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# Linux em zSeries: Próximos Passos

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**Marcelo L. Braunstein**

*Gerente de Vendas e Mktg para Linux,  
IBM América Latina  
[marcelol@br.ibm.com](mailto:marcelol@br.ibm.com)*

# Eating My Own Words

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*A letter to Lou Gerstner from Stewart Alsop.*

**FORTUNE**

*Monday, February 18, 2002*

*By Stewart Alsop*

[http://www.fortune.com/indexw.jhtml?channel=artcol.jhtml&doc\\_id=206327](http://www.fortune.com/indexw.jhtml?channel=artcol.jhtml&doc_id=206327)

"... Of course, the most impressive thing about your tenure at IBM has been your ability to ignore the nattering nabobs. Just 18 months before you signed on, I wrote a column predicting the death of the mainframe. (I even predicted that the last one would be unplugged and retired by 1996!) So it was a thrill for me, just one week ago, to pose for your upcoming annual report. Your photographer put me in front of a plate covered by letters spelling out the words DEATH TO THE MAINFRAME. Well, let me metaphorically eat my words now. While those 1991-era mainframes are virtually extinct, it is clear that corporate customers still like to have centrally controlled, very predictable, reliable computing systems--exactly the kind of systems that IBM specializes in. It is also perfectly clear that you were right, and I was wrong. ..."

IBM



# O que é Linux em zSeries?

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- **A native zSeries operating environment**
  - ▶ Pure Linux, an ASCII environment
  - ▶ Exploits IBM S/390 hardware, including IEEE floating point
  - ▶ Linux for S/390 - 32-bit
  - ▶ Linux for zSeries - 64-bit
- **Not a unique version of Linux or other operating system**
- **Not a replacement for other IBM zSeries operating systems**



# Porque Linux em zSeries?

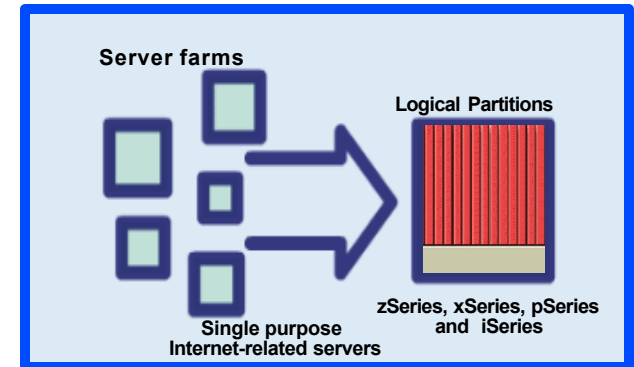
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- **Increased solutions** through Linux application portfolio
- Large number of **highly skilled programmers** familiar with Linux
- **Integrated** business solutions
  - ▶ Data richness from zSeries
  - ▶ Web capability of Linux applications
- **Industrial strength** environment
  - ▶ Flexibility and openness of Linux
  - ▶ Qualities of service of zSeries
- Unique ability to easily **consolidate** large number of servers
- **Reduced Total Cost of Ownership (TCO)**
  - ▶ Environmental savings - single footprint vs. hundreds of servers
  - ▶ Consolidation savings - less storage, less servers, less software licenses, less server management/support
- **Speed to market**
  - ▶ Capacity-on-demand capability on zSeries
  - ▶ Dynamic allocation of on-line users, less than 60 Seconds to add a new Linux server image using z/VM



# O que zSeries traz para o Linux?

- The most reliable hardware platform available
  - ▶ Redundant processors and memory
  - ▶ Error detection and correction
  - ▶ Remote Support Facility (RSF)
  - ▶ Reliability, availability, security of zSeries hardware
- Improved service level
  - ▶ Systems management (single point of control)
  - ▶ Centralized Linux systems are easier to manage
- Security
- Scalability
  - ▶ Physical - scale to 16 application processors and up to 3 dedicated I/O processors
  - ▶ Logical - scale to hundreds of Linux images
  - ▶ Non-disruptive capacity upgrade on demand
- Designed to support mixed workloads
  - ▶ Allows consolidation while maintaining one server per application
  - ▶ Complete work load isolation
  - ▶ High speed inter-server connectivity



# zSeries z900

## Asset Protection

Upgrades from G5/G6

## High Speed Socket Connections

Linux to OS/NP  
OS/NP to OS/NP  
Linux to Linux

## Non Disruptive Scalable Growth

20 Processor MCM  
Capacity Upgrade on Demand  
3X IO bandwidth vs. G6  
96 FICON  
64 GBytes Central Storage

## Intelligent Resource Management

LPAR Clustering  
Work load to PR/SM communications  
Dynamic Channel Management  
IO priority Queuing  
Network  
Storage Devices ( Shark DASD )

