

Les plus Techniques de zVM avec **Linux** sur zSeries et z9

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Agenda

- Ou en sommes nous avec Linux ?
- Linux sur zSeries
- Technologie de Virtualization z/VM
- Simplification avec Linux sur zSeries
- Conclusion

Pourquoi IBM se focalise sur l'Open Source ?



➤ Recherche des Clients

- OSS est une bonne approche pour **developper des STANDARDS OUVERTS**
- Beaucoup de projets OSS peut devenir des standards ouverts

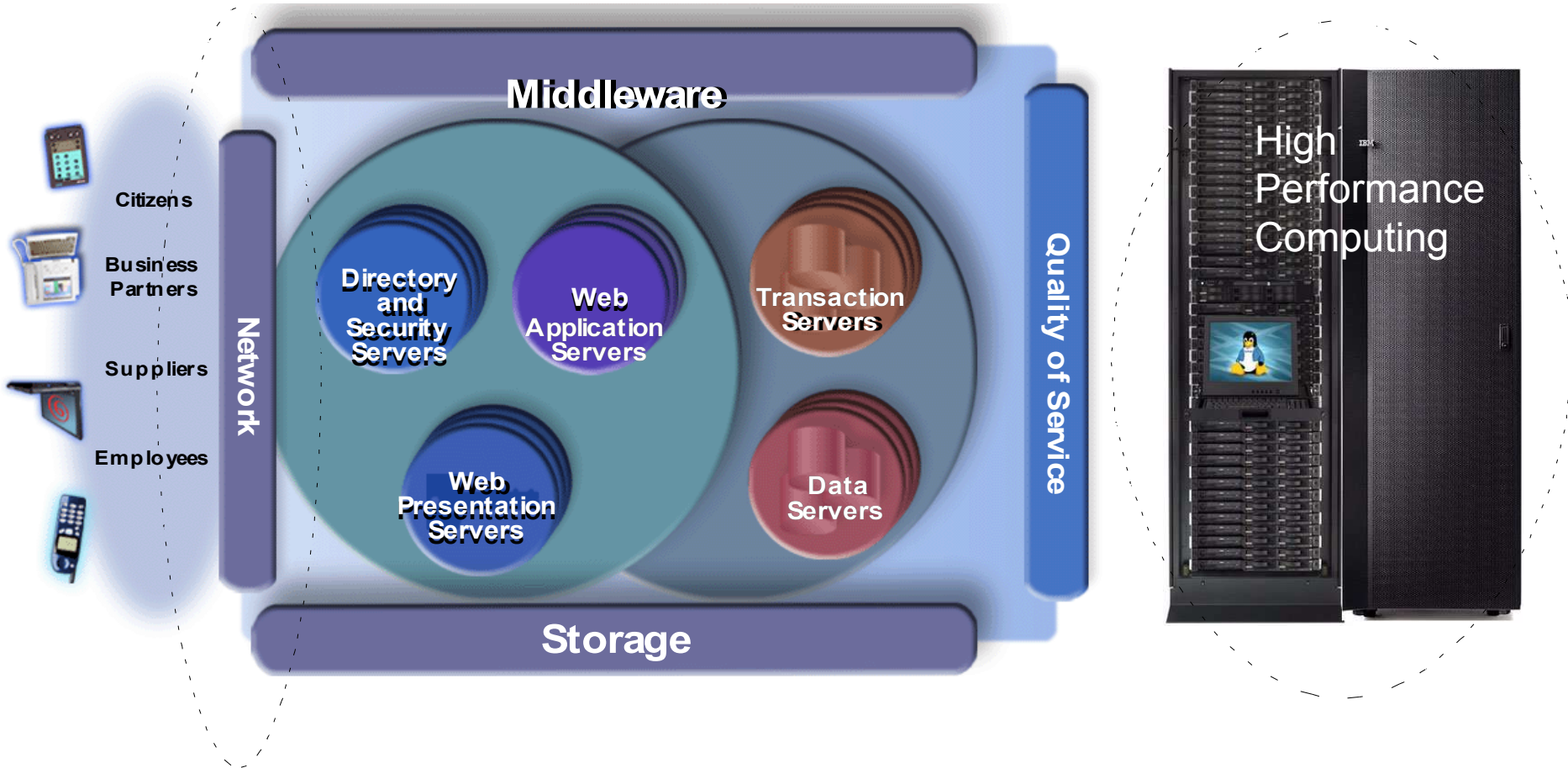
➤ Distribution OSS peut créer des standards

- OSS est une **source d'innovation**

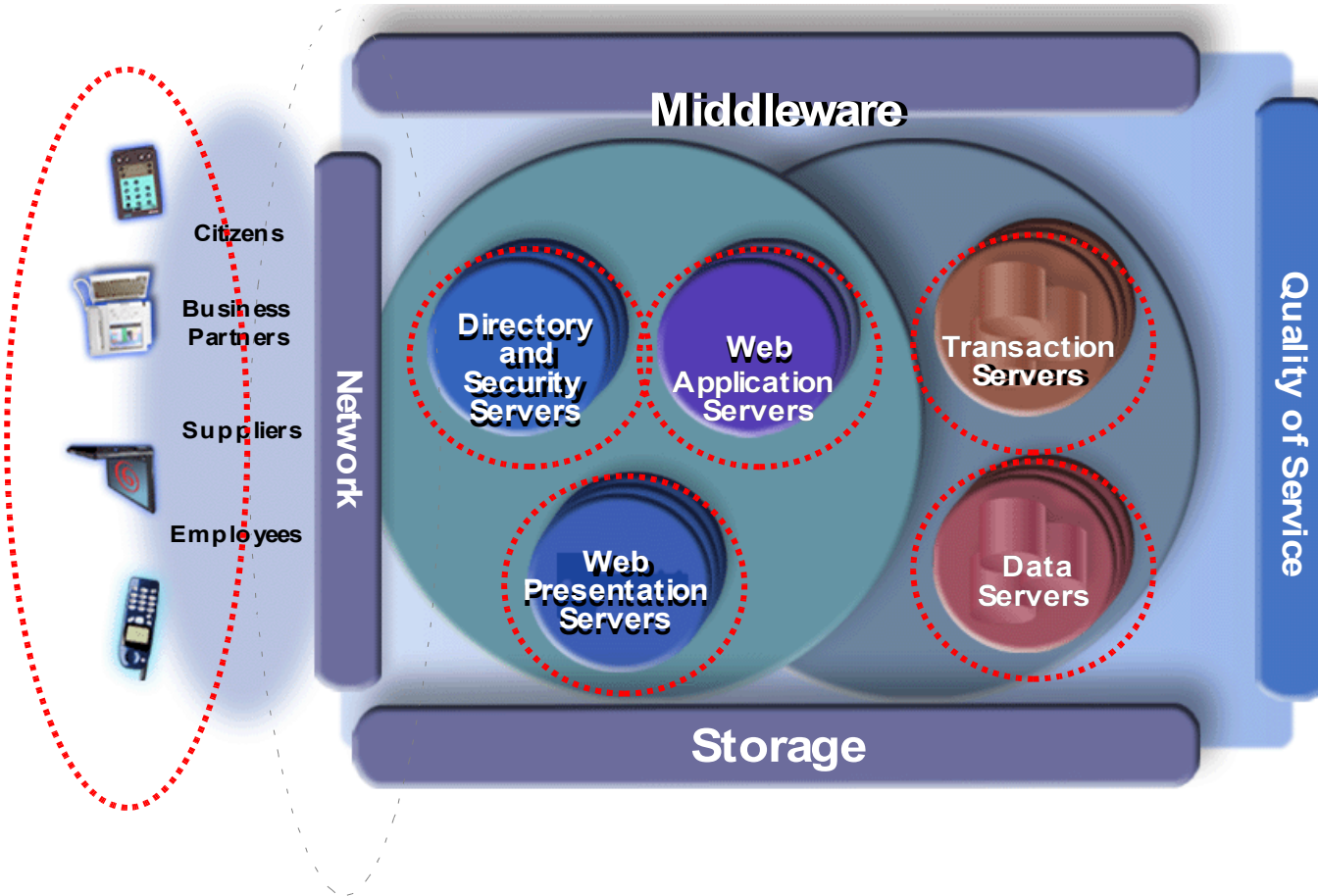
➤ Développer à travers une "open community" est source de brassage d'idées et de **créativité**

➤ Décision d'utiliser les « OSS » est simplement une décision

Vue "Traditionnelle" de Linux



Mais en réalité Linux est partout ...



Linux caractéristiques

- Linux se développe beaucoup en **scalabilité** horizontal
- Linux est fiable pour beaucoup d'**applications**
- **Compétences Linux** sont disponibles
 - Linux est populaire dans l'éducation
 - Les programmes de certification Linux sont disponibles
- **Portage vers Linux** est simple
 - Plusieurs grands projets ont migrés de UNIX rapidement et complètement.
 - Les outils sont disponibles
- **Les ISVs adoptent Linux**
- Linux est bien architecturé pour la **sécurité**, le développement Open Source améliore ceci
 - Le « process » de développement (Exposé vs. Caché)
 - The US National Security Agency (www.nsa.gov/selinux)
 - Linux security seb site (www.linuxsecurity.com)
 - Common criteria certification
- Gouvernements et clients **adoptent Linux**



L'investissement d'IBM dans toute son offre

- IBM investit dans l'**open source movement**
 - Open Source Development Lab (OSDL) – membre fondateur
 - IBM Linux Technology Center (LTC)
- IBM Linux **WW Centers**
 - IBM Linux Integration Centers (LIC)
 - IBM Competency Centers for Linux
 - IBM Porting Centers, IBM Customer Integration Centers
 - Linux Enabled Business Partners
- Industry's Broadest **Linux Server and Software Line**
 - Linux for IBM eServer
 - xSeries - "Industry Standards meet enterprise capabilities"
 - iSeries - "Linux complements integrated e-business solutions"
 - zSeries - "Linux ascends to the mainframe"
 - pSeries - "Where Linux meets UNIX"
 - IBM e-business software for Linux
 - DB2, Lotus, WebSphere family, Rational, Tivoli for Linux
 - IBM Global Services for Linux



IBM utilise Linux

Plus de 3500 serveurs en production WW

- en excluant la Recherche et le développement

Quelques Projets :

- IBM intragrid
- Linux on xSeries
 - e-mail antivirus, antispam scanners
 - IBM Standard Client Installer (ISCI)
IBM Standard Software Installer (ISSI)
- Linux on zSeries
 - e-hosting and network management
 - IBMMink
 - Asset monitoring
 - Lotus Domino



Agenda

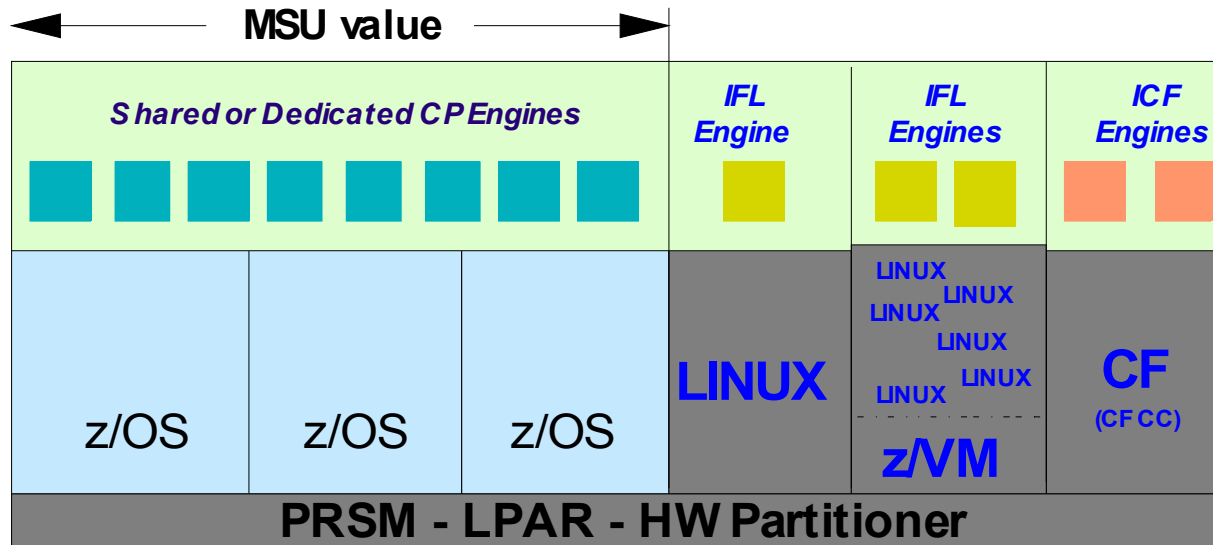
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Qu'est ce Linux sur zSeries?

