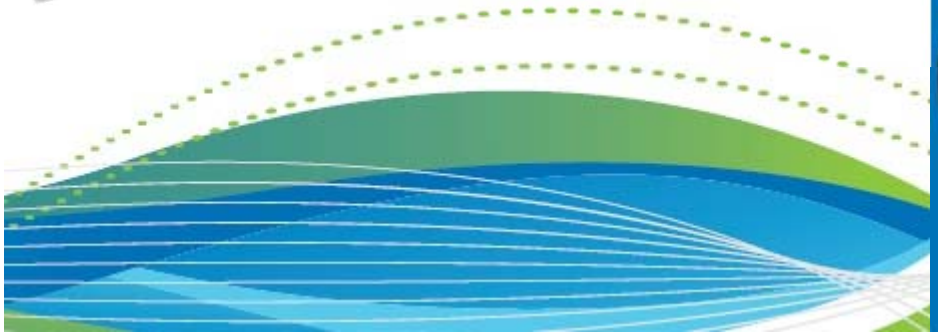
Enterprise SAP on System zEnterprise Data Hub

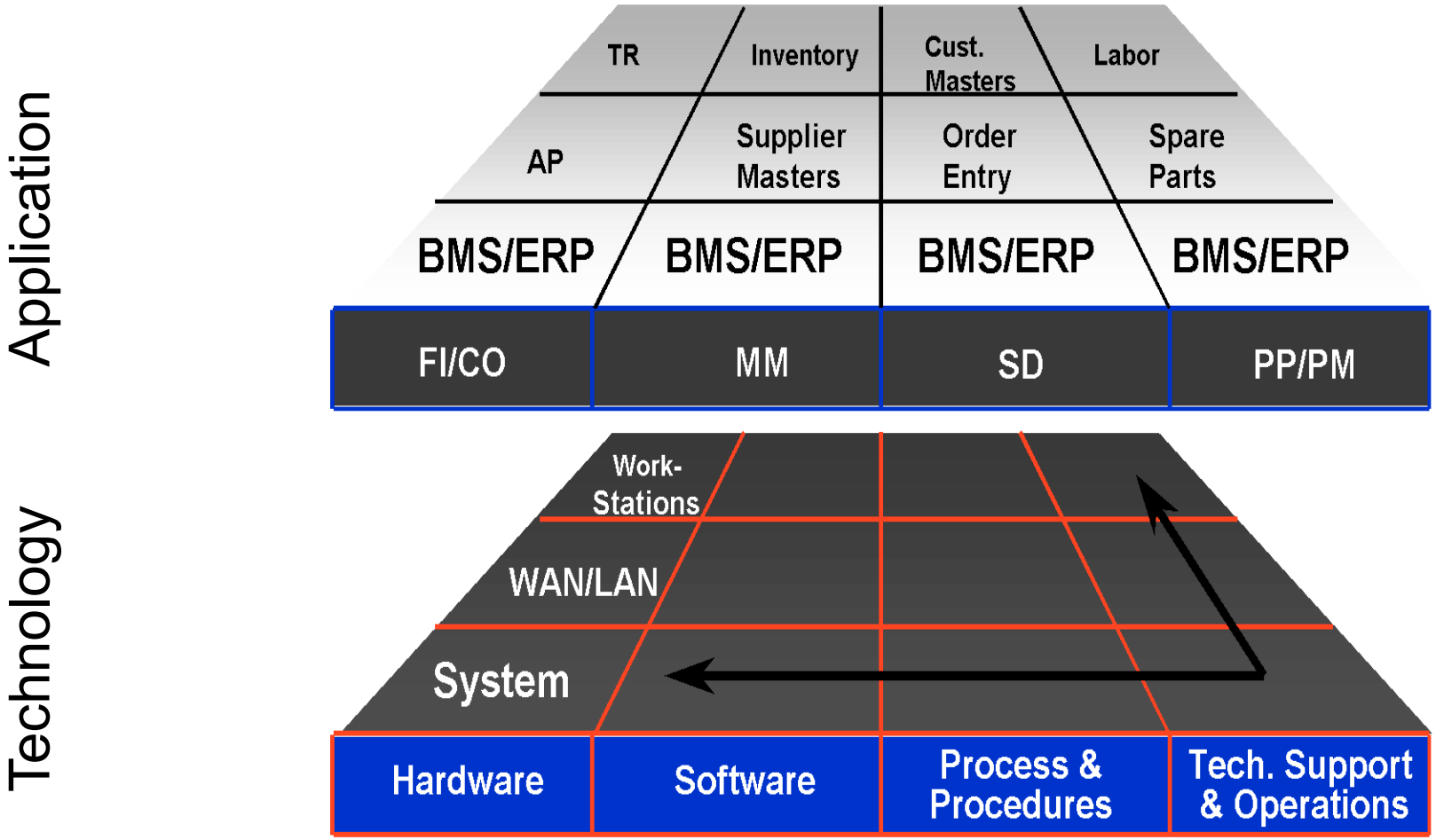


INFRASTRUCTURE:

SOONER OR LATER,

IT MATTERS.

Technology is everything beneath the application layer being implemented. The application layer cannot meet business needs unless the technology layer is sized and architected correctly.



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SAP the Company

- Founded in 1972, SAP is the world leader in enterprise applications in terms of software and software-related service revenue. Based on market capitalization, we are the world's third largest independent software manufacturer. We have more than 109,000 customers in over 120 countries. The SAP Group includes subsidiaries in every major country and employs more than 53,000 people. *(2010 Annual Report)*

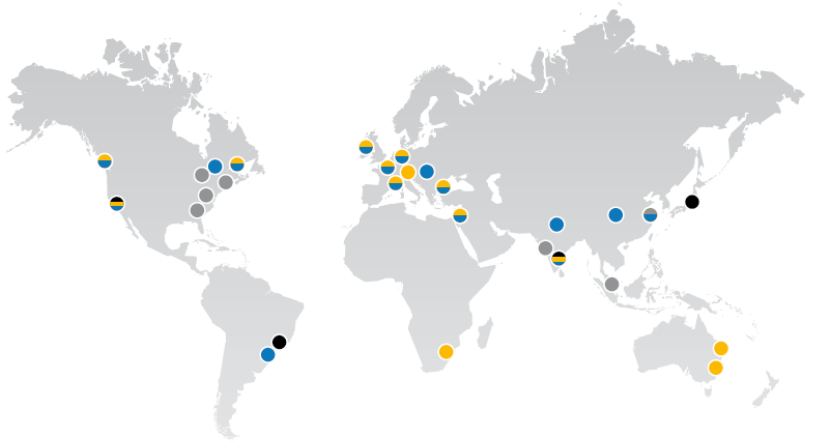
Portfolio of Software and Services

Core Competencies

Business Process	Business Analytics	Technology	Services
– Enterprise resource planning (hr, finance and operations) – Supplier relationship management – Product lifecycle management – Supply chain management – Customer relationship management – Collaboration – Industry specific applications	– Business intelligence – Enterprise information management – Enterprise performance management – Governance, risk, and compliance – Sustainability	– Application foundation – Database – Integration/orchestration – Mobility platform	– Implementation consulting – Business analytics consulting – Transformational consulting – Custom development – Support and maintenance – Program management and quality assurance – Education and training

Solution Categories

The Global Research & Development Network



Development Center

- **Bangalore & Gurgaon** INDIA
- **Budapest** HUNGARY
- **Dublin** IRELAND
- **Montreal & Toronto** CANADA
- **Markdorf** GERMANY
- **Palo Alto** USA
- **Paris** FRANCE
- **Ra'anana** ISRAEL
- **São Leopoldo** BRAZIL
- **Shanghai & Chengdu** CHINA
- **Sofia** BULGARIA
- **Sophia Antipolis** FRANCE
- **Vancouver** CANADA
- **Walldorf & St. Leon-Rot** GERMANY

SAP Research Locations

- **Bangalore** INDIA
- **Belfast** UNITED KINGDOM
- **Brisbane** AUSTRALIA
- **Darmstadt** GERMANY
- **Dresden** GERMANY
- **Dublin** IRELAND
- **Karlsruhe** GERMANY
- **Montréal** CANADA
- **Palo Alto** USA
- **Paris** FRANCE
- **Pretoria** SOUTH AFRICA
- **Ra'anana** ISRAEL
- **Sofia** BULGARIA
- **Sophia Antipolis** FRANCE
- **St. Gallen** SWITZERLAND
- **Sydney** AUSTRALIA
- **Vancouver** CANADA
- **Walldorf** GERMANY
- **Zurich** SWITZERLAND

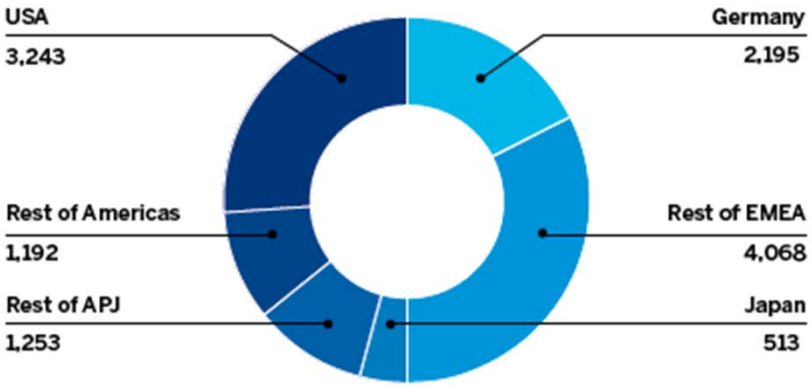
Co-Innovation Labs

- **Bangalore** INDIA
- **Palo Alto** USA
- **Sao Paulo** BRAZIL
- **Tokyo** JAPAN

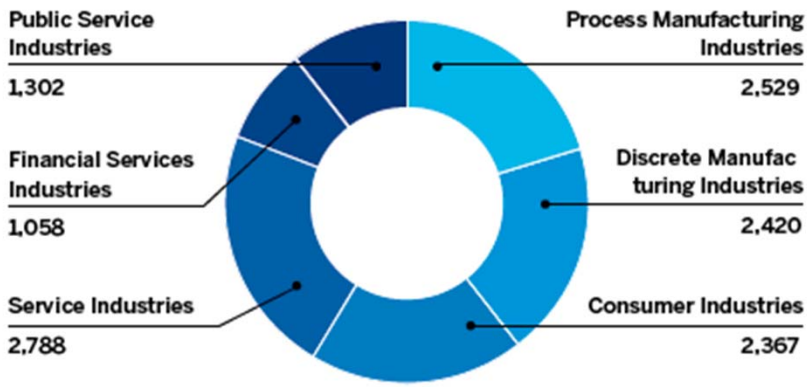
Sybase Research and Development Locations

- **Alpharette** USA
- **Concord** USA
- **Dublin** USA
- **Pune** INDIA
- **Reston** USA
- **Shanghai** CHINA
- **Singapore** SINGAPORE
- **Waterloo** CANADA

Revenue by Region



Revenue by Industry



(€ millions)

2010 Annual Report

Ok, so SAP did well in 2010. What about 2011?

Best ever year

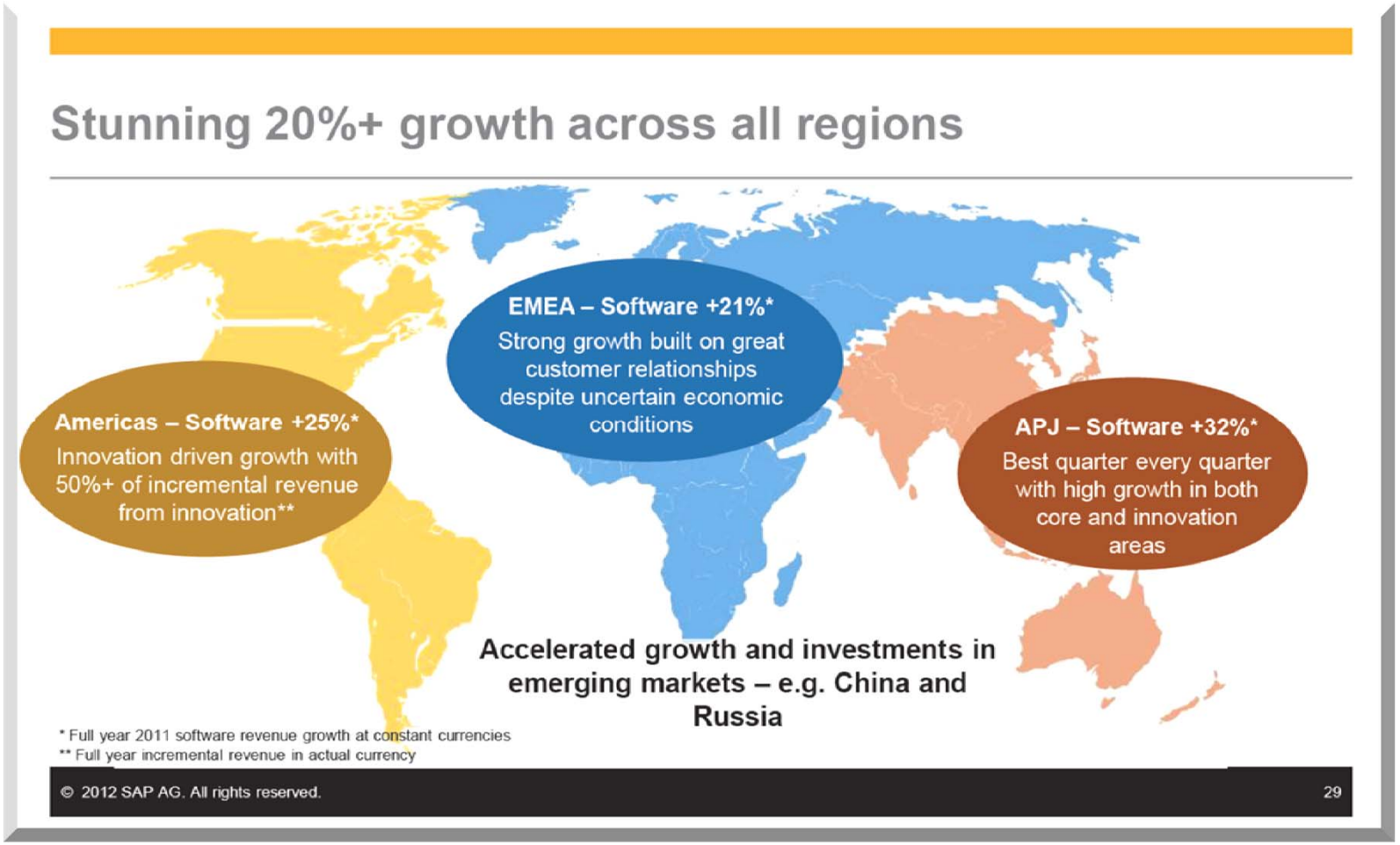
Software Revenue	SSRS Revenue	Operating Margin
+25%*	+17%*	+110bps*

- Best year in SAP's 40 year history driven by our successful innovation strategy
- Q4 was the largest quarter ever
- 8th consecutive quarter of double digit SSRS growth
- Significant momentum resulting in separation from competition
- Outperformed company guidance and market expectations

