

Architecture SAP sur zSeries

Maurice PETER

IBM Software et IBM System & Technology Groups





Agenda

- ❑ **SAP Architecture Overview**
- ❑ **SAP DB server with DB2 for z/OS**
- ❑ **SAP AS server with DB2 for z/OS**
- ❑ **Why SAP on zSeries**



The Architecture of SAP portfolio

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SAP for <Industry>

- SAP for Aerospace & Defense
- SAP for Automotive
- SAP for Retail.
- SAP for Oil and Gaz
- ...

mySAP Business Suite

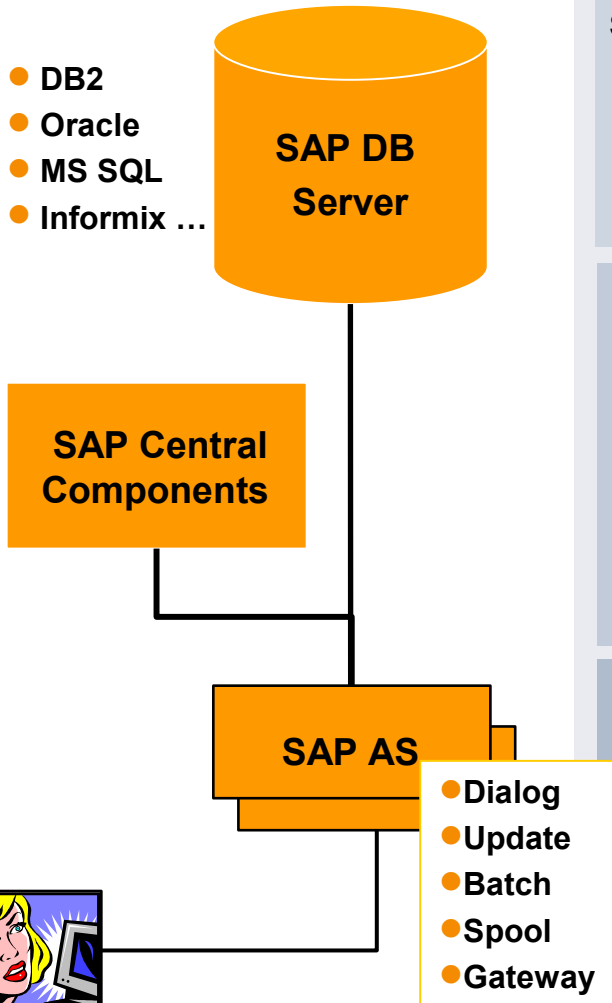


SAP NetWeaver

- SAP Enterprise Portal
- SAP Business Intelligence
- SAP Mobile Infrastructure
- SAP Master Data Mgmt
- SAP Exchange Infrastructure
- SAP Web Application Server



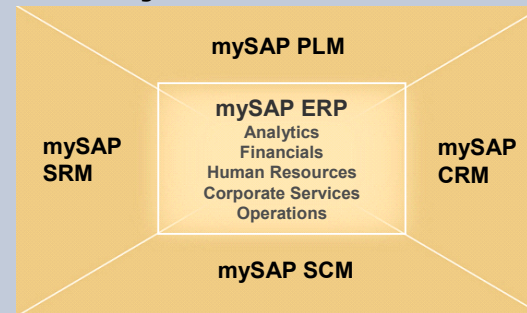
SAP Architecture overview **Université du Mainframe 2005**



SAP for <Industry>

- SAP for Aerospace & Defense
- SAP for Automotive
- SAP for Retail.
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mySAP Business Suite

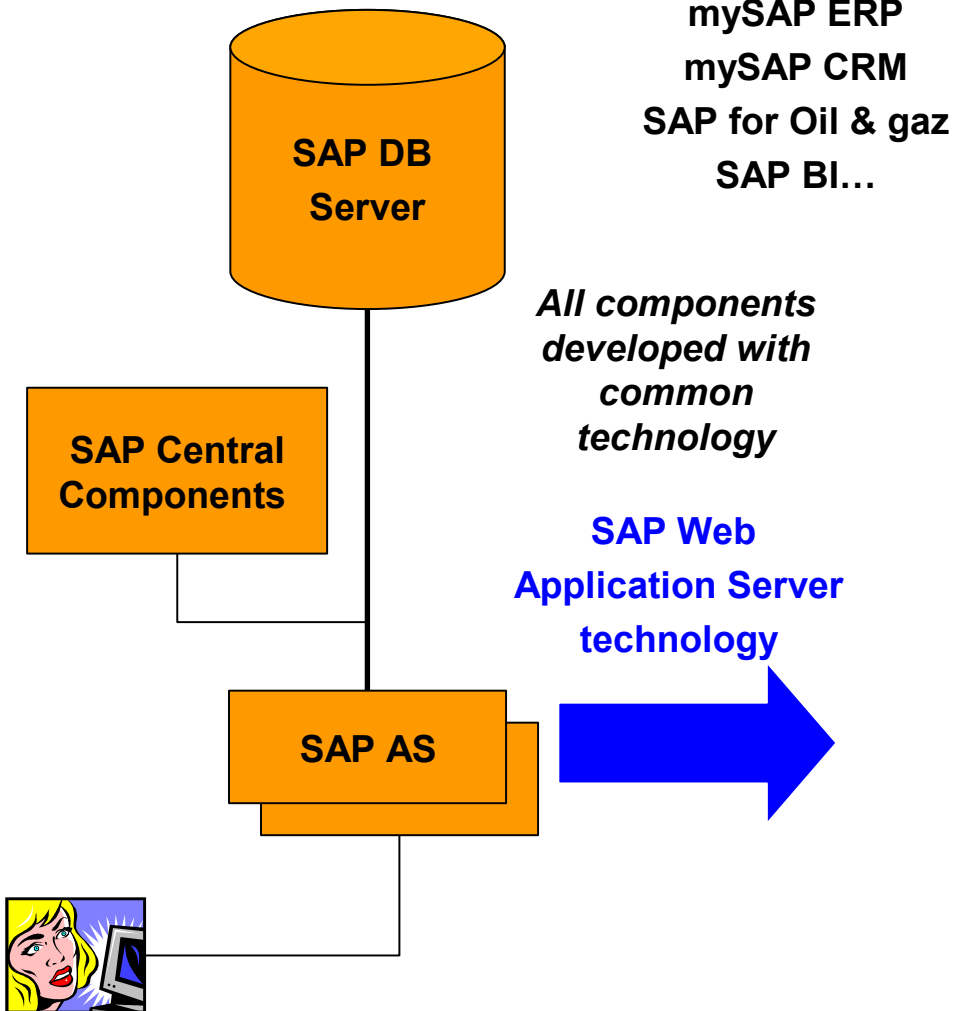


SAP NetWeaver

- SAP Enterprise Portal
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- SAP Exchange Infrastructure
- SAP Web Application Server



SAP Architecture overview



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SAP for <Industry>

- SAP for Aerospace & Defense
- SAP for Retail.
- SAP for Automotive
- SAP for Oil and Gaz

SAP Packaged Solutions

- Service Management for <Branche>
- Financial Insights for <Branche>
- ...

SAP xApps

- SAP xApp Resource & Program Mgmt
- SAP xApp Product Definition
- SAP xApp Mergers & Acquisition
- ...

mySAP Business Suite

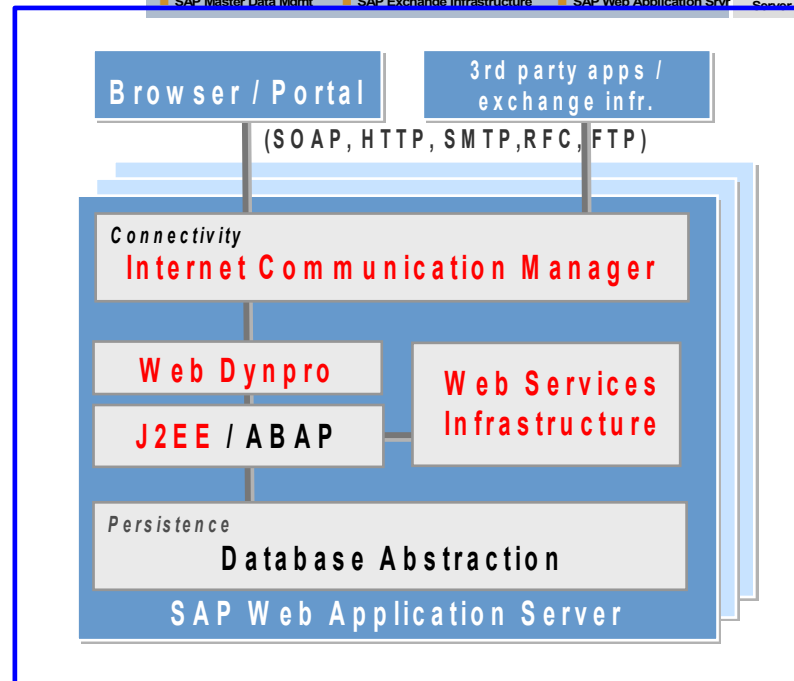
- mySAP PLM
- mySAP ERP (Analytics, Financials, Human Resources, Corporate Services, Operations)
- mySAP SRM
- mySAP CRM
- mySAP SCM

SAP Smart Business Solutions

- mySAP All-in-One
- SAP Business One

SAP NetWeaver

- SAP Enterprise Portal
- SAP Business Intelligence
- SAP Mobile Infrastructure
- SAP Master Data Mgmt
- SAP Exchange Infrastructure
- SAP Web Application Srv
- SAP Business One Server



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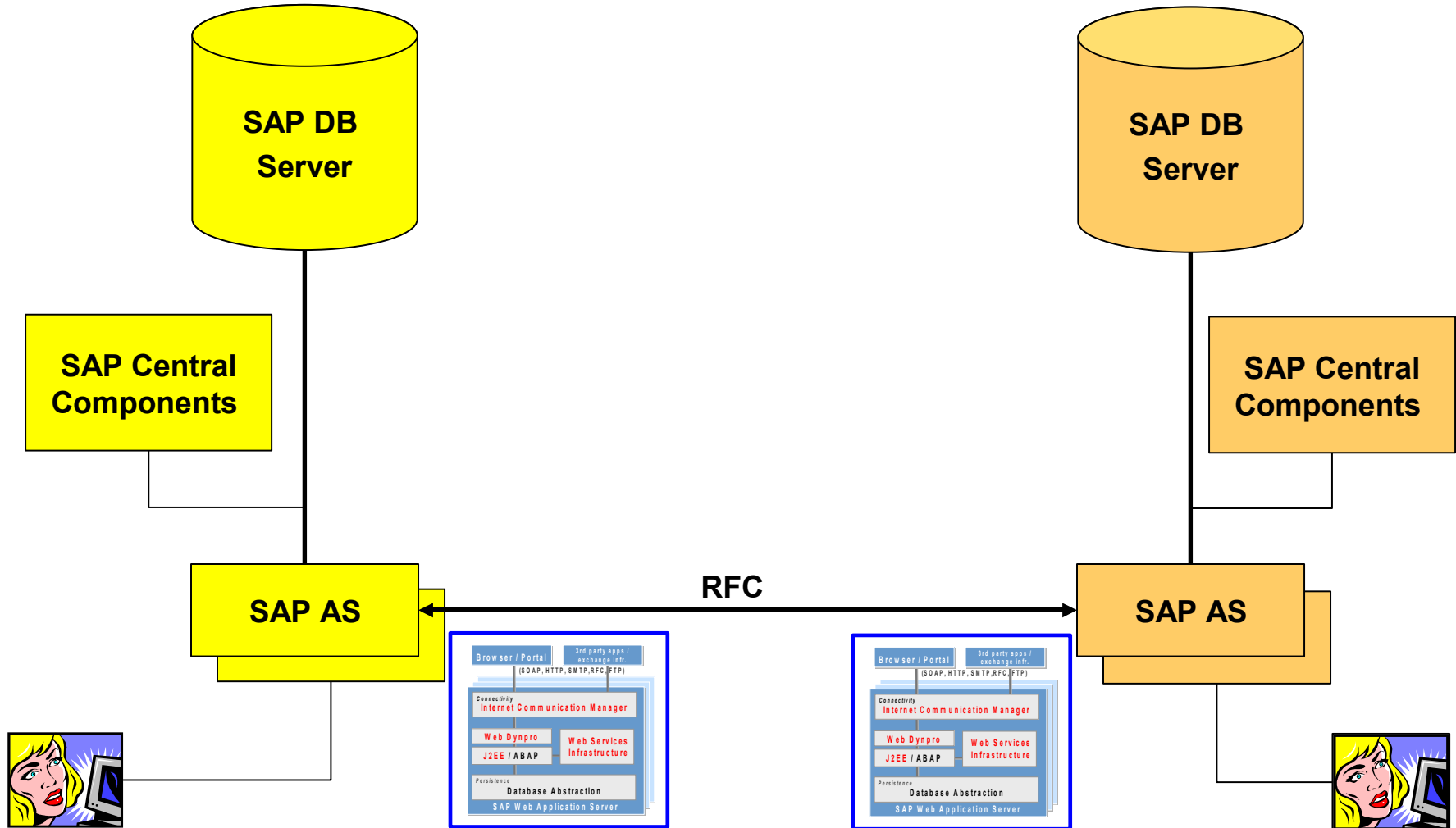
SAP Architecture overview