## Balanced System

64 Bit Architecture  
Increased Parallel Sysplex Link Speed  
Enhanced Hardware Compression  
Freeway based coupling facility

## Security

Crypto Co processors  
PCI Crypto card

## Specialized Engines

Internal Coupling Facility

## Linux ( IFL )

System Attached Processor (SAPs)

## Simplified Model Structure

Single Cycle Time



## z/OS 1.3

IBM License Manager (ILM)  
Intelligent Resource Director (IRD)  
Managed System Infrastructure (msys)  
SNA Master Console Support  
64-bit real support ( *also in OS/390 2.10* )

IBM



# Introducing zSeries Offering for Linux

*zSeries is introducing its first dedicated server offering for Linux*

- ▶ The first Linux for zSeries offering designed from the ground up for server consolidation
- ▶ Improved Total Cost of Ownership through consolidation of UNIX, Windows NT and Linux applications to Linux on zSeries
- ▶ Virtualization capability to run 20 to many hundreds of Linux images
- ▶ Delivers high performance, scalability, availability, security and connectivity through advanced zSeries architecture
- ▶ Investment protection by choosing the world of open standards



***It's a mainframe... and it's Linux!***



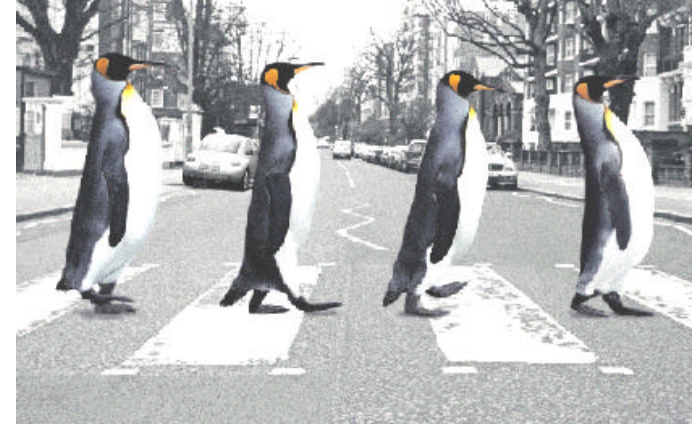


# IBM @server zSeries offering for Linux

*So, What do you get.....*

## ■ zSeries Hardware

- ▶ z800 Server - Model 2066-0LF
- ▶ 1 to 4 Integrated Facility for Linux engines
- ▶ Memory pre-configured to match enabled processors
- ▶ Includes FICON Express, OSA-Express, and ESCO connectivity
- ▶ HiperSockets
- ▶ Built in redundancy, Sparing, Hot Pluggable I/O



## ■ zSeries Virtualization Technology: z/VM

## ■ zSeries Maintenance and support

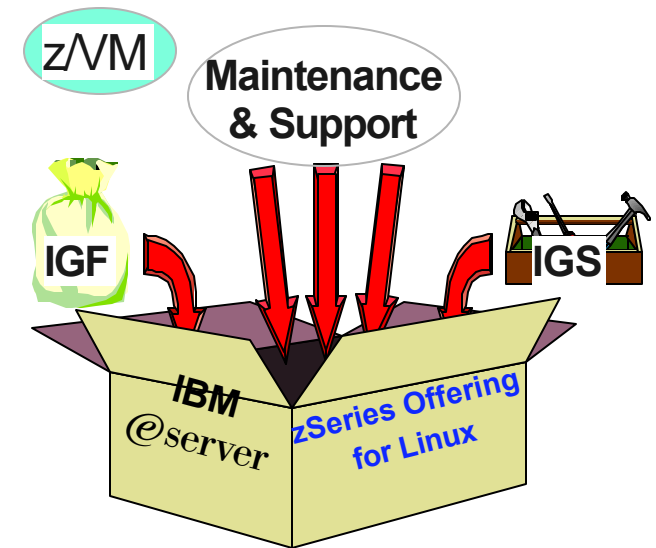
- ▶ 3 years hardware maintenance (1 year warranty)
- ▶ 3 years z/VM Subscription and Support License

## ■ IBM Global Finance - optional

- ▶ Financing options available from IBM Global Finance

## ■ IBM Global Services - optional

- ▶ IBM Support Line Software Services for Linux
- ▶ IGS Linux Rapid Deployment Service