* Full year 2011 numbers, based on non-IFRS, at constant currencies

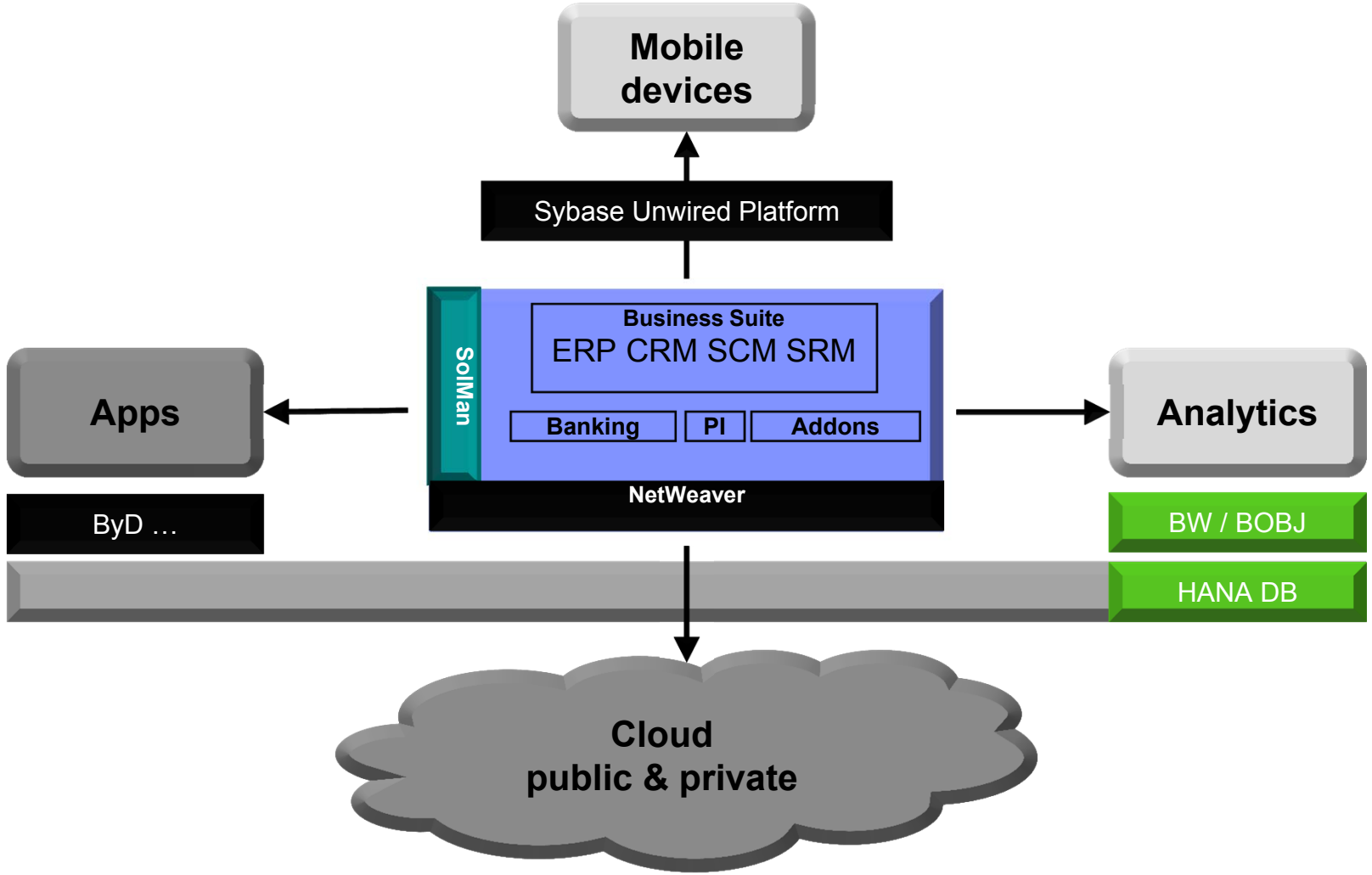
 28

In 2011, SAP beat their 2010 performance



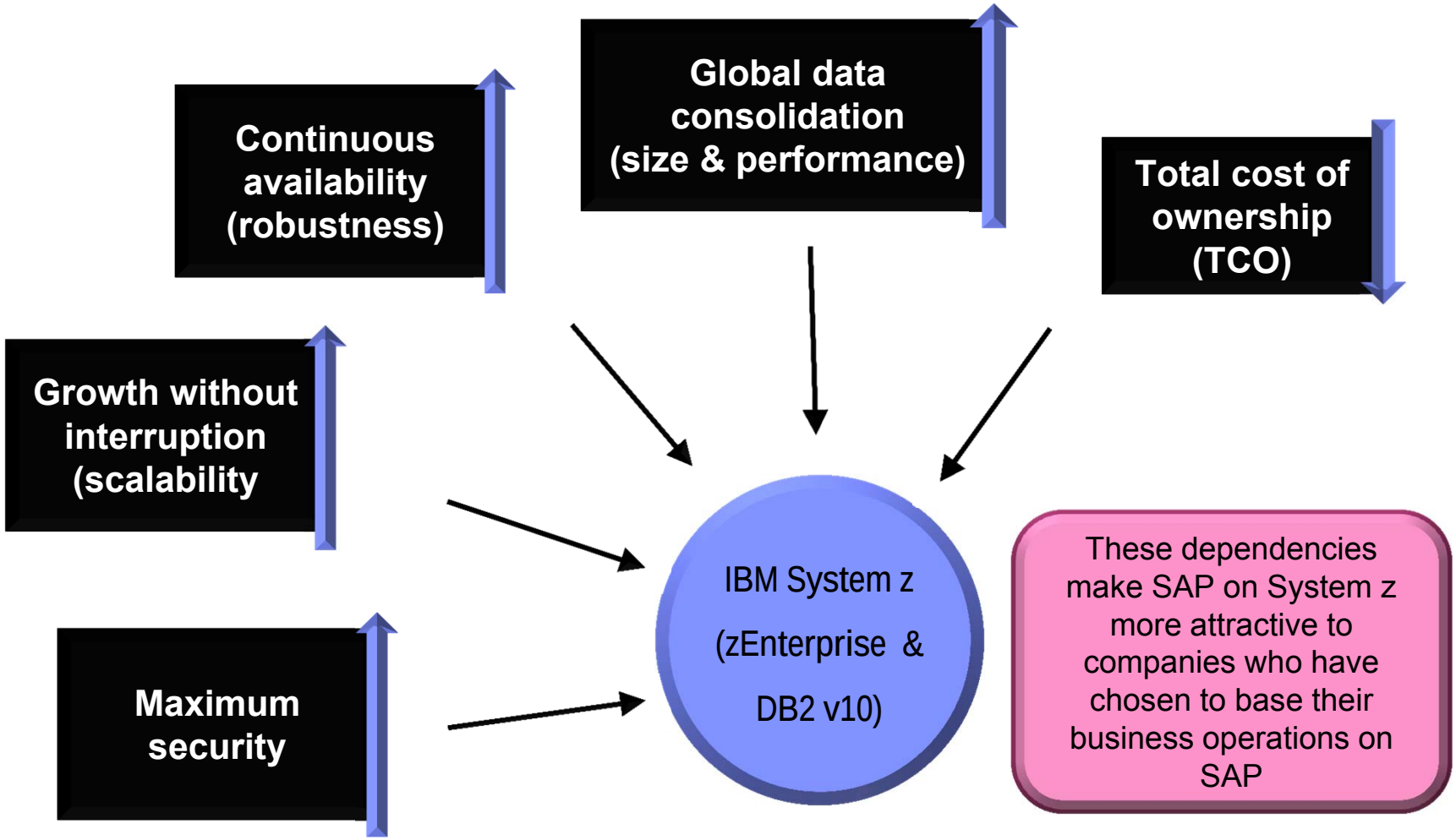
SAP Strategy in a Nutshell

Add More Value to the Core



Requirements to SAP Core

A Perfect Match with IBM System z Capabilities



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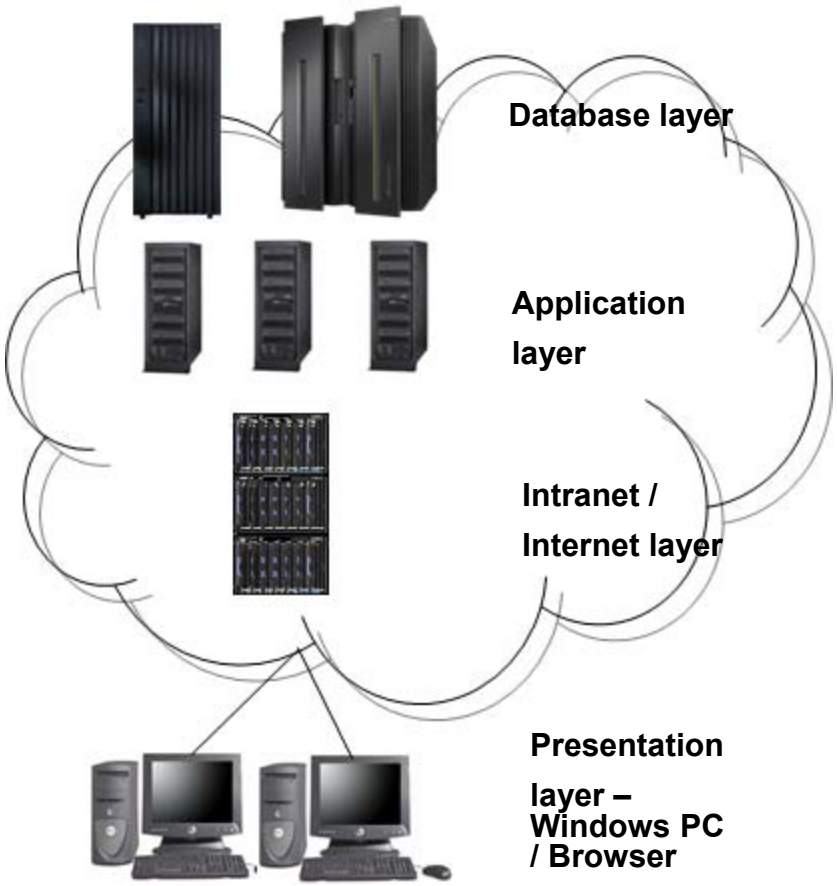
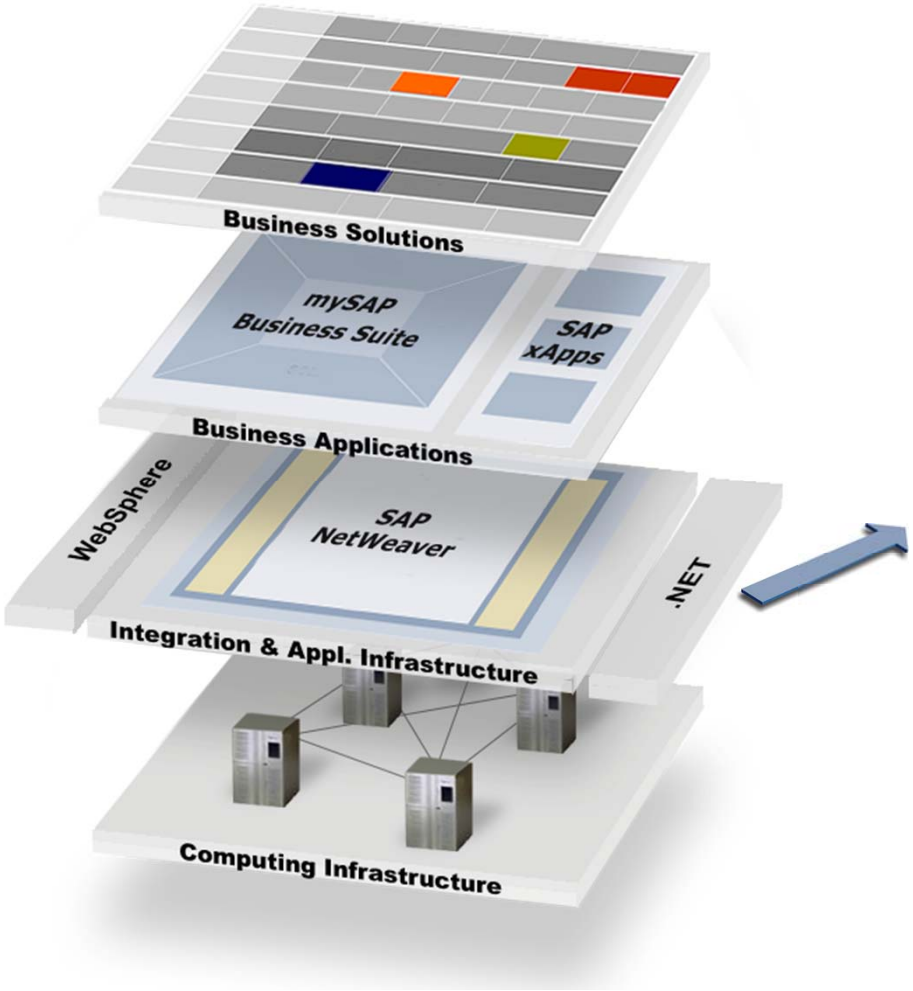
SAP Solution Overview

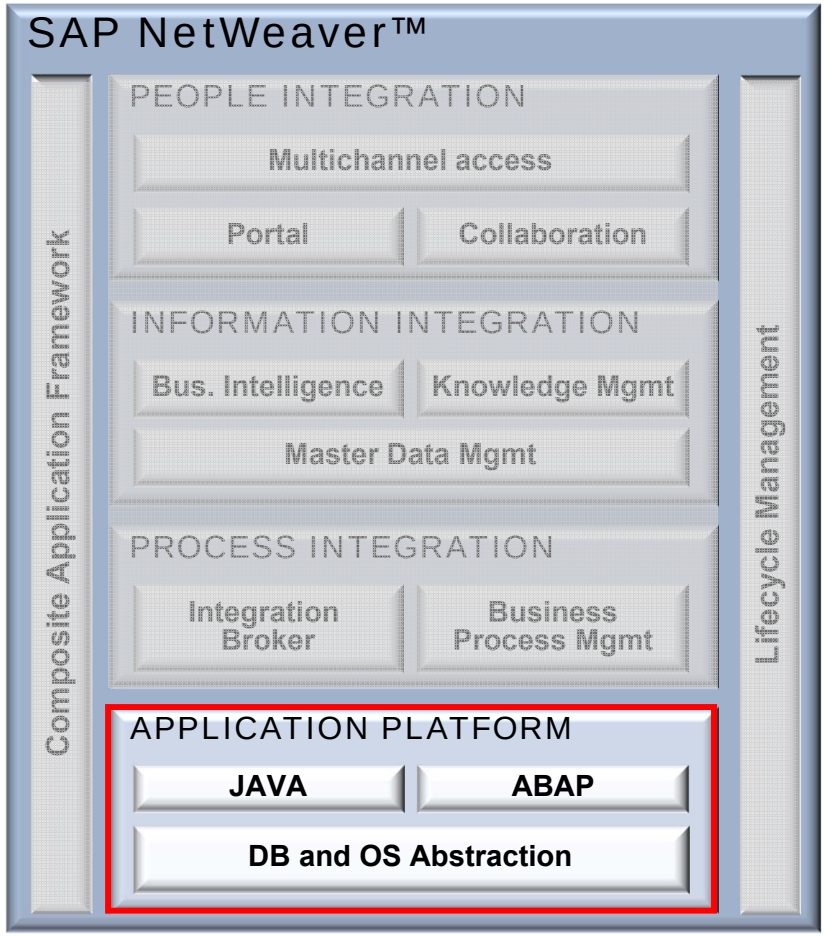
High Level Architecture

- SAP's applications run on the Application Layer servers.
- SAP's application code and user data are on the Database Layer servers.
- End users run GUI/Browser software on their Presentation Layer workstations.
- Users often access the SAP application servers via the Intranet/Internet Layer servers.
- Storage devices (DASD/Disk) are present on all layers, but the most sophisticated are on the database servers.



SAP Architecture



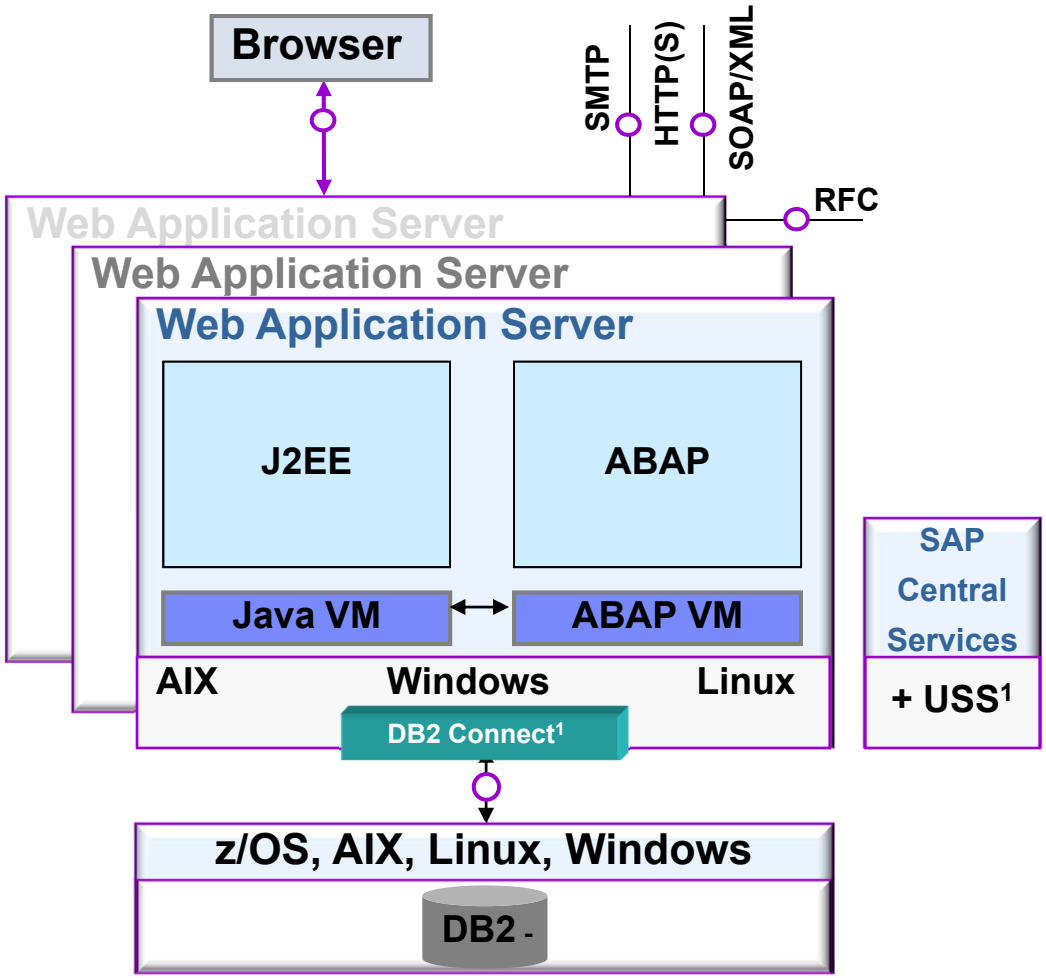


IBM's implementation flexibility

Application Server platforms for SAP

SAP Central Services platforms for SAP

Database Server platforms for SAP



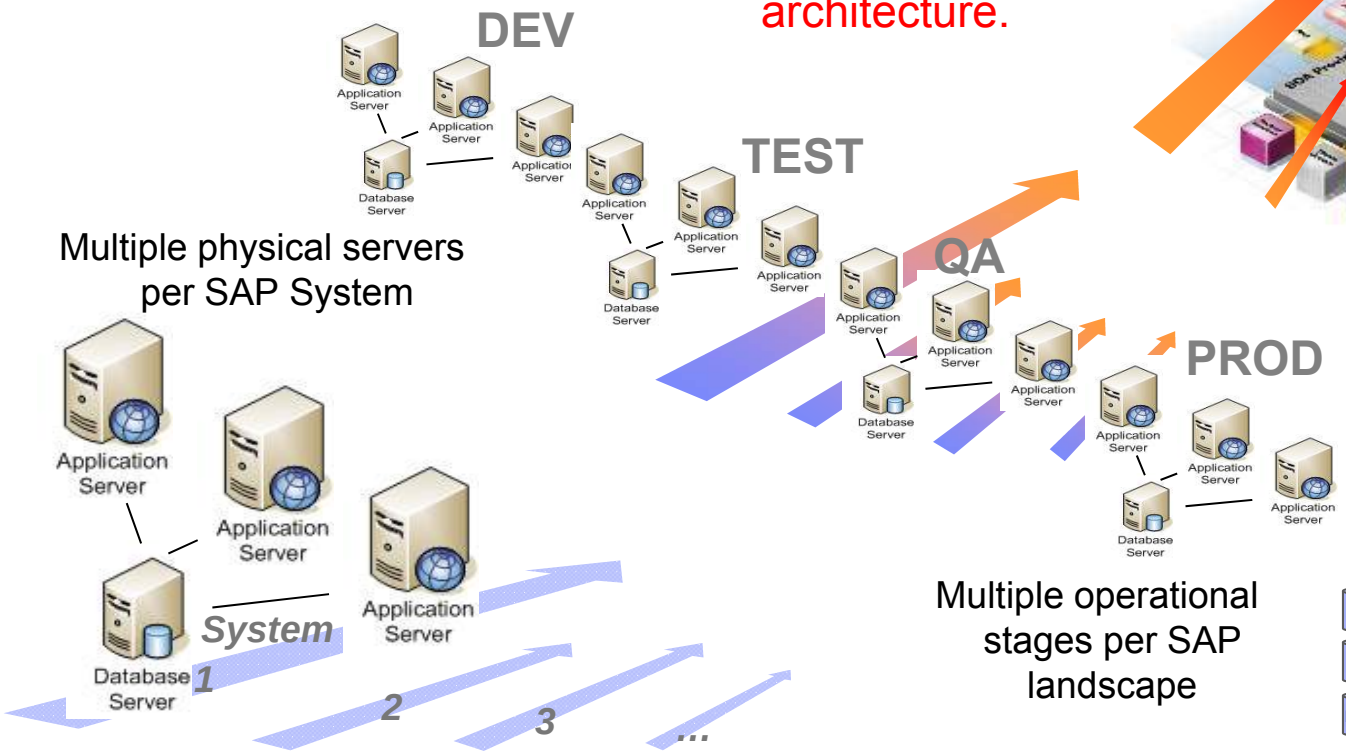
[1]For z/OS as the database

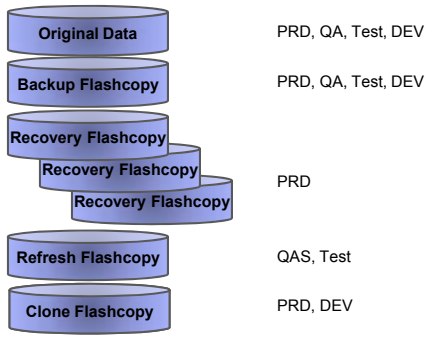
SAP System Landscape Complexity

Multi-tier, multi-platform heterogeneous architecture

One size DOES NOT fit all.
SAP demands a "best fit" architecture.

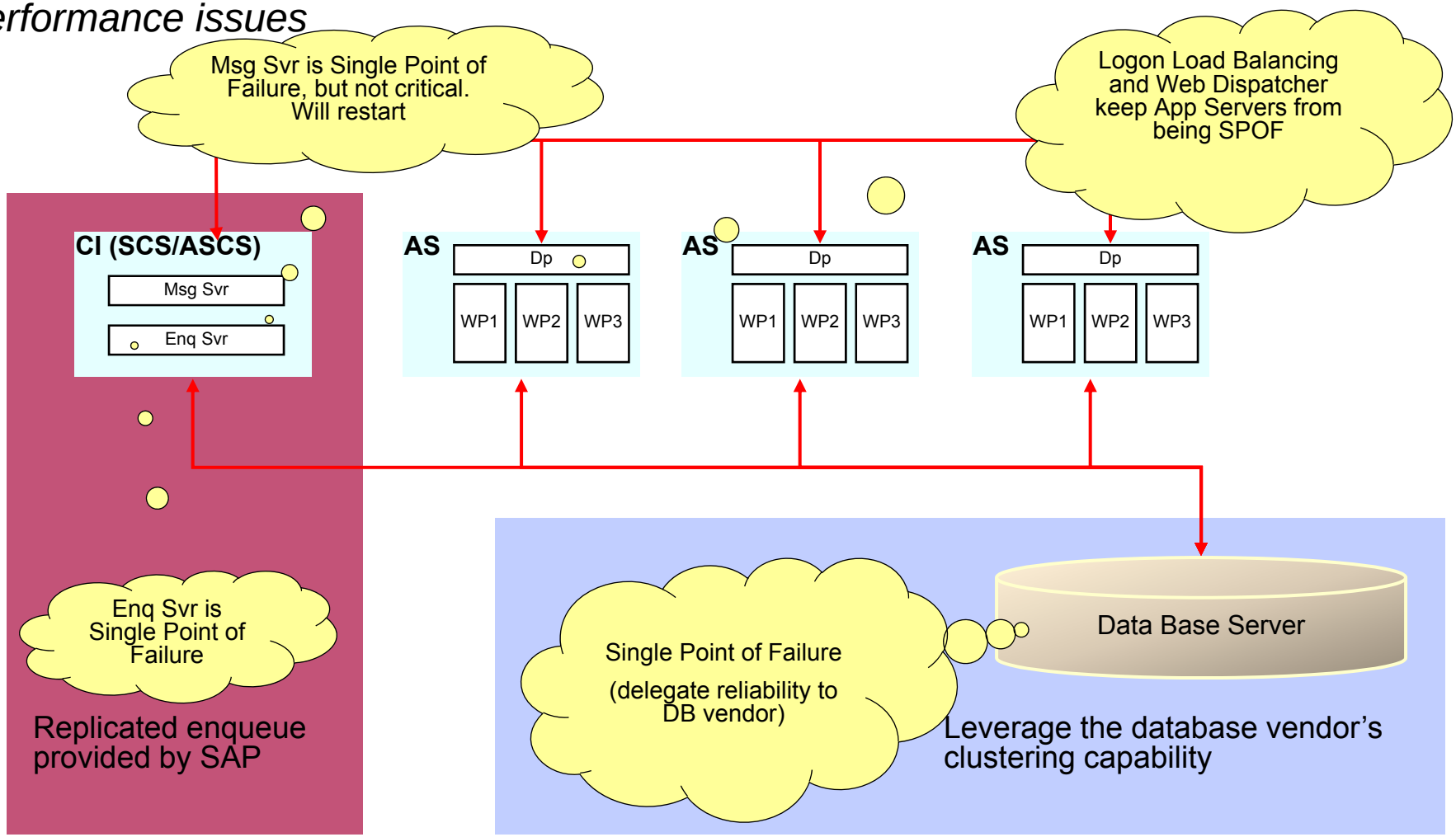
Multiple system landscapes per SAP product implemented





Single Points of Failure in an SAP System

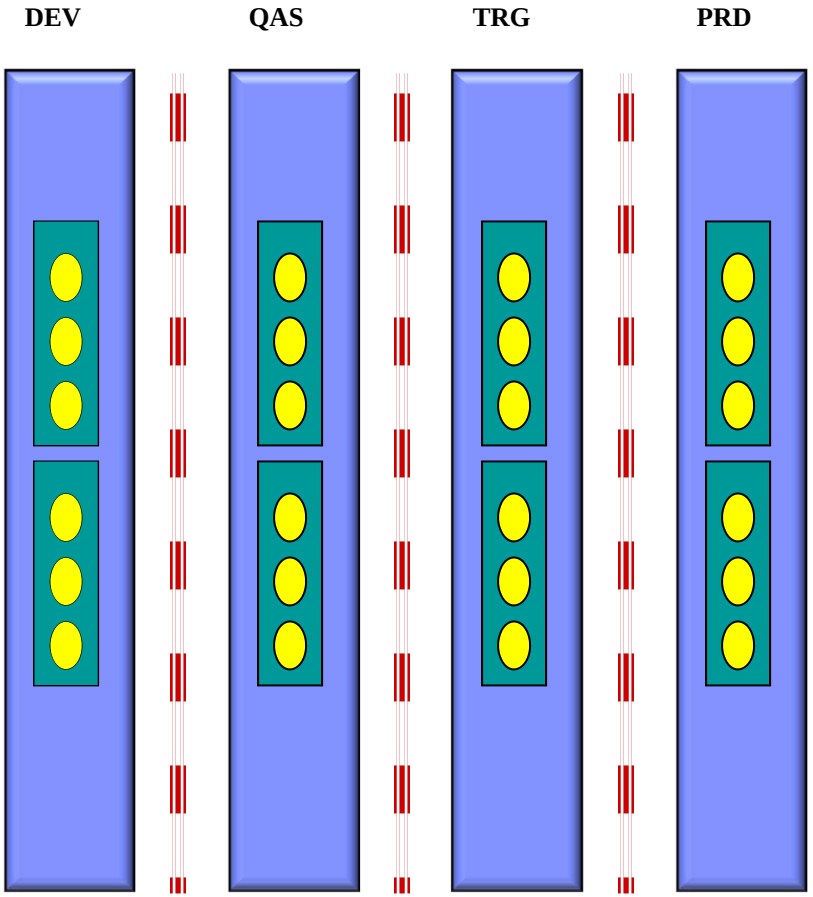
Affects planned and unplanned outage avoidance plus denial of service due to performance issues