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mySAP ERP

mySAP BI

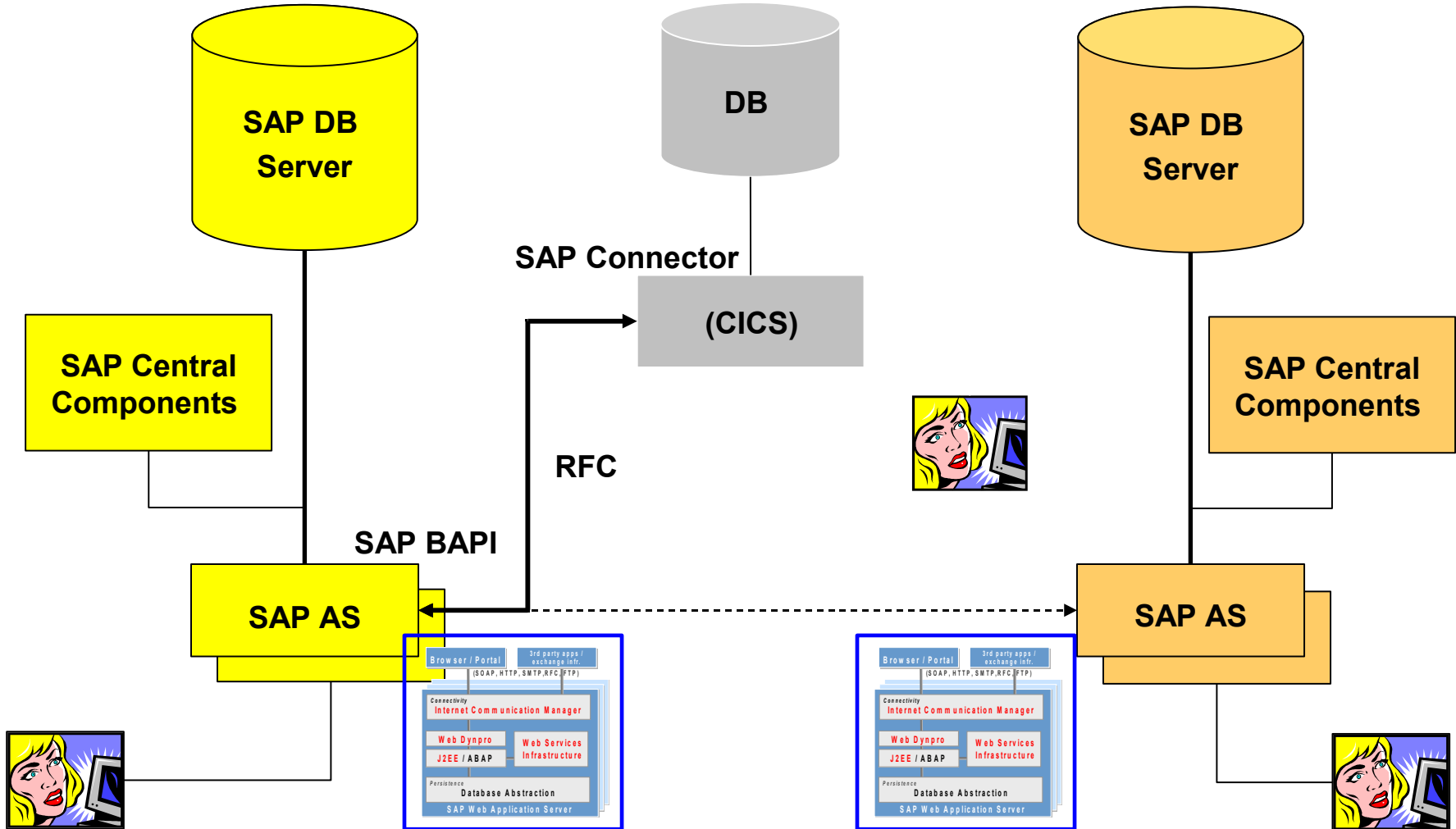


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SAP Architecture overview

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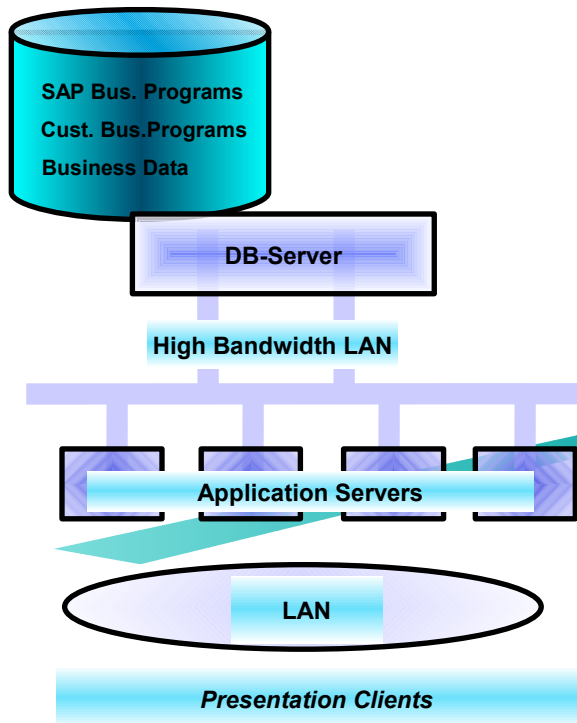
mySAP ERP
mySAP BI

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SAP : many servers...

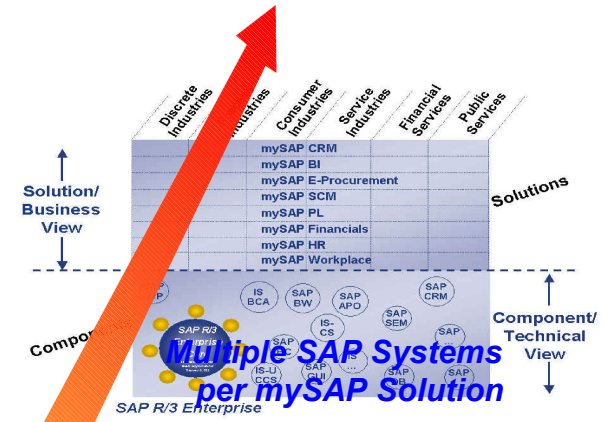
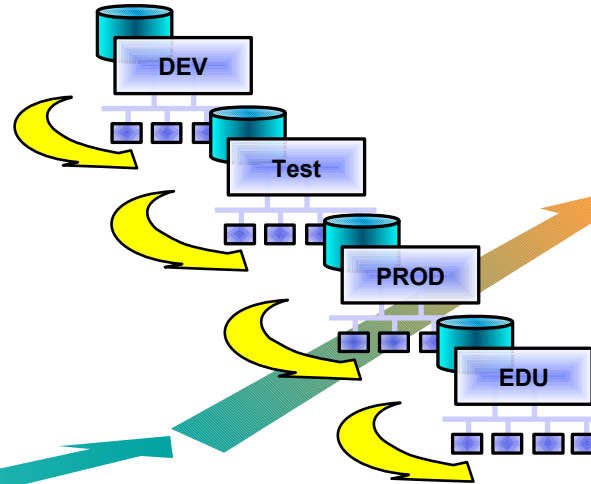
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Multiple Servers per SAP System

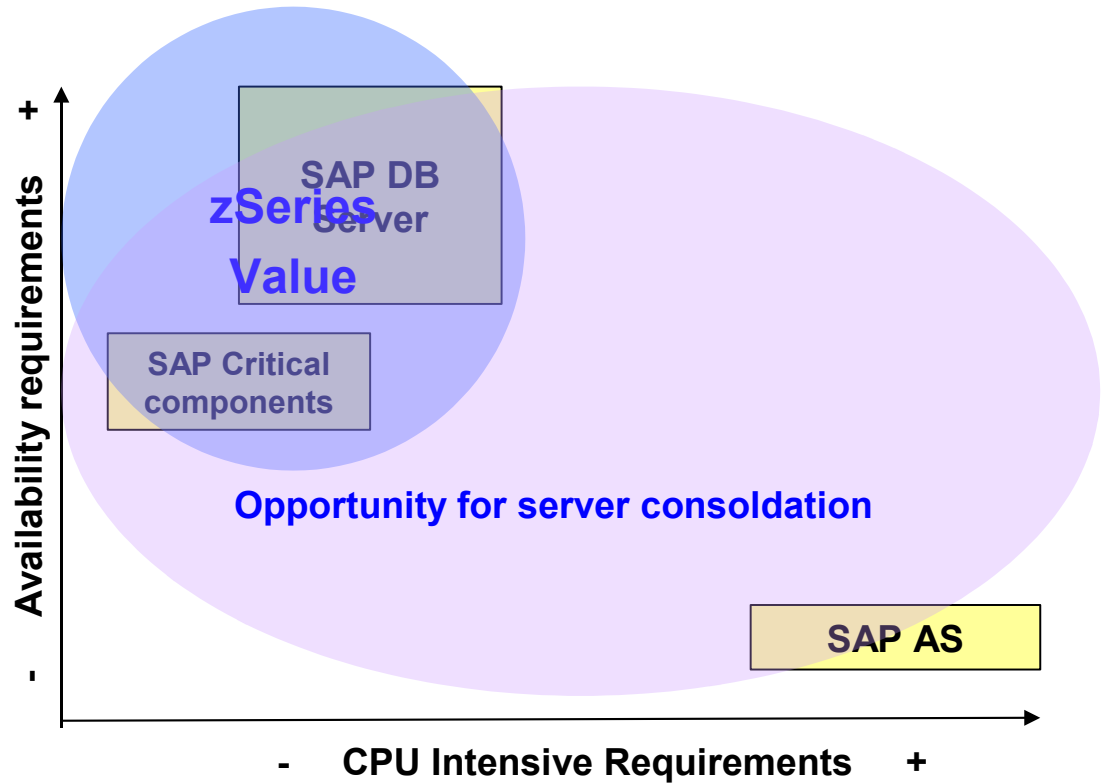
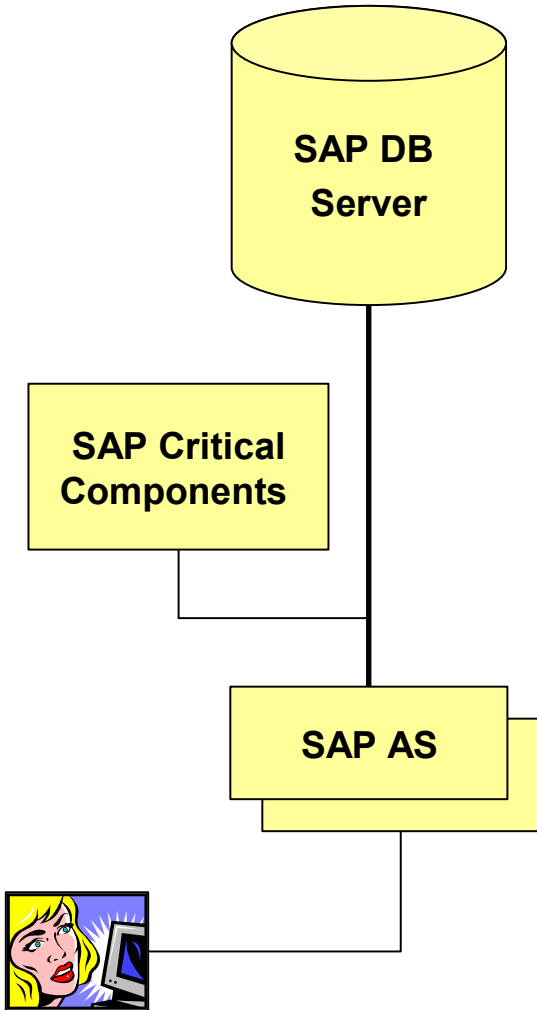