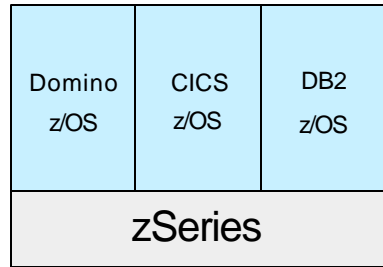
IBM



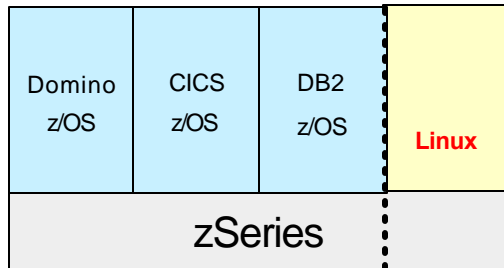
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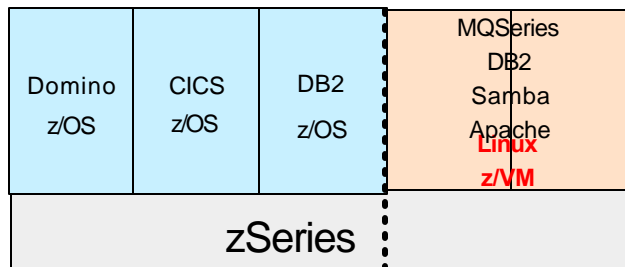
# IBM zSeries Integrated Facility for Linux



Example 1



Example 2



Example 3

## ■ Business As Usual

- Typical z/OS environment on a 3-way processor

## ■ Add IBM zSeries Integrated Facility for Linux engines

- Traditional environment price remains the same
- Cost of IBM zSeries Integrated Facility for Linux and Linux distribution

## ■ Add IBM software for Linux on zSeries

- Traditional environment price remains the same
- Cost of IBM zSeries Integrated Facility for Linux, Linux distribution, z/VM, and IBM middleware (e.g. MQSeries and DB2 Connect)

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# Linux and z/VM: Perfect Together

## *The Value of z/VM for Linux*

The machines are virtual -- *productivity and cost advantages*

- Ideal for **prototyping**, proof-of-concept, system testing
- More **flexible** and less disruptive than LPAR
- **System resources** can be virtualized, simulated, and shared
- Customers can **adapt** quickly with virtual system environments



Very large multi-image support -- *do more with less*

- Run tens to hundreds of images on **one server** (even in one LPAR)
- Ideal for **consolidating** multiple server images on a single processor
- Enables workload growth via **server replication**
- Virtual machines for **every** developer, tester, student, department, etc.

Architecture exploitation -- *enhanced qualities of service*

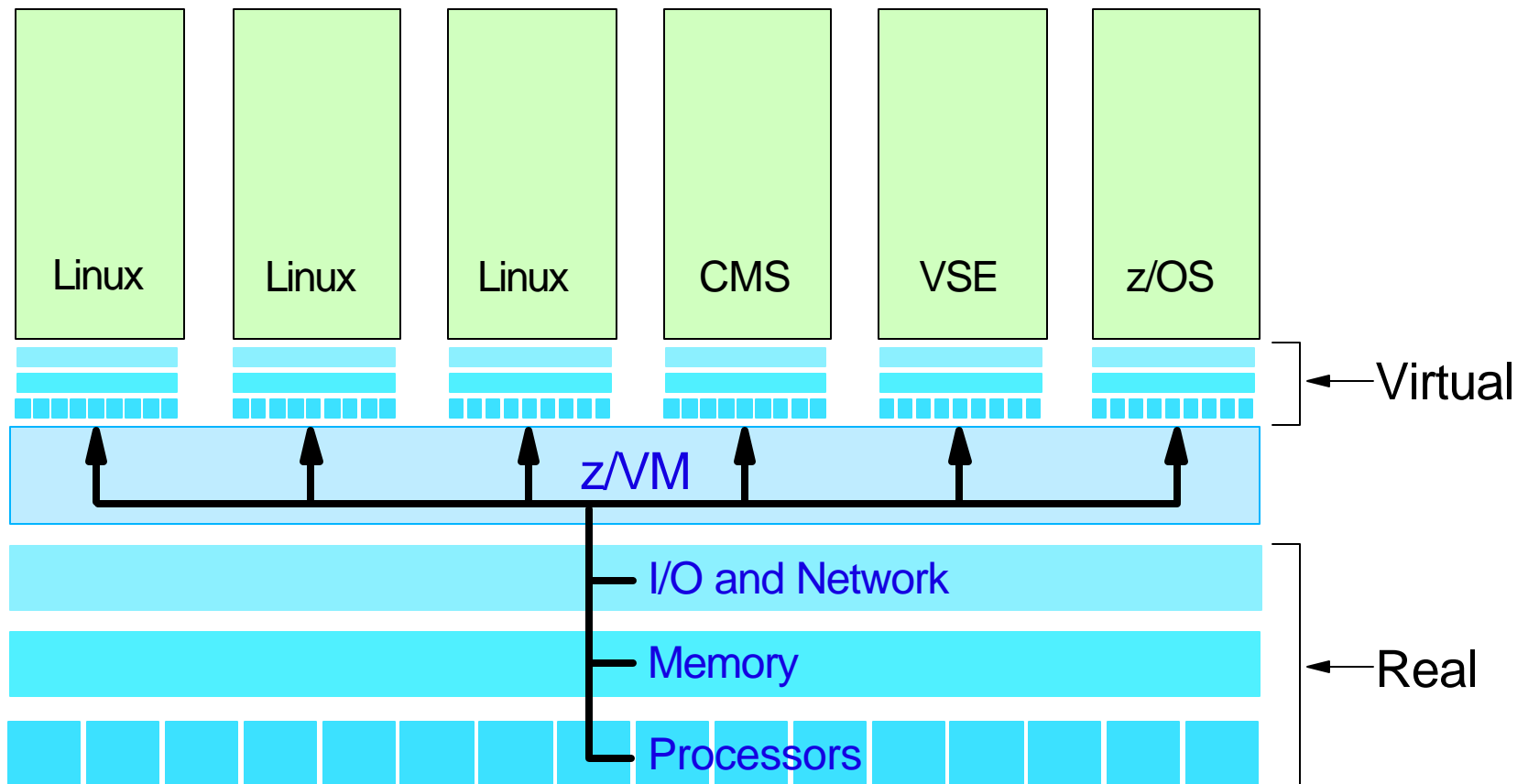
- Create a guest environment **functionally richer** than native or LPAR
- High-performance **networking** among virtual machines
- Transparent exploitation of VM's **hardware support** (with error recovery)
- Enhanced **performance** using VM's data-in-memory support
- Multi-system **thruput** improvements using VM's large n-way support