- Un système en mode natif
 - ▶ **Pure Linux**, en environnement ASCII
 - ▶ Exploitation du **IBM zSeries hardware** (IEEE FP)
 - ▶ Linux for S/390 (31-bit)
 - ▶ Linux for zSeries (64-bit)
- Linux fonctionne en:
 - ▶ LPAR, **z/VM**
 - ▶ z/VM peut avoir plus de **100's Virtuel Serveurs**
- Support des Processeurs
 - ▶ Multiprise 3000, 9672 G5, G6, **z800, z900, z890, z990 & z9-109**
- Integrated Facility for Linux (**IFL**)
 - ▶ Dédié à z/VM et au « workload » Linux



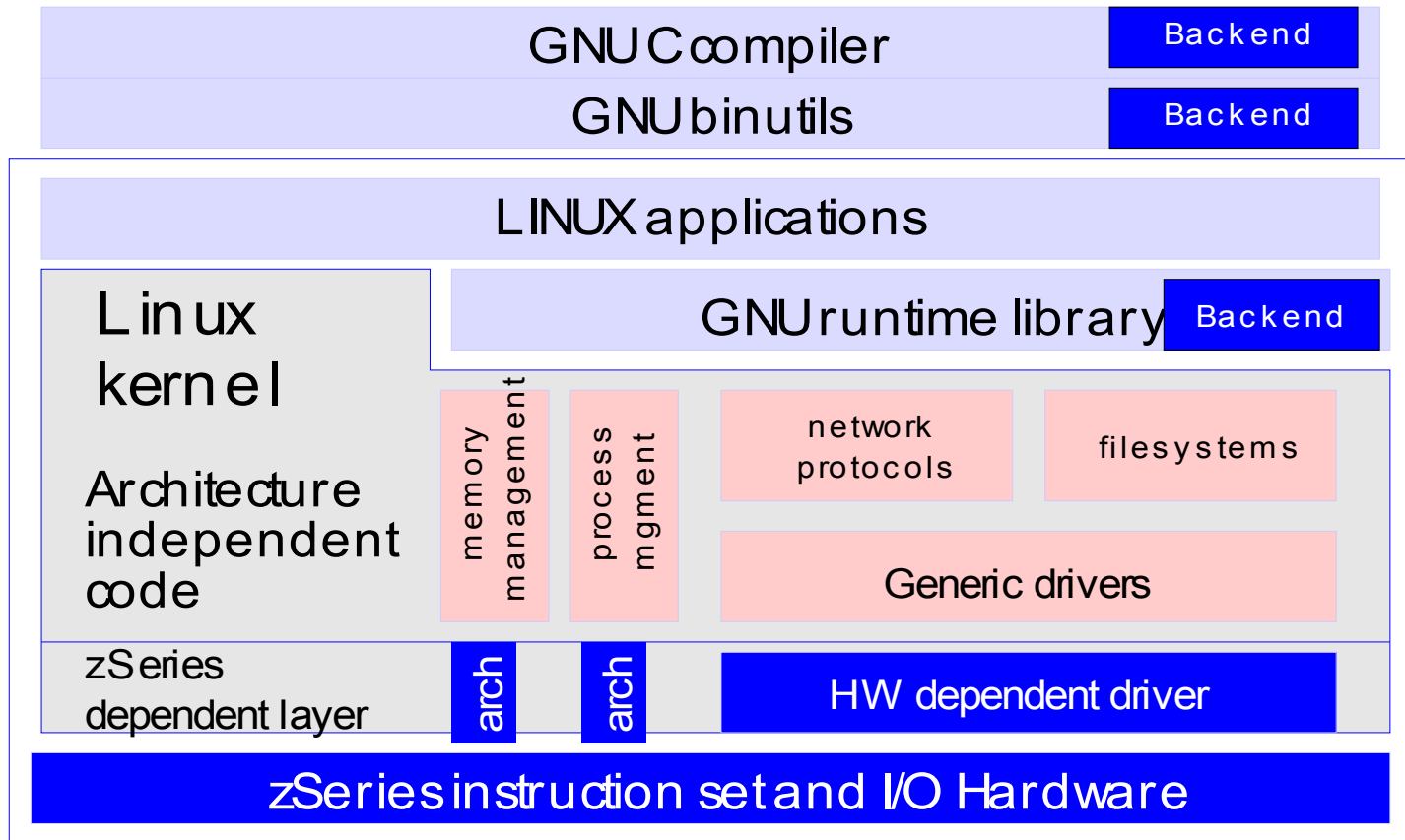
Integrated Facility for Linux



IFL engines

- Engines dédiés à Linux - **NO** z/OS ou un autre zSeries operating system
- IFL & CPs ne peuvent pas être dans une même LPAR
- IFL n'affecte pas le prix SW d'IBM & ISV sous z/OS

Linux System Structure



IBM contributed



Linux Distribution Partners

Distribution	GA	EoMaint	EoService	Comments
SUSE SLES 7 31bit, K 2.4.7 2004 Midsummer Upd	10/31/2001 06/30/2004	06/30/2004	06/30/2006	05/2002: major refresh for IBM middleware 06/2004: final SW update before EoMaint, incl. IBM memory mgmt fix (dirty bit)
SUSE SLES 7 64bit, K 2.4.17 2004 Midsummer Upd.	04/30/2002 06/30/2004	06/30/2004	06/30/2006	same as above
SUSE SLES 8 31/64bit, K 2.4.19 SP3: K 2.4.21 SP3 Upd: K 2.4.21 SP3 Sec Upd: K 2.4.21 SP4: K 2.4.21	11/18/2002 11/14/2003 04/30/2004 08/03/2004 12/10/2004	11/30/2005	11/30/2007	UnitedLinux (SUSE, Turbolinux, Conectiva), 6/2003 code drop: z990 exploitation SP 3 includes latest IBM fixes 1/2004 code drop: z890 & z990 GA3 supp. SP3 Sec Upd: CAPP/EAL3+ certified SP4: OSA Layer2 Switch Support
SUSE SLES 9 31/64bit, K 2.6.5 SP 1: K 2.6.5	08/03/2004 01/27/2005	08/2007	08/2009	4/2004 code drop: 2.6 exploitation items, incl. glibc 2.3.3, gcc 3.3, binutils 2.15.90.0.1, strace 4.5.2, qdb 6.1, ltrace not supported
Red Hat 7.2 31bit, K 2.4.9	12/17/2001	n/a	12/31/2003	IBM certified since 06/28/2002 with Errata Level 2.4.9.37
Red Hat 7.1 64bit, K 2.4.9	06/12/2002	n/a	12/31/2003	same as above
Red Hat RHEL 3 31/64bit, K 2.4.21 Upd1: K 2.4.21 Upd2: K 2.4.21 Upd3: K 2.4.21	10/21/2003 01/15/2004 04/30/2004 09/03/2004	n/a	10/31/2008 plan to extend to 10/2010	Selected parts of 6/2003 code drop Upd1: SCSI multipathing, zFCP, HW crypto Upd2: Sev 1 fixes, CAPP/EAL3+ certified Upd3: Support for Power5 + selected fixes
Red Hat RHEL 4 31/64bit, K 2.6.x	02/15/2005	n/a	tbd	4/2004 code drop: 2.6 exploitation items



IBM Software pour Linux sur zSeries

Les prix restent cohérent avec les applications Linux sur xSeries

Tivoli Software

Creation de la sécurité,
environnement pour e-business:
Access Manager, Storage Manager,
Configuration Manager, ...

Rational software

Outils de
Développement

Lotus Software

Permet à l'Entreprise virtuelle de
travailler ensemble:
Domino 6.5 ...

Software est au coeur de l'infrastructure



DB2 Software

Gère, Intègre l'information en
toute forme:
DB2 UDB EE, Intelligent Miner,
Informix, ...

WebSphere Software

Transaction "inside & outside" de
l'organization:
Appl. Server, Portal Server,
Commerce, MQ, Connectors, ...

Certification des logiciels avec RedHat et SuSE

Tous les produits IBM pour Linux sur zSeries

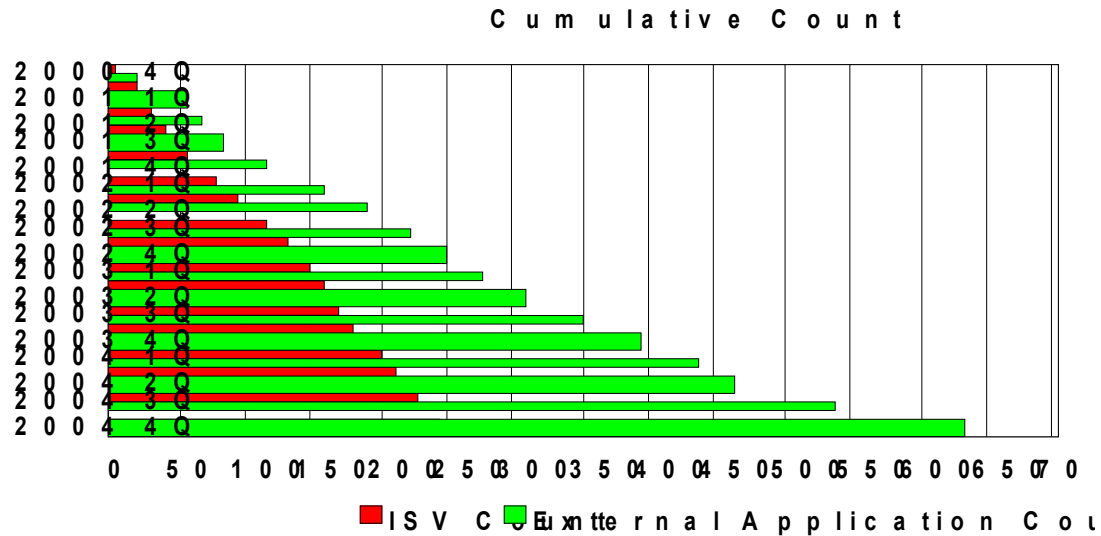
	2002	1H03	2H03	2004 / 2005
2.4 Kernel, 31-bit				
■ DB2 UDB (incl. DB2 Connect)		V8.1		V8.2
■ Informix 4GL				V7.32
■ Websphere Application Server			V5.1	V6.0
▶ Commerce Suite Bus. Edition			V5.5	V5.6
▶ Portal Enable / Extend			V5.0.2	V5.1
▶ Network Deployment / Ent.			V5.1	V6.0
■ Java JDK			V1.4.1	V1.4.2
■ CICS Transaction Gateway	V5			V6.0
■ IMS Connector for Java	V1.2			
■ MQ Client (C) / Server (S)		V5.3		
■ Rational ClearCase				V6.0
■ IBM Directory		V5.1	V5.2	V6.0
■ Tivoli TSM Client (C) / Server (S)		V5.2		V5.3
■ Tivoli Access Manager	V4.1			V5.1
■ Tivoli System Automation for Linux		V1.1		V1.2
- Tivoli workload Scheduler				V8.2
■ Lotus Domino			V6.5.1	V6.5.3 - V7.0
■ IBM Communication Server				V6.2
2.4 Kernel, 64-bit				
■ Java JDK		V1.4.1		V1.4.2
■ DB2 UDB (incl. DB2 Connect)				V8.2



ISVs pour Linux sur zSeries

■ June 2005

260 ISVs avec 700 applications sur Linux/zSeries



■ Complete list of applications available on Linux for zSeries:

<http://ibm.com/servers/eserver/zseries/solutions/s390da/linuxproduct.html>

<http://ibm.com/servers/eserver/zseries/os/linux/apps/>

Principaux ISVs Supportent Linux sur zSeries

ERP, Production Planning, Logistics

- ABAS Software
- 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, LINUXCARE)

- 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)



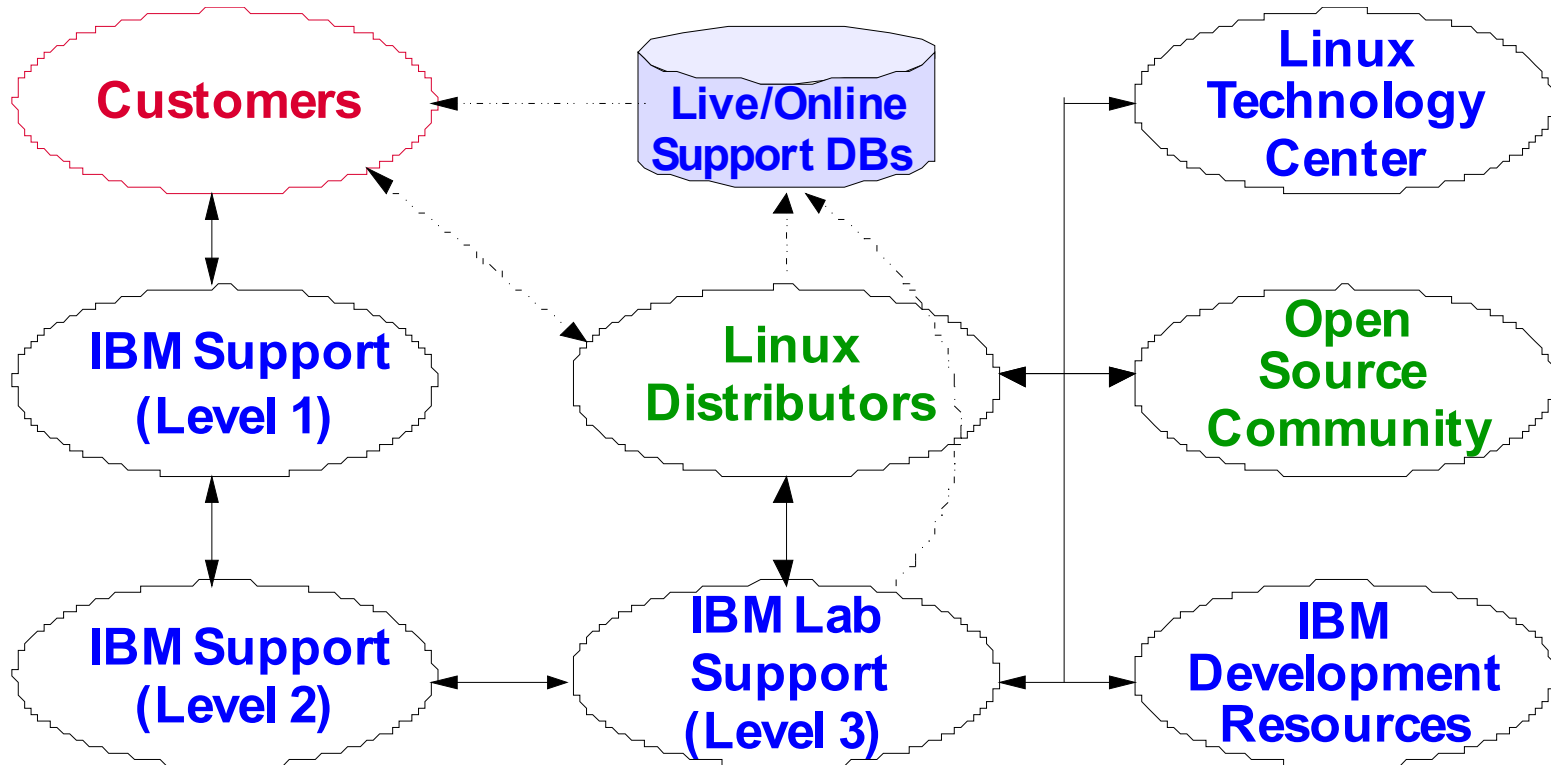
Grid Computing

- Platform
- Data Synapse
- Globus Toolkit



ISVs relasent régulièrement de nouvelles applications pour Linux sur zSeries

Linux IBM Support

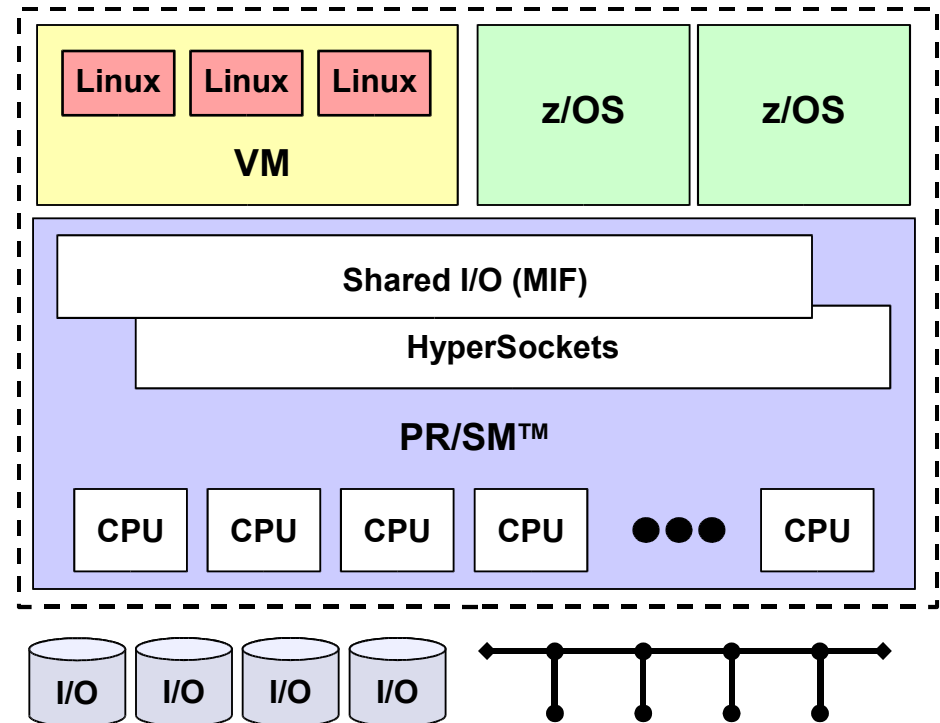


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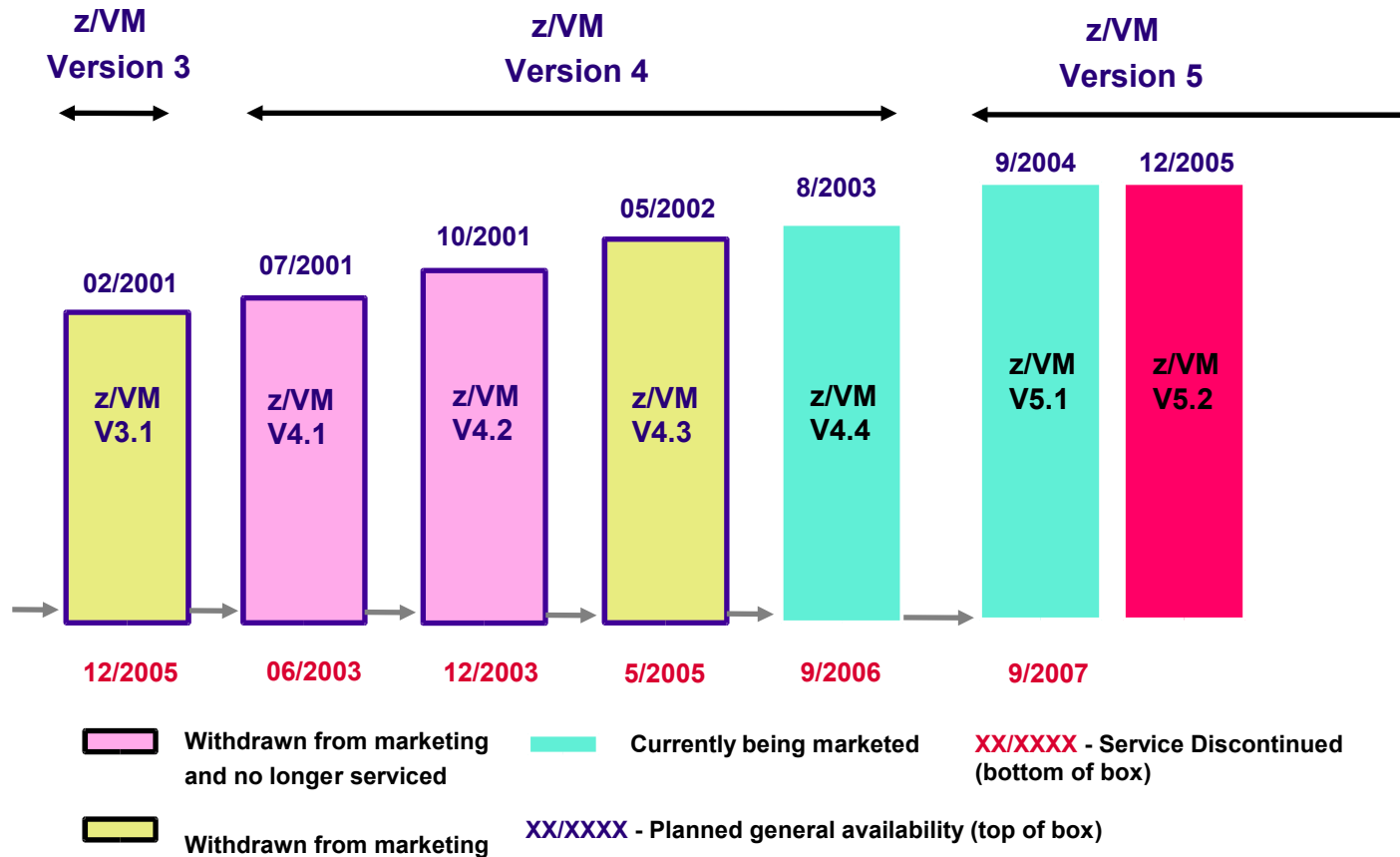
Virtualization du zSeries Servers

- Général
 - Maximum de 60 dynamic LPARs
 - Increases utilization & lower costs
 - Provision servers to respond to dynamic business needs
- Logical Processors
 - Dedicated or shared partitions
- Virtual I/O
 - Multi-Image Facility (MIF)
 - Dedicated or shared I/O
 - HyperSockets – high speed low latency in memory network

