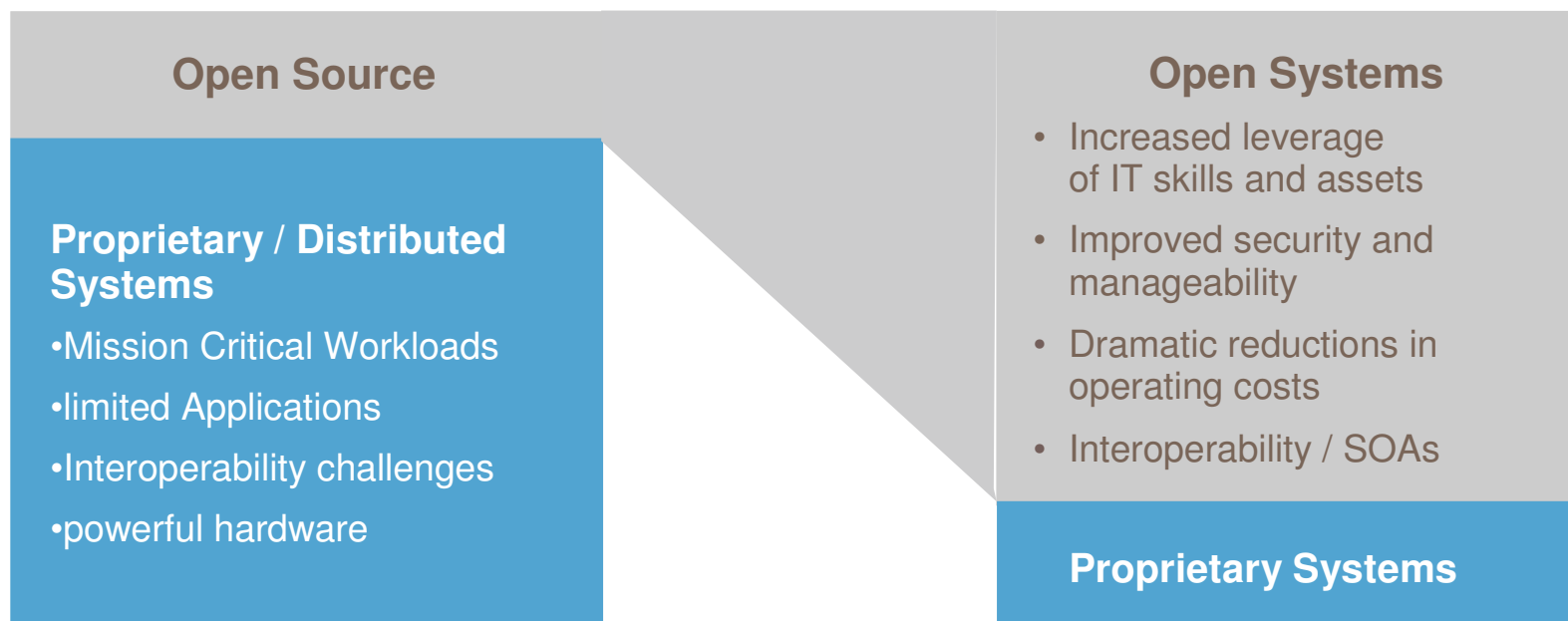
- To help reduce complexity and simplify maintenance tasks

*For the same reasons that IBM does –
it makes good business sense.*

Enterprises are Shifting to Open

- *Today's Enterprise: Multiple platforms, proprietary technologies, management and security challenges*