# Virtual Machine Partitioning

## *Efficiently Exploiting the Entire Mainframe Complex*

A Virtual Machine simulates the existence of a dedicated real machine, including processor functions, storage, and input/output resources.



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# **z/VM Version 4 Product Information**

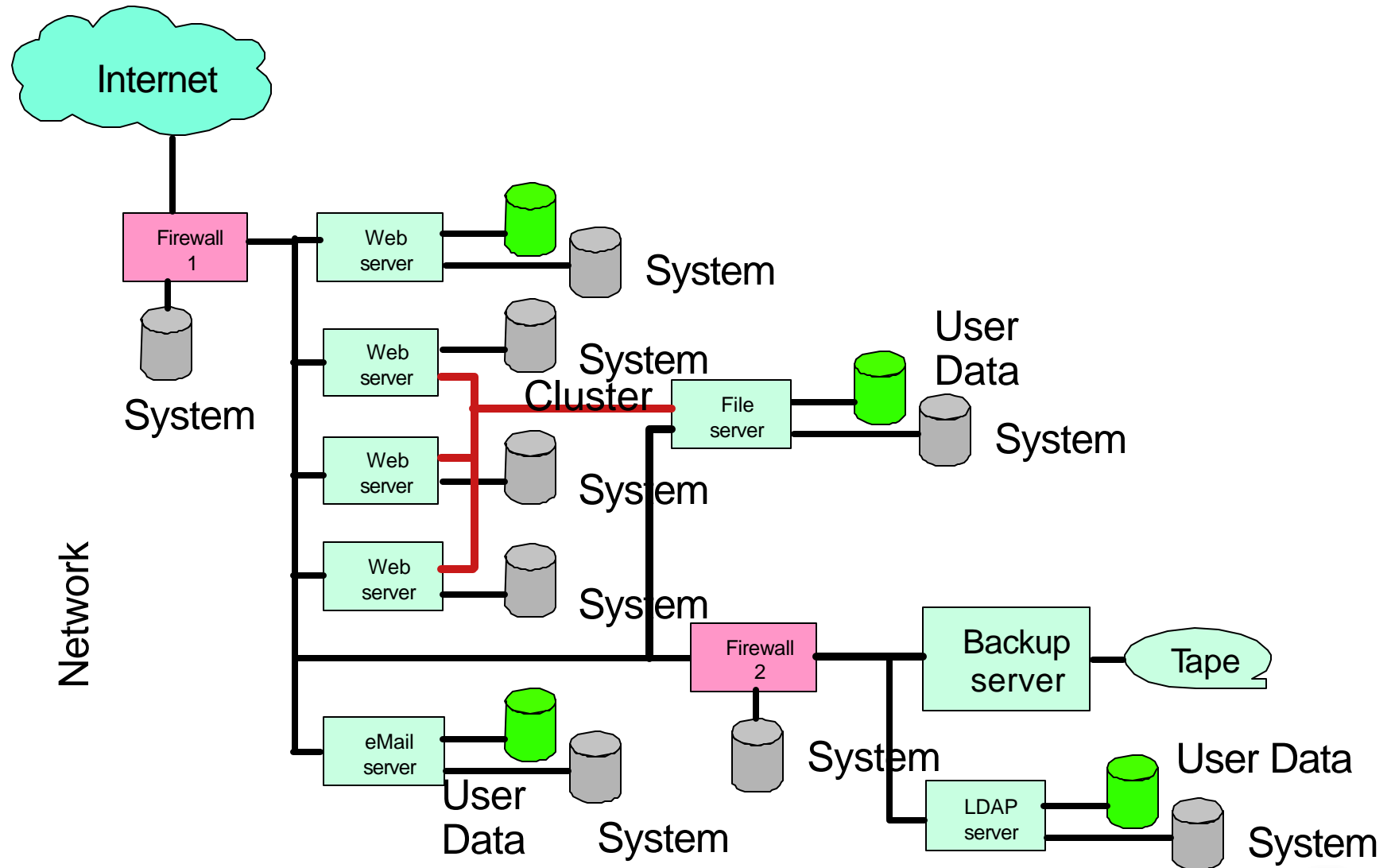
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- **Runs on IBM G5 processor technology or better**
  - ▶ IBM @server zSeries 900
  - ▶ IBM Parallel Enterprise Server G5 and G6
  - ▶ IBM S/390 Multiprise 3000
- **Runs on Integrated Facility for Linux (IFL) engines as well as standard processor engines**
- **IPLA software product (5739-A03)**
  - ▶ One-time charge (OTC) on a per-engine basis (\$45K per engine in the U.S.)
  - ▶ Can be transferred within an enterprise
  - ▶ Serviced only via mail, fax, or e-mail under basic warranty
- **Optional Software Subscription and Support product (5739-SWS)**
  - ▶ Required to receive telephone defect support
  - ▶ Entitles customers to future z/VM releases and versions
  - ▶ Annual, renewable charge per engine (\$11K per engine per year in the U.S.)