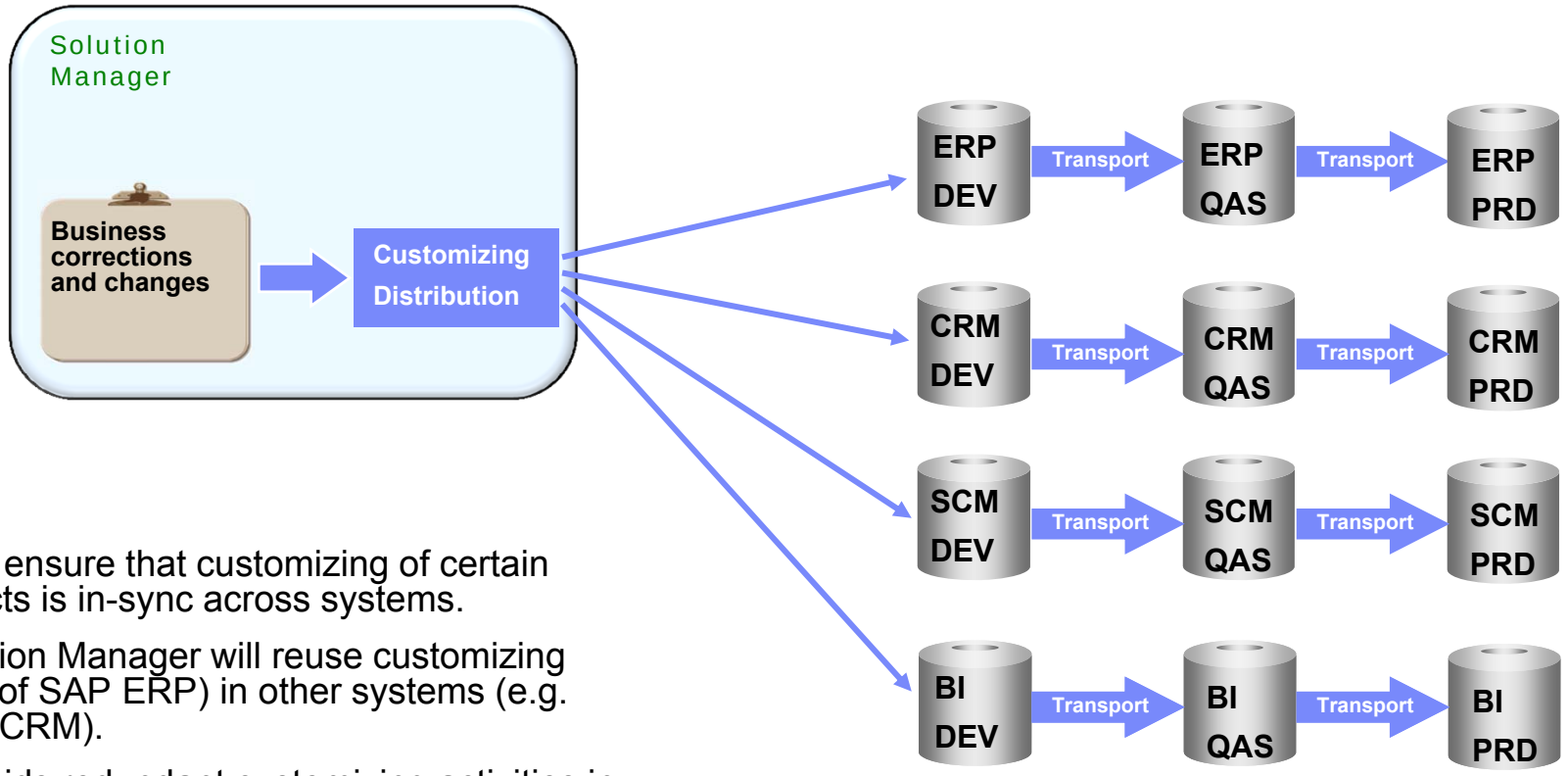
Only 20% of typical SAP infrastructure is a SPOF

Promote to Production Approval and Transport Process

- Project Lead opens request in master.
- Developers create tasks in request.
- Project Lead approves and closes requests.
- Test Manager approves import and Basis moves requests to QAS.
- After testing Training Manager approves import and Basis moves requests to TRG.
- Production Owner approves requests for import then Basis moves requests to PRD.



Technical Change Management ensures the integrity of changes across the landscape

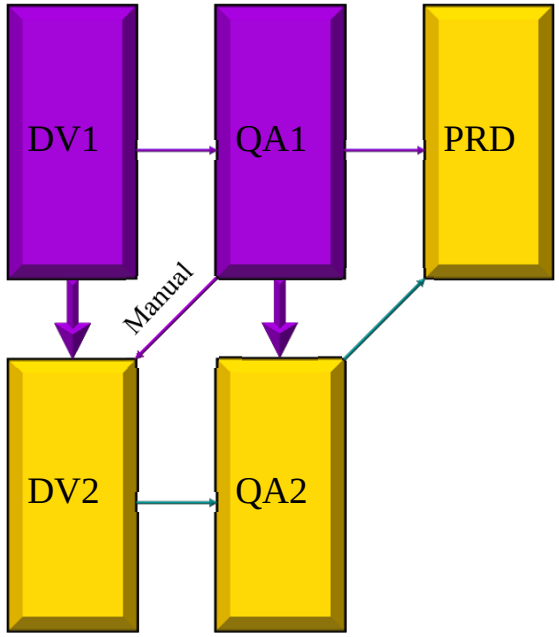


- Must ensure that customizing of certain objects is in-sync across systems.
- Solution Manager will reuse customizing (e.g. of SAP ERP) in other systems (e.g. SAP CRM).
- It avoids redundant customizing activities in a solution landscape.

Multi-development phases

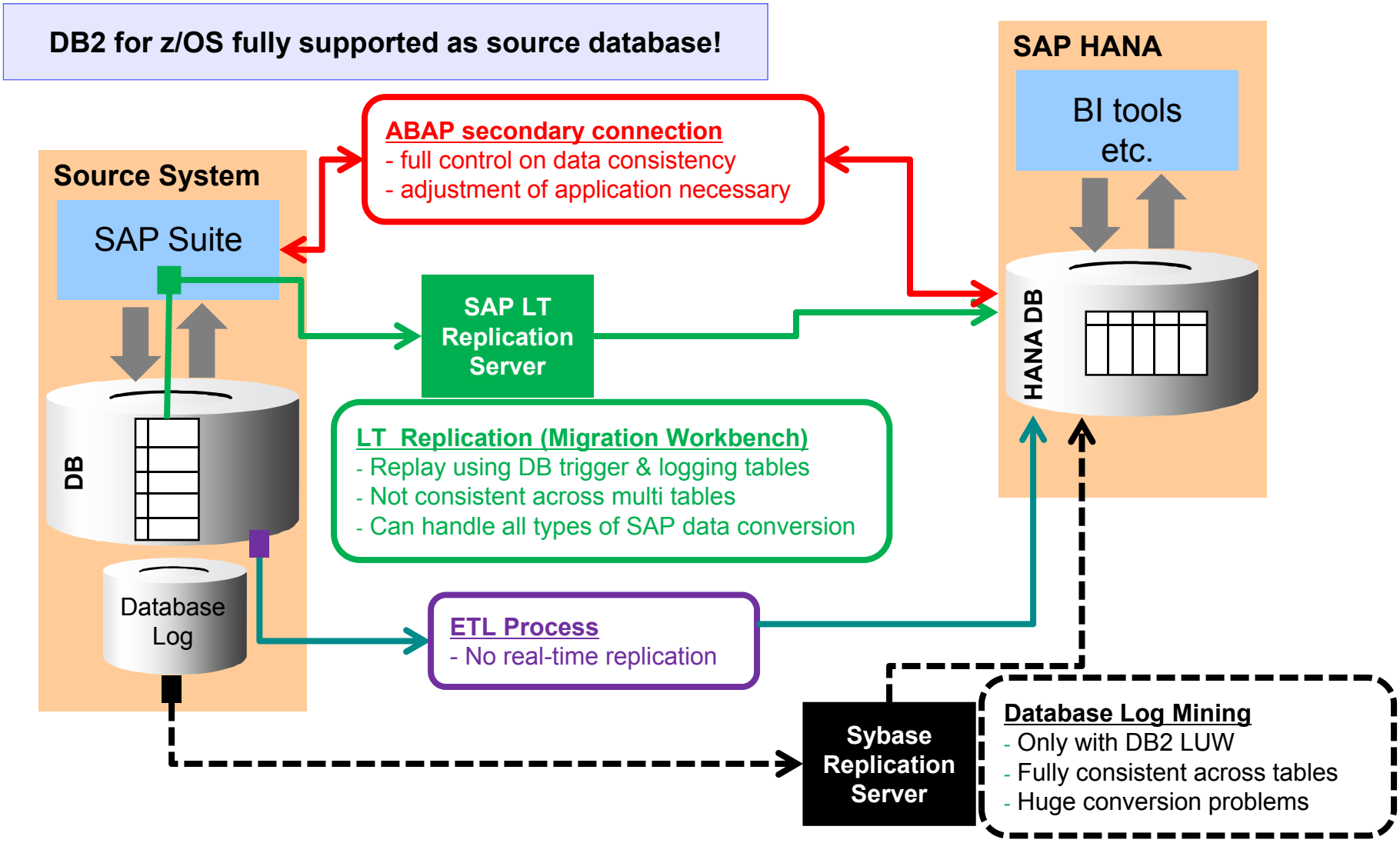
Promote to Production (PTP)

- Phase 1 PTP path
- Phase 2 instance copies – retain SIDs
- Phase 2 development
- Phase 2 PTP path, Phase 1 continues with maintenance
- Phase 2 golive
- Final PTP path for phases 1 and 2



SAP HANA

Replication Mechanisms



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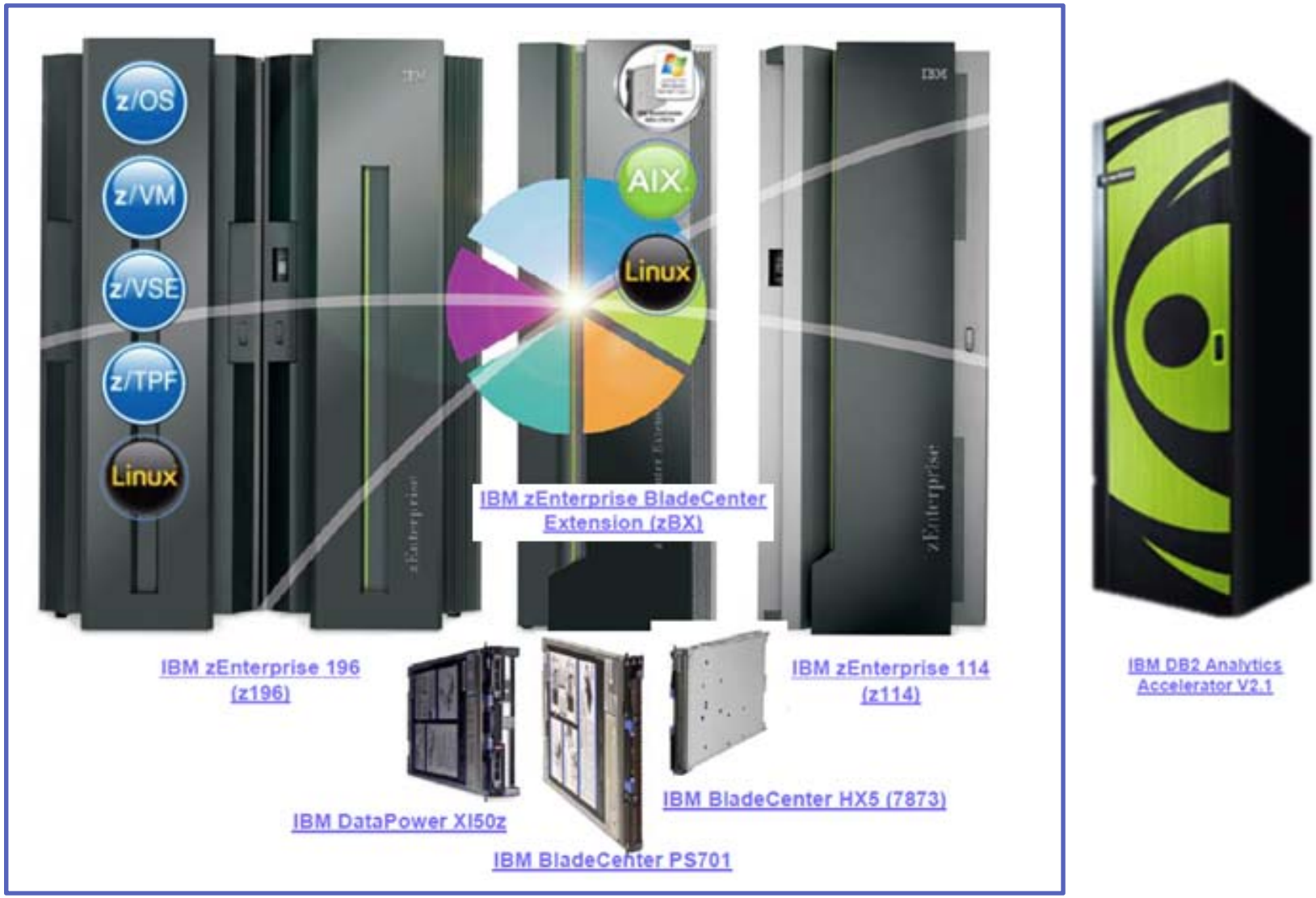
System z family:



Technology Evolution with Mainframe Specialty Engines

IBM System z Integrated Information Processor (zIIP) 2006

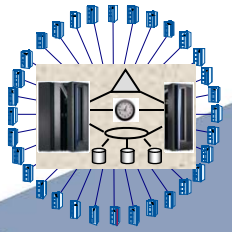
Incorporating Java into existing mainframe solutions

IBM System z Application Assist Processor (zAAP) 2004

Designed to help improve resource optimization for eligible data workloads within the enterprise

Integrated Facility for Linux® (IFL) 2001

Support for zVM and zLinux workloads and open standards

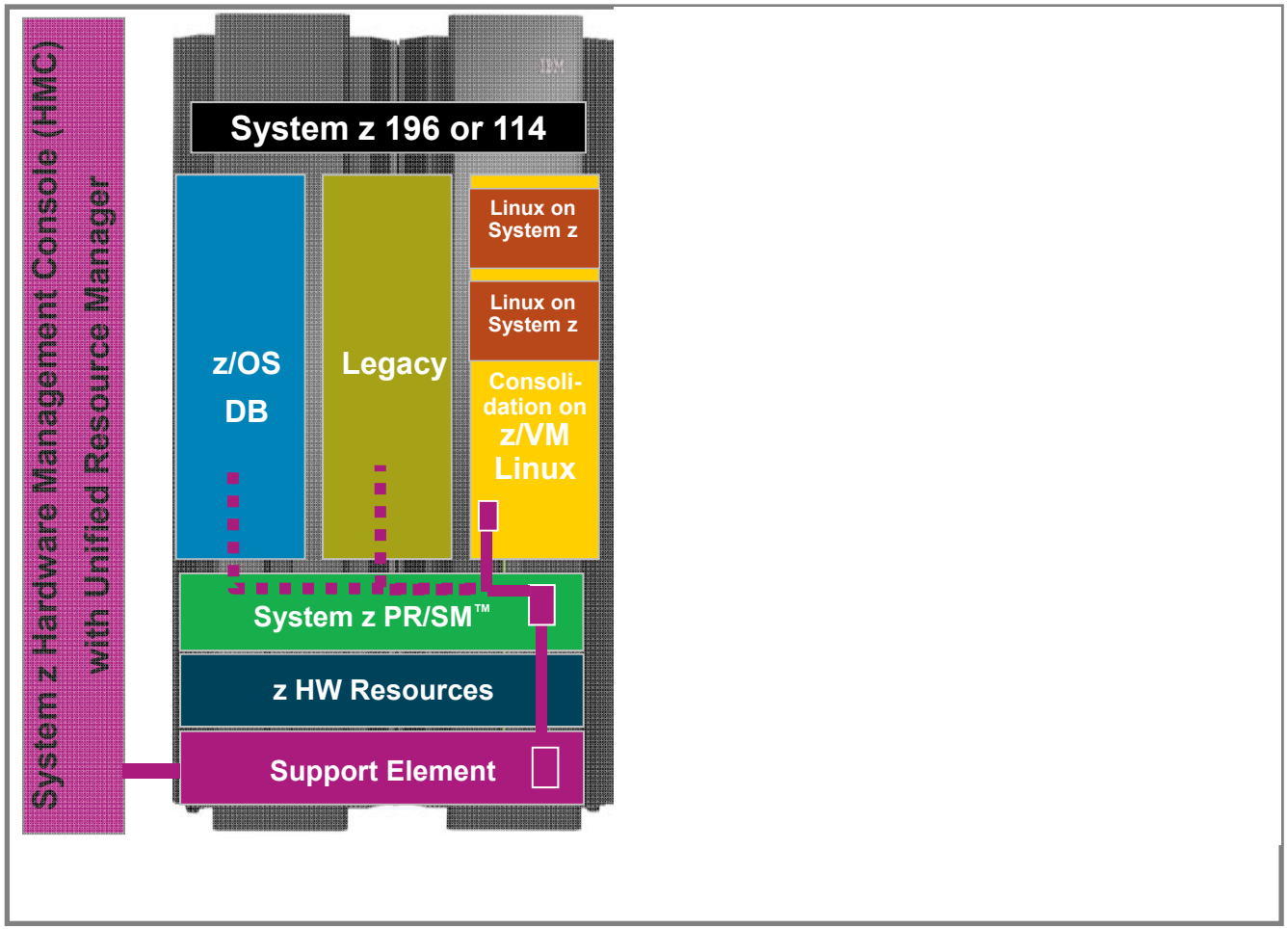


Internal Coupling Facility (ICF) 1997

Centralized data sharing across mainframes

A look inside the IBM zEnterprise System

A new dimension in application architecture: Unified resource management of zEnterprise LPARs for database, legacy, and z/VM consolidation of distributed workloads



DB2 for z/OS Optimized for SAP

DB2 V5	DB2 V6	DB2 V7
- Dynamic Statements Cache - Statement Level Perf Indicators - 255-char Columns as Short Strings - Update of Partitioning Key Column - Alter Table to Extend Column Length - Data Sharing Scalability Improvements - Rename Table - ASCII Tables - Reduce Impact of DBD Locks - Improve Recover Performance - Read Stability - Keep Update Locks - DDL Concurrency: Create Objects - New Client Correlation Identifiers - Table/Index Growth Monitor - Streamline UPDATEs/DELETEs	- Index Access on Small Tables - Snowflake Scheme Join - Unlimited Number of Tables in Join - Defer Dataset Creation - Switching off Logging - Local Predicates in Join ON Clause - Accounting Class 3 Enhancements - Non-JCL API to DB2 Utilities - 8K and 16K Page Tablespaces - COPY Utility Consistent Backup - DB2 Logging Bottleneck Relief - Table Self-Reference on Mass Insert - Index Access 'IN non-corr subquery' - Triggers, UDFs, UDTs - Suspend Log Write Activity - Log Shortage Avoidance - Changing Partitioning Key Ranges - DDL Concurrency: Drop Database	- Lockout Diagnostics - Deadlocks at Insert - FETCH FIRST n ROWS ONLY - Online REORG Switch Phase - Report IRLM Start Parameters - Evaluate uncommitted - Option on Timeouts for Utilities - Retained Locks Concern - Simplify Monitoring VS Usage - Row Level Locking for Catalog - Statement Id for Cached Stmts - Real-time Statistics - Preformatting - Business Warehouse Joins

DB2 for z/OS Optimized for SAP

DB2 V8

- VS Constraints / - Unicode
- Automate BackupRecovery
- 64bit DB2 Connect for zLinux
- Multiple DISTINCT Clauses
- Lock Contention on SAP Cluster Tables
- Fast Retrieval of Most Recent Value
- Create Deferred Index Enhancement
- Provide DSTATS Functionality
- Convert Column Type
- Altering CLUSTER Option
- Adding Columns to Index
- Index-only Access Path for VARC
- Changing Number of Partitions
- Partitioning Nonclustering Ke
- ...

V8 includes 53 features explicitly requested by SAP

DB2 9

- Optimistic locking
- Modify early code without requiring an IPL
- APPEND option for inserts
- Relief for sequential key insert
- LOB performance and scalability
- Utilities CPU reduction
- Faster restart of data sharing
- CLONE Table: fast replacement of one table with another
- Renaming column, index, and schema
- Table space that can add partitions, as needed for growth
- Improve ability to create an index onli
- Online reorganization with no
- Parallel unload and reload d
- ...