Multiple Operational Stages per SAP System



SAP Architecture and zSeries positioning

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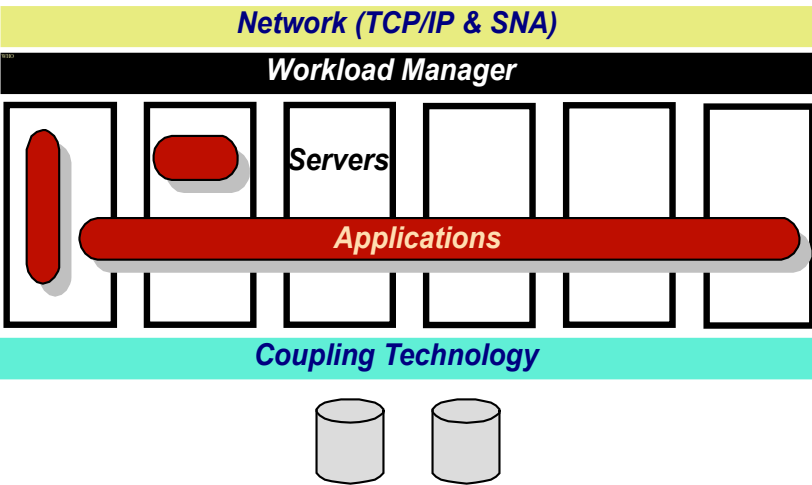
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Clustering zSeries : Parallel Sysplex

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✓ zSeries (z = zero down time)

✓ 24/24 7/7

✓ 99,999%

✓ Sans compromission

• Apports du Sysplex

- **Scalabilité, croissance horizontale**
 - 32 images , 1024 processeurs
- **Disponibilité continue**
 - différent de Haute Disponibilité
 - aucun "single point of failure"
 - pas de "fail over"
 - insensible aux arrêts planifiés (changemenst SW, HW) comme aux arrêts non planifiés

• Fonctions du Parallel Sysplex

- 2 à 32 images z/OS
- **Partage actif (R/W) des données**
 - **Data Sharing DB2, IMS, VSAM,...**
- Exécution parallélisée des transactions applicatives
 - ✓ IMS,CICS,BATCH,WEB,BI,ERP
- Workload Management
- Réseau partagé
- Vue "single system"
 - par l'utilisateur
 - par l'exploitation

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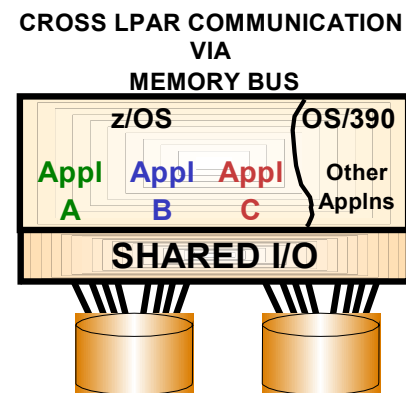




zSeries virtualization leadership

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- **VM provided the first logical partitioning capability**
 - enabled many virtual servers within a single processor
 - 100 to 1000 virtual server
 - HW and SW architecture (SIE)
- **PR/SM introduced LPAR on S/370 in 1987**
 - **60 LPARs –**
 - shared resources – CPU & IO
 - 4 LCSS, EMIF + SPANNING
 - **HiperSocket**
 - TCPIP network via memory communication
 - **Shared and dedicated logical processors**
 - fine CPU granularity
 - Event driven dispatching
 - HW & SW synergy
 - **Shared IO**
 - No capacity or performance impact
 - Synergy with **WLM** (Intelligent Resource Director)



- ✓ Dynamic allocation of I/O to Partitions
- ✓ Full I/O sharing across partitions
- ✓ CPU Shared across LPARs
- ✓ High Availability
- ✓ EFFECTIVE Usable Capacity
- ✓ Utilization up to 100%

zSeries Server

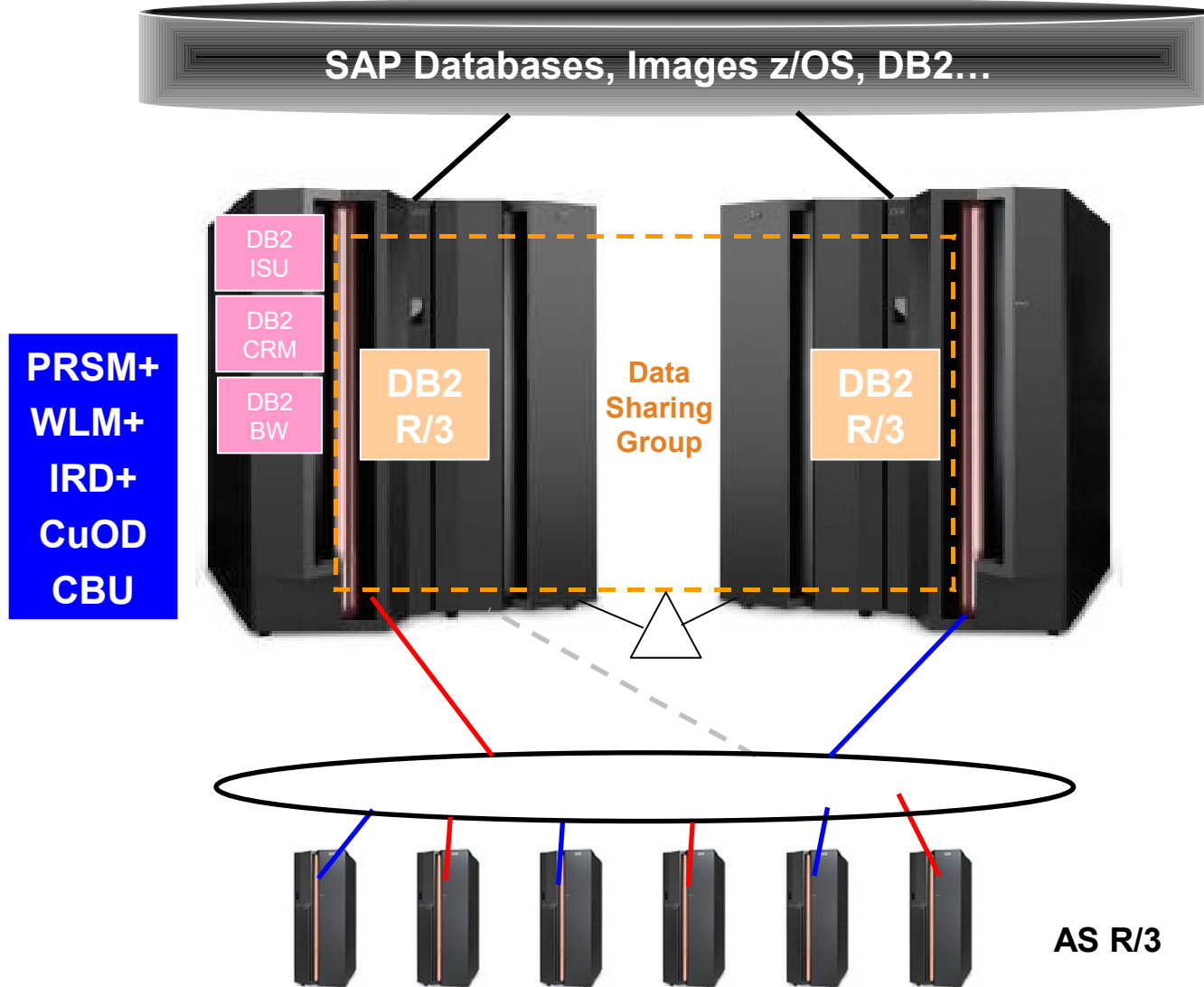
Less
Capacity
Needed





DB server High Availability solution

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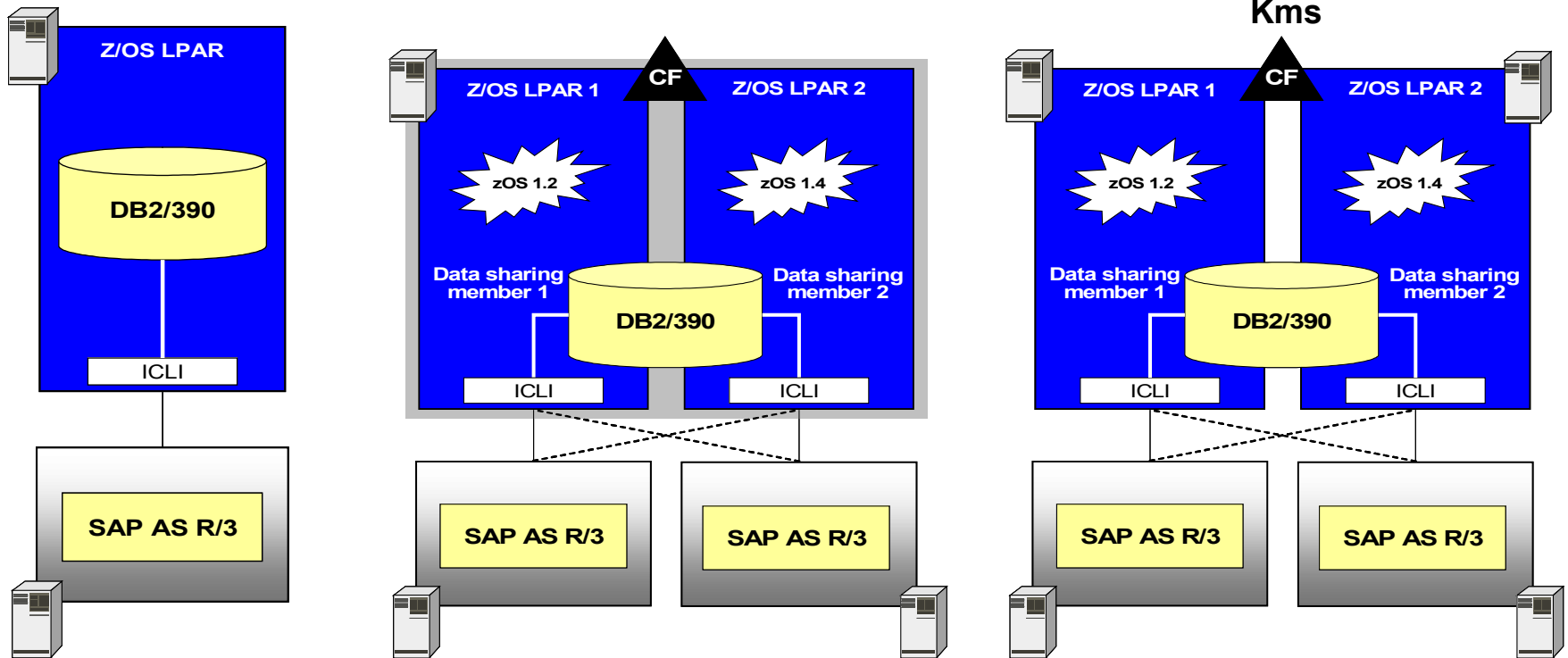