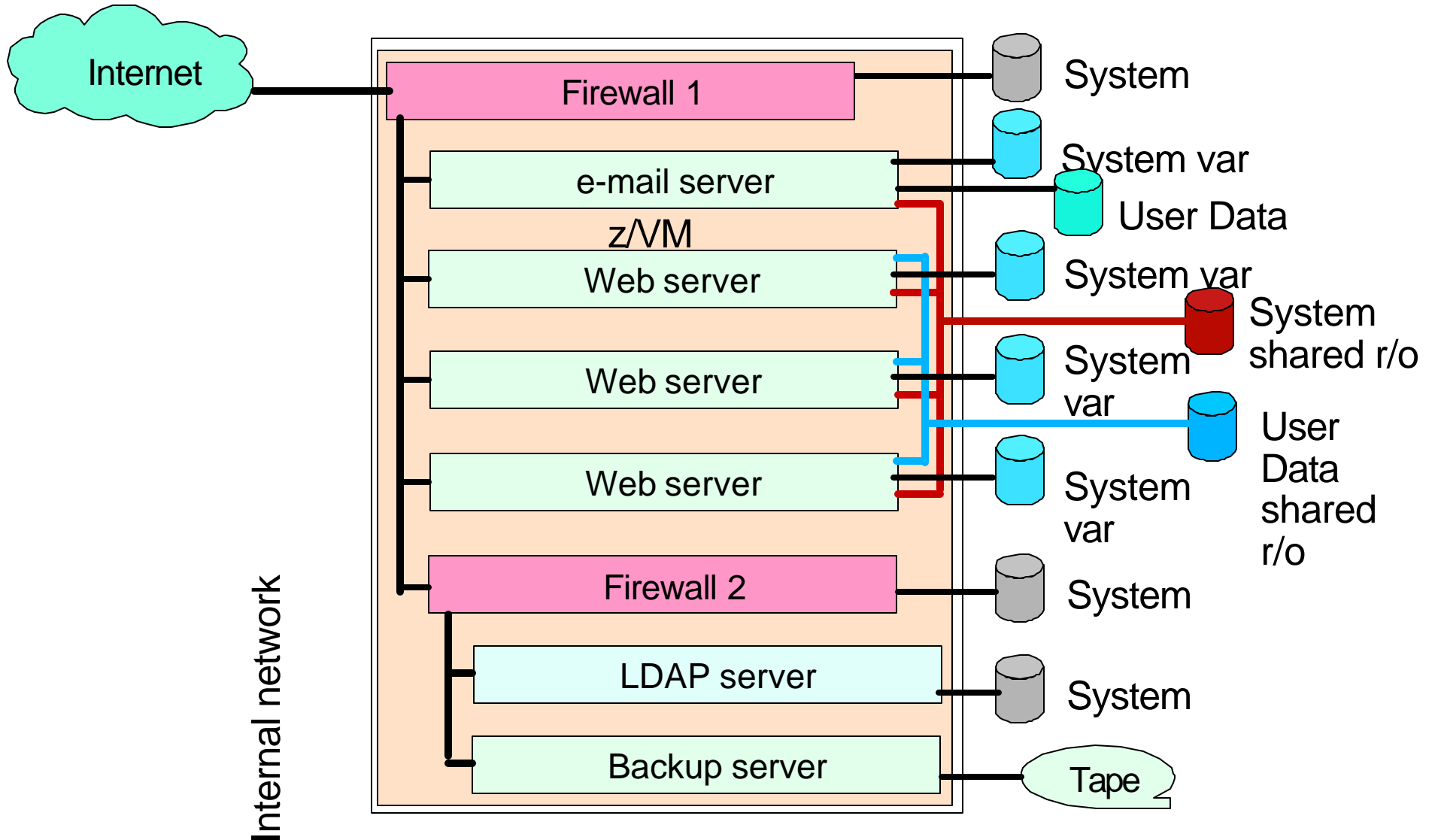
# Web Serving with Linux

## Classical scenario



# Web Serving with Linux

for zSeries !



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# IBM Software for Linux

Java Development kit Eclipse

WebSphere Site Analyzer

Network Dispatcher

SecureWay Wireless Software

WebSphere Host On-Demand

WebSphere Commerce Suite

Performance Pack Cache Manager for Multi-platform



WebSphere Application Server

WebSphere Homepage Builder

ViaVoice Dictation

DB2 Universal DataBase (UDB)

VisualAge for Java

Tivoli Storage Manager

WebSphere MQ

Lotus Domino





# IBM SW releases

<u>Product</u>	<u>Release</u>
CICS Transaction Gateway	4.0
DB2 Connect Enterprise Edition DB2 Net Search Extender DB2 Universal Developer's Edition DB2 UDB, Enterprise Edition	7.2
IBM Screen Customizer	2.0
MQSeries Client	5.2
MQSeries Everyplace	1.2
Object REXX	2.2
Tivoli Management Framework Tivoli Software Distribution	3.7
Tivoli Storage Manager Client	4.2
Tivoli Workload Scheduler	8.1
Websphere App. Server Advanced Edition for Linux	4.0
Websphere Commerce Suite, Pro Edition for Linux	5.1
Websphere Host on Demand	5.0/6.0
Websphere Personalization Server	3.5

- **Website for IBM sw products supported by Linux on all platforms:**
  - ▶ <http://www-4.ibm.com/software/is/mp/linux/en/>