Tomorrow's Open Enterprise: Performance, reliability, and world-class support on standards-based, open platforms leveraging key investments
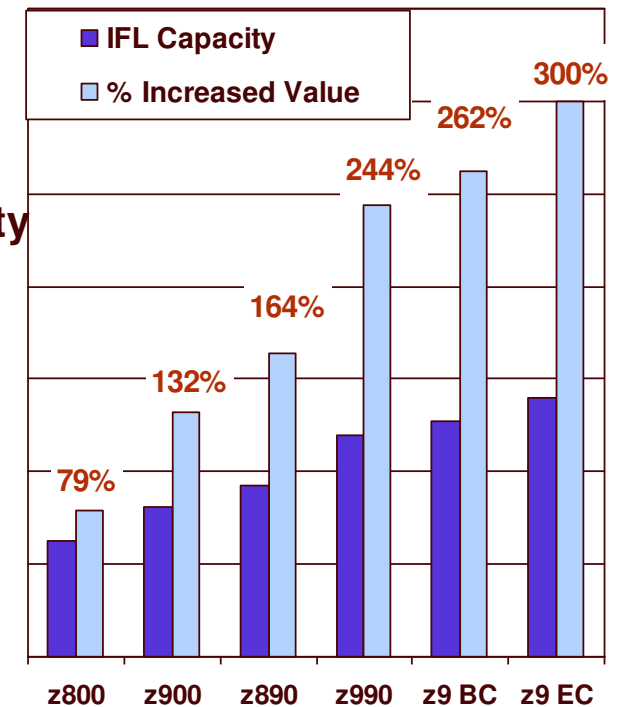
Open Source

Open Systems

Proprietary / Distributed Systems

- Mission Critical Workloads
- limited Applications
- Interoperability challenges
- powerful hardware

- Increased leverage of IT skills and assets
- Improved security and manageability
- Dramatic reductions in operating costs
- Interoperability / SOAs

Proprietary Systems

Integrated Facility for Linux (IFL)
The specialty engine for the Linux workload

- **Supports Linux on System z and z/VM**
- **Traditional mainframe software charges unaffected**
  - ▶ **IBM mainframe software**
  - ▶ **Independent Software Vendor products**
- **Linux and z/VM charged only against the IFLs**
- **IFL supports Capacity on Demand (On/Off CoD), Capacity Upgrade on Demand, and Capacity BackUp (CBU)**
- **IFLs on z9 BC, IBM eServer™ zSeries® 890 and 800 (z890 and z800) run always on "full speed"**
- **The IFL price for the new z9 BC servers is $95K***
  - ▶ **This is a 24% reduction when compared to other System z servers that are currently priced at $125K***
- **Aside from the reduced price for the IFL on the z9 BC, price/performance gains with each successive generation of technology**
  - ▶ **Consistent IFL price for all other System z generations**

Chart legend:
- ■ IFL Capacity
- ■ % Increased Value

Values: 79%, 132%, 164%, 244%, 262%, 300%

Categories: z800, z900, z890, z990, z9 BC, z9 EC

Mainframe Computing
with SUSE® Linux Enterprise

Fact:

More than 85 percent of all mainframes with Linux deployments are running on SUSE Linux Enterprise Server

- System z RAS Design features

- X

- SUSE Linux Enterprise 10 Benefits

- =

- **Exponential value through performance, reliability, security!**

SUSE Linux Enterprise on System z
Total Cost of Ownership

•Mainframe will deliver and sustain high levels of utilization (90% +) vs. UNIX @ 15-20% and Windows NT @ 5%

•System z + SUSE® Linux Enterprise Server Deployment = More processing power with an IFL (at a fraction of a CP) combine with competitive licensing of SUSE Linux Enterprise Server

Cost of labor per transaction on System z has been decreasing at a rate of 16.9 percent per year.

Inflation-adjusted labor costs per transaction in dollar's
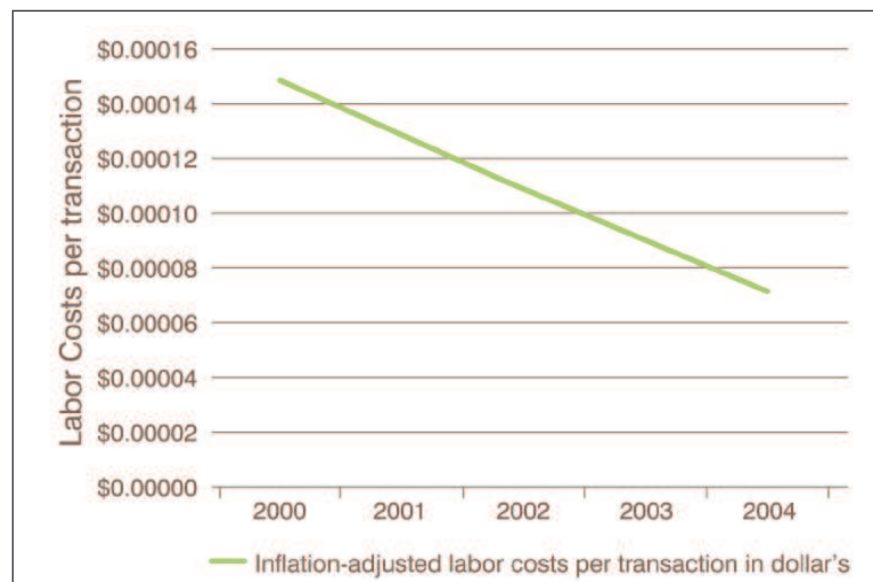
IBM System z and Oracle Collaboration