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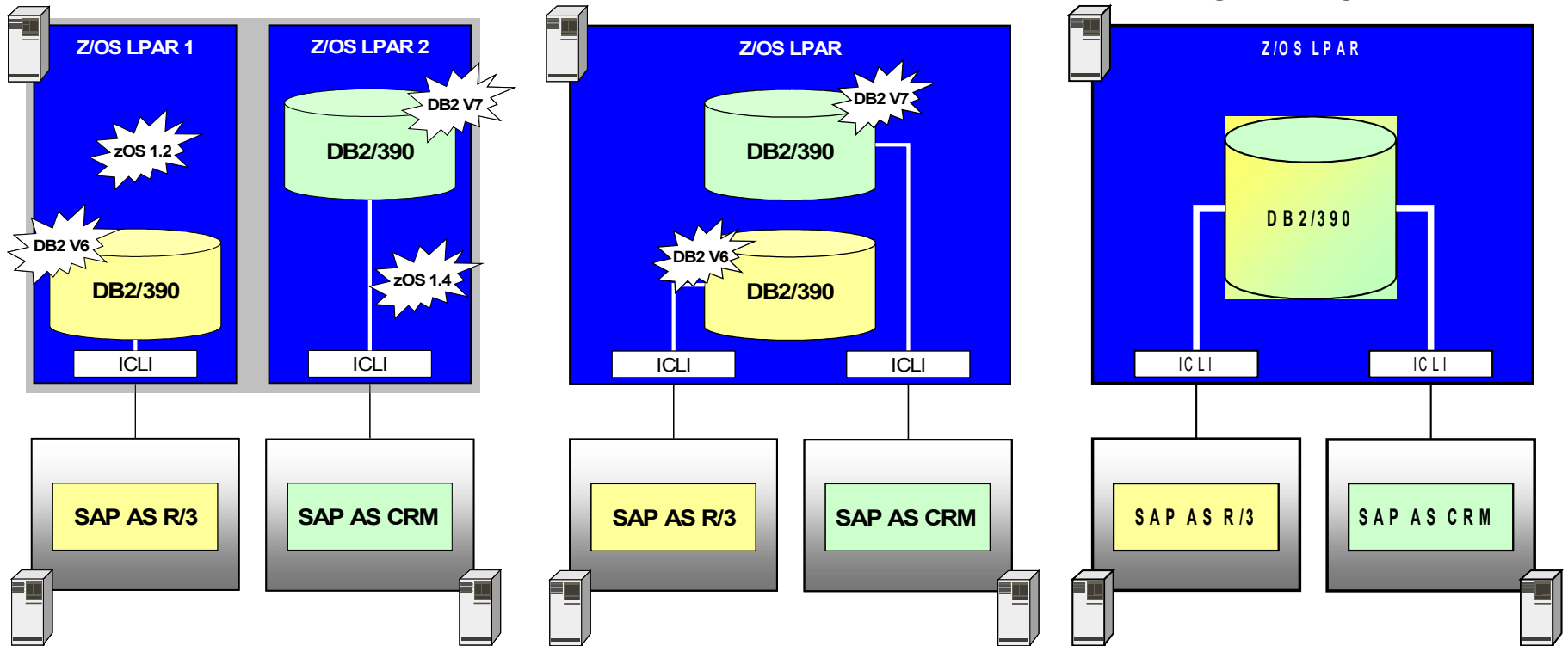
SAP DB Server on zSeries with DB2 for z/OS **Université du Mainframe 2005**





SAP DB Server consolidation on zSeries with DB2 for z/OS

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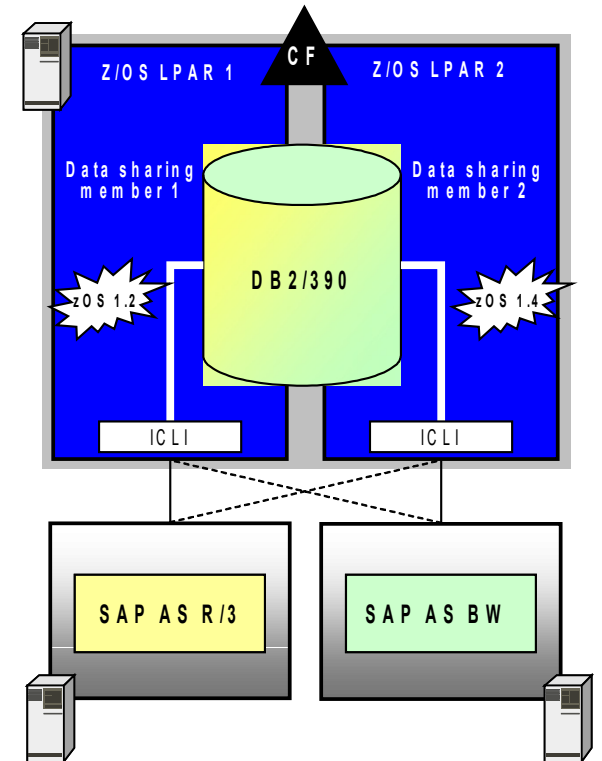
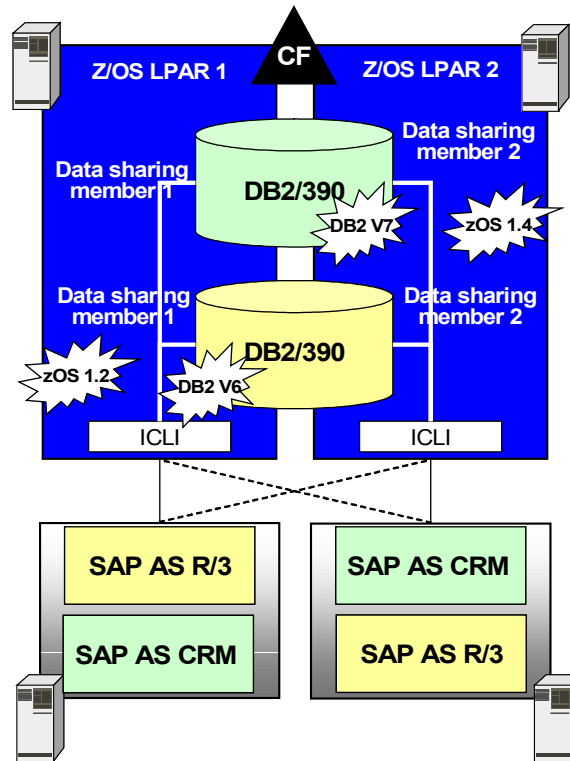
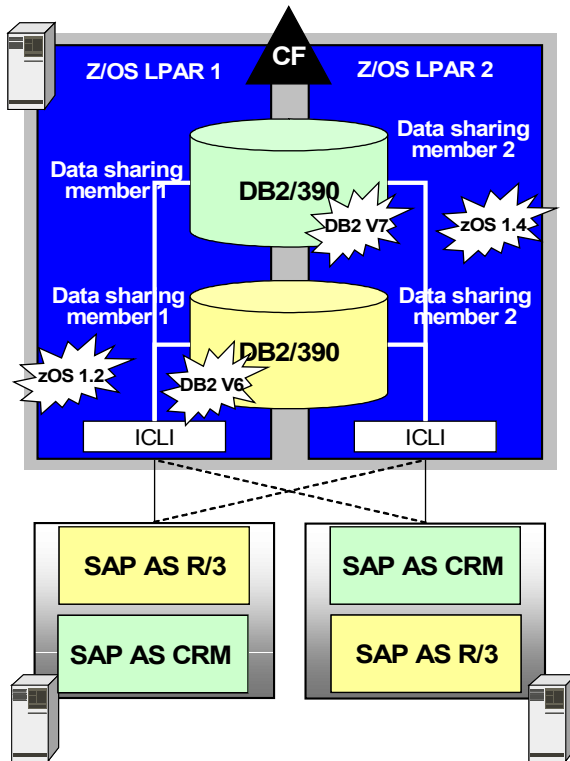
SAP MCOB