# ISVs e Aplicações

*Linux: the list of applications just keeps on growing...*

- **ERP, Production Planning, Logistics**
  - ▶ ABAS Software AG
  - ▶ SAP
- **Database**
  - ▶ Oracle 9i
  - ▶ Software AG XML Database
- **Application & e-business Integration**
  - ▶ Tibco
  - ▶ Iona
  - ▶ BEA
  - ▶ Aeonware (B2B/B2C)
- **Systems Management**
  - ▶ BMC Patrol
  - ▶ BMC Mail Server Knowledge Agent
  - ▶ BMC Web Server Knowledge Agent
  - ▶ Computer Associates
- **Windows migration, ASP**
  - ▶ Halcyon Software
- **Backup Software**
  - ▶ Legato
- **Stock tracking**
  - ▶ RTS Realtime Systems
- **Core Banking Applications**
  - ▶ Sanchez
- **Mail and Calendaring server**
  - ▶ Sendmail
  - ▶ Bynari (Mail & Calendaring)
  - ▶ Steltor (Calendaring)
- **Print server**
  - ▶ Macro4
  - ▶ SAMB (File & Print)
- **Development & Testing Tools**
  - ▶ Logics Software
  - ▶ Rational Software
  - ▶ Rogue Wave Software
  - ▶ Dignus
  - ▶ ACTS (testing)
- **Firewall**
  - ▶ zGuard

*ISVs are constantly releasing new applications for Linux on zSeries. Get the most current information from the Developer Products for Linux for zSeries and S/390 Web page at:*

[www-1.ibm.com/servers/eserver/zseries/solutions/s390da/linuxproduct.html](http://www-1.ibm.com/servers/eserver/zseries/solutions/s390da/linuxproduct.html)