- Customer Value:
- Provide Oracle customers with IBM System z9™ premier server technology, configuration options, support, services and financial incentives for Linux on System z Oracle application deployments and Linux database consolidations
- Key Messages:
- Ultimate virtualization for flexible and managed growth
- Ultimate availability for I/T Infrastructure
- Ultimate security to protect critical business data
- Superior economics and energy efficiency
- IBM Technology:
- IBM System z9 Business Class (z9 BC) or IBM System z9 Enterprise Class (z9 EC)
- IBM Integrated Facility for Linux (IFL)
- IBM TotalStorage® DS6000 an DS8000
- z/VM ® 5.2
- IBM Director and Virtualization Engine™
- Tivoli Storage Management™ and Tivoli® Systems Automation
- IBM System p® or System x® or BladeCenter ® as Application Server
- Oracle Technology on Linux for System z:
- Oracle Database 10gR2
- Oracle PeopleSoft People Tools 8.4.8
- Oracle Siebel CRM 7.8
- Oracle EBusiness Suite 11i
- Oracle Application Server 10g

- Announcement Highlights:
- IBM System z and Oracle are announcing a strategic Linux initiative **to significantly expand our mutual Linux enterprise application business by helping customers to exploit the benefits of Oracle solutions on IBM System z9 Linux.**
- Introduces Oracle solutions for the System z9 Linux platform which feature the mainframe as the data server , complemented by services and a customer incentive
- **IBM and Oracle are investing** additional technical resources **in Joint Solutions centers to support mutual customers, and** increasing sales and marketing activities **to supplement an existing Linux ecosystem**
- **IBM is** extending its Linux Strategy **into the expansive Oracle ecosystem**
- **IBM and Oracle intend to** collaborate to further expand our Linux offerings **for System z**

Market Overview
of SUSE Linux Enterprise Server on System z

- First enterprise Linux product in 2000

- Installed base of 1700+ customers worldwide

- Companies like Boscovs Dept Stores, Renfe, Banca Populare di Milano, Deutsche Bahn, HSBC, Audi, Endress+Hauser run mission critical applications on SLES for System z

- 80-90% market share for SUSE Linux Enterprise on mainframe

- First SAP-certified solution stack on mainframe 2002, first productive customer (2002 OMV Austria, oil & gas)

- 740+ of certified applications from 260+ ISV, including DB2, Oracle, Websphere, Lotus Domino, SAP

- First implementation of Common Code Line on mainframe

- First CC/CAPP-EAL security certification 2002, SUSE Linux Enterprise Server SP1 under evaluation for EAL4+

Novell and IBM Partnership

- Novell SUSE Linux Enterprise runs on **all IBM hardware platforms**

- IBM and SUSE **co-developed Linux for Power and System z**

- IBM/Novell **co-developed IBM Retail Environment on SUSE (IRES)**

- **Dedicated Alliance Teams** at Novell and IBM

- **Novell is Strategic IBM Alliance Partner** since December 2005

- **IBM Leaders for Linux** and Novell PartnerNet **aligned programs**

- **IBM support**-line on SLES

- SLES part of IBM **Passport Advantage price list**

- **Integrated Stack for SUSE Linux Enterprise System x / System p**

- **Novell SLES is on IBM's Passport Advantage (PPA) Program**

- **1300+ IBM staff** in EMEA are members of Novell's Linux Champion

SUSE® Linux Enterprise Server for System z

New features for SLES on System z:

- **new Fibre Channel Protocol, SCSI over Fibre Channel**

  - Host Bus Adapter Virtualization on System z9 now allows sharing of FCP adapters in a fully SCSI compliant way

  - comprises SAN access right management and disk sharing through virtual HBAs

- **SLES 10 Network adapters enhanced to enable the Communication Controller for Linux products on System z9 for 374x NCP virtualization**

- **support of the new cryptographic adapters of System z and the new crypto instructions of the System z processors**

- **miscelleaneous virtual server enhancements:**

  - more hypervisor friendly

  - options to analyze network traffic on virtual connections

  - shared memory for executables and library code across multiple Linux guests running in the same z/VM system

SLES 10 on System z provides a cost efficient and reliable scale-up and scale-out application-hosting environment specifically meant to augment z/OS enterprise deployments. SLES 10 exploits the newest System z architecture level

Open Source Packages available for SLES for System Z

Highlights

- Apache Webserver
- MySQL and PostgreSQL databases
- OpenLDAP Directory Server
- SAMBA – CIFS File- and Printservice for Windows environments
- Network Filesystem (NFS)
- FTP, DNS, DHCP, NTP, ...
- Mailserver, Newsserver, ...
- Basic Firewall functions (iptables)

In general all open source packages that are delivered with the SUSE Enterprise distribution are included in Support.

IBM Solutions supporting SLES for System z

IBM product families available for Linux for System Z

Data Management

- e.g. DB2/UDB Server, DB2 Client

Lotus Domino™

MQ Series → WebSphere MQ

Rational

- e.g. ClearCase, ClearQuest

Tivoli

WebSphere

- e.g. Application Server (WAS), Host on Demand (HoD), Host Access Transformation Service (HATS), MQ, Portal

more infos at ibm.com/linux/matrix/linuxmatrixhwz.html

IBM Solutions for SLES on System Z

IBM connector software for Linux allows to integrate applications running on zLinux smoothly in z/OS and VSE environments:

- Communication Controller for Linux (CCL) to provide SNA network communication

- Communication Server for Linux (CS) providing multiprotocol gateway functionality

- DB2 Connect, IMS Connect, Informix Connect

- CICS Transaction Gateway

- WebSphere MQ

- VSE Connectors

Linux takes the advantage from using HiperSockets when communicating to other z operating Systems.