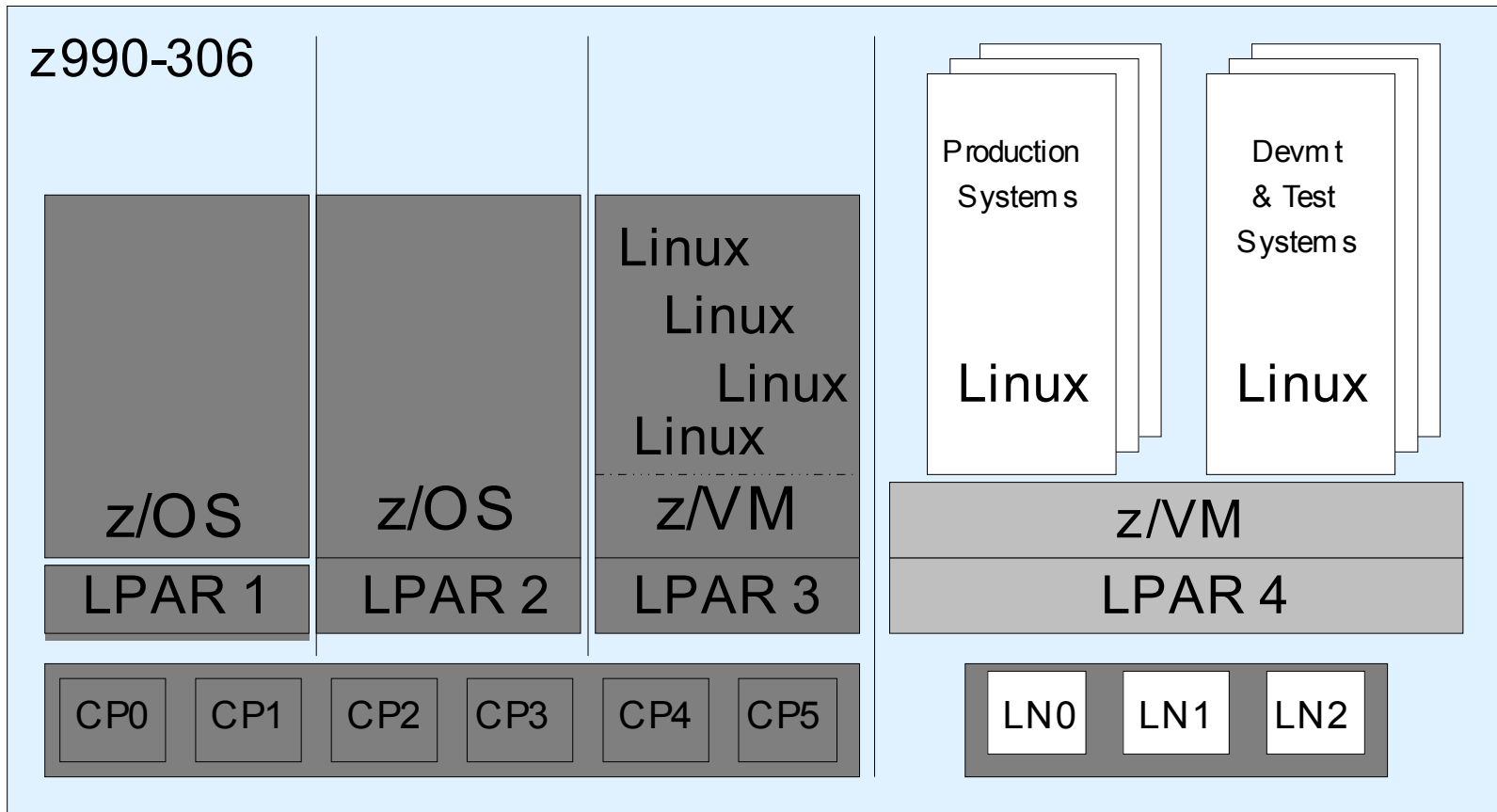


PR/SM: Common Criteria at Evaluation Assurance Level 4 (EAL4), EAL5 in Germany

Evolution z/VM

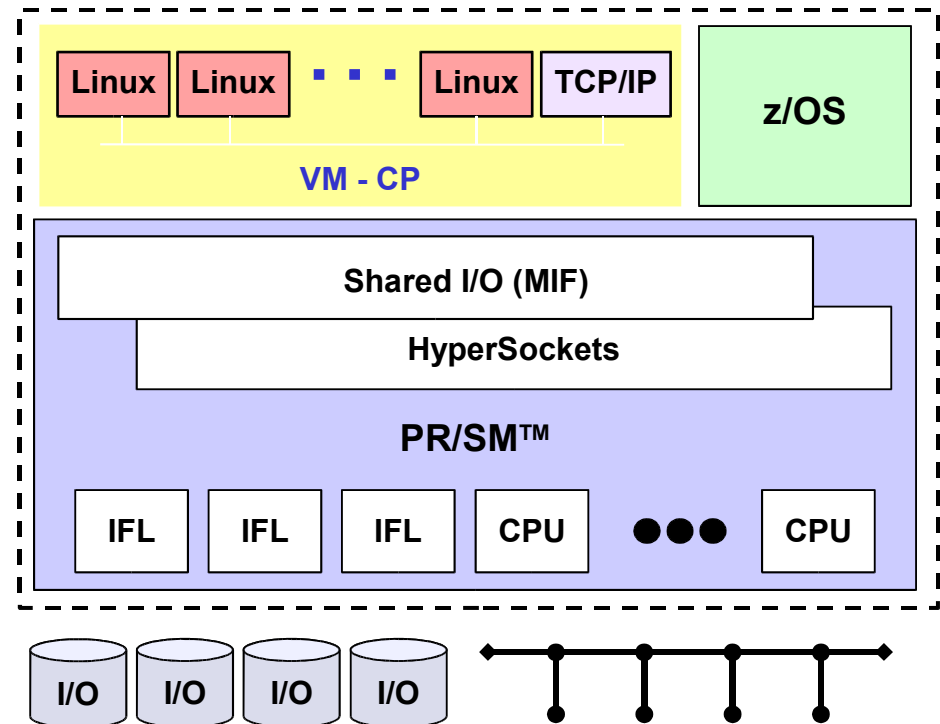


Exemple de Configuration IFL



z/VM Virtualization

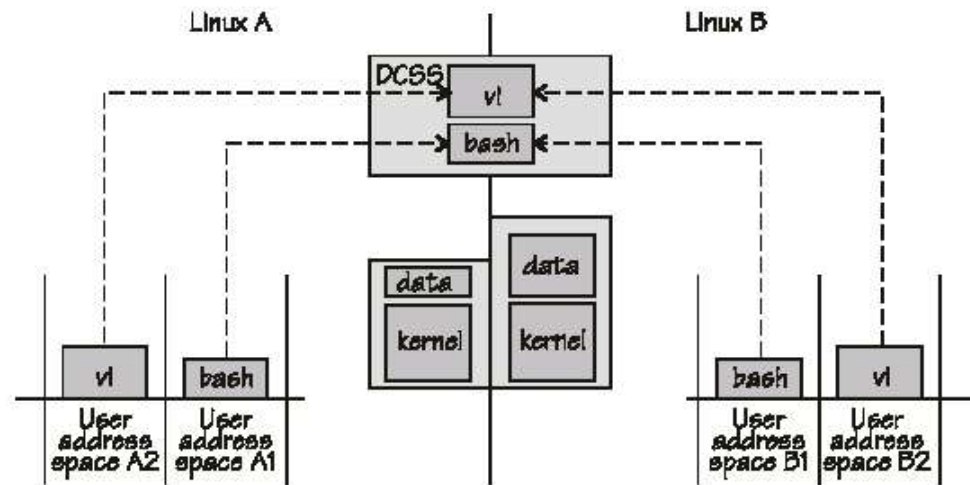
- Général
 - Introduit en 1967 (CP67 & VM/CMS 1972)
 - +3700 active licences
 - Support de centaines de guests
 - Fonctionne dans une LPAR
- Processeurs Virtuels
 - 1-64 Virtual processeurs
 - Support des PCI-X Cryptographic
- Mémoire Virtuelle
 - Création de la mémoire virtuelle
 - Partagre de la mémoire virtuelle entre guests
- Réseau Virtuel
 - HiperSockets virtuel ou réel
 - Virtual IP ou Layer 2 Switch
 - IEEE VLAN Support
- Disque dédié ou partagé
- Machine de service additionnel
 - Console Automatique (PROP)
 - TCP/IP stack



Gestion de la mémoire zSeries Linux

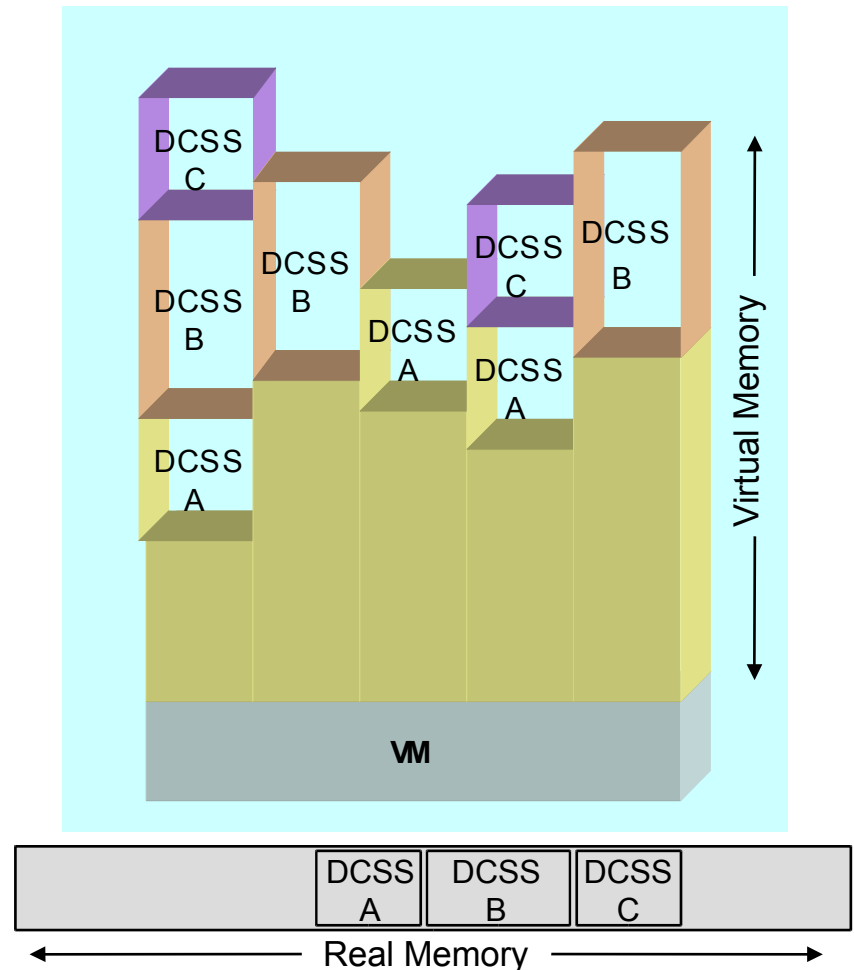
- Mémoire Virtuelle
 - 64-bit
 - 4TB address space
 - 31 bit compatibility mode
- Named Saved Systems
 - Permet d'avoir une simple copie d'un SE (CMS), partagé par de multiples guests.
 - Operating systems est IPL'd/Boot'd par nom.

- Discontiguous Shared Storage (DCSS)
 - Partage de mémoire réelle pour de multiples machines virtuels
 - Permet d'éviter la duplication des disques
 - Aide à l'élimination des I/O (memory-to-memory vs data transfer)



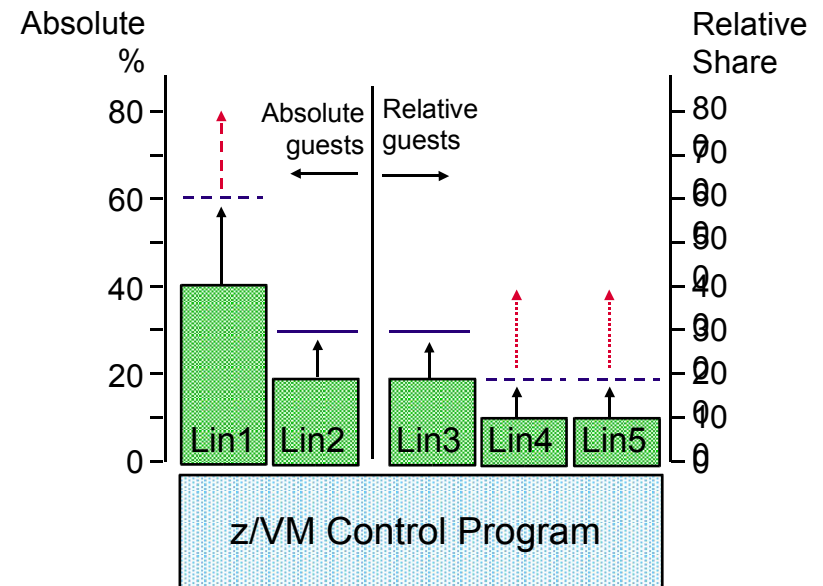
z/VM Technologie et DCSS

- **Discontiguous Shared Storage (DCSS)** is currently a z/VM exclusive
 - ▶ Sharing a single, real memory location among multiple virtual machines
 - ▶ High-performance data access
 - ▶ Can reduce resource consumption
- Many exploitation opportunities
- Example: **Execute-in-place File System**
 - ▶ Same data required for each Linux image
 - ▶ Single real memory allocation mapped into participating guest images
 - ▶ Can avoid duplication of disk data and virtual memory allocations
 - ▶ Helps eliminate disk I/O (memory-to-memory data transfer instead)
 - ▶ Hypervisor overhead can be reduced
 - ▶ Enables throughput benefits for Linux guest images and overall system performance