SAP DB Server consolidation on zSeries with DB2 for z/OS

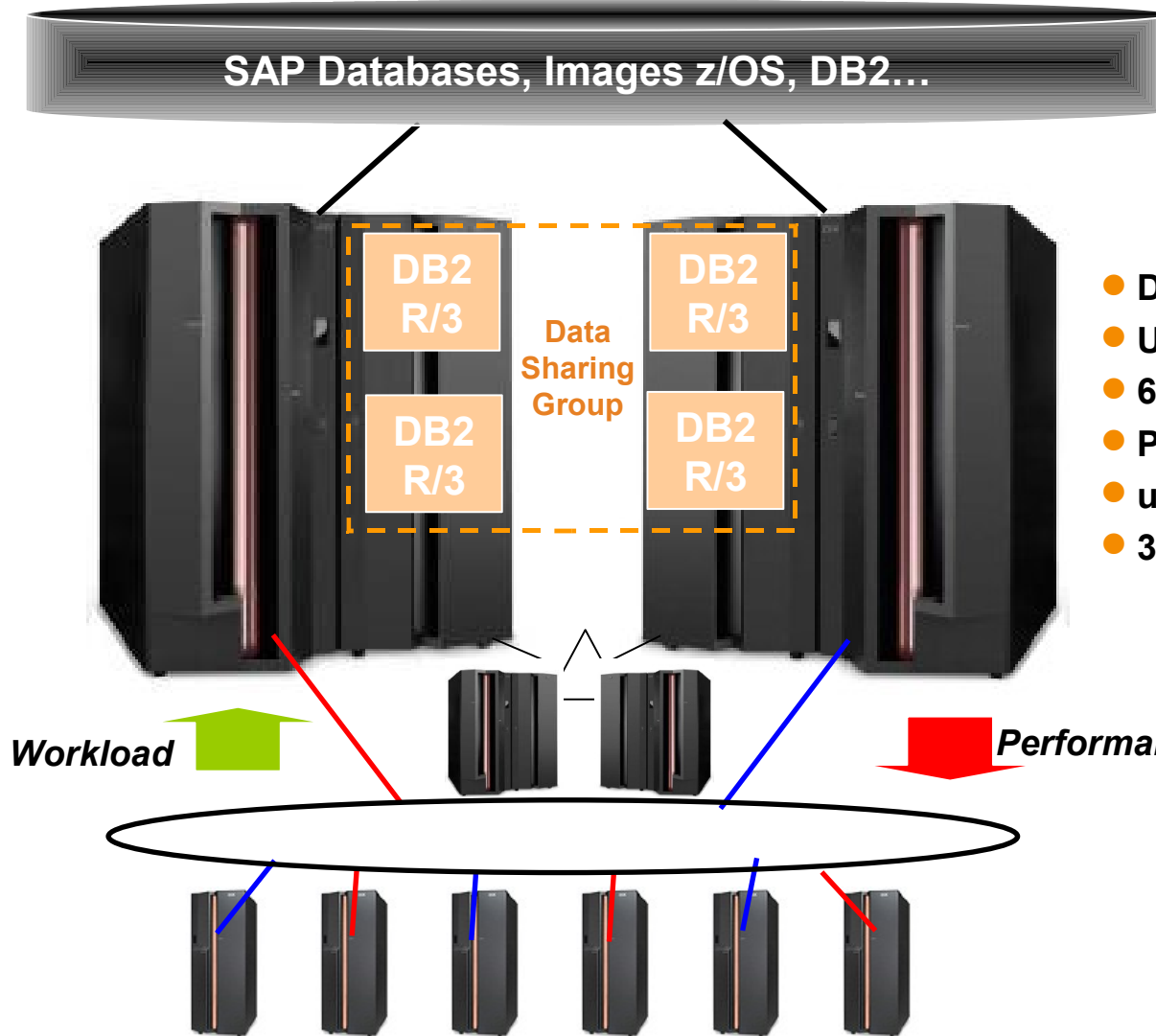
Université du Mainframe 2005 SAP MCOB





DB Server Scalability with DB2 Data Sharing

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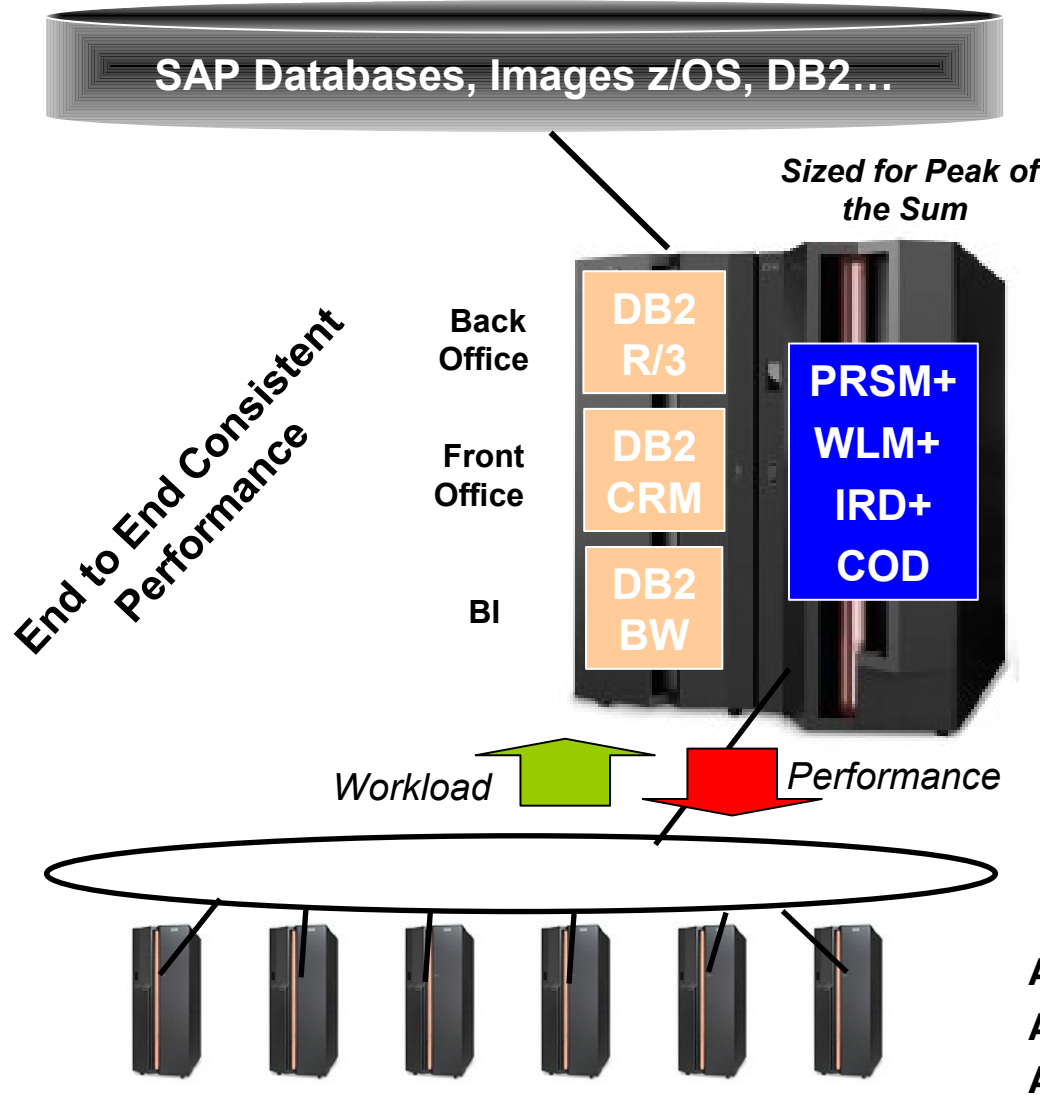
- Datasharing 32 members
- Up to 10 DB instance / LPAR
- 60 LPAR / System
- PR/SM, WLM, IRD
- up to 32 CP / LPAR
- 32 Systems in Sysplex+CF





DB Server Consolidation (production systems)

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- Up to 32 CP / System
- 0 to 30 LPAR / System
- Up to 10 DB Instances / LPAR (prod)
- Up to 30 DB Instances / LPAR (Dev, test)
- 0 to 24 CP / LPAR
- 0 to 24 CP / DB Instance

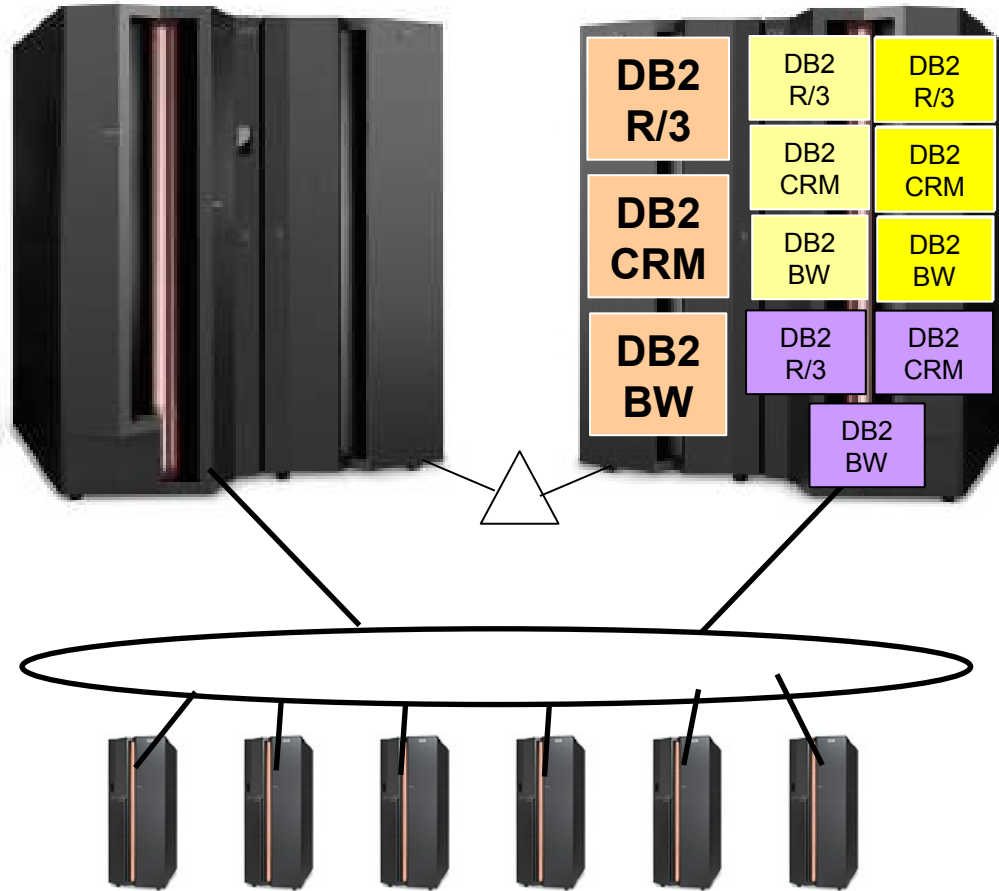
- On-Line transaction
- Daily Batches
- Monthly Batches
- Reporting
- Administration

AS R/3
AS BW
AS CRM





SAP Databases, Images z/OS, DB2...



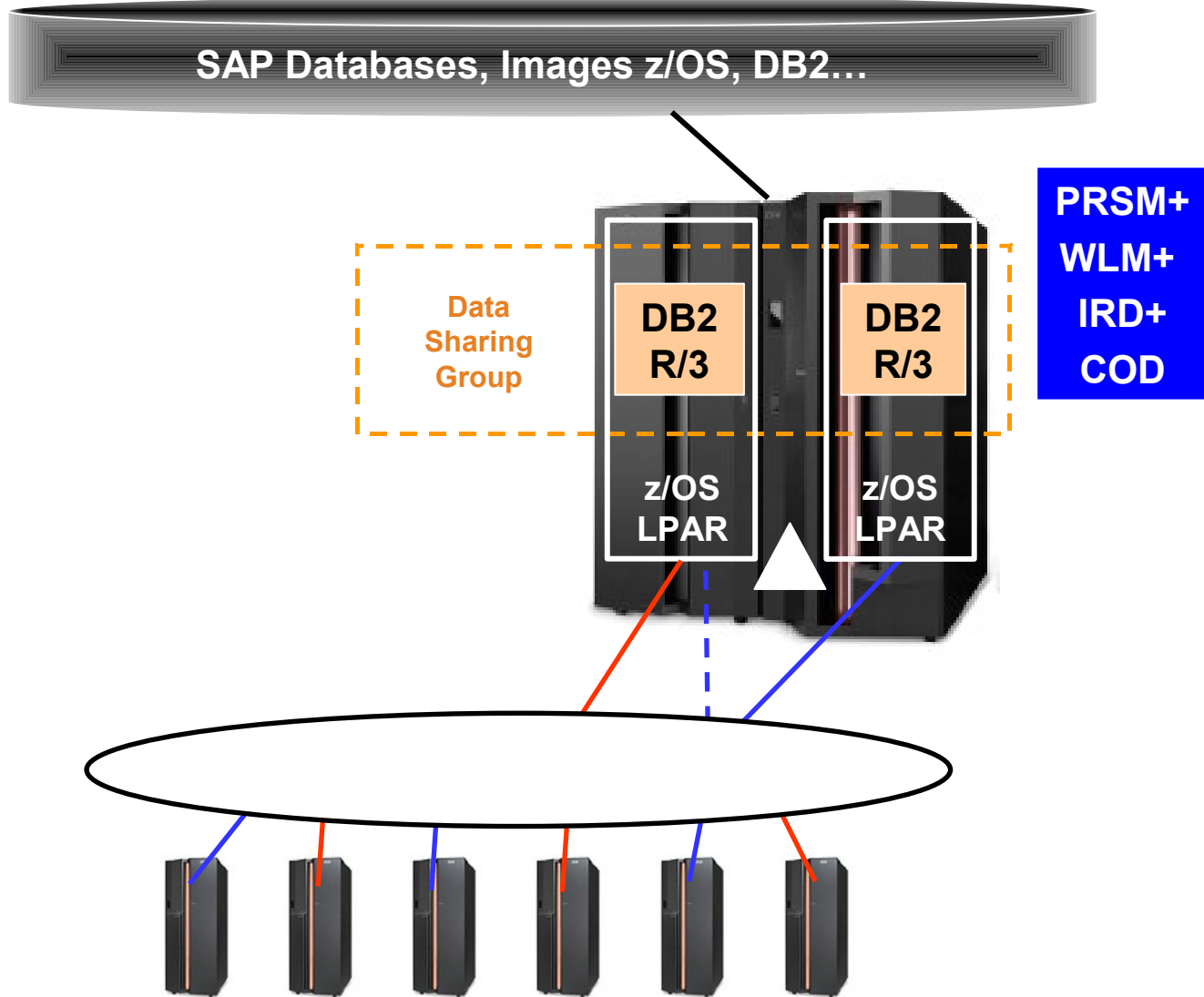
PRSM+
WLM+
IRD+
CuOD

Homogenous and dynamic DB server landscape improves administration efficiency and bring flexibility to project