V9 includes > 40 features for SAP

DB2 10

- Full 64-bit runtime support
- Reducing internal latch contention
- Workfile spanned records, PBG support
- in-memory enhancements
- Auto-stats
- Default SAP settings for DB2
- Access path stability and hints enhancements
- Hash access path
- Parallel index update at insert
- Numerous optimizer enhancements
- Query parallelism enhancements: lifting restrictions
- More granular DBA privileges
- More online schema changes for table spaces, tables and indexes via online REORG
- Automatically delete CF structures before/during first DB2 restart
- Allow non-NULL default values for inline LOBs
- Loading and unloading tables with LOBs
- Full Decimal Floating Point support
- 'Last committed' locking semantics
- Easier SQL paging through resul
- Online REORG for LOB
- Online add log
- …

Dominated by >40 features for SAP

A clear definition of availability is important to ensure users have access to business critical applications

HA: High availability

- Unplanned outage avoidance
- On distributed this is a hardware statement
- On System z we include OS and DB
- Sometimes equated to MTBF

CO: Continuous Operations

- Planned outage avoidance
- No maintenance windows
- A hardware, database and applications statement
- Systems, network, users

CA: Continuous availability

- No application downtime
- User accessible
- Hardware, software, network, etc

HA + CO = CA

Maintenance	Repartitioning	Reorgs	Runstats	Backups
Backups	Reindexing	Repartitioning	Reorgs	Runstats
Runstats	Maintenance	Failure	Repartitioning	Reorgs
Upgrades	Backups	Maintenance	Reindexing	Repartitioning
Reorgs	Runstats	Backups	Maintenance	Reindexing

Parallel Sysplex with DB2 Data Sharing:

Unmatched Continuous Availability

- Unplanned outages are handled with robust failover mechanisms
- Managing planned outages with controlled failovers
- Rolling z/OS maintenance and upgrades
- Rolling DB2 software maintenance and upgrades
- Rolling hardware and firmware maintenance and upgrades

Unique in the industry: on-line database reorganization, release upgrades, and maintenance demonstrates the attitude and passion for excellence with which the DB2 product is designed and developed

Guess Who Said This ?

eWEEK (www.eweek.com) 31-Oct-2003:

I make fun of a lot of other databases - all other databases, in fact, except the mainframe version of DB2. It's a first-rate piece of technology.

Larry Ellison, Oracle's Founder and CEO

He Was Right! He Is Right!

http://www.eweek.com/c/a/Database/In-Larrys-Own-Words/2/

Oracle and DB2 LUW on System z are NOT certified by SAP

Yes, Oracle and DB2 LUW do run under Linux for System z …
but, they are not certified under Linux for System z with SAP
and are not planned for certification in the future

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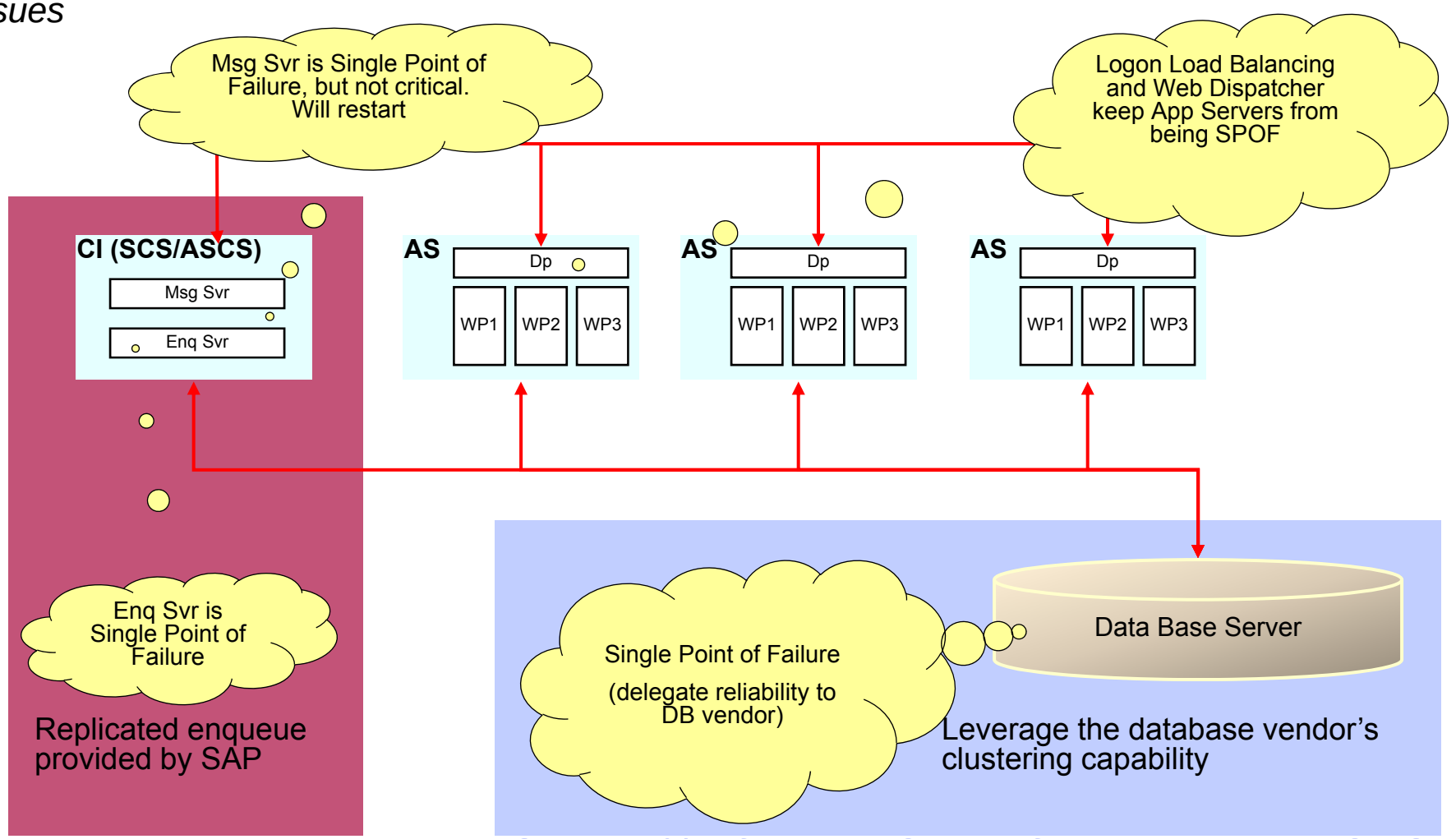
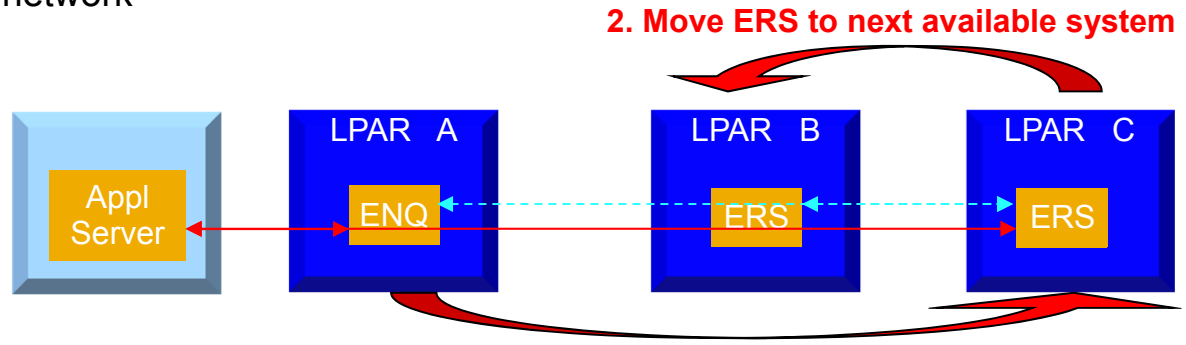


Only 20% of typical SAP infrastructure is a SPOF

SAP Enqueue Server Exploiting Coupling Facility

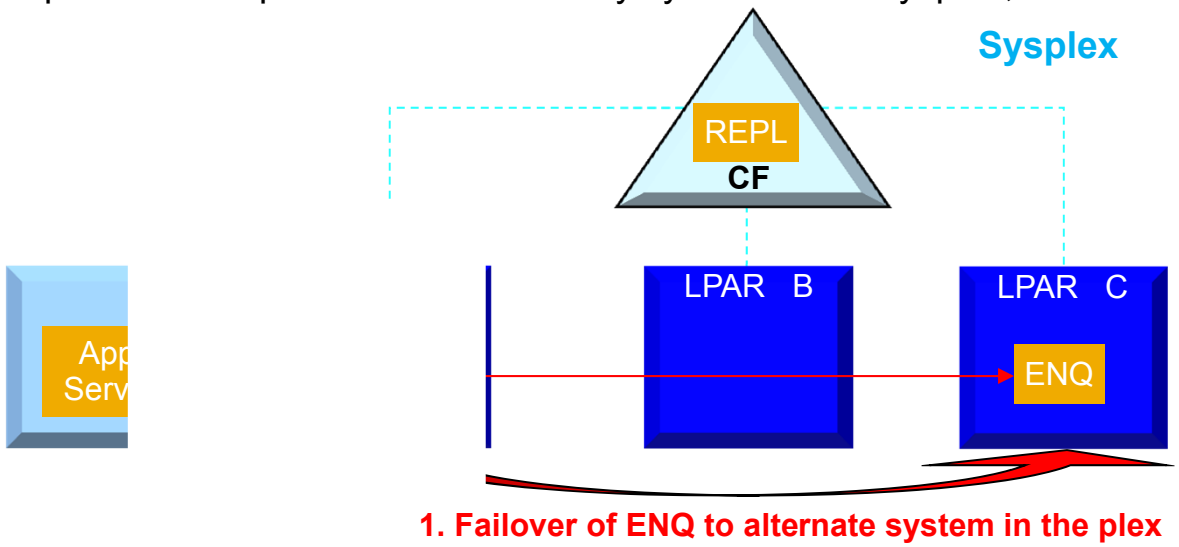
Lab Preview

Today: Complex failover scenario controlled by System Automation; monitoring multiple components plus network



Automation Policy Rules
- ENQ, MSG, VIPA collocated
- ERS starts after ENQ
- ERS is anti-collocated to ENQ
- ENQ collocated to ERS if ERS not offline

Simplified, bullet-proof configuration using Parallel Sysplex capabilities:
Simple restart in place or failover to any system in the Sysplex; data in CF are accessible from any system



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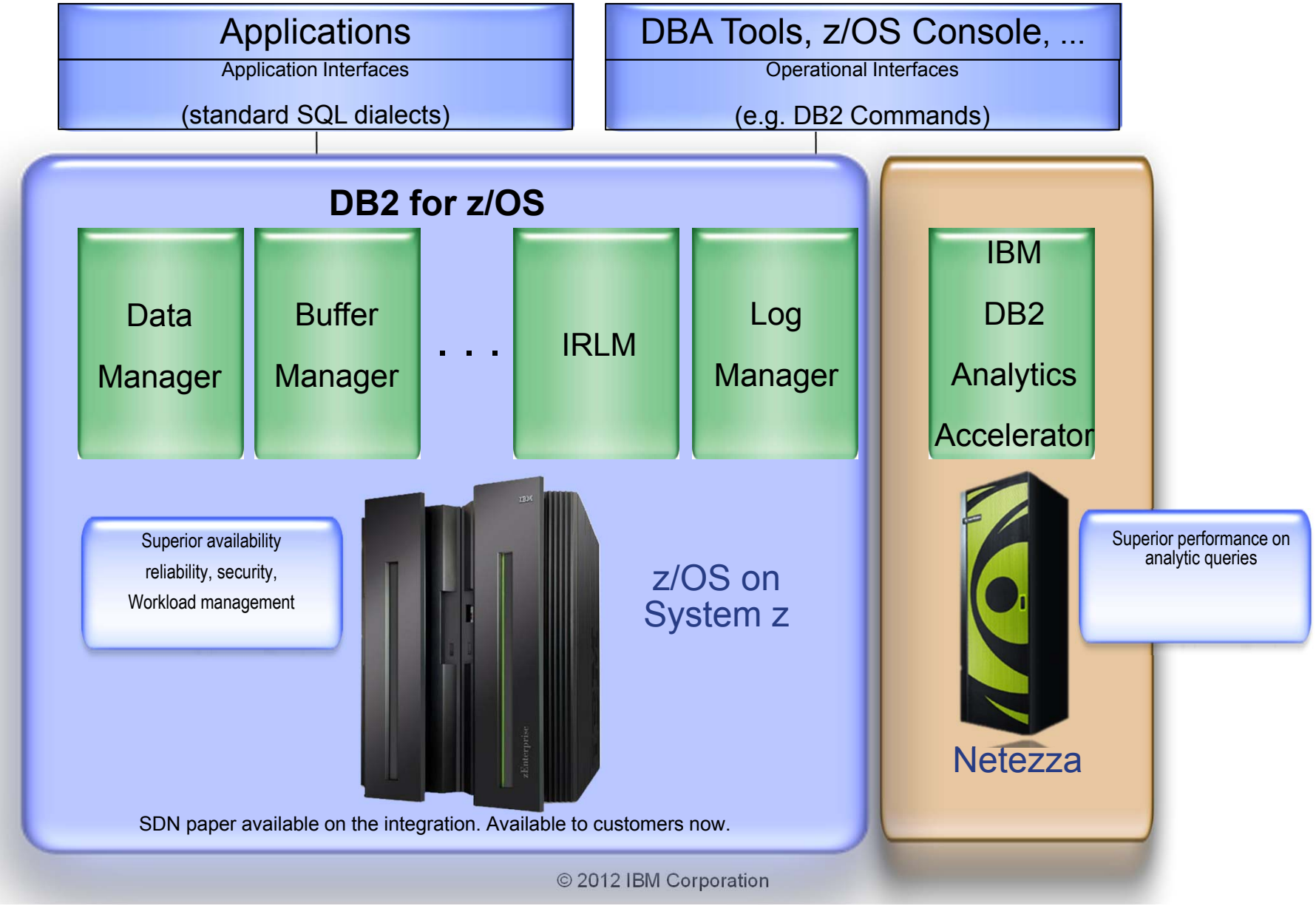
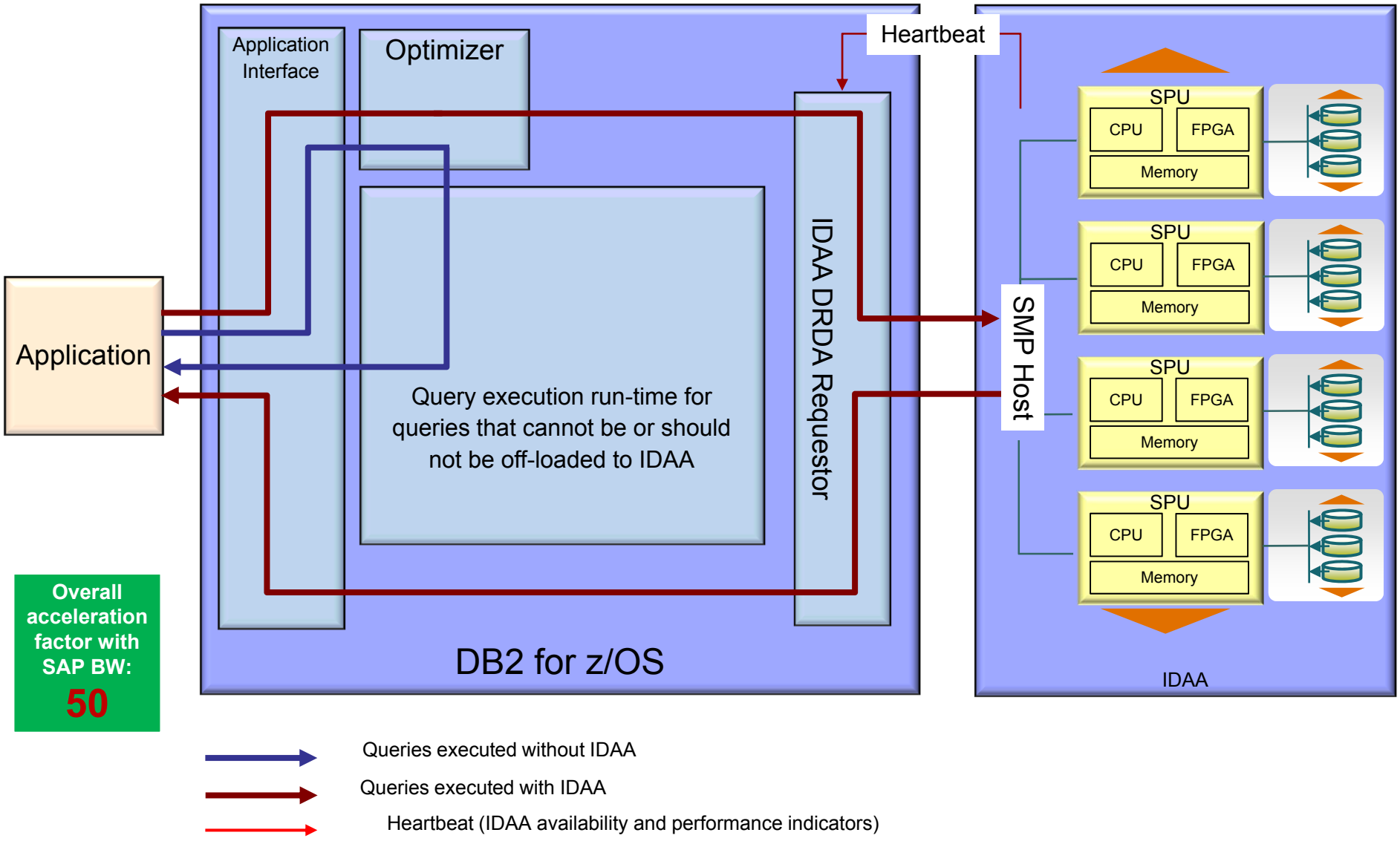
Deep DB2 Integration within zEnterprise

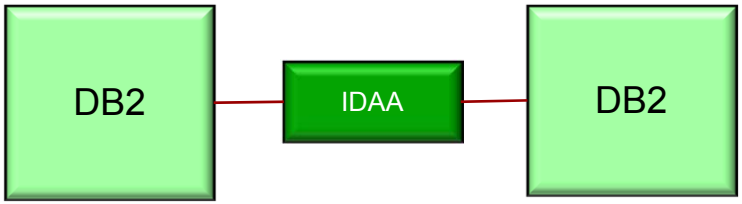


Query Execution Process Flow

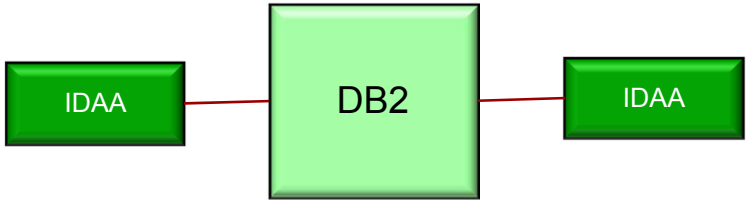


Connectivity Options

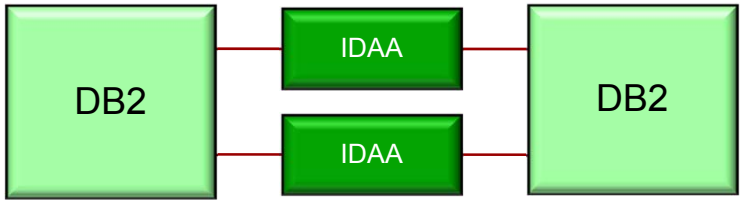
Multiple DB2 systems can connect to a single IDAA



A single DB2 system can connect to multiple IDAAs



Multiple DB2 systems can connect to multiple IDAAs



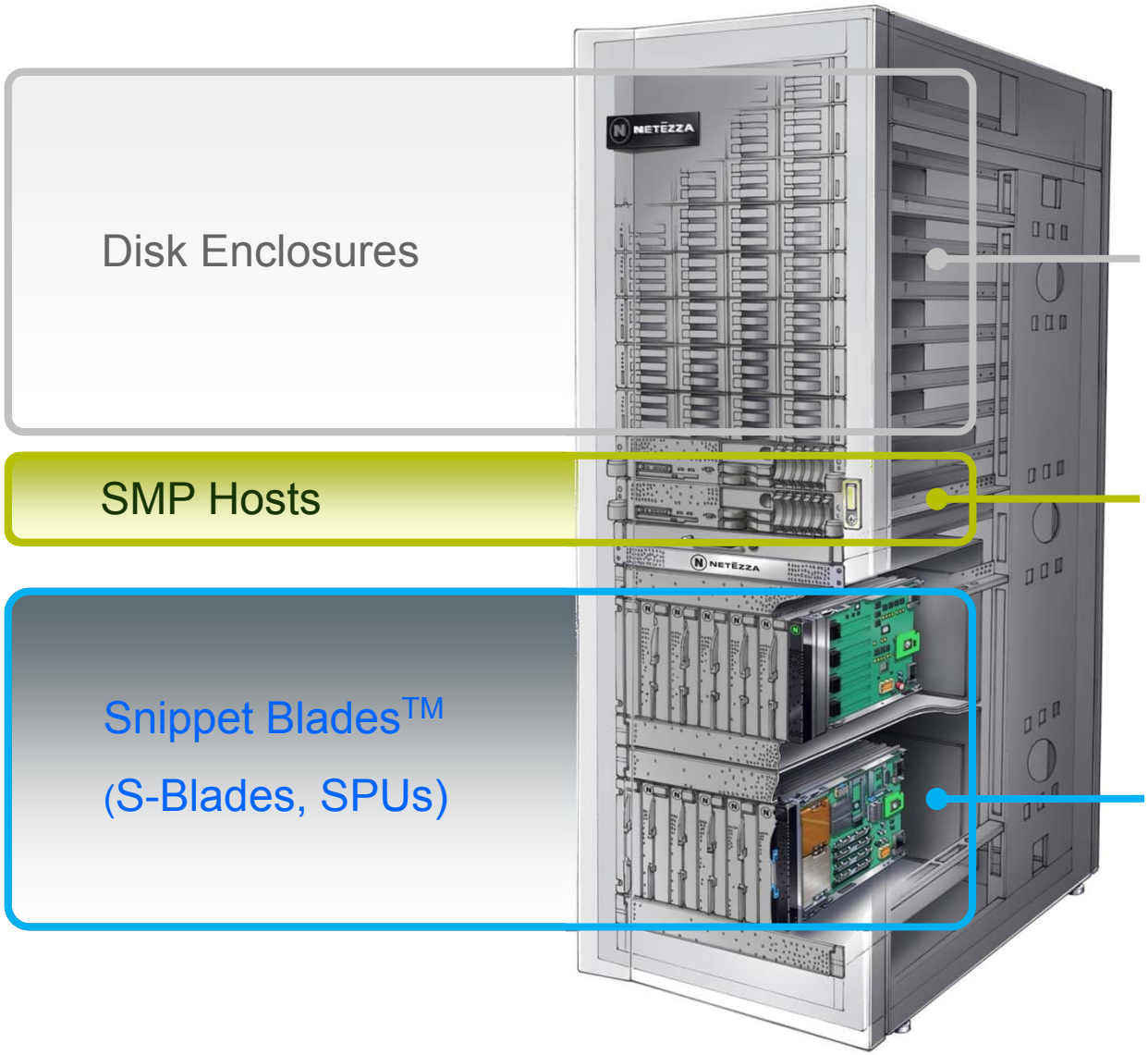
Better utilization of IDAA resources
Scalability
High availability