Contrôle de la ressource CPU - Technologie z/VM

- Allocation de CPU et mémoire aux machines virtuelles
 - Absolute guests
 - Relative guests
- Gère et ajuste les capacité dynamiquement



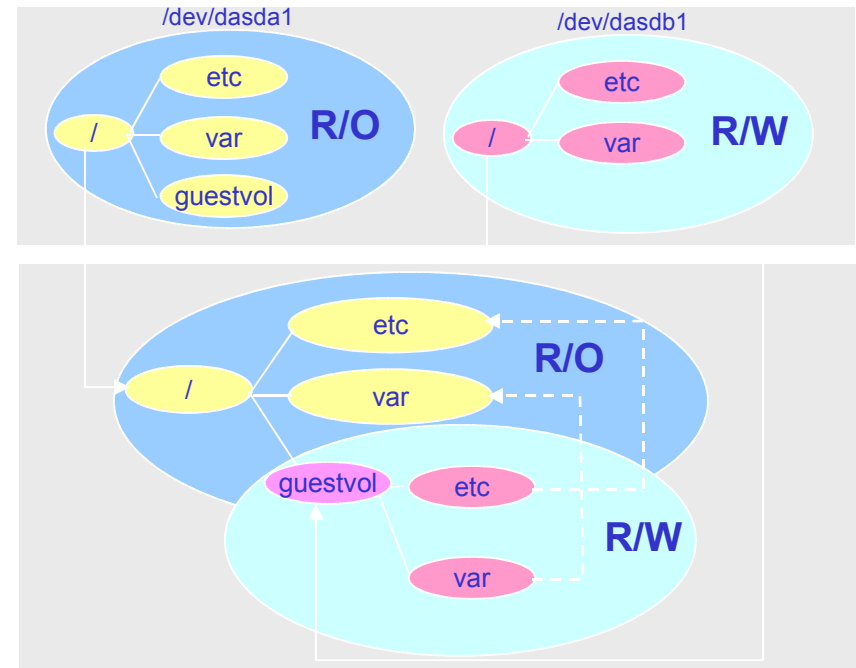
Notes:

----- = limit can be exceeded if unused

———— = capacity is available (limits off)

Partage de Filesystems Linux

- Bind mount directories
 - Method to share common filesystems among multiple Linux guests
 - Differ from device mounts in that the source is the global filesystem namespace itself - not a block device.
- Basevol filesystem
 - Bootable read-only common packages and services needed by all Linux guests in a penguin colony including:
 - /sbin, /bin, /lib, /usr, /var/lib/rpm
- Guestvol filesystem
 - Read/write filesystem containing the packages and configuration files needed to personalize a single Linux guest
 - /etc, /var, /home, /opt, /dev, /tmp, /boot

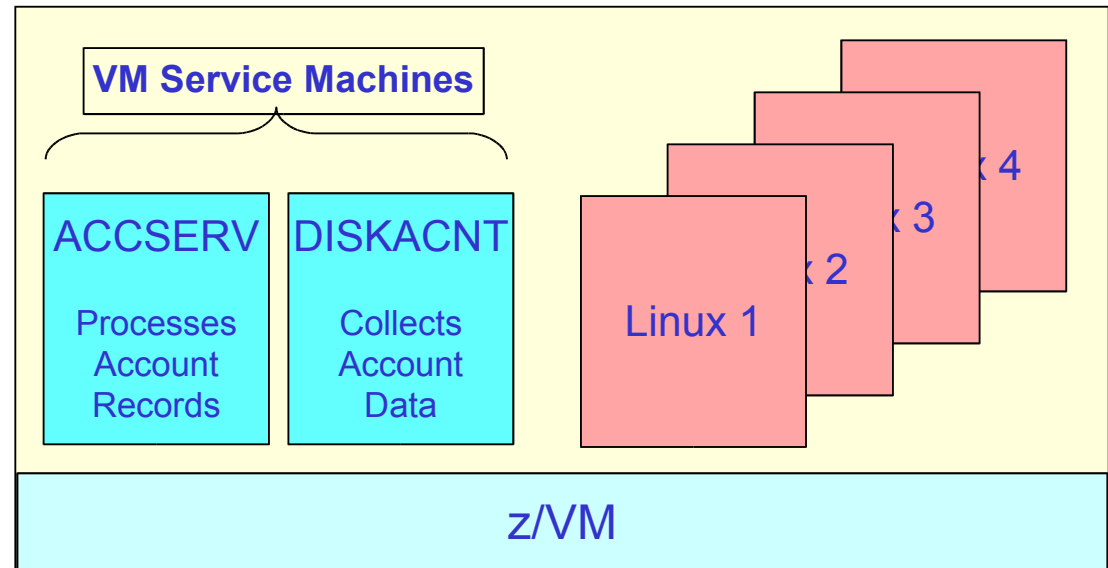


Example:

```
mount /dev/dasda1 /
mount /dev/dasdb1 /guestvol
mount --bind /etc /basevol/etc
mount --bind /var /basevol/var
```

Accounting z/VM

- Collecte données accounting
 - CPU
 - Mémoire
 - Network devices
 - I/O adapters
 - Disk space
- Utile pour comptabilité
- Utile pour le reporting ou l'attribution des ressources



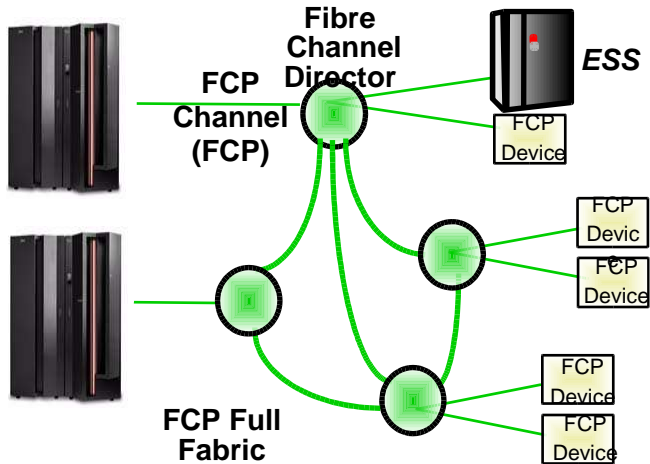
Support des disques SCSI : FCP-attached

- **Support SCSI FCP disk (SCSI disks) pour le système et les “guests”**
 - ▶ Avec un IBM TotalStorage® Enterprise Storage Server® (ESS) quand il est connecté en “fibre-channel fabric” via zSeries FCP channels
 - ▶ Ajoute la sécurité pour les SCSI devices (including system-owned disks) résidant sur SAN avec FCP LUN Access Control (z990, z890 et z9-109)
- SCSI devices **peut être utilisé par des “guests”** contenant leur propre support SCSI (comme Linux)
- Emulation d'un 9336 Model 20 FBA pour CMS et CP for:
 - ▶ System paging, spooling, directory services, minidisks, et les autres fonctions systemes (utilisant FBA)
 - ▶ Autorise les “guests” supportant FBA (e.g. CMS, VSE)
 - ▶ Supports une emulation FBA (jusqu'à 381 GB)
- **Bénéfice:**
 - ▶ Installation d'un DVD, IPL, et operate z/VM d'un SCSI disks
 - ▶ Déploiement des Linux sur z/VM utilisant seulement des disques SCSI



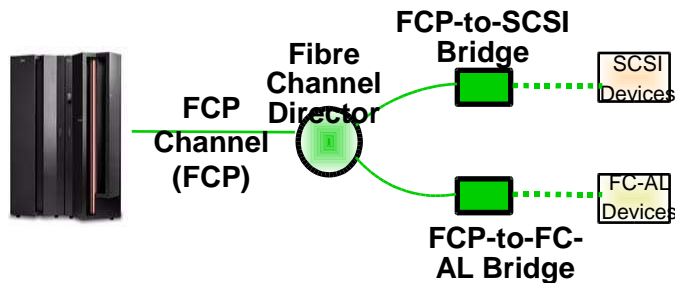
FCP Full Fabric

No direct attachment to controllers/ devices or bridges



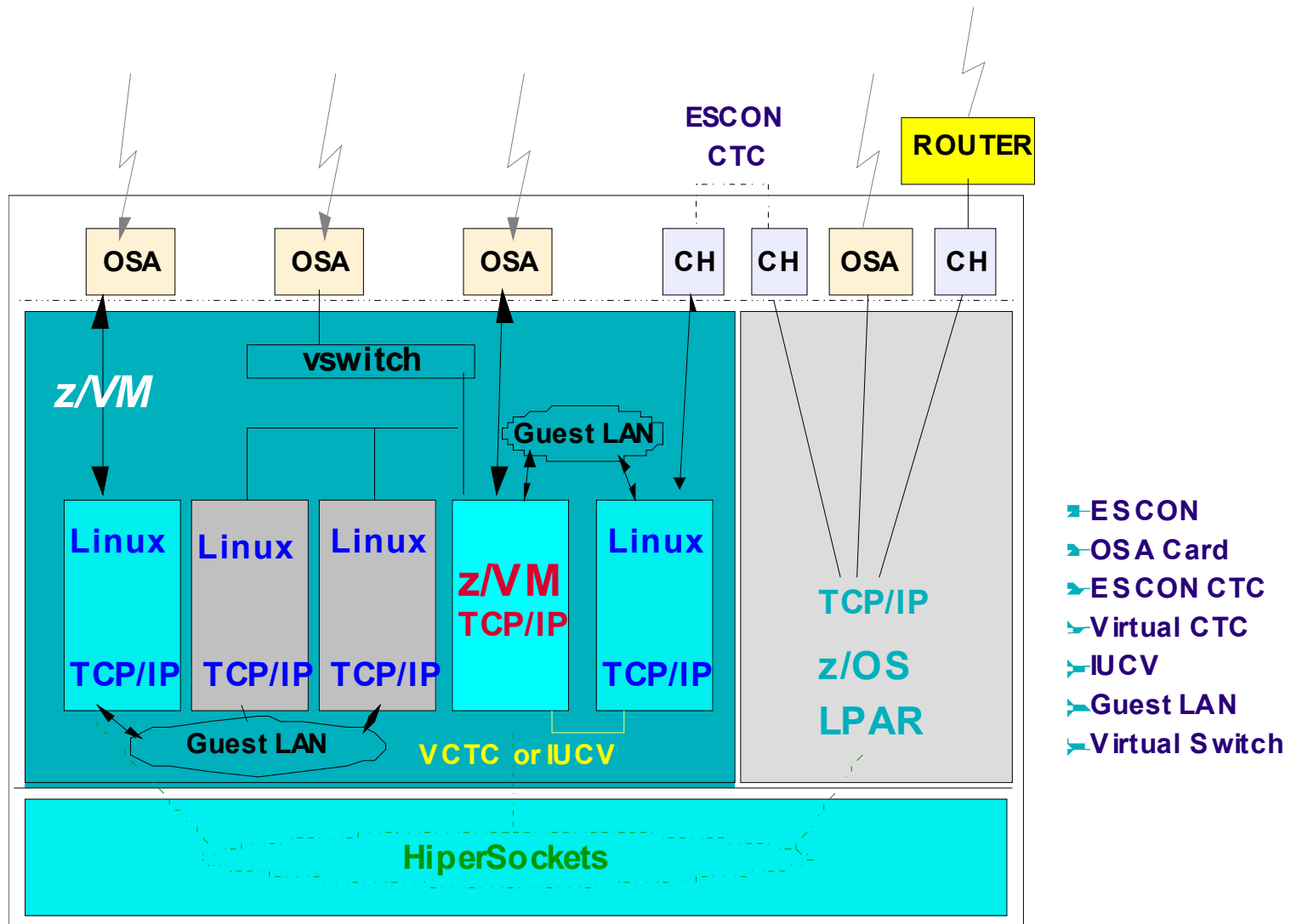
- **FCP for Linux environments**
- **Single vendor fabric**
- **FCP to FCP Directors**
 - McDATA Intrepid 6000 Series Directors
 - McDATA ED-5000
 - INRANGE IN-VSN FC/9000 family
 - IBM 2109 TotalStorage® SAN Switch
 - ☒ Models S08, S16, F16