# Distribuições Linux para zSeries-S/390



- Red Hat z/Linux 7.2
  - ▶ Standard and Premium Edition
  - ▶ Francisco PESSERL, (41) 9979-7555, francisco@pessler.com.br
- SuSE Linux Enterprise Server 7.1
  - ▶ Lúcio Baldacci, (11)5089-2770
  - ▶ s390-sales@suse.de



- Turbolinux Server 6.5
  - ▶ Media Kit and Full Distribution
  - ▶ [www.turbolinux.com/products/s390/](http://www.turbolinux.com/products/s390/)



- Conectiva S/390
  - ▶ Informações: [sac@conectiva.com.br](mailto:sac@conectiva.com.br)
  - ▶ (41)360-2662

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# Building Services on Strength of Linux

- **Integrated Technology Services**

- ▶ e-business infrastructure
- ▶ Performance testing
- ▶ Business recovery
- ▶ Technical support
- ▶ IT architecture
- ▶ Network and connectivity
- ▶ Storage and SAN services

- **Business Innovation Services**

- ▶ e-business strategy
- ▶ Buy and supply
- ▶ Sell and support
- ▶ Enterprise resources
- ▶ e-business integration

- **Strategic Outsourcing**

- **Learning Services**



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# IBM Linux Services

## IBM Service Offerings

### *Appliance & File/Print*

- System Installation & Configuration
- e-business eServer Solutions
- Support Line
- Open Source SW Consulting
- Classroom & Web-based Courses
- Installation Services for WebSphere
- Installation Services for MQ Series

### *Clusters*

- High Performance Clusters
- Classroom Courses

### *Distributed Enterprise*

- System Installation & Configuration
- e-business eServer Solutions
- Support Line
- Open Source SW Consulting
- DB2 Migration
- Installation Services for MQ Series
- Classroom & Web-based Courses

### *Workload Consolidation*

- Workload Consolidation
- Solaris -> Linux Migration
- Platform Migration
- Support Line
- Open Source SW Consulting
- Classroom Courses

### *Strategy*

- Open Source SW Consulting
- Classroom & Web-based Courses



# Learning Services Linux Classes

## Brazil

Course	code	Days	Start Date	Price(R\$)
Linux Power User	QLX02	5	-	1.900
Systema Linux Management	QLX03	5	-	1.900
Linux for UNIX Professionals	QLX12	5	06/05	1.900
Linux Basis	QLX13	4	-	1.650
Linux - System Management	QLX14	4	28/01	1.650
Linux TCP/IP Management	QLX07	5	18/02 e 17/06	1.900
Linux as a Firewall	QLX24	5	15/04	1.900
Linux as a Webserver (Apache)	QLX25	3	11/03 e 05/06	1.400
Integrating Linux to Windows (Samba)	QLX26	2	14/03 e 03/06	1.100
Perl Fixture for Linux and World Wide Web	QLX28	5	-	1.900
<b>Linux Basics - An S/390 Perspective</b>	HLX13	2	25/02 e 10/06	1.400
<b>Linux Implementation for S/390</b>	ZL100	3	27/02 e 19/06	2.100
<b>VM Basics for Linux</b>	ZV050	2	08/04	1.400

[www.ibm.com/services/learning/br](http://www.ibm.com/services/learning/br)

0800-781426 (extension 1312)

All dates mentioned refer to courses in the city of São Paulo  
Consult IBM for courses that don't have a defined date