Linux on System z: Typical Architecture
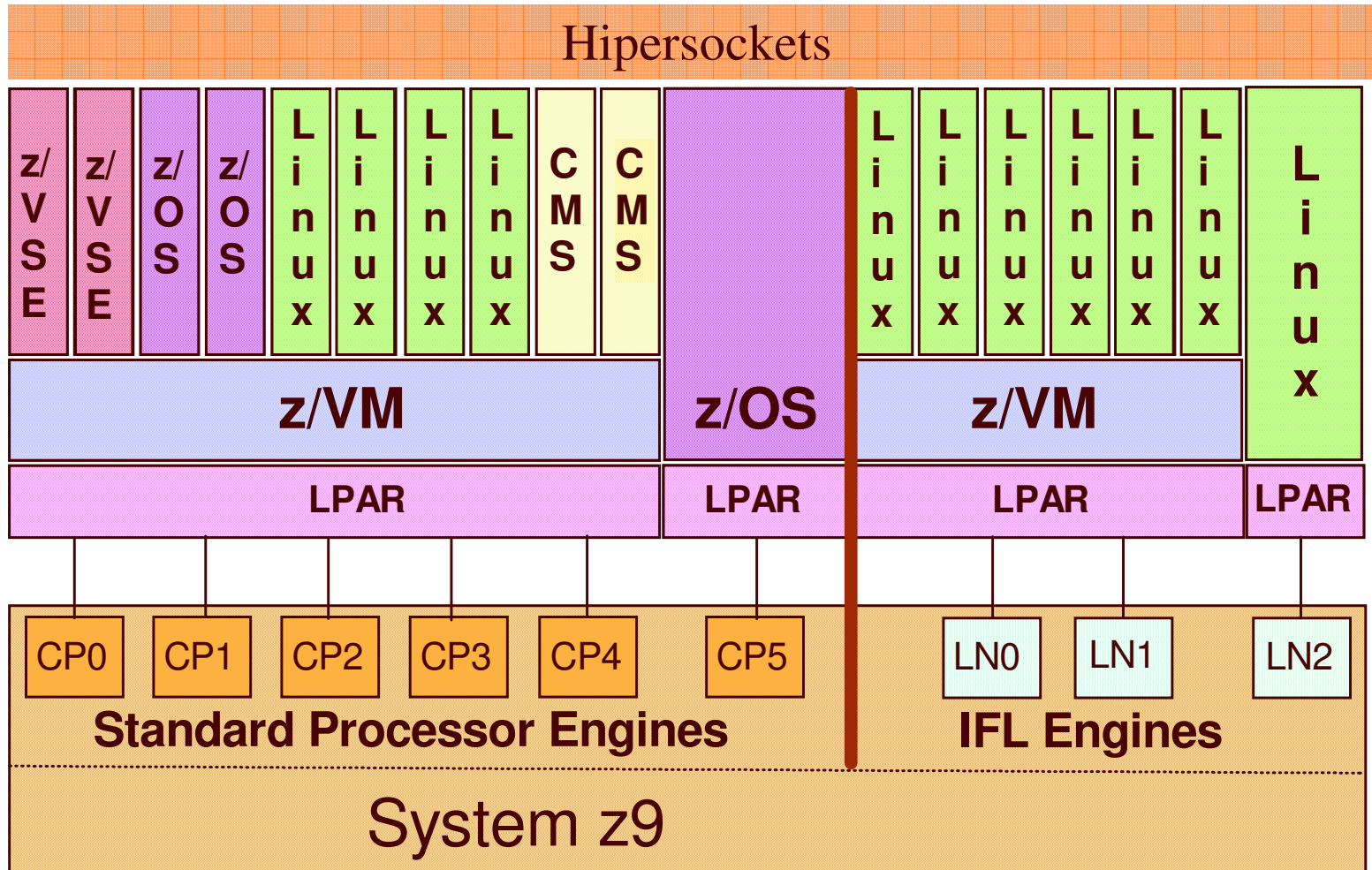
Major ISVs supporting SLES on System z

ERP, Production Planning, Logistics
- ABAS Software AG
- SAP
- IFS

Database
- Oracle 9i & 10g
- Software AG Tamino (XML Database)

Application & e-business Integration
- Tibco
- Iona
- BEA WebLogic
- Aeonware (B2B/B2C)

Systems Management
- BMC Patrol
- BMC Mail Server Knowledge Agent
- BMC Web Server Knowledge Agent
- Computer Associates
- Legato Networker for Linux
- LinuxCare (Levanta)
- Veritas Software Corp.

Windows migration (ASP, .NET)
- Stryon Software

Print server
- Macro4

Stock tracking
- RTS Realtime Systems

Core Banking Applications
- Sanchez, M2M, S2, ...

Mail & Calendaring server
- Sendmail (Mail)
- Bynari (Mail & Calendaring)
- Nexus Neon

Development & Testing Tools
- Logics Software
- Rational Software (now IBM)
- Rogue Wave Software
- Dignus
- ACTS (testing)
- Acucorp Inc. (Cobol solutions)
- MicroFocus

Firewall
- zGuard
- StoneSoft (Stonegate)

Grid Computing
- Platform
- Data Synapse
- Globus Toolkit

Linux on System z typical architecture with z/VM and z/OS

ERP

trans-action

SAP R/3 PARTNER

Appl.+DB

trans-action

business appl.

SENDMAIL

CICS

IMS

PEOPLE Soft

IBM WebSphere

Java & EJB Appl*

SAP R/3 PARTNER

ORACLE

DL/I DB2

ORACLE Siebel

.domino

WebSphere e-commerce

Linux Appl

Consolidate Cluster/Parallel File/Disk/Print

JVM

Linux

z/OS

Linux

z/VM

PR/SM LPAR

z9 Platform

Linux on System z typical architecture with z/VM and z/VSE

Development Environment	Production Environment	Production Environment		Production Environment	Test Environment

Linux

RAD:
Apache,
MySQL,
Perl,
Eclipse,
Subversion,
...