- **Devices**
 - IBM TotalStorage Enterprise Storage Server®
 - IBM 2105 F10 / F20 / 800
 - IBM Enterprise Tape Controller
 - IBM 3590



- **FCP to SCSI Bridge or FC-AL**
 - FCP-to-SCSI Bridge
 - IBM 2108-G07 SAN Data Gateway
 - FCP-to-FC-AL bridge
 - McDATA ES-1000 Loop Switch (IBM 2031-L00)

Réseau – connectivité des guests Linux

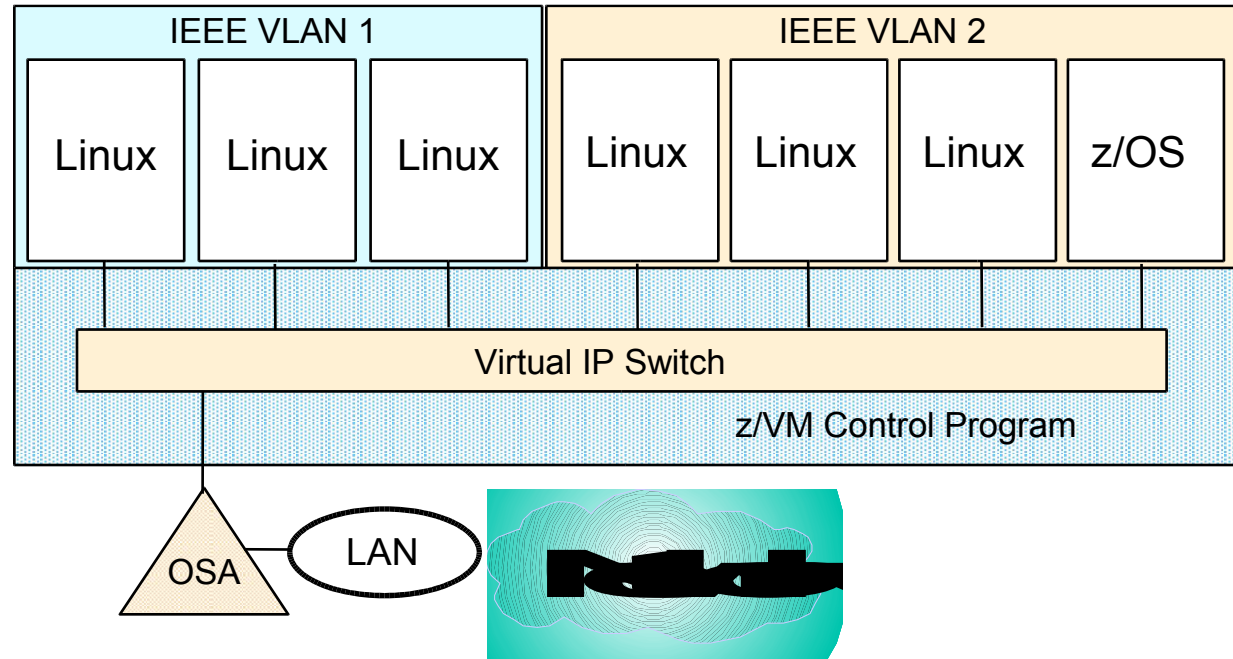


Utilisation du Virtual IP Switch de zVM et le VLAN

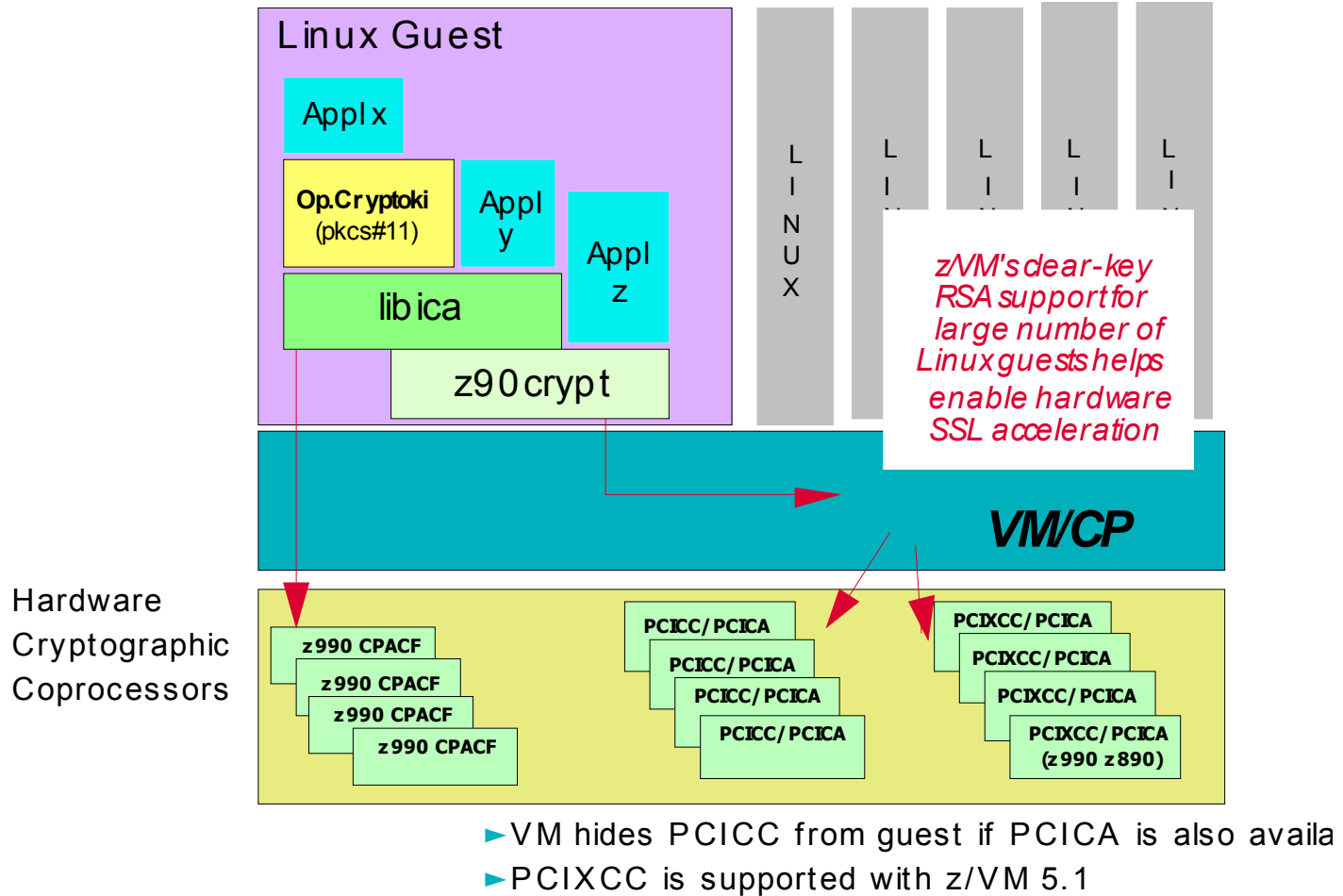
Permet une gestion centralisée et virtualisée du réseau

- ▶ Facilité pour activer ou révoquer des accès
- ▶ Permet la gestion des segments VLAN

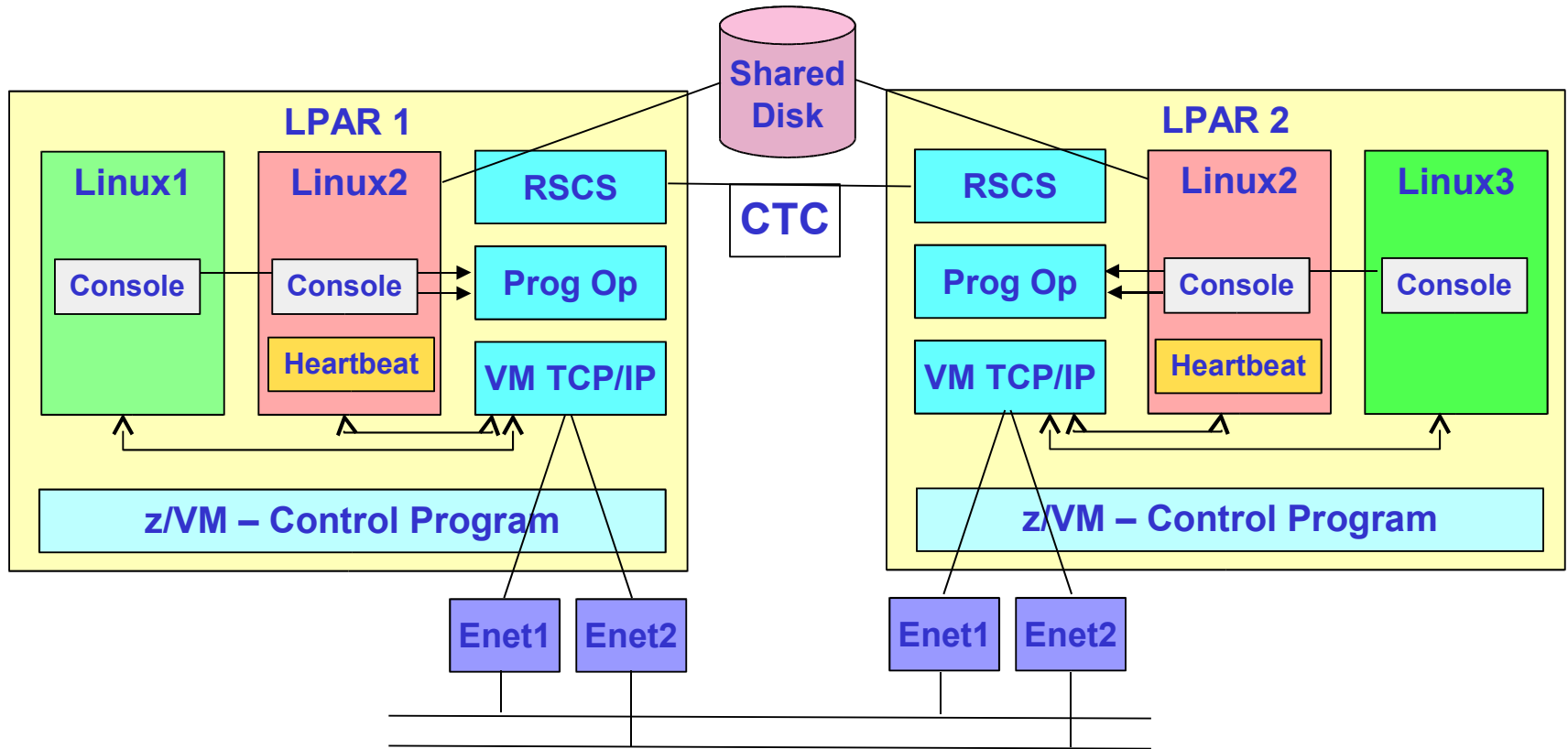
z/VM Virtual IP Switch accélère l'accès au réseau externe (Mac Address)