Full flexibility for DB2 systems:

- residing in the same LPAR
- residing in different LPARs
- residing in different CECs
- being independent (non-data sharing)
- belonging to the same data sharing group
- belonging to different data sharing groups

DB2 Analytics Accelerator V2

Powered by Netezza Twinfin™ Appliance



Slice of User Data

Swap and Mirror partitions

High speed data streaming

High compression rate

EXP3000 JBOD Enclosures

12 x 3.5" 1TB, 7200RPM, SAS (3Gb/s)
max 116MB/s (200-500MB/s compressed data)

e.g. TF12:

8 enclosures ⟶ 96 HDDs

32TB uncompressed user data (⟶ 128TB)

ISAO Server

SQL Compiler, Query Plan, Optimize

Administration

2 front/end hosts, IBM 3650M3

clustered active-passive

2 Nehalem-EP Quad-core 2.4GHz per host

Processor &

streaming DB logic

High-performance database

engine streaming joins,

aggregations, sorts, etc.

e.g. TF12: 12 back/end SPUs

(more details on following charts)

Agenda

- SAP AG and SAP products overview
- SAP technical architecture
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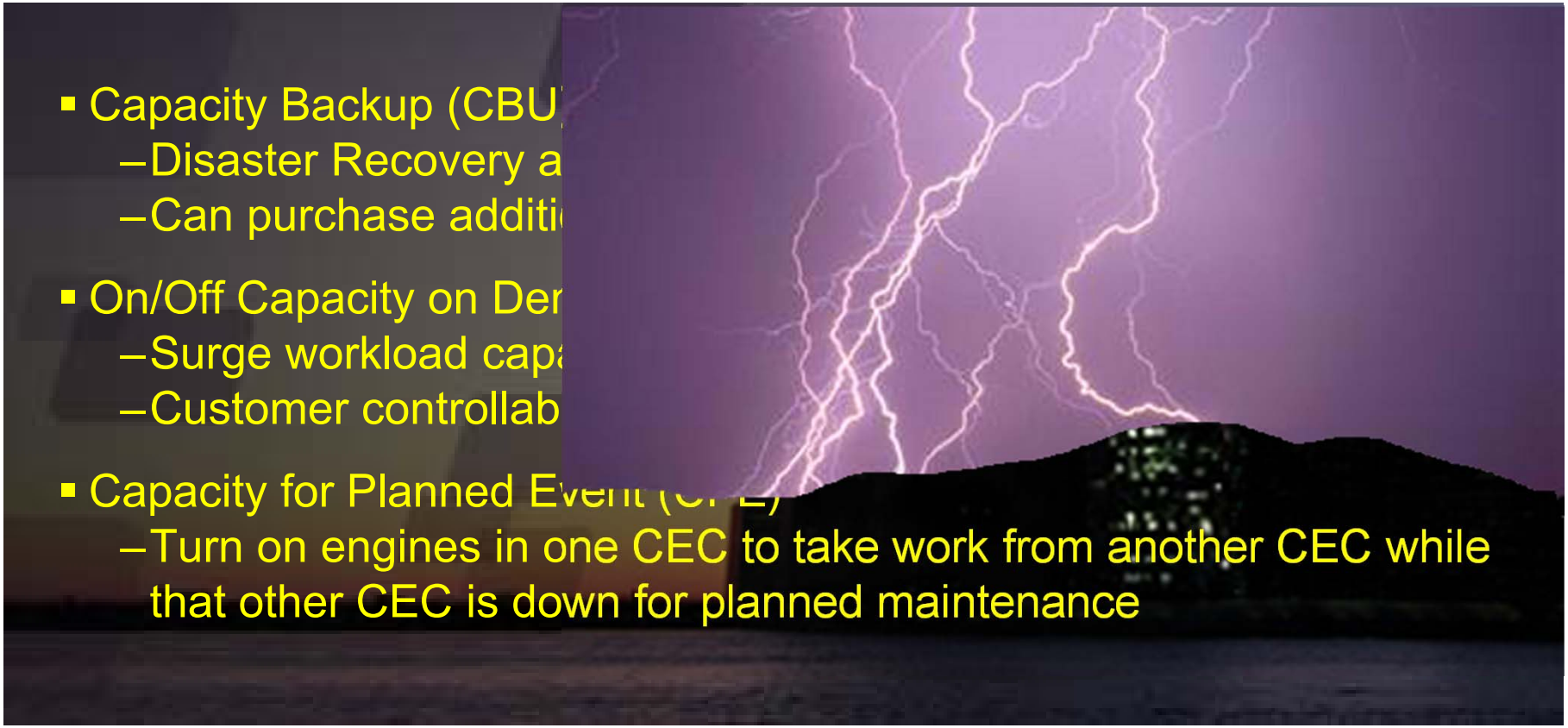
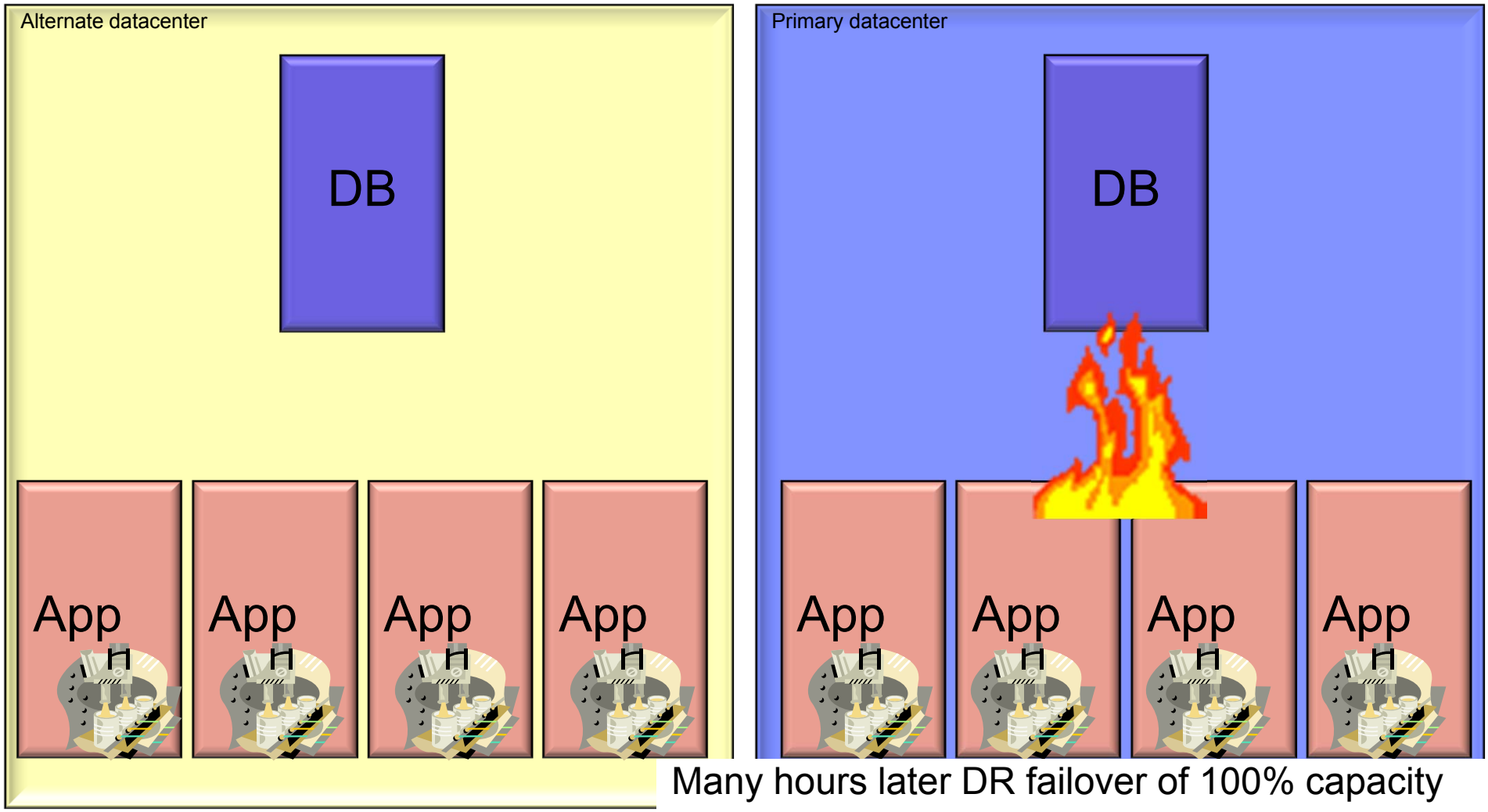
  - IDAA with SAP
  - Disaster Recovery for SAP
  - Application servers for System z database
  - System z compared with distributed for SAP
- Reference Architecture, analyst papers, contacts, and other supporting documentation

System z supports multiple onDemand offerings

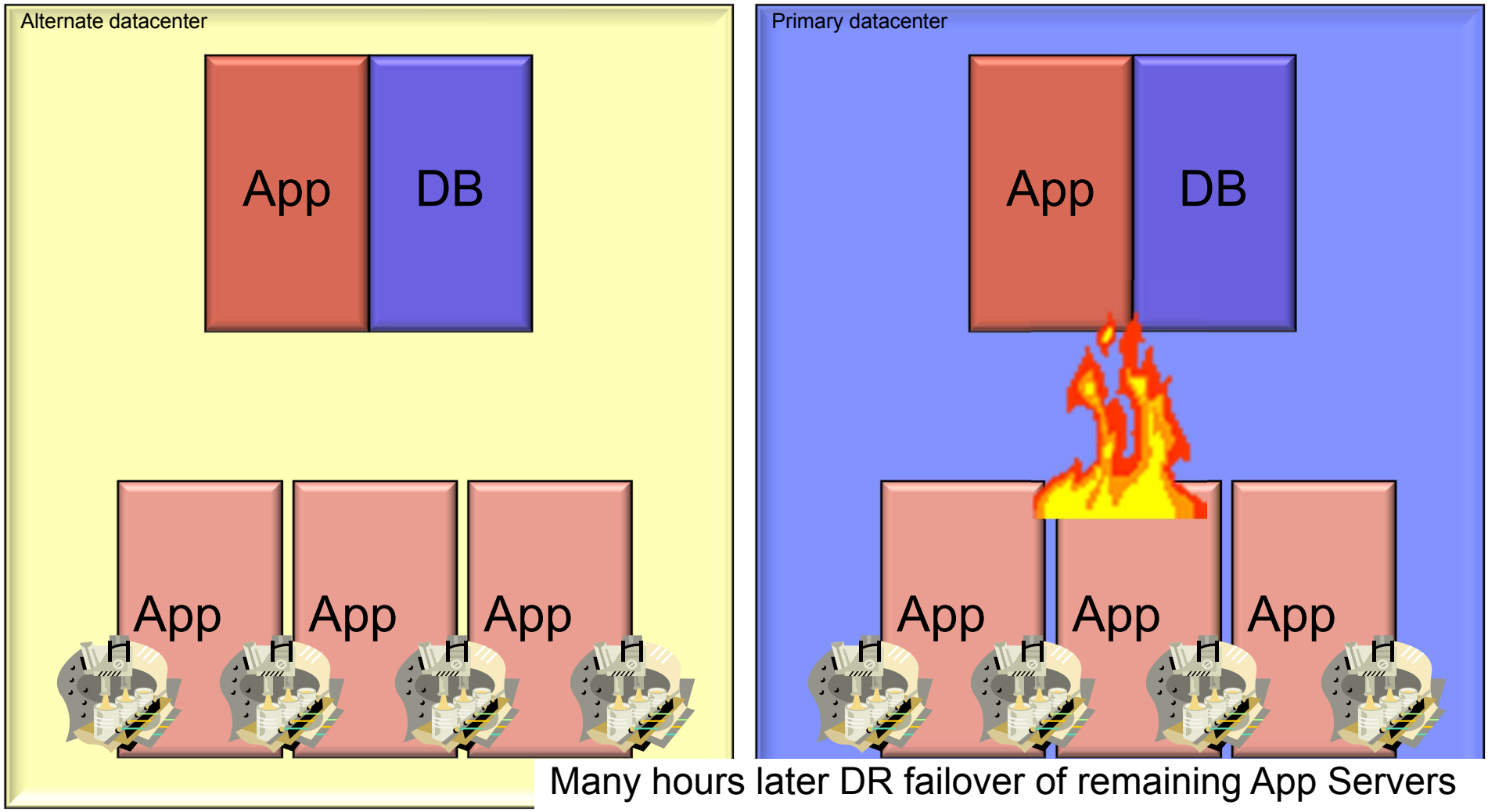


Disaster Recovery is a driver for zLinux use.

Recovery with 100% distributed application servers

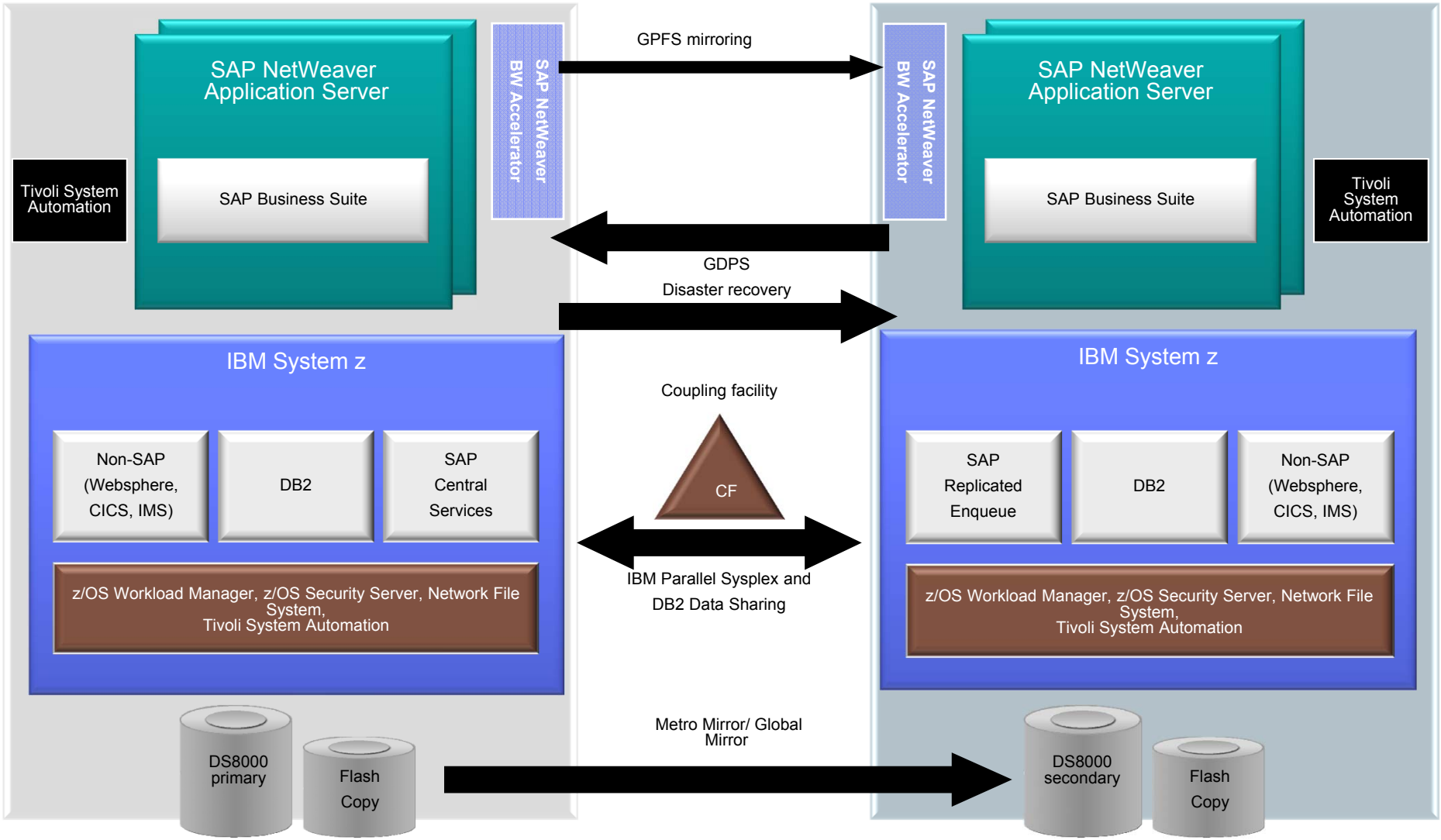


Recovery with 25% zLinux application servers on zLinux



Business Continuity

System Setup for Continuous Availability and Disaster Recovery



Business Continuity

Disaster Recovery Over Unlimited Distance

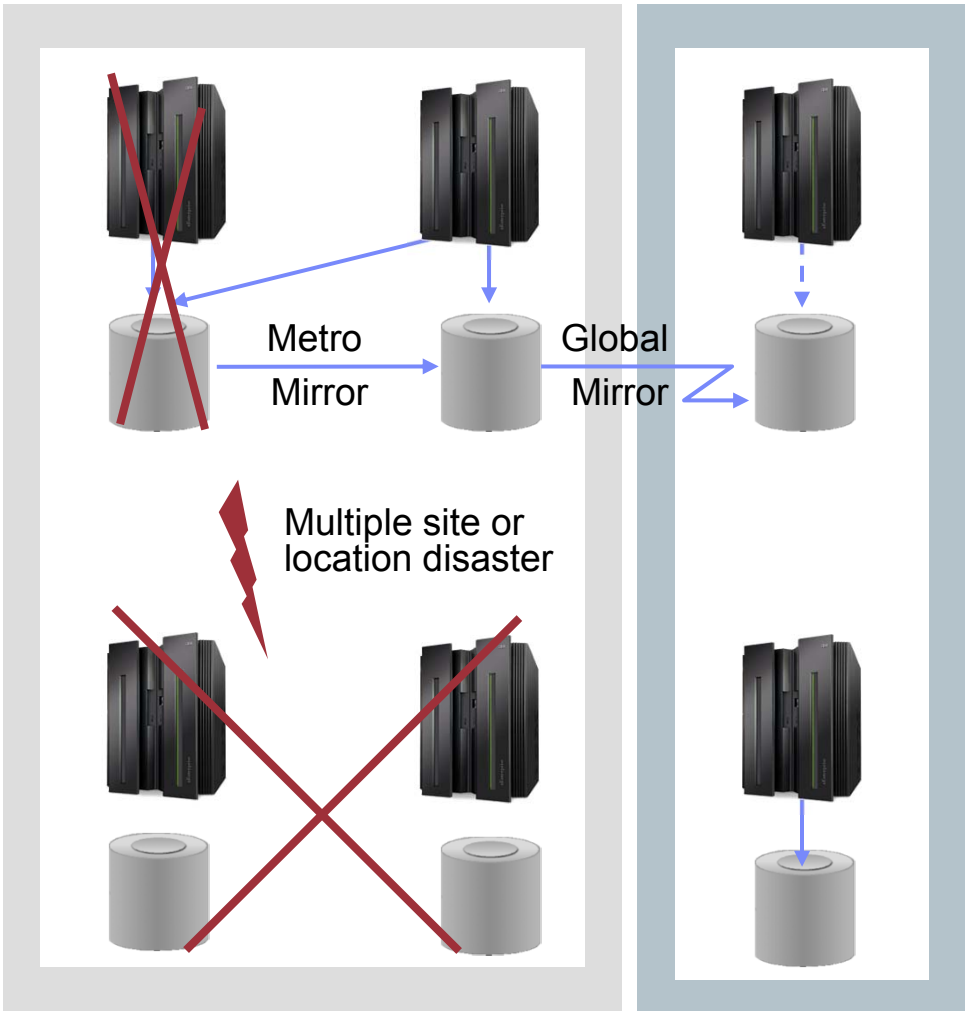
Requirement:

- Mitigate a real disaster with automatic takeover by a global backup site, don't lose any business data.