# **zSeries New Workloads Workshops**

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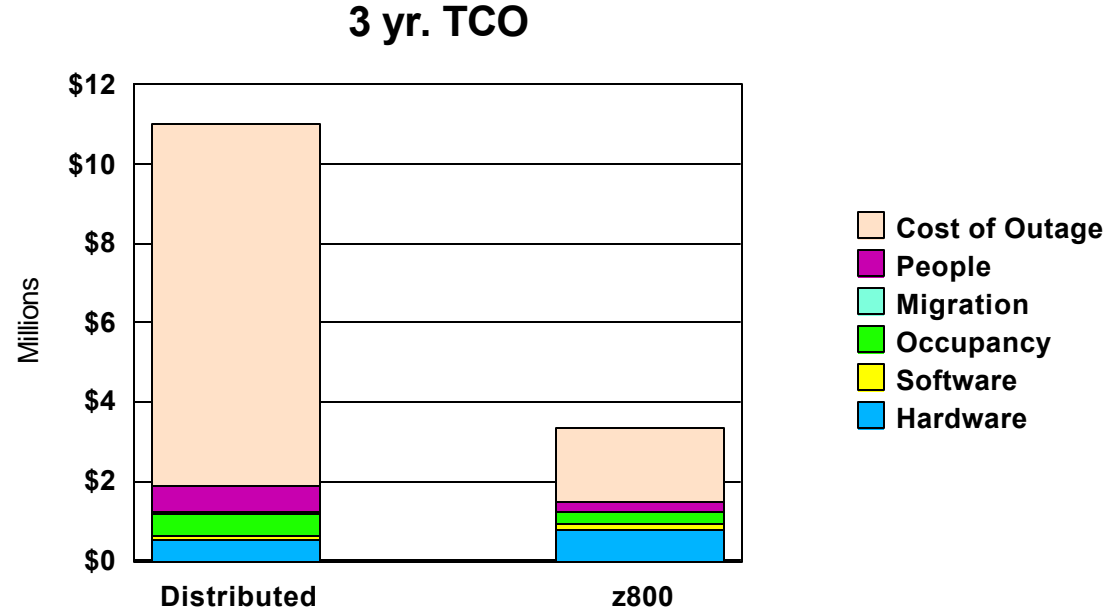
- **Linux Bootcamp**
  - ▶ 13 classes, 76 customers, 173 persons
  - ▶ Brasil (10), Argentina, Venezuela
  - ▶ Rio: Abril 16 ; SP: Abril 23 e Maio 7
  
- **WAS for Linux**
  - ▶ To be announced
  
- **Web Enablement Gen II**
  - ▶ 11 classes, 58 customers, 145 persons
  - ▶ Brasil(6), Argentina(2), Venezuela, Chile, Mexico
  
- **Web Enablement Gen III**
  - ▶ To be announced (June)
  
- **Web Security**
  - ▶ 6 classes, 41 customers, 97 persons
  - ▶ Brasil(3), Argentina, Venezuela, Mexico
  
- **ITSO Classes**
  
- **z/Explorers**



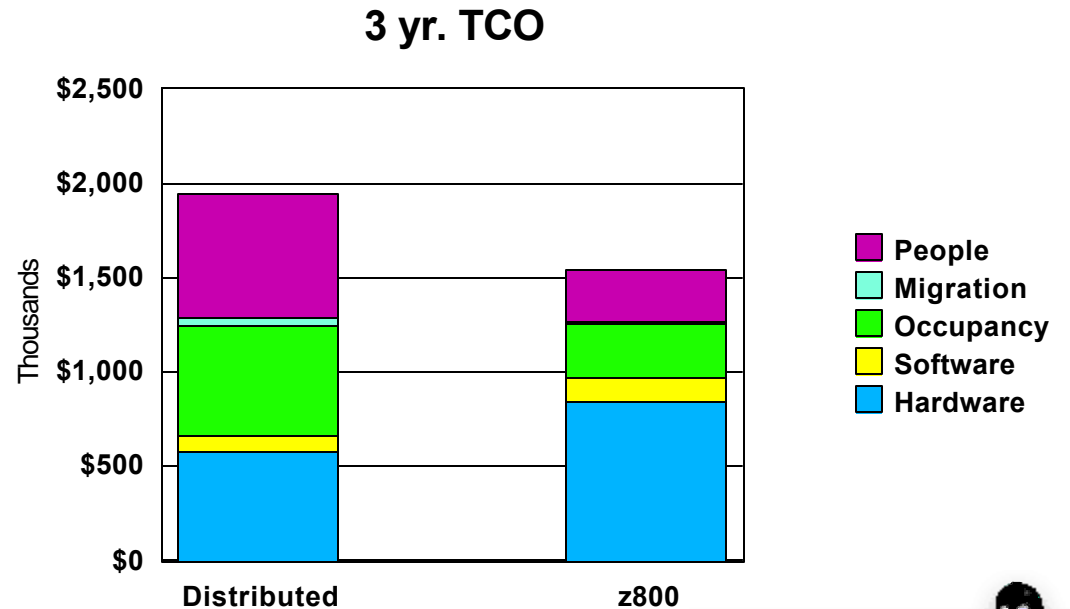


# TCO para 30 servidores Unix/Intel

Comparação levando em conta o custo de disponibilidade:



Comparação sem o custo de disponibilidade



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# Referencias/Projetos na América Latina



Universidade Regional do  
Noroeste do Estado do  
Rio Grande do Sul

Telcos, Varejos, Bancos ...

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# **Exploiting Linux for Competitive Advantage**

*IBM is Ready to Help You:*

- ...get educated
- ...assess what's happening in your company
- ...develop your strategy
- ...pick and implement a pilot
- ...be a reference !

## ■ Info:

- ▶ <http://www.ibm.com/linux>
- ▶ <http://s390.ibm.com/linux/>





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