Cryptographic facility disponible pour les “guests” Linux

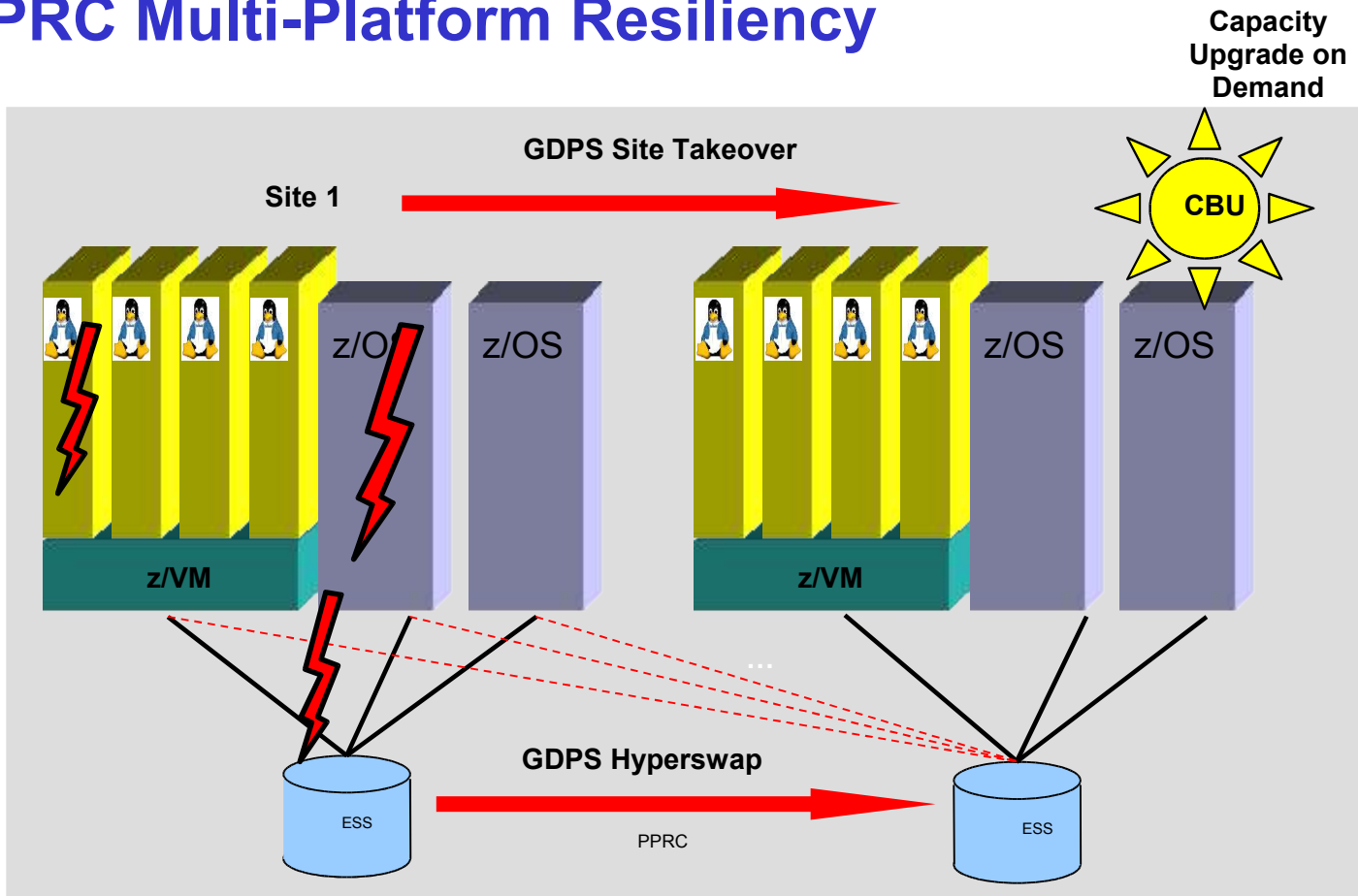


Exemples High Availability Linux & z/VM



- Shared Disk Clusters (Heartbeat)
- Duplex network (OSA) adapters
- Programmable Operator Facility
- PPRC (Mirrored Remote Disk (VM))

GDPS/PPRC Multi-Platform Resiliency

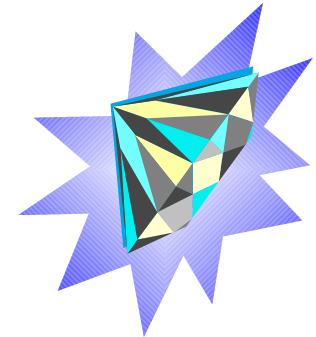


- ✓ Coordinated near-continuous availability and DR solution for z/OS and Linux guests running under z/VM
 - Valuable for customers with distributed applications
 - SAP application server running on Linux for zSeries
 - SAP DB server running on z/OS
- ✓ Planned and Unplanned Reconfigurations

Améliorations z/VM Version 5.2 (Dec 2005)

- **Amélioration de Linux (et autres guests)**
 - Amélioration de l'exploitation de grande mémoire (>2 GB)
 - Amélioration des performances de z/VM Control Program (CP) pour SCSI I/O
 - Support for OSA-Express2 OSA for NCP (OSN)
 - SSL server support for additional Linux distributions
 - Amélioration assiste pour z/VM guests (OSA-Express, FCP et HiperSockets)
- **Amélioration du Réseau virtuel et Sécurité**
 - Amélioration du guest LANs et virtual switches
 - Amélioration du dynamique routing avec le MPRoute server
- **Technologie d'exploitation**
 - **Support du System z9 109:**
 - Crypto Express2 Accelerator for SSL acceleration
 - Improved FCP channel utilization and sharing among operating system images
 - Up to 60 logical partitions
 - Dynamic addition and deletion of logical partition names
 - Support for the IBM TotalStorage DS4000 Midrange Disk systems
- **Systems management improvements**
 - Improved management for Linux and other virtual images
 - Simplified user administration with the coordination of DirMaint and RACF changes

 - Improved DirMaint directory management performance
 - Service and installation enhancements



Options z/VM

■ z/VM Performance Toolkit

- Facilite l'analyse des performances et de la gestion des ressources sous z/VM.
- Analyse les données du "system's monitor" et fournit des rapports (performance, history files)
- Possibilité de fusion avec RMF™ Linux performance gatherer

■ RACF for z/VM Feature

- RACF permet d'avoir les sécurités :
 - Contrôle Flexible d'accès aux ressources protégées
 - Protection of installation-defined resources
 - Transparence pour les utilisateurs finaux

■ Directory Maintenance Facility (DirMaint)

- Fournit une gestion interactive et sécurisée de la maintenance de la DIRECTORY de z/VM (définition des machines virtuelles).

Avantages de l'offre avec z/VM

- **Optimisation des ressources matérielles**
 - Partage des CPUs, I/O adapters, disques, cartes réseaux, etc.
 - Avoir plus de workload avec les mêmes ressources
- **Moins de temps pour créer et configurer (or reconfigurer) images server**
 - Répondre aux demandes business ***maintenant***
- **Workload management au niveau serveur**
 - Allocations des ressources au niveau serveur
 - Complémente le « workload management » du niveau applicatif
- **Aide à faire des économies sur les prix software**
 - Software licensing sur le nombre de CPU, non sur le nombre de serveur

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e-Business Implementation Types

➤ Enterprise Servers Consolidation

Infrastructure and Networking Servers
File & Print,
Proxy, DNS, LDAP,
Firewall, ...

➤ Distributed applications servers

Application Servers,
Web Servers,
Mail Servers,
Database Servers, ...

➤ Development Environments

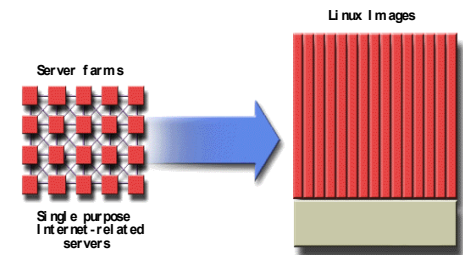
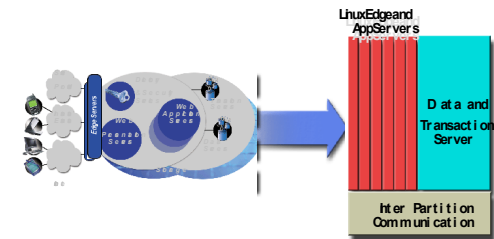
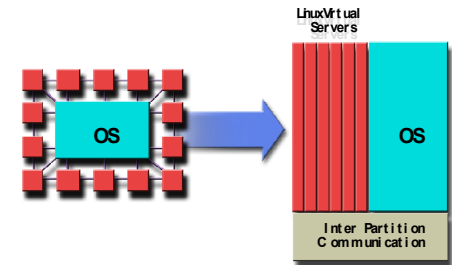
Web Servers, ...

➤ Application Integration

Consolidation of middle tier UNIX servers
Leverage z/OS data server back-end

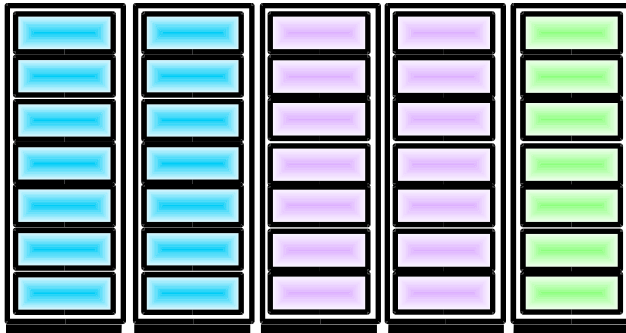
➤ Hosting Services (ISP / ASP)

Web hosting, Messaging, e-Mail, ...

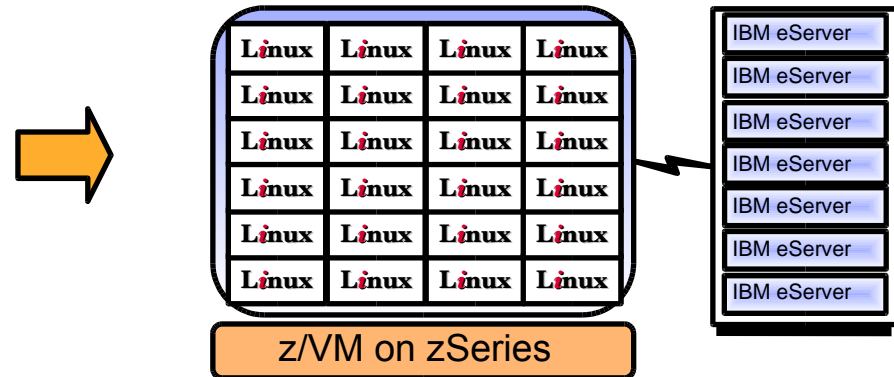


Simplification et Consolidation avec Linux sur zSeries

Traditional Server Farm



Server farm in a box



- Discrete servers consume **incremental expense**
 - ▶ Hardware price and maintenance
 - ▶ Floor space, power, cooling
 - ▶ Additional support staff
 - ▶ Per server (engine) software fees
- Connectivity requires **kilometers of cables**
- High availability ensured by **spares/re-boots**
- **Disaster recovery difficult to test**
- Can help **reduce costs** without sacrificing server autonomy (one server per application)
- **Virtual**, high-speed, **inter-server connectivity**
- Exploit an architecture designed for **high availability**
- Mainframe **qualities of service**
- **Tested disaster recovery** services
- Connect to discrete servers as required

Simplification des Infrastructures

➤ Scale Up Ultime

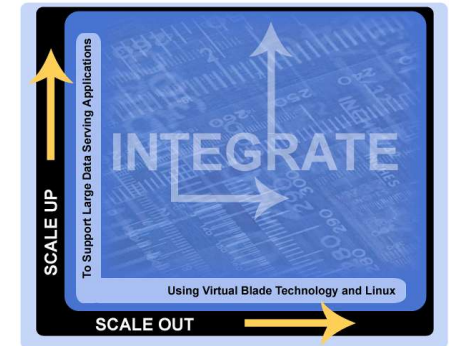
- Mainframe qualities of service: reliable, available, manageable
- Rock solid security, data privacy and highly resilient
- Highly responsive with unbounded capacity
- Efficiency and extremely competitive cost of ownership.

➤ Scale Out : Virtual Blades

- Rapid server provisioning ... new virtual servers can be provisioned in seconds, and reclaimed almost instantaneously.
- Support multiple diverse workloads with high security and isolation.
- Low network latency between servers.
- Support up to 100s of virtual servers from single code base.