Technologies: DS8000 Metro/Global Mirror, GDPS

- Extending disaster recovery (DR) approach to three sites
- Three-site Metro/Global Mirror topology
  - o Local synchronous mirror
  - o Remote asynchronous mirror
- Data at remote site is consistent
- GDPS provides all management functionality
  - o Error detection
  - o Freeze operation
  - o Transaction consistency

Continuous availability and global disaster recovery in a three-site topology



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Technology Evolution with Mainframe Specialty Engines

The most efficient and effective consolidation platform

IBM zBX Intel eX5 blade 2011

IBM zBX Power 7 blade 2010

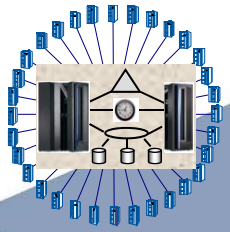
IBM System z Integrated Information Processor (zIIP) 2006

Integration of 16 core/32 thread Intel blades with KVM for Linux and Windows workloads

Integration of 8 core/32 thread Power blades with PowerVM for AIX workloads

IBM System z Application Assist Processor (zAAP) 2004

Designed to help improve resource optimization for eligible data workloads within the enterprise



Integrated Facility for Linux® (IFL) 2001

Incorporating Java into existing mainframe solutions

Internal Coupling Facility (ICF) 1997

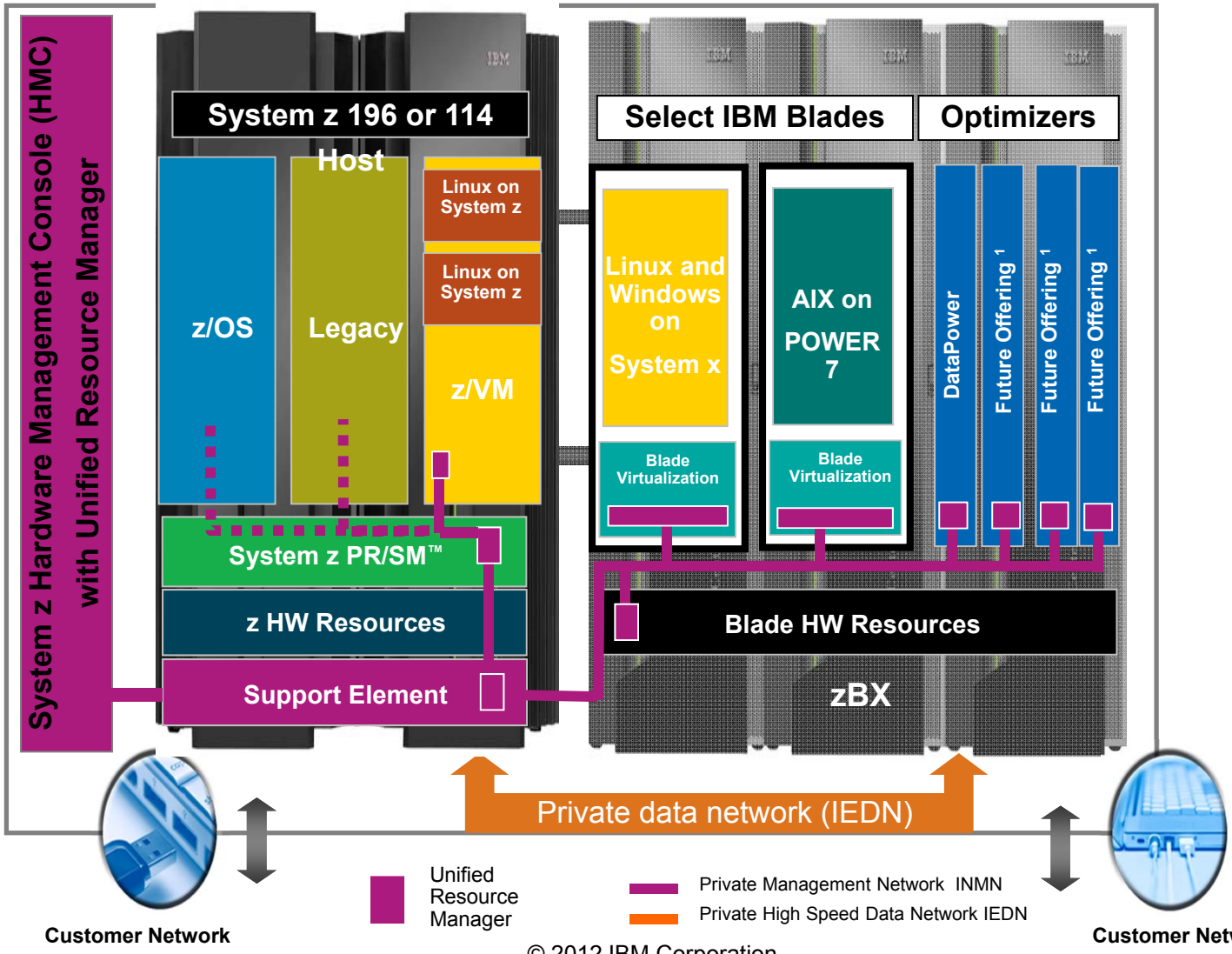
Support for zVM and zLinux workloads and open standards

Centralized data sharing across mainframes

Fully supported by SAP (see SAP Note 1650076 and 1492000)

A look inside the IBM zEnterprise System

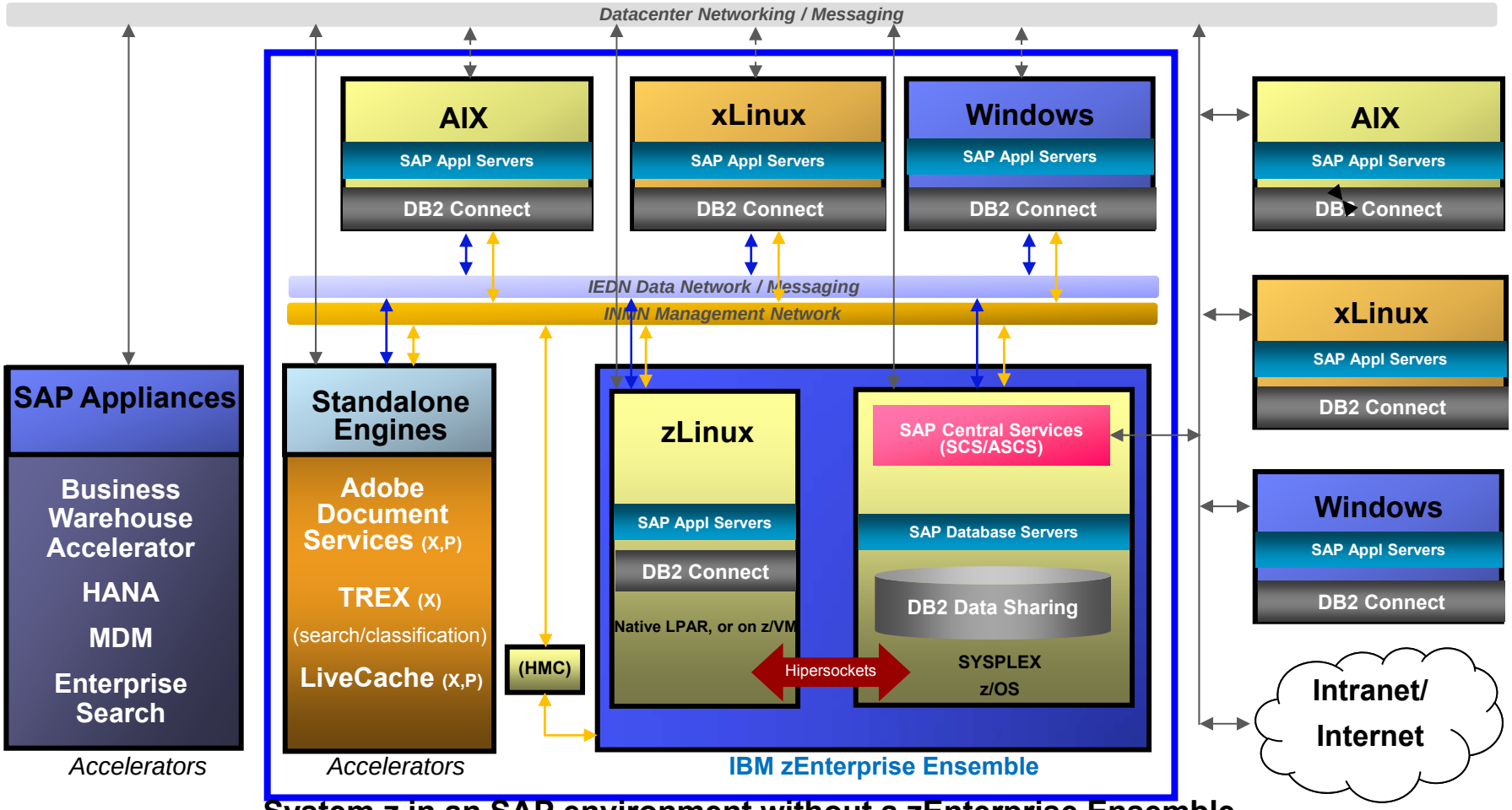
SAP applications on z/VM Linux guests, Power blades, and Intel blades – managed by the Unified Resource Manager.



[1] All statements regarding IBM future direction and intent are subject to change or withdrawal without notice, and represents goals and objectives only.

SAP on System z Solution Architecture of today:

Workloads are inherently heterogeneous



System z in an SAP environment without a zEnterprise Ensemble
zEnterprise covers most of the application server computing requirements for today's SAP customers

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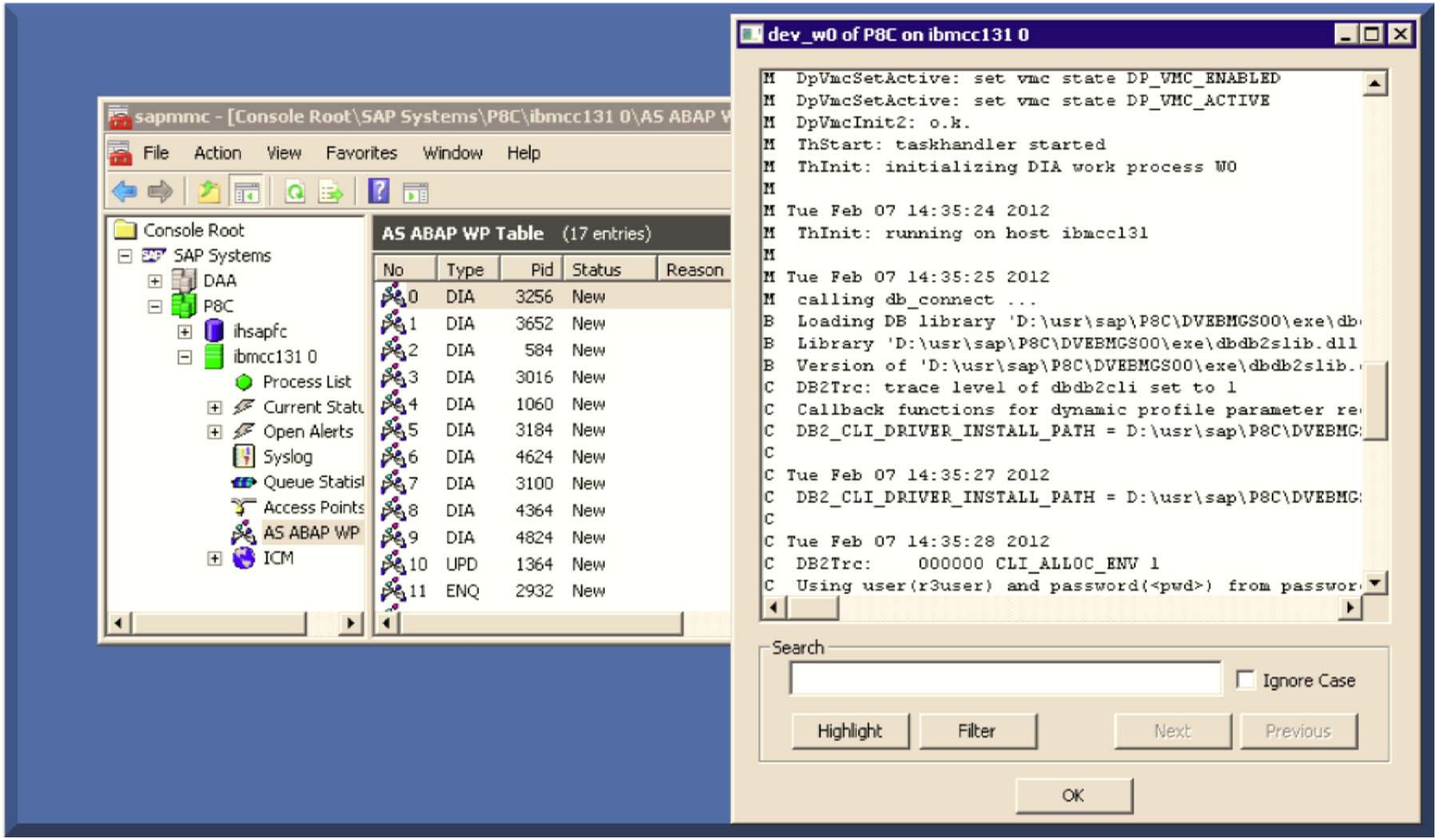
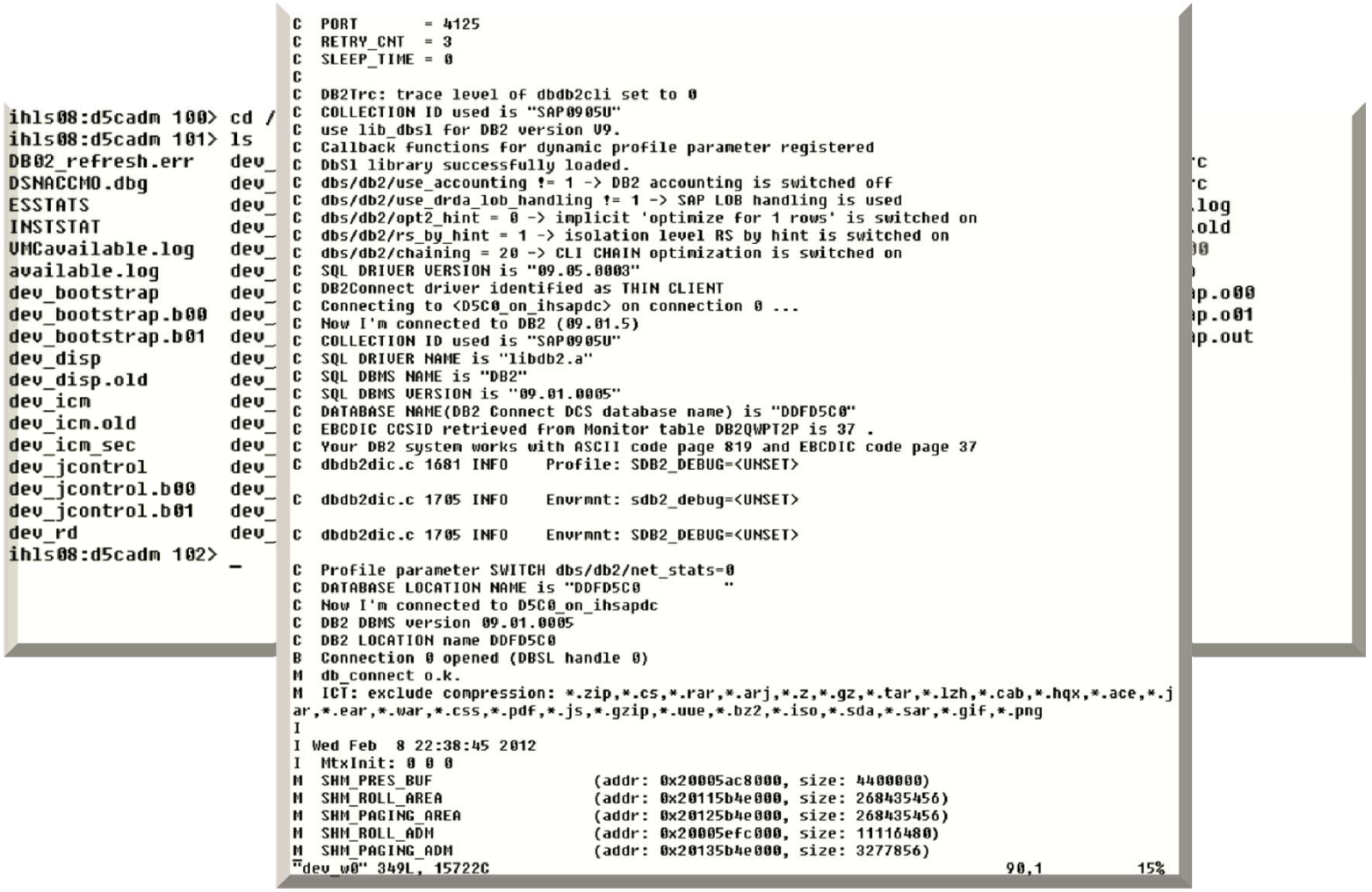
Here are some SAP application server screens from a Windows application server interfacing to a DB2 for z/OS database



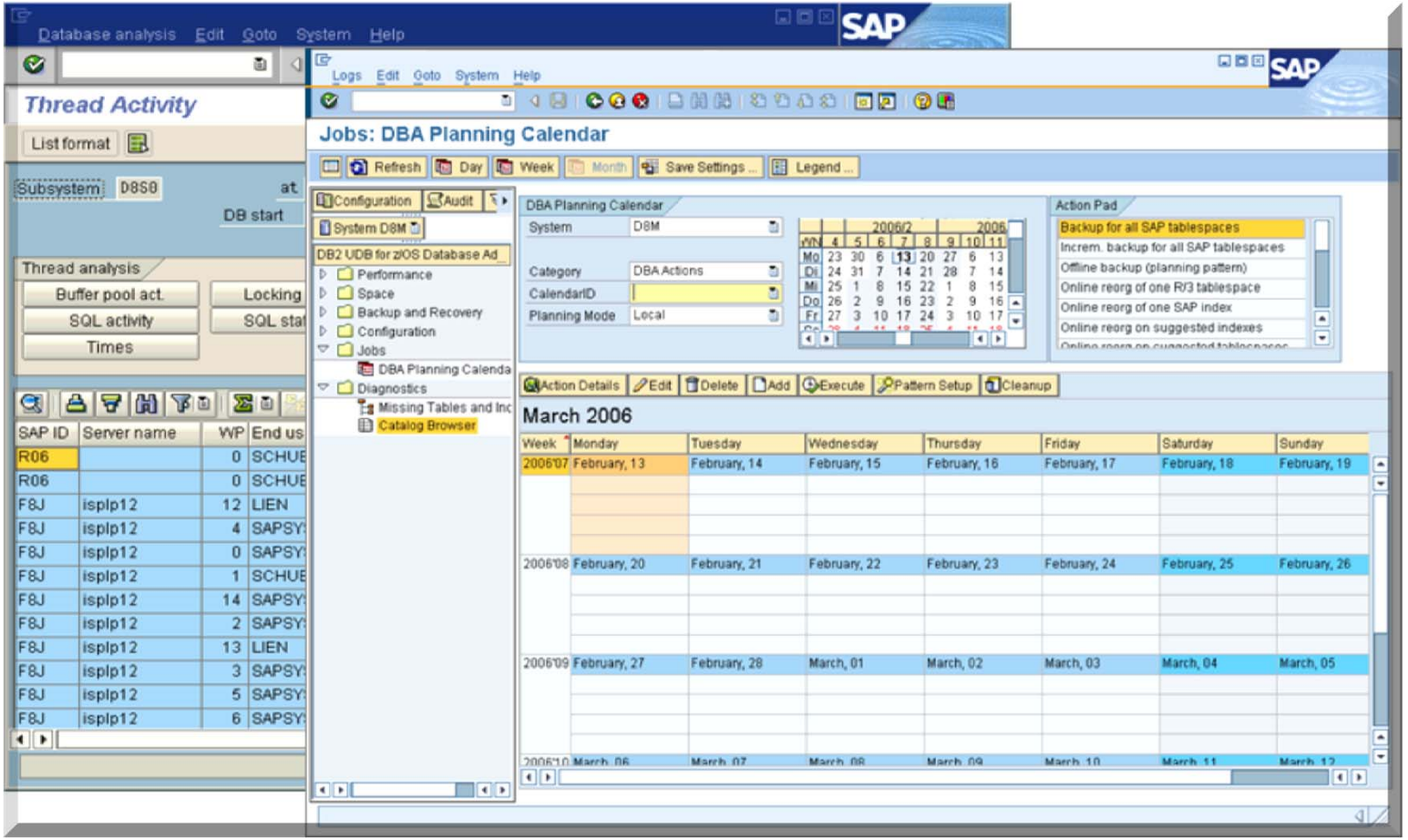
These screens would be very similar if the database were DB2 LUW or Oracle

Here are some SAP application server screens from a zLinux application server interfacing to a DB2 for z/OS database



These screens would be very similar if the database were DB2 LUW or Oracle, or the operating system were AIX or Linux on Intel

SAP looks and acts the same on System z as it does on distributed platforms. Only database oriented screens will have fields specific to the underlying database.