- 0 to 60 LPAR / System
- Up to 10 DB Instances / LPAR (prod)
- Up to 30 DB Instances / LPAR (Dev, test)
- up to 32 CP / LPAR
- up to 32 CP / DB Instance



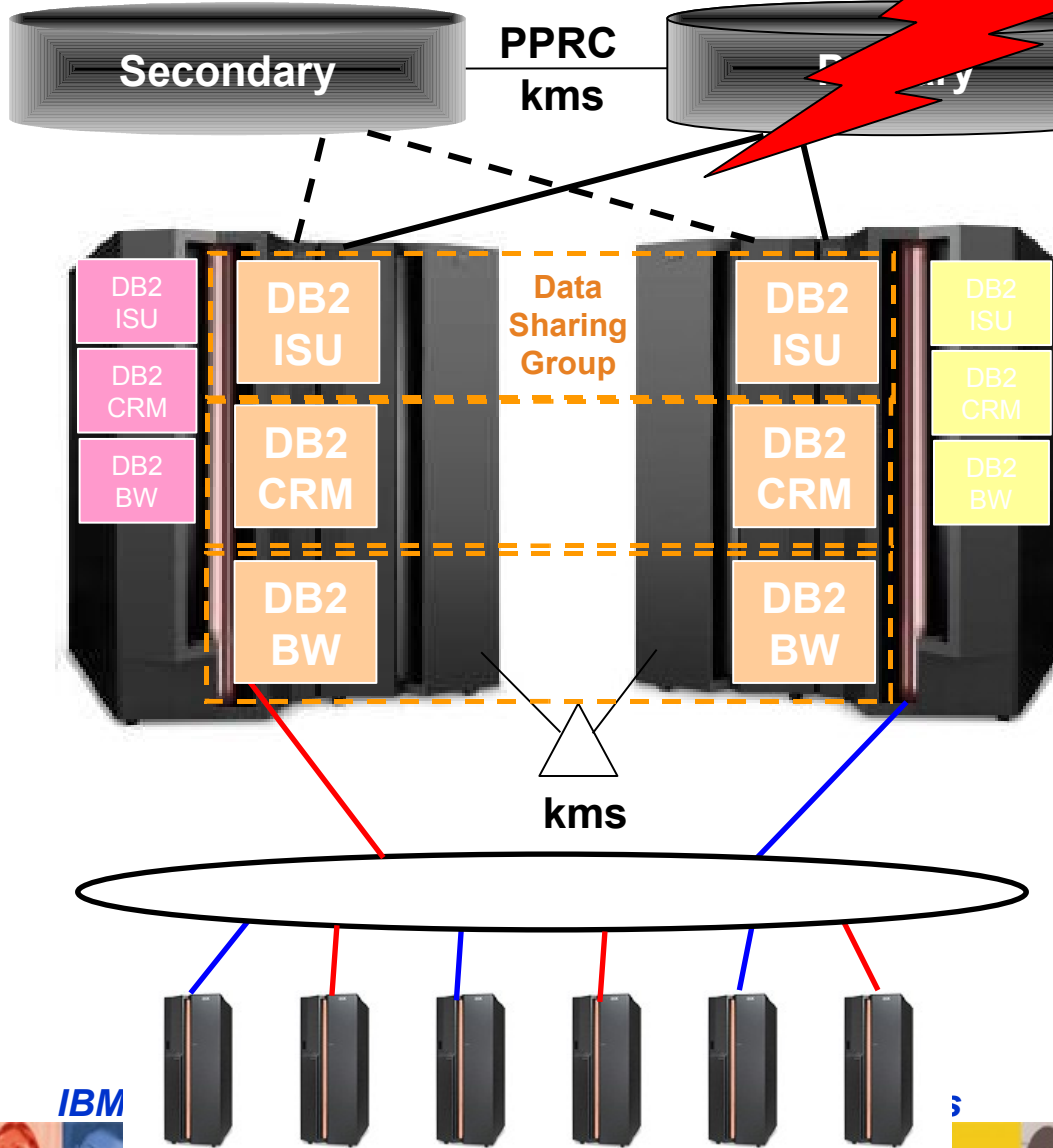
DB server High Availability solution (Planned/unplanned) **Université du Mainframe 2005**





Storage devices Consistent Disaster Recovery

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- Consistency Group Flashcopy
- Metro Mirror (synchronous PPRC)
- Global Mirror (Asynchronous PPRC)
- Cascading Global Mirror
- Tivoli System Automation
- Automatic Restart Management
- GDPS PPRC
- GDPS XRC
- GDPS/PPRC Hyperswap
- GDPS for IBM Total Storage Global Mirror
- DS8300 Out of the box functions





IBM @server™ zSeries and S/390 Sizing Estimates for mySAP™
Revision 45
July 25, 2005

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e-mail: Michael Sheets/Poughkeepsie/IBM/IBMUS or MSHEETS@us.ibm.com
File name: SAP_zSeries_Size.pdf

This information is **IBM Confidential**.

Introduction

Attached below are sizing estimates for mySAP.com on IBM @server zSeries and S/390. This includes both database and application server functions. In this document I often use the old term SAP R/3 for mySAP. Additionally, I often use the terms S/390 and zSeries, z/OS and OS/390 interchangeably. As SAP on zSeries is more mature, it is my intention over time to make this a document less a general tutorial and stick closer to sizing issues.

Be sure that you understand this document - reading all the assumptions, notes, and cautions before using this information. Subsequent revised sizing information may differ significantly - positive or negative.

These guidelines are based on customers not only implementing recommended features and options but also customers making a significant effort at tuning. Installation, migration, database load, and implementation activities





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SAP Applications server with DB2 for z/OS

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IBM zSeries

DB2 V8



Dialog ?
 Batches ?
 AS to DB intensive ?
 Interface with z/OS WL ?
 Serviceability level ?
 IT Consolidation ?



IBM zSeries



IBM xSeries



IBM p5 and pSeries



IBM BladeCenter HS20

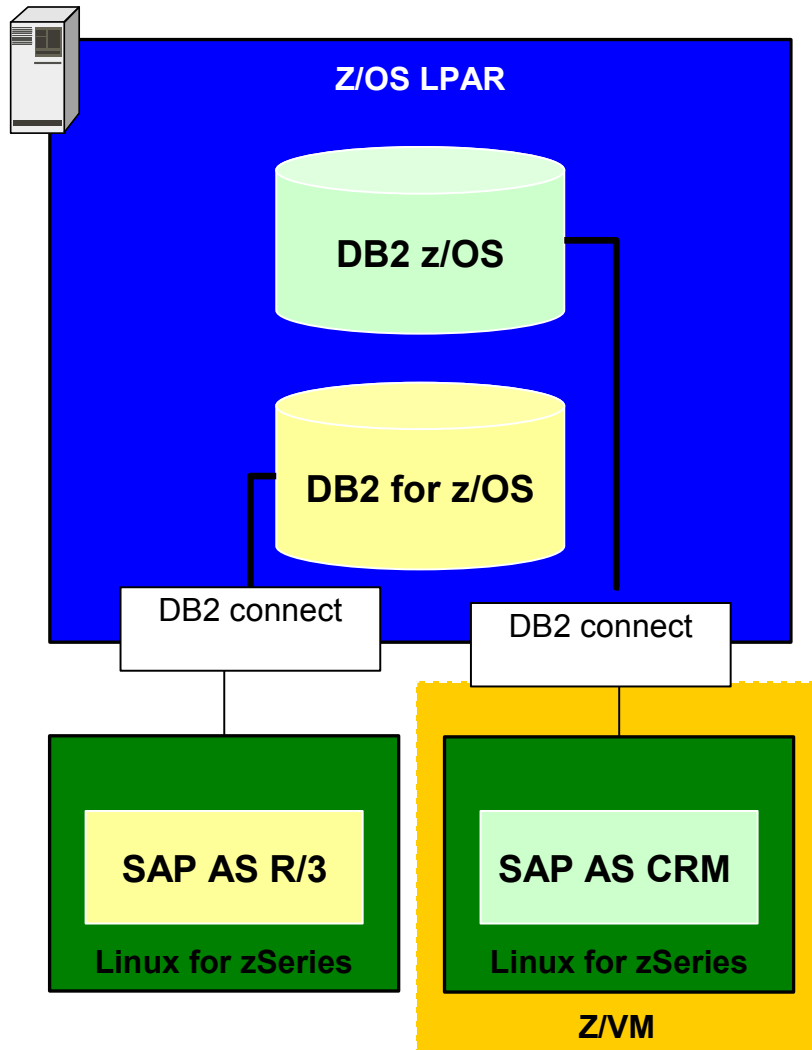


BladeCenter JS20

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SAP Application Server running under linux for zSeries



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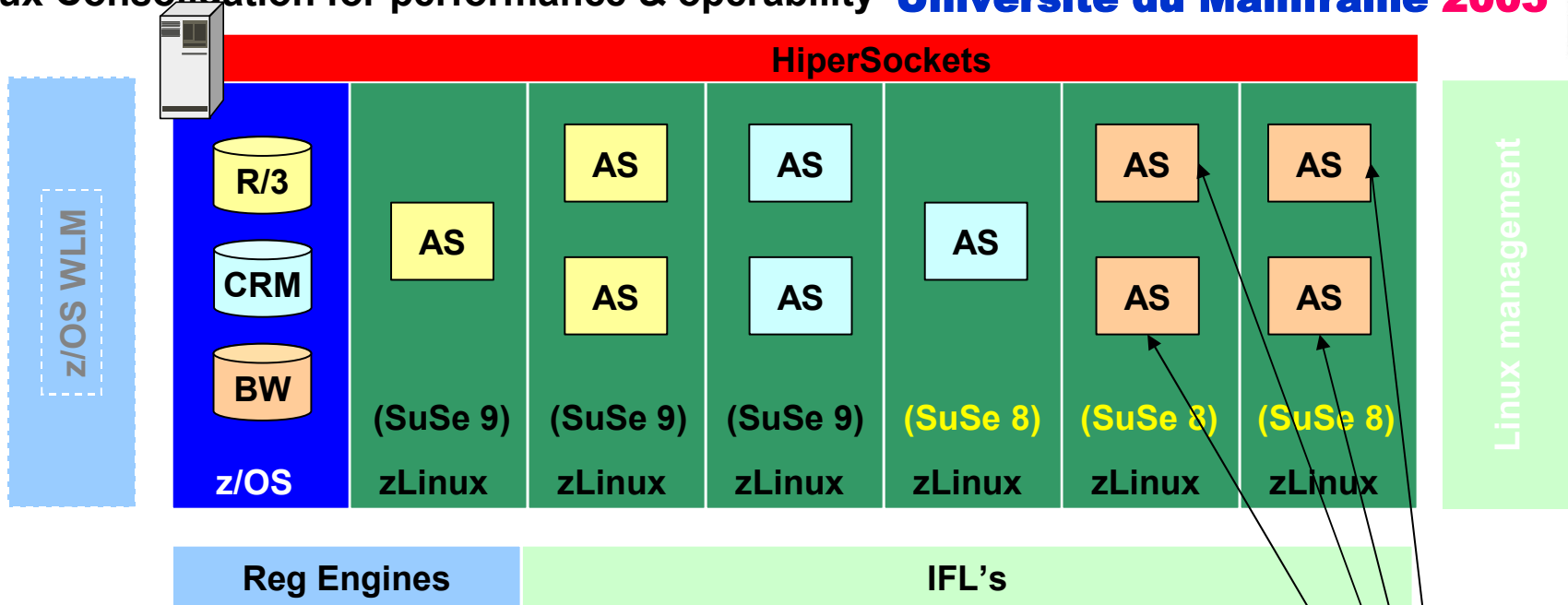
Linux 64 bits is strategic SAP and IBM zSeries development platform