➤ Simplification des Infrastructures : VIRTUALISATION

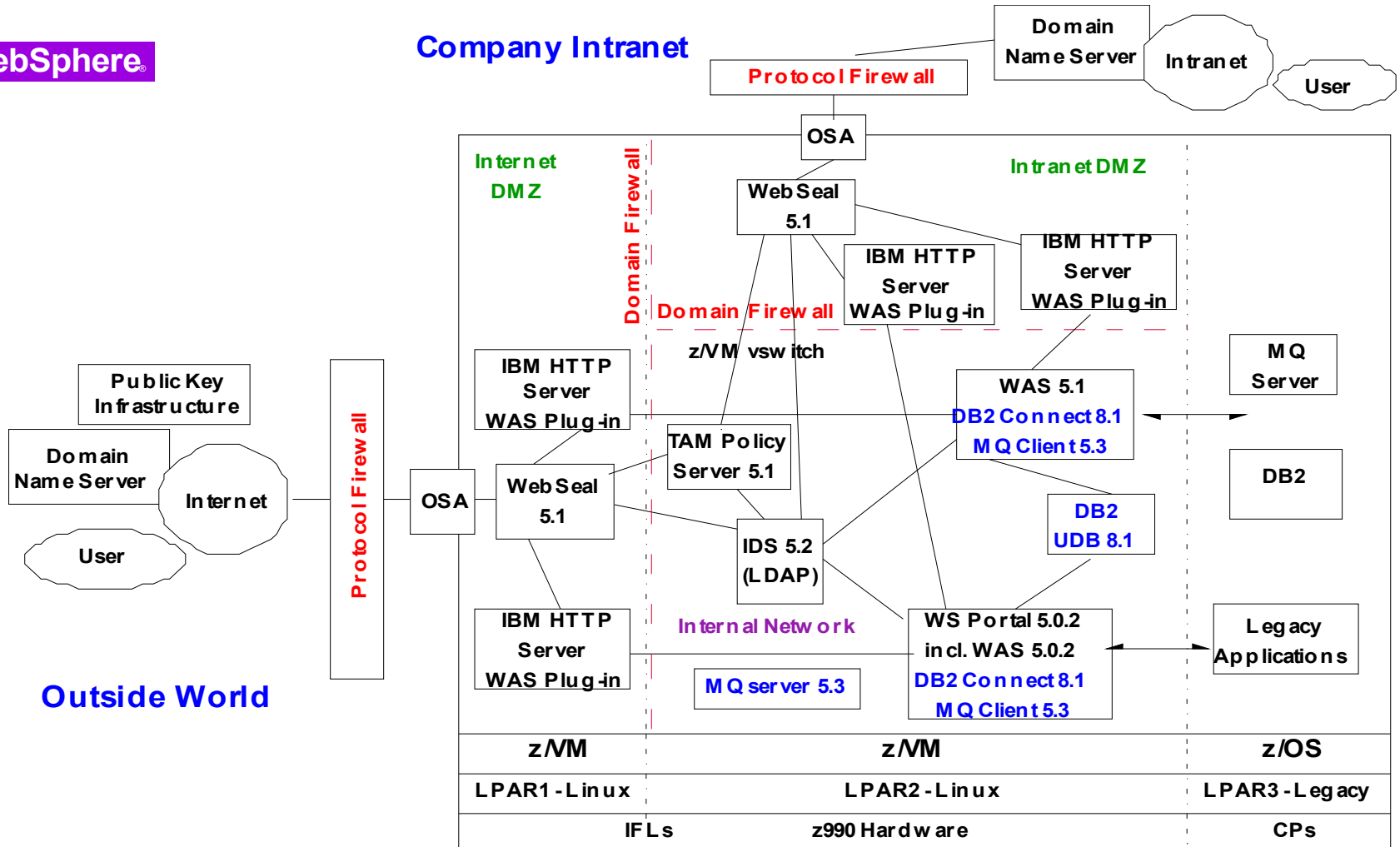
- Simplification Infrastructure ... la prochaine étape de la consolidation.
- zSeries fournit la solution.



High Security Internet Topology on zSeries

WebSphere

Company Intranet



Linux at Renfe (Spain)



- z/VM 4.4 in an LPAR with 4 Shared IFLs (z900-104)
- RENFE Portal: IBM **WebSphere Portal Server** for Linux zSeries. More than 1.700.000 hits/day - 5.000 users
- Postfix mail: 2.000 messages per minute and only took 6% of one CP
- Web Server - Apache: **24.000 hits/hour** with less than 2% of one CP.
- Log Analyzer - Webanalyzer: Batch Process managing 5 GB Log files
- **DNS - bind8**: 4% of one CP for resolving 100 NEW addresses/second.
- **File Servers - Samba**: a virtual CD-ROM juke-box perfectly integrated on existing NT Domains. The CP load was irrelevant.
- Dynamic Storage Management: LVM. Hot adding or removing of disks and minidisks (z/VM), expanding file systems on the spot.
- Rsync, vsftp, ssh... any Linux standard application ...
- Additionally, **Firewall, VPN and Security Services using StoneGate.**

Linux and the server strategy of Swisscom IT Services

Linux is, beside Windows, the primary choice for Tier-1 and -2, for the following reasons:

- **High stability** of the kernel and the application software
- **High security standard** with permanent public review from open source
- **Flexibility** (the system can be configured individually)
- **Independence of hardware** and vendors (Alpha, ARM, Intel, MIPS, Power, Sparc, zSeries)
- **High portability** of operating system and applications
- The **openness and interoperability** between the different IT Infrastructure components
- It's ready for business operation



Main Linux Applications in Production today

- **Order Management System:** replacement of an internally developed proprietary Unix application Server by a WebSphere-EJB solution based on zSeries Linux.
1500 Users - 300 MIPS (IFL) - 350'000 EJB-TRX per day
- **Swisscom Billing:** Migration from z/OS Web applications server on Linux-zSeries Server based on OrbixWeb technology.
4000 Users (700 concurrent) - 75 MIPS (IFL) - 250'000 Orbix-TRX per day
- **21 Oracle Servers**
- **SAP for Swisscom Systems:** Linux Intel-Platform with 11 Server
- Currently ~**150 virtual zSeries Linux** servers defined, ~60 are production machines (mix of business applications, test and development servers, NFS-, Samba-, DNS-servers).



Domino on Linux zSeries project

➤ Lotus Notes environment:

62,500 registered users (including mail and application users)

Notes and iNotes (Domino Web Access) users (No replication)

5,500 Domino Applications databases – **6.5 Terabytes of data**

Two zSeries z990 running z/VM and SuSE Linux Enterprise Version 8 (SLES8)

z990 A : 12 IFLs and 14GB (12 CS + 2 ES)

z990 B : 10 IFLs and 14GB (12 CS + 2ES)

2 x 5 z/VM LPARs (10 LPARs / 8 for Domino mail and 2 for applications)

4 Linux guests per z/VM image for mail and 5 Linux guests per z/VM for applications

5 logical CPs per z/VM LPAR and 5 virtual CPs per Linux guest

1 Domino server per guest in Cluster (for mail only, no cluster for applications)

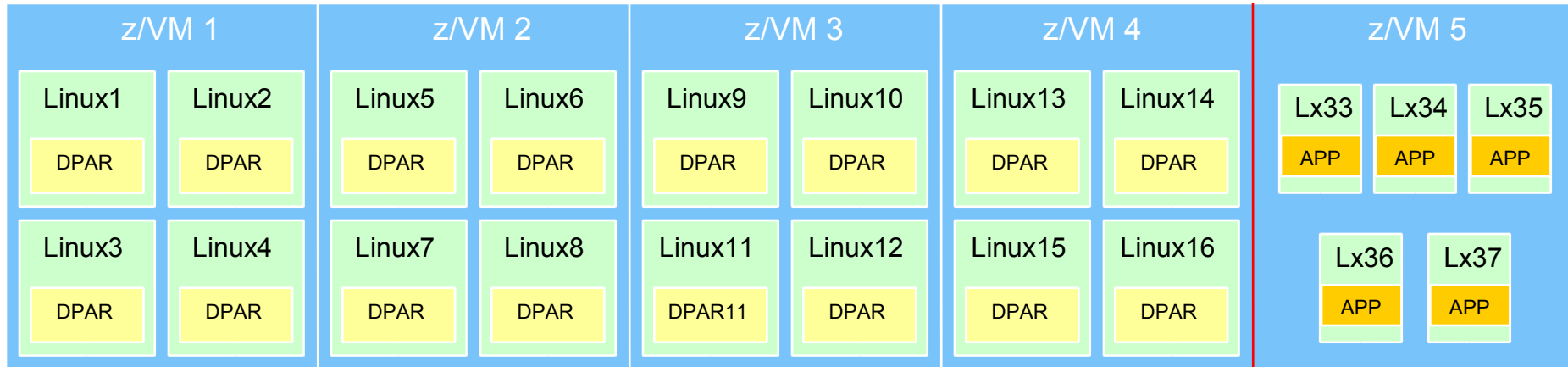
Total of 32 Domino Mail Servers in cluster and 10 Domino Application servers

Total of 42 Linux guests

Between 1,700 and 3,000 mail users per Domino server

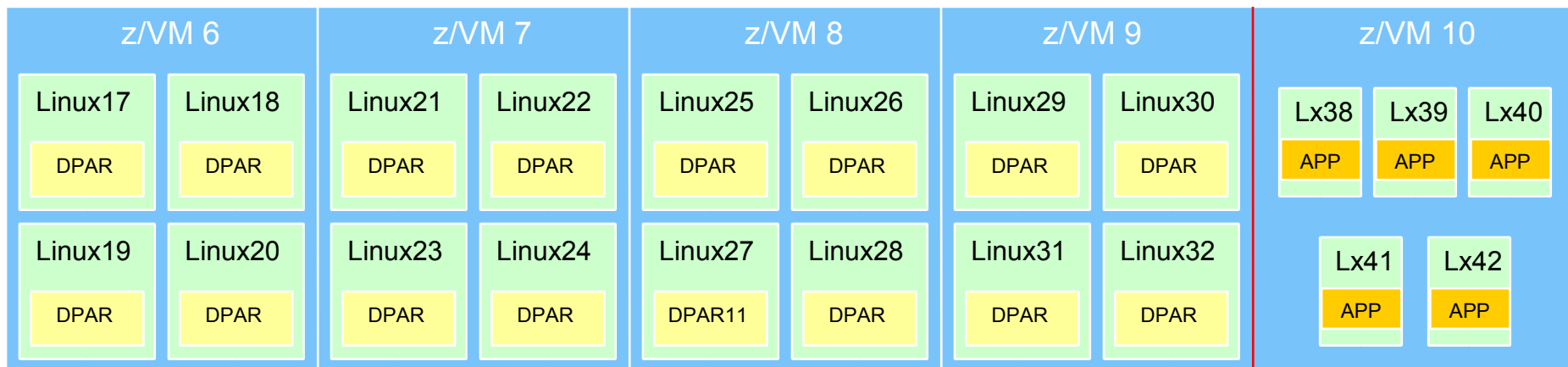
Deutsche Bahn Infrastructure

zSeries 1



(Domino Mail Clustering)

zSeries 2



Experiences Clients avec Linux sur zSeries

- **Deutsche Bank** (Germany) : runs WAS applications on Linux zSeries
- **UCM** (Belgium) : runs Java parsing (XML) applications on Linux zSeries.
- **FMSB** (Belgium) : runs WebSphere Application Server applications on Linux zSeries.
- **Porsche** (Germany) : has consolidated Oracle databases (Oracle 9i) on Linux zSeries
- **Banca Popolare di Milano** (Italy) : runs WebSphere applications on Linux zSeries. Direct access to legacy applications on z/OS.
- **Michelin** (France) : runs Open Source intranet applications on Linux zSeries
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Agenda

- Ou en sommes nous avec Linux ?
- Linux sur zSeries
- Technologie de Virtualization z/VM
- Simplification avec Linux sur zSeries
- Conclusion

Avantages de tourner Linux sur le zSeries sous z/VM



- Légendaire **Reliability, Availability** et **Security** pour le presque zero downtime
- Technologie de **Virtualization** sur plus de 90% ressource
- High-speed performance pour **Communication Applicative**
- **Gestion centralisée** pour une grande productivité
- **Scale-up** et **Scale-out** pour des workload changeant et évoluant sans interruption
- **Economie** à travers la Virtualisation et un Single Point of Control

zSeries - z9

Questions ?

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