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SAP Reference Architectures

SAP Community Network - SAP on DB2 for z/OS (SDN)

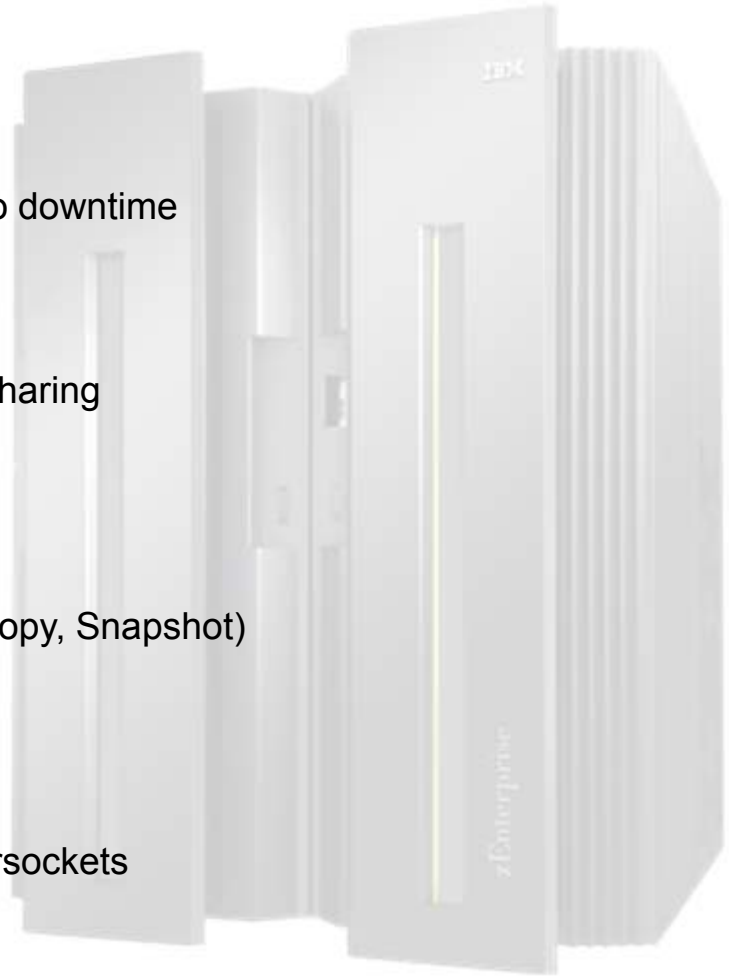
- SAP Business Suite on IBM System z Reference Architecture for System Infrastructure
  http://www.sdn.sap.com/irj/sdn/db2?rid=/library/uuid/7071c07f-d0d1-2c10-47a8-b19735a31850

- SAP for Banking on System z Reference Architecture
  http://www.sdn.sap.com/irj/sdn/db2?rid=/library/uuid/a00e4718-314f-2b10-19a6-a76f257addaf

- SAP for Insurance on System z Reference Architecture
  http://www.sdn.sap.com/irj/sdn/db2?rid=/library/uuid/806914a9-16df-2b10-96a0-eec0b1296f10

Key reasons customers implement SAP solutions on IBM System z

1. **Continuous Availability**
   - 99.999% application availability
   - Continuous availability for critical SAP functions
   - Unplanned and planned outages avoidance – near zero downtime
2. **Scalability**
   - Vertical and horizontal scalability
   - Parallel Sysplex with Coupling Facility and DB2 Data Sharing
3. **Large database manageability (SAP optimized)**
   - Multi-Terabyte databases w/ HW data compression
   - Online Backup and reorganization
   - Unique I/O subsystem and storage technology (Flashcopy, Snapshot)
4. **Consolidation and integration with other applications**
   - Mixed workload management
   - Simplified operation and fewer support personnel
   - Data and application colocation, local connectors, hipersockets
5. **Security**
   - Designed to deliver system integrity and the highest levels of security



Tightly integrated SAP/IBM development and support teams

System z Value Proposition for SAP applications

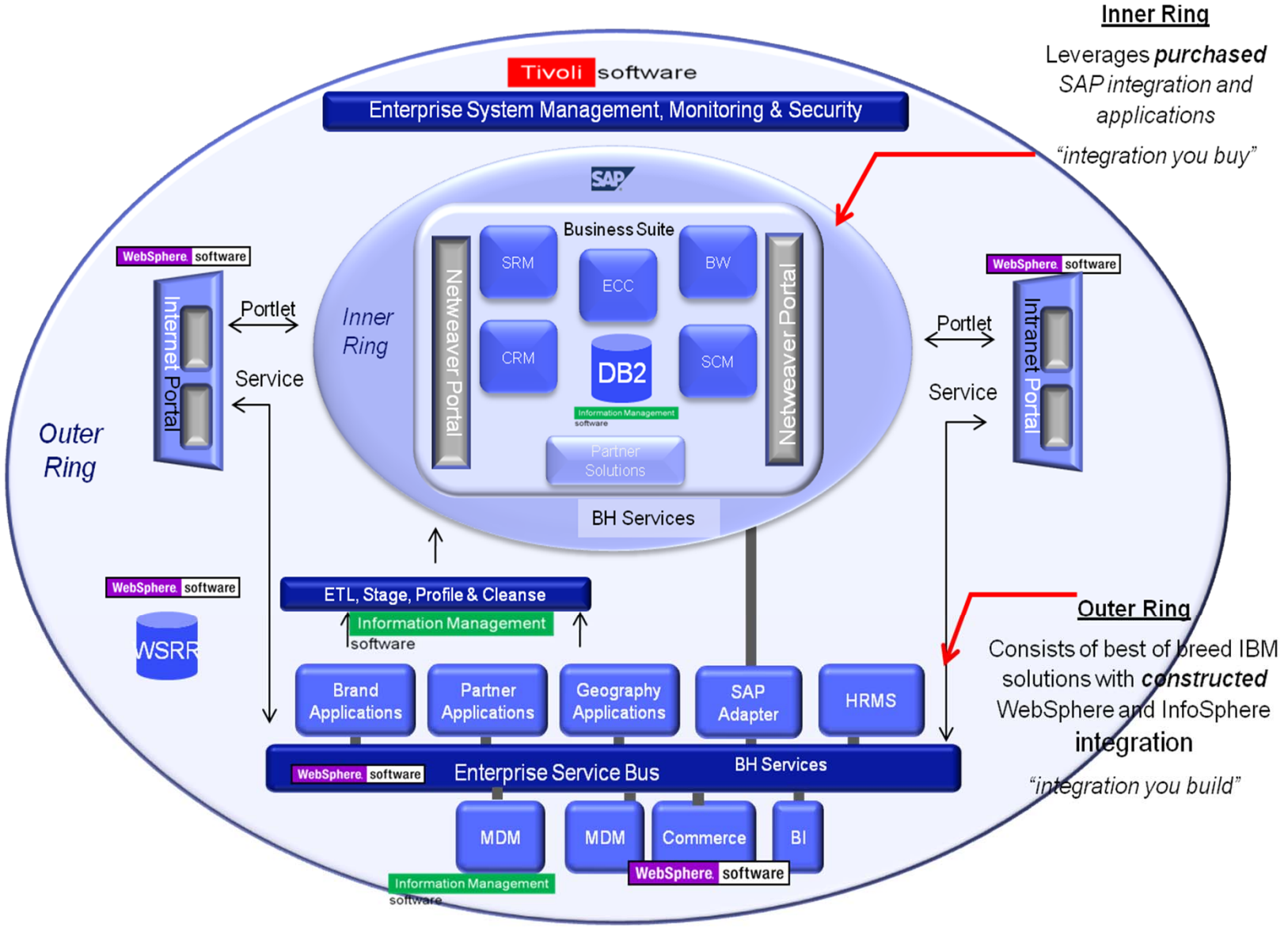
- IBM's System z running SAP applications offers the ultimate choice in security, stability and scalability in the marketplace through world-class workload management and an industrial-strength database server. SAP on System z platform delivers to the customers **continuous availability** to mission critical applications and data by avoiding outages for any hardware or database maintenance thru implementation of DB2 for z/OS Data Sharing.
- The difference between High Availability (= unplanned outages avoidance) and continuous availability (= planned outages avoidance) translates into superior Total Cost of Ownership, as the difference between 99.99% and 99.86% application availability to users can represent more than 50 million dollars outage costs in Retail Industry (see more details in the referenced ITG Study).

Figure 15

Availability Levels and Costs of Outages Detail for IBM System z and HP Integrity/Oracle RAC Deployment Scenarios

Company	Consumer Products	Automotive Parts	Electronic Components	Retail Chain	Airline
IBM SYSTEM z SCENARIO					
Availability Level	99.99%	99.99%	99.99%	99.99%	99.99%
Three-year costs ($000)	2,523.7	3,029.2	915.6	4,961.7	1,295.7
Five-year costs ($000)	4,206.2	5,048.7	1,526.0	8,269.5	2,159.6
HP INTEGRITY/ORACLE RAC SCENARIO					
Availability	99.87%	99.90%	99.92%	99.86%	99.84%
Three-year costs ($000)	33,313.0	36,350.7	13,276.4	59,540.4	18,140.5
Five-year costs ($000)	55,521.7	60,584.4	22,127.4	99,234.0	30,234.1

IBM's internal project uses an Inner Ring / Outer Ring Architecture



Worldwide SAP/z Tiger Team

Objective: Position System z as the ultimate database server for the enterprise

Tiger Team is both a technical and a sales team supporting all geographies with expert SAP skills

- Assist local teams in specific account situations
- Skills transfer
- Conduct education and SAP specific Five In A Box or Fit For Purpose value sessions
- Help the teams understand and use the System z price model for SAP
- Target large SAP installations not meeting their service level objectives or not realizing their total cost of ownership objectives
- Move beyond SAP ERP into SAP Core Banking, Retail, Automotive, BI/BIA

Portfolio of workshops and support provided by worldwide team

Infrastructure Selection Workshop (1 to 2 days)

- Understanding SAP infrastructure requirements – strengths and weaknesses
- Understanding distributed solutions for SAP infrastructure requirements
- Understanding System z "fit for purpose" for SAP database requirements
- Understanding System z "fit for purpose" for SAP application server requirements
- Overview of sizing activities, inputs, and outputs
- SAP consolidation, Highly Available & Disaster Recovery architecture
- High level architecture design

SAP Architecture Design Workshop (3 days)

- Business requirement definition, Promote to production
- Lifecycle and client definition, Logon Group, Web Dispatcher, and workload splitting
- Operations mode (normal and DR) definition
- CEC/System, LPAR, and DB member definition
- Application server and SCS/ASCS definition
- Storage, flashcopy, and shared filesystem definition
- Networking design
- Project plan definition

Installation Planning Workshop (2 days)

- z/OS and DB2 preparation
- Recommended parameters
- Application Server preparation
- Sample planning

Platform/database Migration Workshop (3 days)

- Migration planning
- Migration activity preparation
- Migration execution activities
- Migration tuning to reduce downtime
- Post migration activities

SAP Performance and Tuning Workshop

- Performance and tuning background
- Database
- WebAS
- Code changes

Continuous Availability Demonstration – planned and unplanned outage avoidance (IBM or customer premises)

- Realtime demonstration on customer premises
- Planned outage avoidance
- Unplanned outage avoidance
- See what the SAP user sees and experience what they experience
- Screen cam projection also available where network access is unavailable
- Static Power Point also available for shorter briefings to higher level audiences

SAP/z Health Check and Golive Support with knowledge transfer (remote or onsite)

- Advance review of critical applications
- Realtime monitoring of golive workloads
- Review of installation parameters
- Review of configuration options
- Configuration recommendations
- Interface with SAP level 1 support
- Recommended changes for best practices
- Knowledge transfer to customer personnel

ADM530 Course -- SAP on DB2 for z/OS Administration

- Preparing platform to run SAP on zDB2
- Administer DB2 for z/OS
- Implement database backup strategies
- Find performance bottlenecks
- Learn about availability options for zSAP
- Offered four times per year

Infrastructure Selection workshops

Health Check

ADM 530

ATS Offerings

Offered on an individual request basis only (i.e., not necessarily regularly scheduled), and offered on an as available basis (i.e., we cannot always guarantee that there will be people available when requested).

Portfolio of workshops and presales support provided by ISICC SAP/z Team

Customer briefings: Running SAP on System z and IBM Storage (1/2 to 2 days)

- Demonstrate and proof IBM and SAP close collaboration
- Reviewing SAP infrastructure requirements – strength and weakness assessments
- Understanding distributed solutions for SAP infrastructure
- Understanding System z “fit for purpose” for SAP
- Assessing system integration requirements
- Meet the SAP developers
- Overview of sizing activities, inputs, and outputs
- Revisit reference implementations
- SAP consolidation, Highly Available & Disaster Recovery architectures
- High level architecture design, database design considersations
- Assessing storage solutions and implementations
- Understanding IBM software solutions for SAP on z
- Understanding SAP/z Solution Edition and DB2 OEM offerings
- Continuous Availability Demonstration – planned and unplanned

SAP Infrastructure Solutions - Customer Workshop (1 to 3 days)

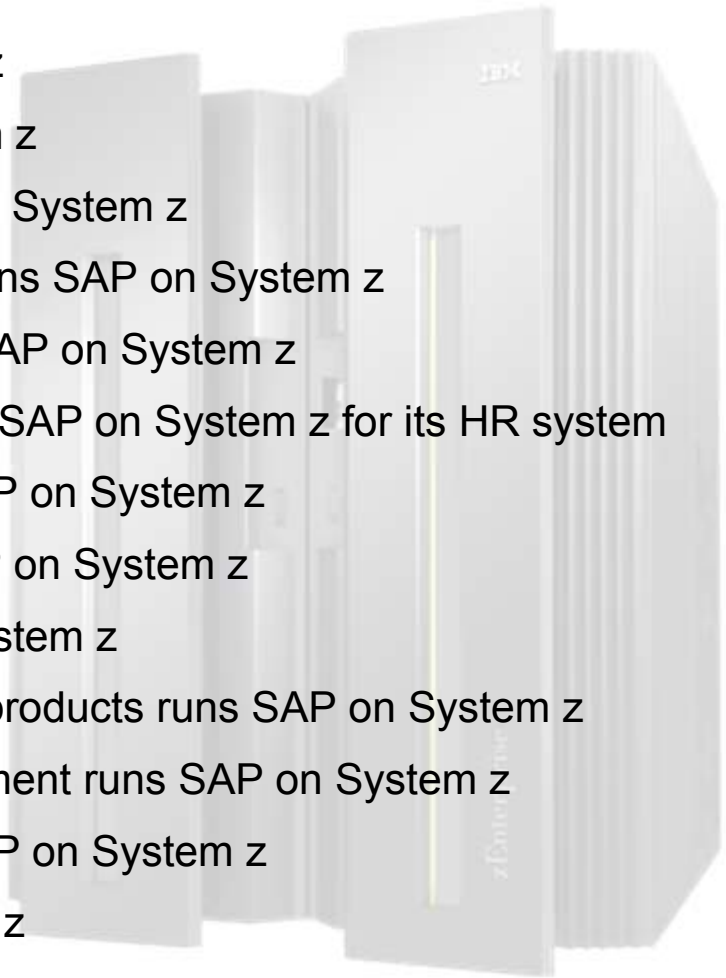
- Business requirement definition, Promote to production
- Lifecycle and user definitions, user groups and workload type and distribution
- Operations mode (normal and DR) definition and assessments
- CEC/System, LPAR, and DB member definition
- Application server and SCS/ASCS definition, layout
- Storage, data backup and shared file system definition
- System automation, monitoring, workload management
- Security considerations & design
- Migration considerations
- Experts from SAP and IBM attending

Solution References

- Build and provide reference stories
- brief solution analysts
- manage reference contacts or visits

… find more details on http://w3.tap.ibm.com/w3ki2/display/isicc/Home

Who are our customers?



- The world's largest oil company runs SAP on System z
- One of the world's largest airlines runs SAP on System z
- One of the world's top ten utility company runs SAP on System z
- World's largest home improvement specialty retailer runs SAP on System z
- The second largest retailer in the United States runs SAP on System z
- One of the largest employers in the United States run SAP on System z for its HR system
- One of the world's largest beverage company runs SAP on System z
- One of Europe's largest insurance company runs SAP on System z
- World's largest industrial gas provider runs SAP on System z
- One of the world's largest manufacturer of packaging products runs SAP on System z
- One of the world's largest manufacturer of farm equipment runs SAP on System z
- One of the world's largest chemical companies run SAP on System z
- Three of the world's largest banks run SAP on System z

SAP References on Demand

KMD	Communications	Computer Services	NE IOT	Denmark
Komatsu Ltd.	Industrial	Construction	GMU	Japan
Kommunale Datenverarbeitung Region Stuttgart Zweckverband / Rechenzentrum Region Stuttgart GmbH	Public	Government	NE IOT	Germany
Metro Inc. Technical Paper	Distribution	Retail	NA IOT	Canada
Nationwide Building Society	Financial Services	Financial Markets	NE IOT	UK
Postbank AG	Financial Services	Banking	NE IOT	Germany
Progress Energy	Communications	Energy & Utilities	NA IOT	USA
ProQuest Dialog	Communications	Media & Entertainment	NA IOT	USA
Retail Trilogy	Distribution	Retail	NE IOT	Germany
SAP for Automotive PoC				
Schwenk Zement AG	Industrial	Construction / Architecture / Engineering	NE IOT	Germany
Shikoku Electric Power Co., Inc.	Communications	Energy & Utilities	JAP	Japan
University of Arkansas	Public	Education	NA IOT	USA
University of Arkansas	Public	Education	NA IOT	USA
Versorgungsanstalt des Bundes und der Länder	Public	Government	NE IOT	Germany
Whirlpool (2008)	Distribution	Consumer Products	NA IOT	USA
Whirlpool (2010)	Industrial	Industrial Products	NA IOT	USA
Zaklad Ubezpieczen Spolecznych	Public	Government	GMU	Poland
Zürcher Kantonalbank	Financial Services	Banking	NE IOT	Switzerland

48 result(s) found

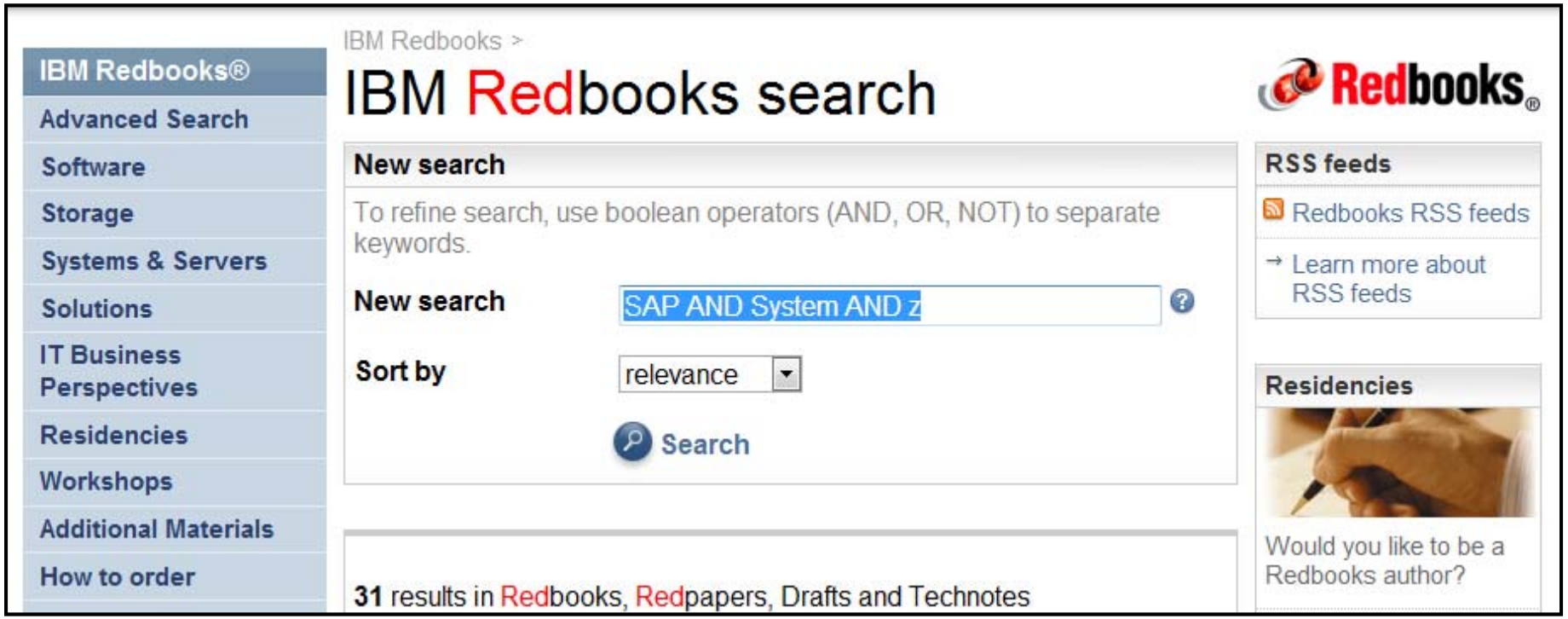
http://ehngsa.ibm.com/gsa/ehngsa/home/s/r/srod/web/public/SROD-online/workbook.html

SAP/z Redbooks and Documentation

Two technical documents from 2010 (one from IBM, one from SAP)

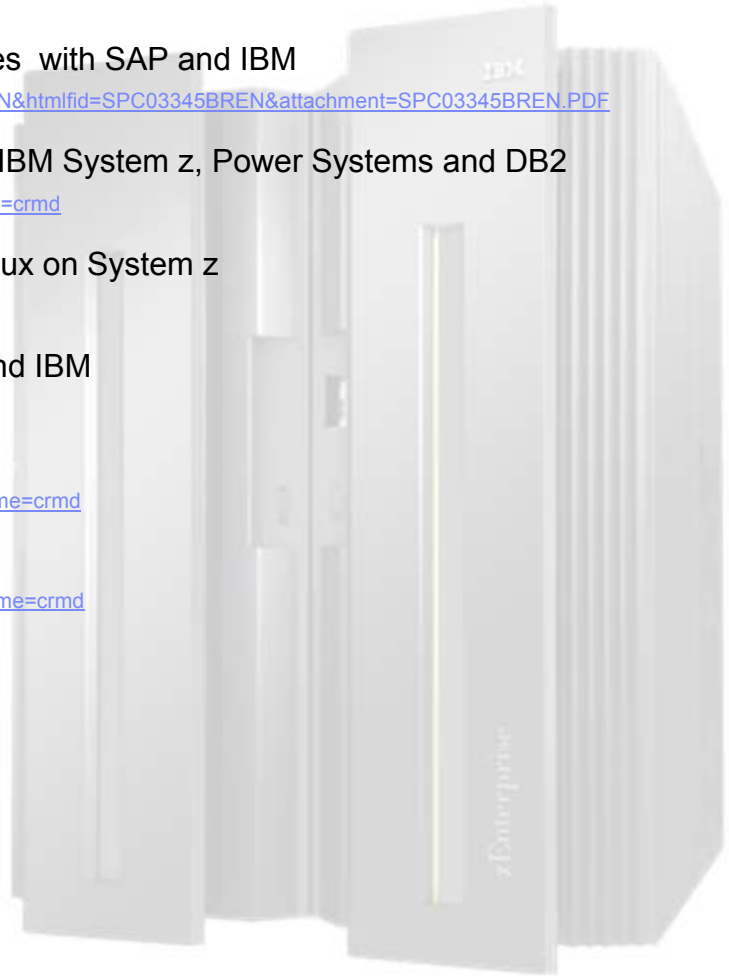
- Business Continuity for SAP on IBM System z, SC33-8206-03
  http://publibfp.dhe.ibm.com/epubs/pdf/iapacs03.pdf
- Implementing High Availability for SAP NetWeaver 7.1 Technology on System z
  http://www.sdn.sap.com/irj/sdn/db2?rid=/library/uuid/d0935882-878a-2c10-3b80-e4def4262679