- AS under Native linux or Linux under z/VM
- SAP DB with DB2 for z/OS
- Use of ICLI (under USS)
- Regular engine or IFL
- Availability May 2002 for
- 4.6D SAP Kernel or higher
- 4.6B SAP R/3 or higher
- DB2/390 6.1 or higher
- OS/390 2.8 or higher for DB server
- z/VM 4.2 or higher
- Linux 64 bits distribution with glibc 2.2.4 and kernel 2.4.x or higher (SuSE ES 7)
- 64-bit z/Architecture available for AS





Linux Consolidation for performance & operability **Université du Mainframe 2005**



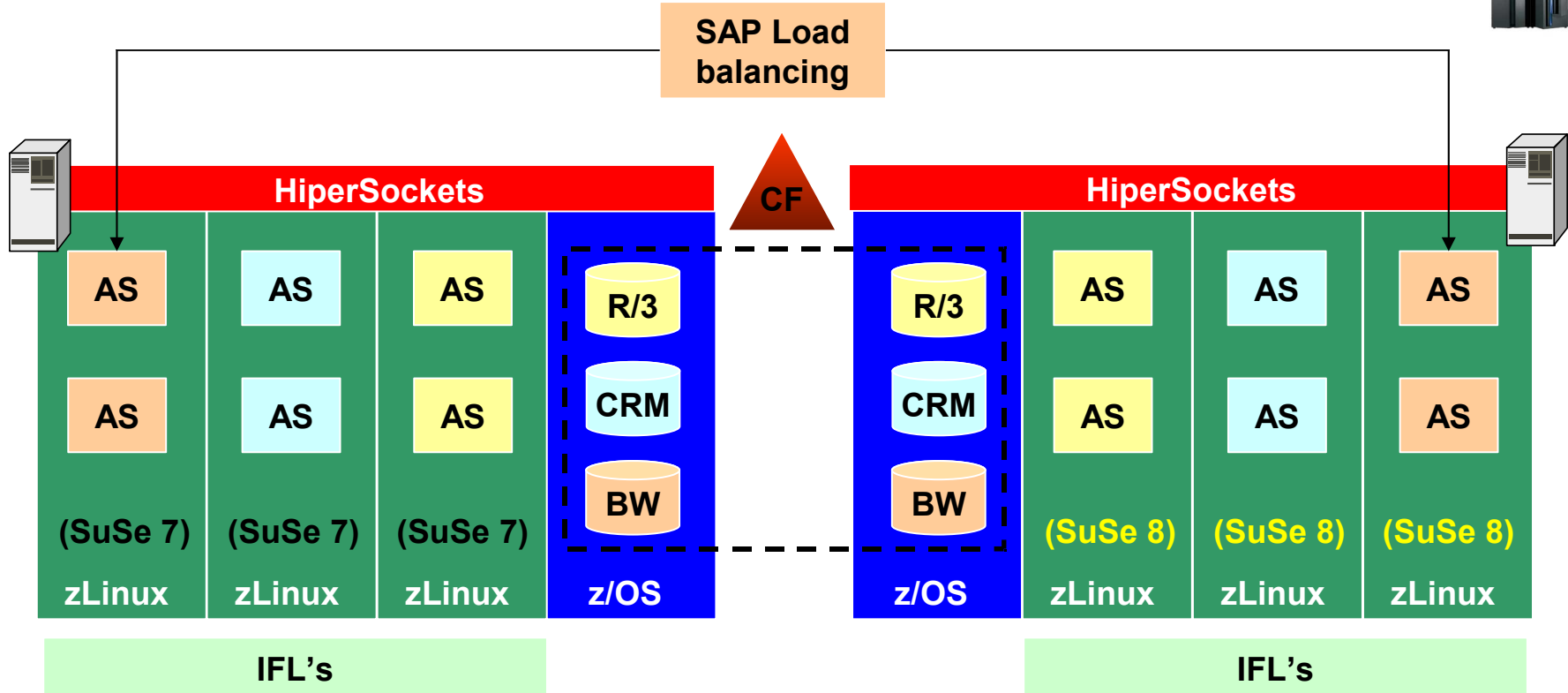
- zSeries HW Reliability (Batches)
- 60 LPAR's PR/SM capability / zSeries
- consolidation, connectivity
- Throughput for I/O intensive activities between AS and DB (Batches, Updates) using HiperSockets

SAP Load balancing



Linux consolidation for performance & scalability

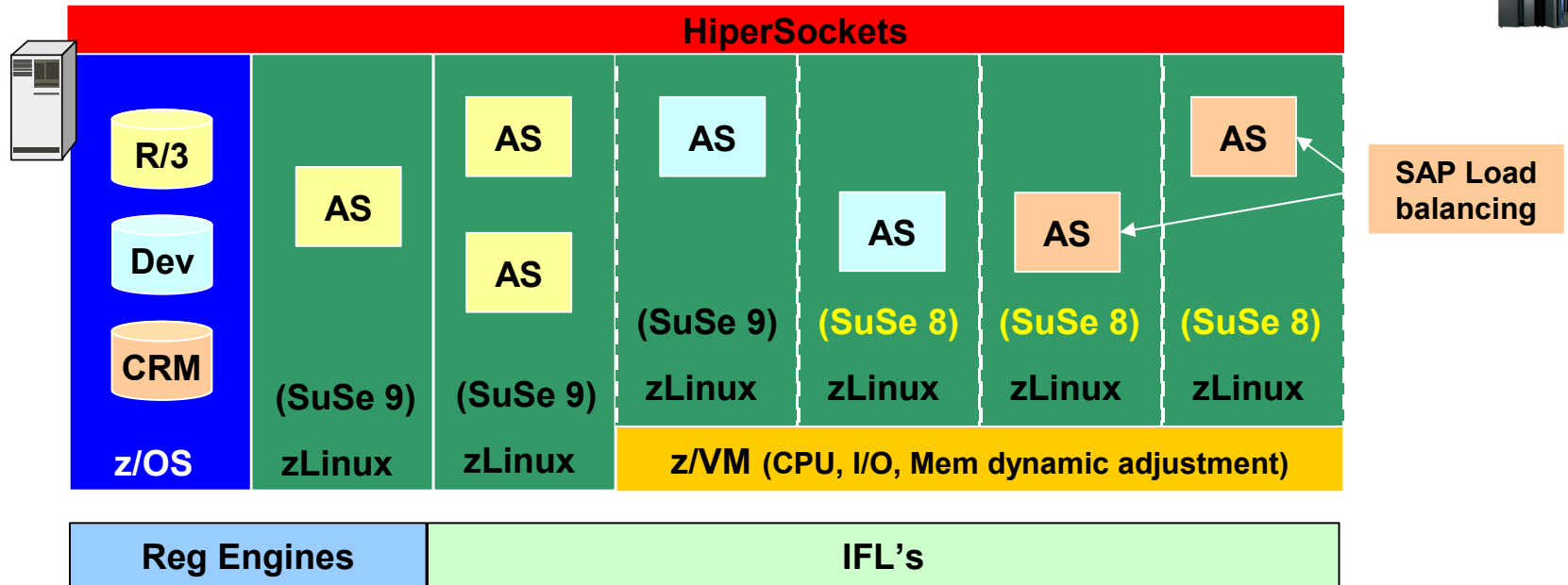
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- 32 LPAR's PR/SM capability / zSeries
- Growth with Infinite Scalability (32 zSeries in //)



z/VM Linux Consolidation for resources sharing **Université du Mainframe 2005**



- central point of control, consolidation, connectivity
- Quick guest and SAP AS Create / delete Hardware
- z/VM dynamic resource adjustment (CPU, I/O and memory)
- Throughput for I/O intensive activities between AS and DB (Batches, Updates) using HiperSockets





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Pourquoi le DB Server SAP sur z/OS ?

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■ Les PLUS de l'architecture zSeries et z/OS

- Architecture de Data Sharing sans limite : **scalabilité & disponibilité continue**
- Sous-système E/S : FICON , Haut débit IO, compression hardware
- Consolidation sous z/OS : robustesse de z/OS et efficacité du WLM
- PRSM : 60 LPAR, MIF, Hipersockets, granularité du partage
- GDPS pour la gestion du PRA

■ Les PLUS de DB2 for z/OS

- Utilisation totale du Sysplex : Efficacité du Data Sharing
- **Compression de données** ... jusqu'au niveau Buffer Pool
- Optimisation – plus de 20 ans de savoir faire et d'améliorations
- Efficacité E/S physiques (VSAM ICI et optimiseur)
- **Réorganisation en ligne** (diminution et rapidité des E/S)
- Partitionnement ... avec toutes les nouveautés V8
- **Prise d'images systeme** (V8)
- Améliorations DB2 z/OS spécifiques pour SAP depuis V5

■ Mise en valeur des compétences et de l'expérience zSeries





■ Performance & scalabilité

- +35% de capacité par processeur
- 54 CP : 1,95 x la capacité du Z990 32W
- Amélioration débit FICON : MIDAW , 64 open exchange
- Capacité mémoire
- Support de 32 CP par image z/OS (z/OS 1.6)

■ Consolidation

- 60 partitions logiques
- Multible SubChannel Sets
- Flexible PU pool management
- Amélioration du RAS

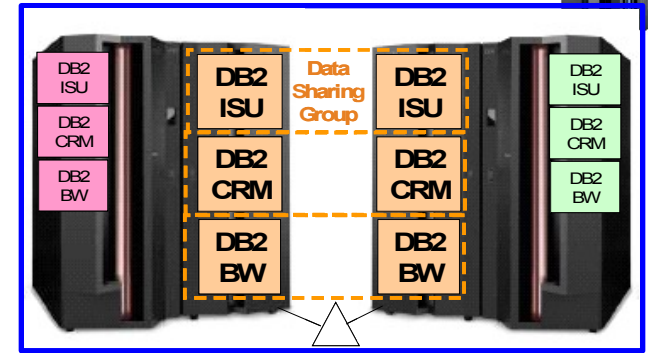
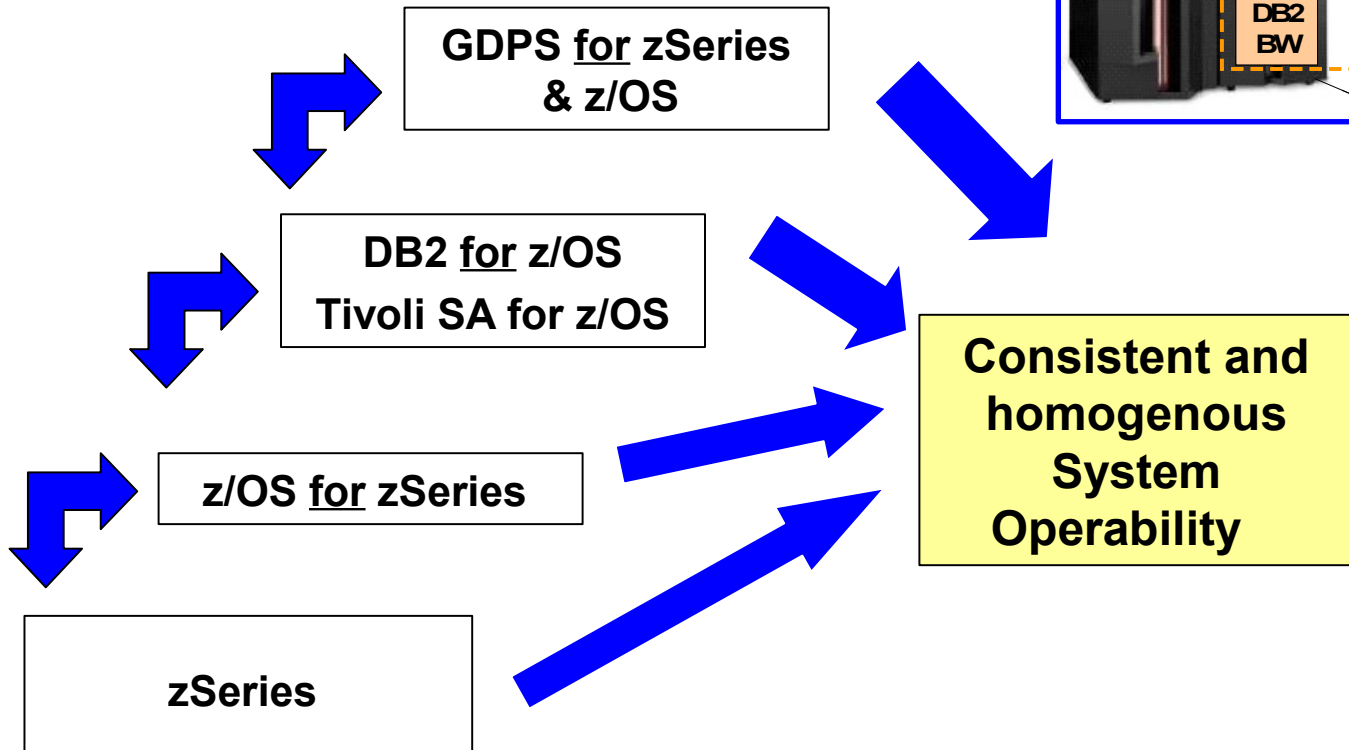
■ TCO