SAMBA
Firewall

Linux

DB2
UDB
MQSeries

Linux

WebSphere
• App. Server
• Host Access Transf. Service
• Host on Demand
• Portal
• MQSeries

HiperSocket Connection

z/VSE

•CICS
•VTAM
•VSAM
•TCP/IP
•Cobol
•DB2
•MQSeries

z/VSE

•CICS
•VTAM
•VSAM
•Cobol

z/VM	LPAR	LPAR
IFLs	Standard Processors	

IBM System Z

Linux opens the world for mainframe users to a broader application portfolio – in the form of ISV and Open Source applications.

User Cases:
SUSE Linux on System z

Swisscom

- Challenge
  - reliable and secure e-business foundation
  - order management 1.500 users, 500.000 EJB transactions/day
  - billing system 4.000 users, 350.000 Orbix transaction/day
- Solution
  - Corba bases ordering and billing system ported to SLES running WebSphere
  - z/VM® and IFL (Integrated Facility for Linux)
- Result
  - highly stable and flexible test and production environment
  - significantly speed up development time
  - improve responsiveness
  - reduced total cost of ownership (TCO)

Deutsche Bahn

Die Bahn **DB**

- Challenge
    - 55.000 mail clients
    - 5.500 Lotus Notes databases
    - distributed on many machines
- Solution
    - Virtual Linux server solution
    - z/VM$^®$ and zSeries 990
- Result
    - improved availibility
    - simplified management
    - reduced total cost of ownership (TCO)
    - extendable solution

Deutsche Bahn
Largest Rail Transportation Company in Germany

"SUSE Linux Enterprise Server has delivered enterprise-class computing at a lower cost than than we could have achieved with proprietary software. We rely on it to run our core business systems and our customer Web site."

Ingo Schwarzer, DB Systems

Business Issues:	Novell® Solution:	Results:
• Transport more than 1.6 billion passenger journeys each year, and well as 280 million tons of freight • 80,000 internal users • Provide reliable ticketing, timetables, logistics planning and maintenance • Control IT costs	• SUSE® Linux Enterprise Server • Intel and AMD-based servers • IBM eServer zSeries	• Reduced software licensing and hardware costs by 50 percent • Reduced maintenance costs by 25 percent • Increased performance and availability of business-critical systems such as timetabling and customer Web site • Increased security • 24/7 uptime

HSBC Trinkaus & Burkhardt

- Challenge
  - new system for securities and settlement application
  - Needed web access to ISV application DB on OS/390 for master account data administration
- Solution
  - WebSphere on SLES on System z hosting Java Servlets
  - Looking at Samba File and Print and ISV applications for SLES on System z
- Result
  - The solution provides cost efficiency, manageability, scalability and ease of system integration
  - The IBM mainframe strengths of reliability, availability and security combined with SLES on zSeries has solidified System z as the platform of choice

Endress+Hauser

- Challenge
  - Improvement of management, power and fexibility for 19 stand alone SAP systems and 20 SAP testing environments
- Solution
  - Migration Unix to SLES on mainframe
  - 2 zSeries z990 with 36 IFL (Linux CPUs)
  - 12 standard CPUs (non IFL) running DB2 on z/OS
- Result
  - increased performance
    - reaction times below 1s
    - increasing number of users did not cause additional administrative overhead
  - improved management of disaster scenarios
  - higher flexibility

Hannoversche Versicherung

- Challenge
  - Setup a save and secure system base
  - operation of complex insurance applications
  - future base for e-business needed
- Solution
  - two redundant System z
  - first step, consolidation of 15 Intel SAP servers
  - second step, migration of Websphere based Intranet
- Result
  - highly stable and flexible production environment
  - flexibility and scalability "Capacity on Demand"

SUSE Linux Enterprise Server on System z: A Success Story

- First enterprise Linux product in 2000

- Installed base of 1700+ customers worldwide

- Companies like Renfe, Banco de Milano, Deutsche Bahn, HSBC, Audi, Endress+Hauser run mission critical applications on SLES for zSeries