- Amélioration de 35% du ratio prix performance des processeurs spécialisés
 - ICF pour DB2 DS, IFL pour AS sur zLinux
- Réduction de 19% des MSU versus z900 et de 10% vesus z990



zSeries and DB2 for z/OS consistency

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- Scalability
- High Availability
- Disaster
- Consolidation





Customers experiences and references



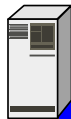


Manufacturing German Customer

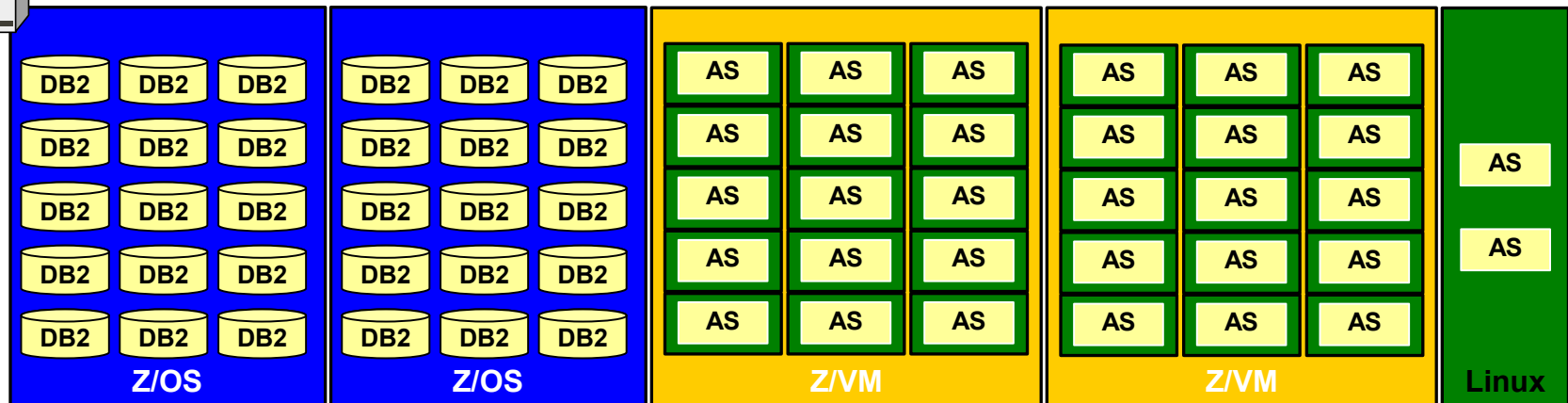
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Production platform : 20 SAP systems

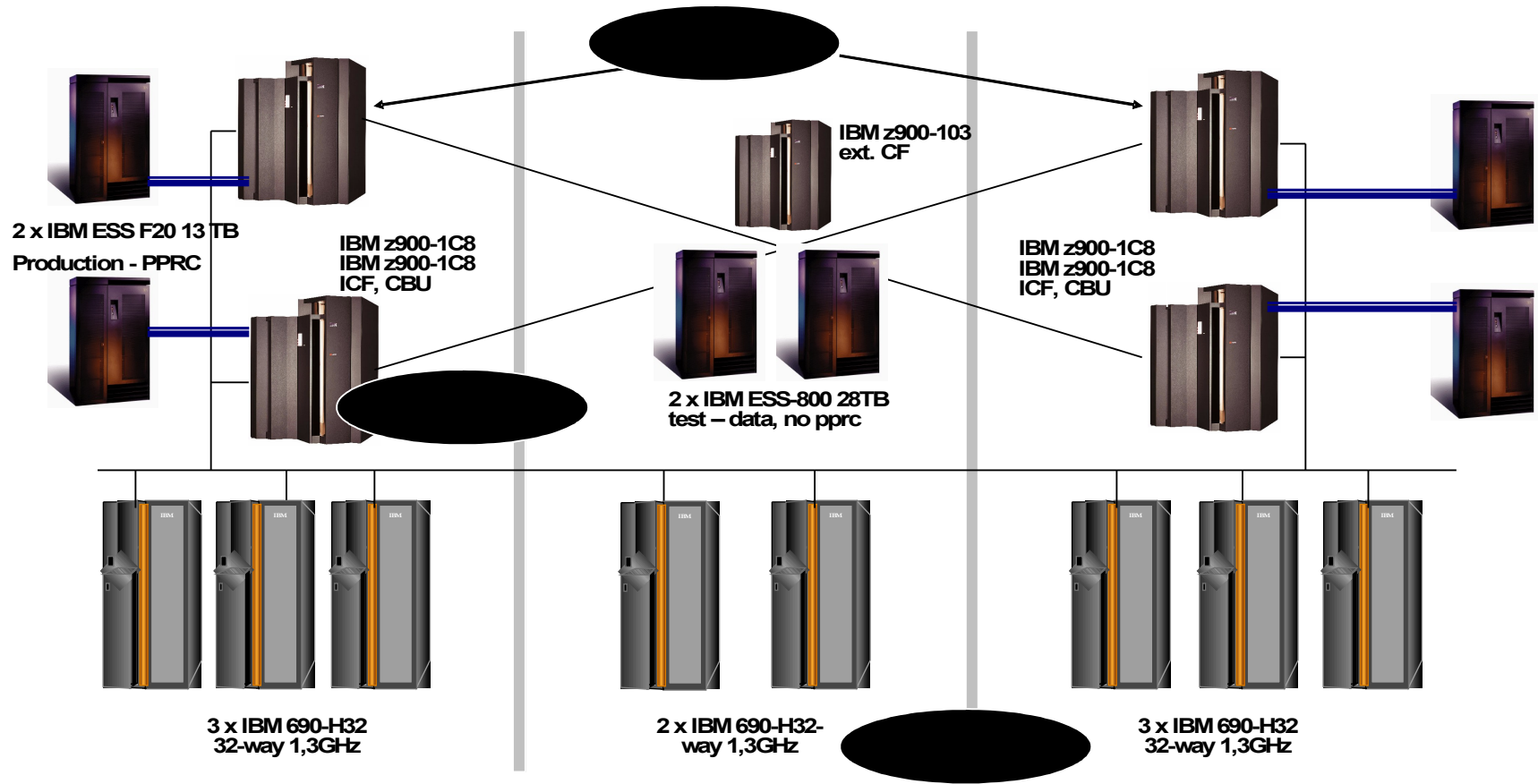


Test platform : 30 SAP systems



Success story : Postbank German Banking Company

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Success story : Postbank German Banking Company *Université du Mainframe* 2005

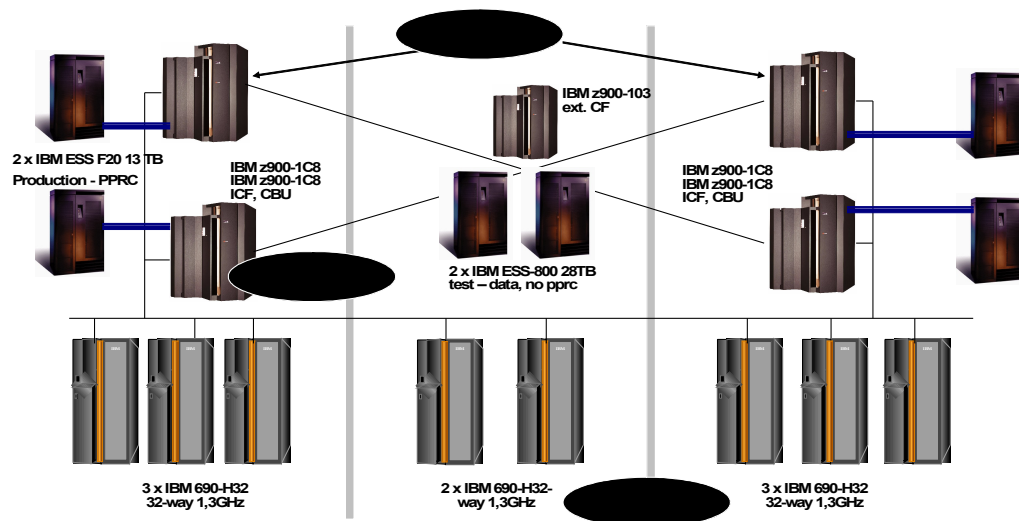

- **SAP AM Giro**
- **11.5 Million customers**
- **9,000 Branch offices**
- **10 Million bookings per day**



- **High performance**
- **Scalability**
- **Hardware security**
- **Non disruptive BackUp**
- **Data consistency**
- **Data security**
- **Capacity on-demand**
- **Autonomic computing**
- **Built-in High availability**



- **DB2/zOS data sharing**
- **zSeries Parallel Sysplex**
- **z/OS automation**
- **GDPS, PPRC**
- **Storage on ESS (70 TB)**
- **AS on pSeries/AIX**





References : SAP on zSeries

- Baldor Electric
- Bridgestone
- Cooper Industries
- Deer & Company
- Department of National Defense Canada
- Gaz Metropolitan
- Jo Ann Stores
- Motorola
- Mead Corporation
- Nabisco
- Pitney Bowes
- Royal Canadian Mounted Police
- Sealed Air Corp.
- TTX Company
- VS Services
- Whirlpool
- Austrian Airlines
- Bausparkasse Schwaebisch Hall
- BOC Gases
- Carl-Zeiss
- Deutsche Bank
- Deutsche Telekom
- Endress & Hauser
- Gerling Insurance
- Iberdrola
- INA
- Italian Railway
- KDRS
- KMD
- KGHM
- OMV
- Sony UK
- Senwes Ltd.
- UK Post Office
- Trinecke Zelezarny
- Zuerich Financial Services
- SurgutNeftgaz
- Usinor
- Alenia Aeronautica
- Eberspâcher
- Alcanet

**1000 Installations
Worldwide**





Thank you ...