- 90% market share for SUSE Linux on mainframe

- First SAP certified solution stack on mainframe 2002, first productive customer (2002 OMV Austria, oil & gas)

- 800+ of certified applications from 290+ ISV, including DB2, Oracle, Websphere, LotusDomino, SAP

- First implementation of Common Code Line on mainframe

- First EAL security certification 2002, today EAL 4+

Customer Success
Baldor Electric

By migrating their SAP application servers to SUSE® Linux on the IBM zSeries*, Baldor Electric gained an **immediate increase in performance**, **systems that are easier to manage and maintain** and **IT costs savings**

Business Issues:	Novell® Solution:	Results:
• Upgrade from SAP R/3 • Add support for new applications including mySAP CRM, mySAP SRM, and its ShopFloor Display portal • Availability and reliability to support always-on requirements of operating in global, integrated environments	• mySAP Business Suite with SAP NetWeaver • SUSE Linux Enterprise Server 9 • IBM eServer zSeries 990	• Reduced operations overhead and IT costs, while improving performance of its core business applications by 40 percent • Reduced administrative workload requires less than 40 technology professionals • Centralized deployment of SAP solutions supporting the work of 3,800 employees worldwide • IT cost savings redeployed toward innovative projects to transform the business

Casas Bahia
Largest Retailer in Brazil

"Having a secure and reliable platform is essential for our $6 billion business. In four years of running Linux, we have never had a problem with security or downtime in any of our stores."

Frederico Wanderley, Casas Bahia

Business Issues:	Novell® Solution:	Results:
• 55,000 employees across 200 cities • Unsupported OS/2 architecture • Move to a platform with greater flexibility and scalability • Provide real-time access to customer data in each of its 500 stores • Support rapid growth	• SUSE® Linux Enterprise Server • IBM System z mainframe	• Avoided US$8 million cost of moving to a proprietary platform • Completed a seamless transition to Linux without any employee retraining • Achieved 99.999 percent uptime • Stores have real-time access to customer data with Linux POS system • Can now set up stores in two days, rather than two weeks

America First Credit Union
13th Largest Credit Union in U.S.

"Novell® products have given us the best technology for our business, as well as the ability to work with other systems. Being an open enterprise gives us greater options for the future."

Dan Williams, America First Credit Union

Business Issues:	Novell® Solution:	Results:
• 357,000 members • 65 locations • Manage extensive ATM network • Provide consistent uptime to members whether visiting branch office or ATM • Evaluate benefits of open source applications	• SUSE® Linux Enterprise Server • Novell Open Enterprise Server • IBM eServer zSeries	• Leveraged Linux to improve speed and performance of large ATM network • New ATM system processes 85 transactions per second • Reduced licensing costs with virtual Linux servers running on one mainframe, instead of two • Enhanced network services on Linux with Novell Open Enterprise Server

First National Bank of Omaha
Bank Holding Company with $16 Billion in Managed Assets

"With SUSE® Linux Enterprise Server on IBM zSeries we not only consolidated all our Sun servers, but we also have tremendous room to grow on our 32-way IBM mainframe. I haven't had to buy a new server in the past two years – how many CIOs are able to say that?"

Kenneth Kucera, First National Bank of Omaha

Business Issues:	Novell® Solution:	Results:
• Handle increasing volumes of electronic data • Invest wisely in security, network capacity and system performance • Reduce costs of managing 600 servers, including 40 Sun boxes • Manage costs by eliminating the need to add servers at the rate of 30 percent each year	• SUSE® Linux Enterprise Server • IBM eServer zSeries	• Consolidated 40 Sun Solaris servers to five virtual Linux servers on an IBM mainframe • Reduced administrative costs by nearly 70 percent • Reduced software licensing costs by more than 90 percent • Realized a $1.8 million savings in first year • Estimates a savings of $9.6 million through 2011

Summary

- Novell stands for the Open Enterprise, complementing IBM's OnDemand Strategy

- Novell stands for Trust, Direction and Future

- Novell and IBM share an excellent partnership guaranteeing solutions for your business needs

- SUSE Linux Enterprise Server 10 is the platform No. 1 for your heterogeneous environment with a z/VSE System as the Center