Numerous Redbooks available on http://www.redbooks.ibm.com



New case studies in 2011 for SAP on IBM System z

- Aug 2011 Eletrobras Termonuclear SA solves company fusion challenges with SAP and IBM
  http://www.ibm.com/common/ssi/cgi-bin/ssialias?subtype=AB&infotype=PM&appname=SNDE_SP_SP_BREN&htmlfid=SPC03345BREN&attachment=SPC03345BREN.PDF
- June 2011 Sony Europe maximizes availability for SAP applications with IBM System z, Power Systems and DB2
  http://w3-01.ibm.com/sales/ssi/cgi-bin/ssialias?infotype=RF&subtype=CS&htmlfid=STRD-8JBKHV&appname=crmd
- June 2011 Endress+Hauser maximizes availability and resiliency with Linux on System z
  http://www-01.ibm.com/software/success/cssdb.nsf/cs/ARBN-8J8NYJ?OpenDocument&Site=corp&ref=crdb
- May 2011 Banco Pastor slashes costs and boosts efficiency with SAP and IBM
  http://www.ibm.com/software/success/cssdb.nsf/cs/STRD-8GZF32?OpenDocument&Site=corp&ref=crdb
- May 2011 El Corte Ingles, Spain, Retail
  http://w3-01.ibm.com/sales/ssi/cgi-bin/ssialias?infotype=CR&subtype=NA&htmlfid=0CRDD-8GSE5S&appname=crmd
- June 2011 New York City Police Department, US, Government
  http://w3-01.ibm.com/sales/ssi/cgi-bin/ssialias?infotype=CR&subtype=NA&htmlfid=0GNCS-842RHW&appname=crmd



SAP/z Case Studies

- SCHWENK Zement builds its future with SAP applications, IBM DB2 and IBM System z (published 11/09/2010)
  http://www.ibm.com/software/success/cssdb.nsf/CS/STRD-8AZLRA?OpenDocument&Site=gicss67sap&cty=en_us
- Shikoku Electric powers up with IBM System z9 solution (published 05/28/2010)
  http://www.ibm.com/software/success/cssdb.nsf/CS/DLAS-84RPFX?OpenDocument&Site=gicss67sap&cty=en_us
- KDRS/RZRS boosts client service with SAP ERP on IBM Systems (published 04/29/2010)
  http://www.ibm.com/software/success/cssdb.nsf/CS/STRD-84WDBN?OpenDocument&Site=gicss67sap&cty=en_us
- Baldor consolidates hundreds of servers and cuts IT and energy cost (published 03/10/2010)
  http://www.ibm.com/software/success/cssdb.nsf/CS/STRD-83LL69?OpenDocument&Site=gicss67sap&cty=en_us
- BCBS Minnesota achieves a significant TCO reduction by virtualizing SAP applications on IBM System z (published 01/11/2010)
  http://www.ibm.com/software/success/cssdb.nsf/CS/STRD-7ZGH73?OpenDocument&Site=gicss67sap&cty=en_us
- University of Arkansas creates new learning with SAP and IBM (published 08/07/2009)
  http://www.ibm.com/software/success/cssdb.nsf/cs/STRD-7UPJCV?OpenDocument&Site=gicss67sap&cty=en_us
- gkd-el achieves 30 percent TCO reduction by migrating its SAP systems to IBM System z10 (published 06/04/2009)
  http://www.ibm.com/software/success/cssdb.nsf/CS/STRD-7S2G54?OpenDocument&Site=gicss67sap&cty=en_us
- gkd-el boosts SAP system throughput by 270% and cuts costs by 30% by migrating SAP solutions to IBM System z10 Enterprise Class (published 01/23/2009; validated 07/05/2010)
  http://www.ibm.com/software/success/cssdb.nsf/CS/STRD-7NKMWM?OpenDocument&Site=gicss67sap&cty=en_us
- Belarusian Railways transforms operations and reporting with SAP and IBM (published 01/07/2009; validated 07/05/2010)
  http://www.ibm.com/software/success/cssdb.nsf/cs/STRD-7N3KZD?OpenDocument&Site=gicss67sap&cty=en_us
- Harnessing the power of IBM System z and SAP for Retail at dm-drogerie markt (published 01/07/2009; validated 07/05/2010)
  http://www.ibm.com/software/success/cssdb.nsf/cs/STRD-7N3MDK?OpenDocument&Site=gicss67sap&cty=en_us
- Beiersdorf cuts costs and boosts resilience with IBM System z and DB2 for SAP software (published 05/10/2007; validated 06/09/2010)
  http://www.ibm.com/software/success/cssdb.nsf/CS/STRD-732LCV?OpenDocument&Site=gicss67sap&cty=en_us
- Postbank Systems "bullet-proofs" its business resilience with IBM and SAP (published 05/23/2005; validated 07/13/2009)
  http://www.ibm.com/software/success/cssdb.nsf/CS/DNSD-6C4MM9?OpenDocument&Site=gicss67sap&cty=en_us

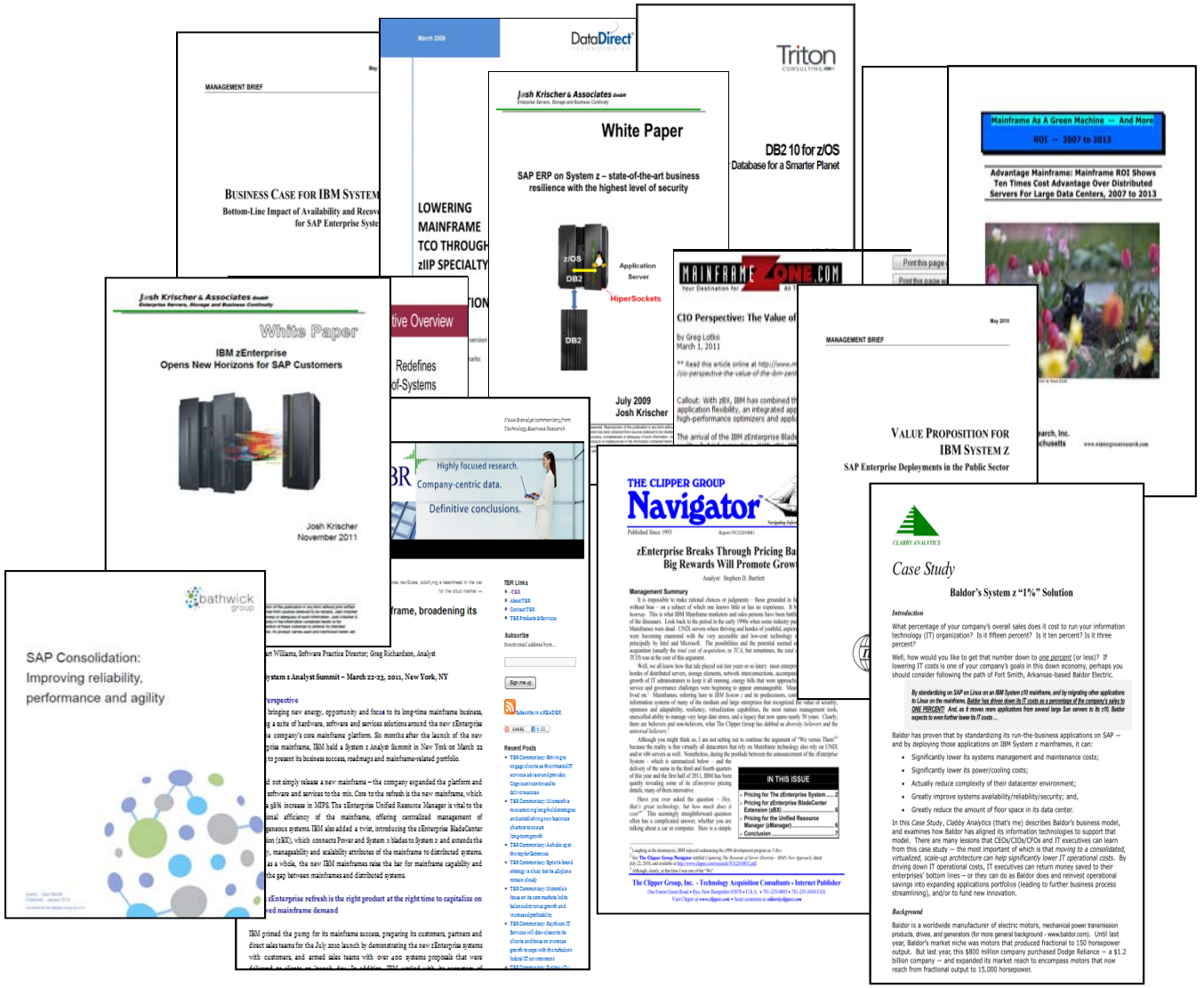
Articles and case studies published by others

- Kärcher - Complete SAP NetWeaver Business Warehouse Upgrade in Eight Weeks (February 2010)
  https://websmp204.sap-ag.de/~sapidp/011000358700000162292010E
- Gruppo API Consolidates Distributed Platforms to System z10 (March 18, 2010)
  http://www.mainframezone.com/it-management/Interviews/gruppo-api-consolidates-distributed-platforms-to-system-z10
- BANCO PASTOR REDUCES COSTS AND IMPROVES SCALABILITY WITH RED HAT, SAP®, AND IBM SOLUTIONS
  http://rhcustomers.files.wordpress.com/2009/10/red-hat-case-study_banco-pastor.pdf or http://customers.redhat.com/?s=pastor
- SAP on Linux on a Mainframe! The Colacem Case Study. Case Study by Clabby Analytics (Published 01/26/2009; validated 07/05/2010)
  http://www.clabbyanalytics.com/uploads/Colacem_Case_Study_Final_Final.pdf
- Baldor's System z "1%" Solution. Case Study by Clabby Analytics (03-2009)
  http://www.clabbyanalytics.com/uploads/BaldorFINAL.pdf

Additional Resources

- IBM/SAP International Competency Center (ISICC): http://www.ibm.com/solutions/sap
- IBM ATS Sizing Group: http://www.ibm.com/support/techdocs/atsmastr.nsf/PubAllNum/PRS261
- IBM Insight for SAP: http://www.ibm.com/support/techdocs/atsmastr.nsf/WebIndex/PRS381
- IBM System z for SAP: http://www.ibm.com/servers/eserver/zseries/software/sap/
- Solution Edition for SAP: http://www.ibm.com/systems/z/solutions/editions/sapapp/index.html
- Solution Edition for Enterprise Linux: http://www.ibm.com/systems/z/solutions/editions/linux.html
- IBM Redbooks search page: http://www.redbooks.ibm.com/
- IBM Redbooks for SAP on System z: http://www.redbooks.ibm.com/cgi-bin/searchsite.cgi?query=sap+and+"system+z"&SearchOrder=1&SearchFuzzy=FALSE
- IBM Techdocs search page: http://www.ibm.com/systems/migration-capabilities.html
- Accelerating Deposits Management with SDD: http://www.ibm.com/support/techdocs/atsmastr.nsf/WebIndex/WP101442
- Migrating to IBM Systems: http://www.ibm.com/systems/migration-capabilities.html

The Analysts on System z Cost and Value



Recent Analysts Studies

Batwick Group: SAP Consolidation - Improving reliability, performance and agility

- Bathwick Group analyst Gary Barnett published a new white paper that describes how companies have chosen IBM System z to consolidate their SAP landscapes into a single environment and the reliability, performance, agility and cost-reduction benefits they've gained as a result. The paper features several client examples and concludes:

  "If your business relies on SAP, it's essential that you ensure that your SAP infrastructure delivers reliability and flexibility, ideally at the lowest cost possible. While recently it has been conventional wisdom to rely on horizontal scaling using racks of blades and technologies like VMware to deliver SAP, it's important to note that you now have a choice when it comes to consolidating and simplifying your infrastructure. IBM's zEnterprise platform offers you a choice, and has proven to be the right choice for a number of organizations.„

Josh Krisher: IBM zEnterprise Opens New Horizons for SAP Customers

- Analyst Josh Krischer published a white paper that outlines the reasons IBM zEnterprise is an ideal platform for organizations of all sizes looking to simplify management and reduce costs by consolidating their SAP infrastructures. The paper concludes:

  "SAP ERP on System z has always been a solid enterprise platform; however, the zEnterprise platform now adds even more reasons to consider this option. zEnterprise raises the bar by offering an integrated system for heterogeneous hardware, as well as software platforms that address the major infrastructure requirements of businesses looking for security, business continuity, and performance. Practically any SAP application can run on a single zEnterprise system. The various blade technologies offer flexibility in selecting options for web applications. The Unified Resource Manager acts as a central point of control – a centralized governance system that can manage an underlying z/OS, Linux on System z, AIX on POWER, or Linux and Windows on System x under a single-management umbrella, thus simplifying system management at lower management costs. The dedicated private network eliminates the needs for external, security-vulnerable connections, reduces the number of hops, reduces latency, and eliminates the need for inter-platform encryption."

What Analysts write on IBM System z Value – Sources (page 1/2)

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What Analysts write on IBM System z Value – Sources (page 2/2)

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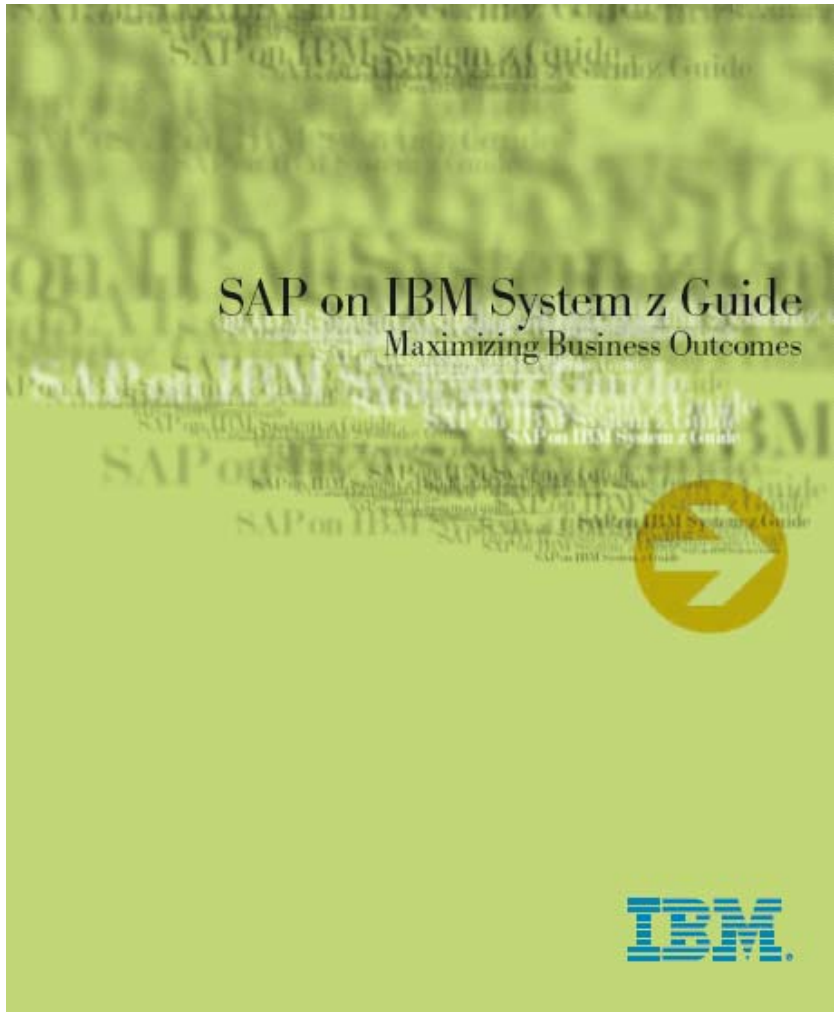
SAP on System z Guide Book



Brand new document

Value Proposition
Reference Customers
Reference Architecture
DB2 for z/OS Optimized for SAP
Joint Solutions

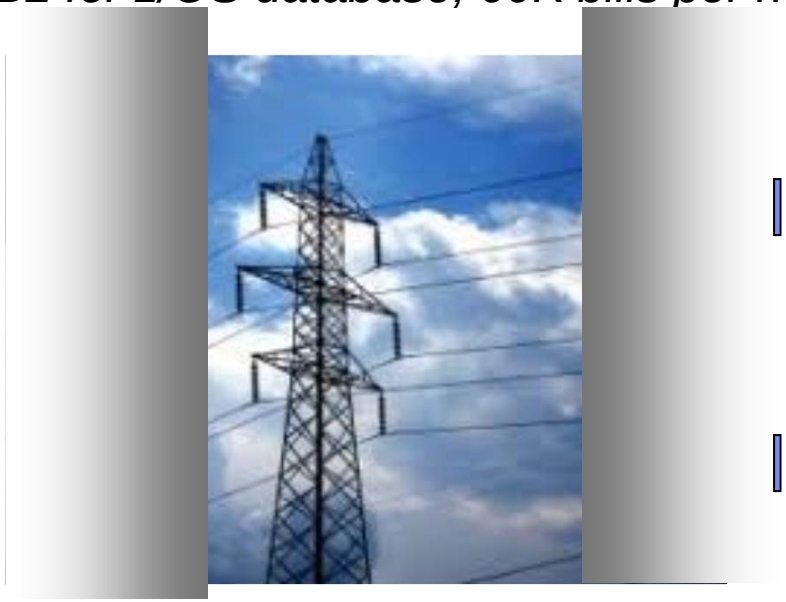
Find out how combining the IBM System z portfolio with offerings from SAP enhances operating dexterity, and how IBM zEnterprise System with its unique ”fit for purpose“ flexibility provides even more value for SAP applications in a multi-platform environment that can be managed E2Eas a single system.

Order free copies of "SAP on IBM System z Guide. Maximizing Business Outcomes" at: http://www.ibm-sap.com/mentorsystemz

- http://www.ibm.com/solutions/sap/us/en/solution/Y067170X54924F07.html

Italian Utility Company Using SAP

The Current: z10 + p595 AIX for SAP Central Instance and Application Servers, with DB2 for z/OS database, 60K bills per hour



Client Requirement

- *Achieve 200K bills per hour*

Provide up-to-date technology
- z196+ p770

✓Results: achieved **250K** bills per hour

✓**300+%** improvement

Provide hybrid technology
- z196+ zBX

✓Results: achieved **430K** bills per hour

✓**600+%** improvement

Hybrid Computing Benefits:

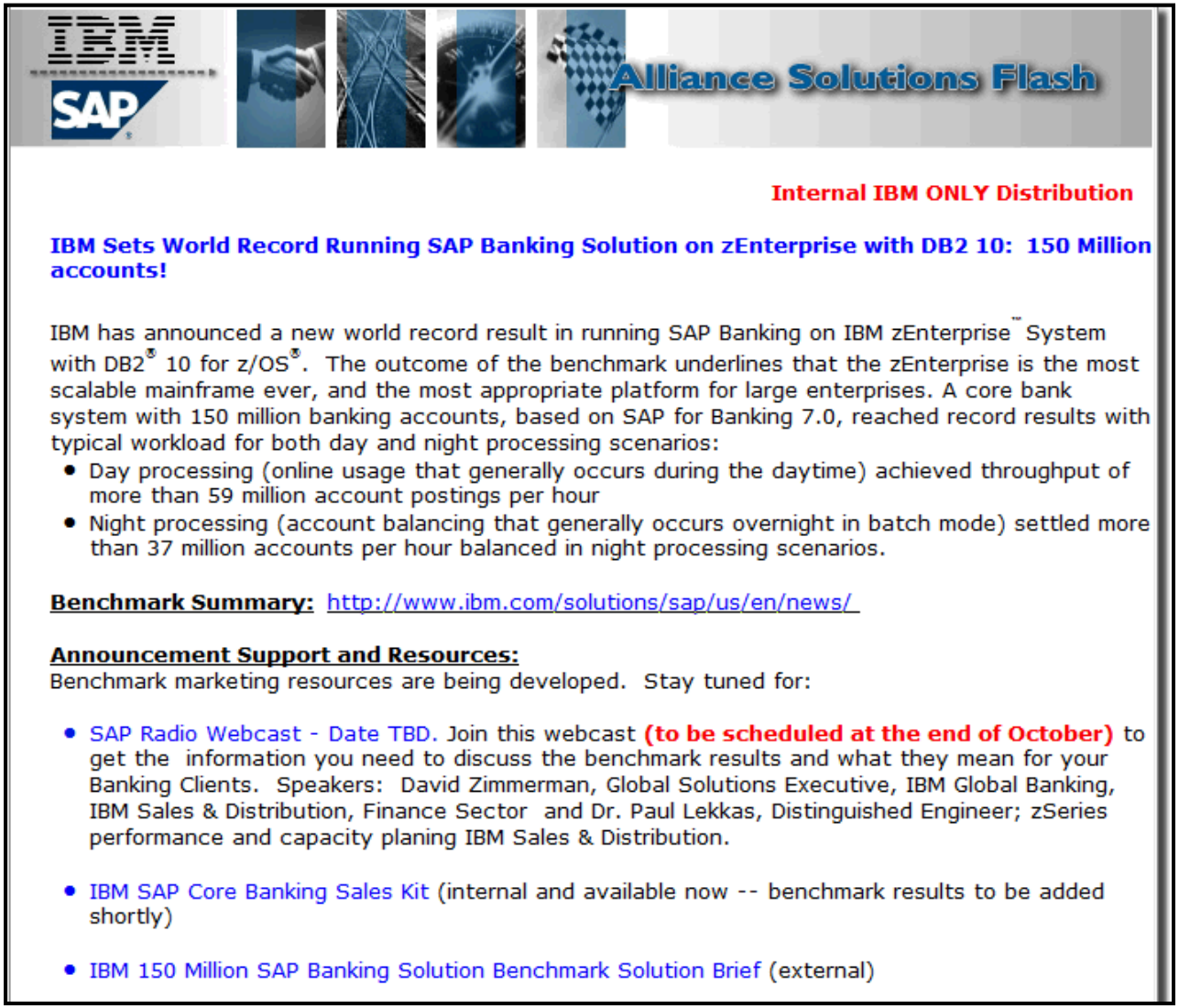
✓Over **600%** improvement in current configuration

✓Hardware setup: implementation of zBX Power Blades in only **2 days**

✓Very good linear **scalability** either on scale-up for DB2 on z, or scale out on pBlades on zBX

✓**Low latency** due to the dedicated IEDN network

SAP Core Banking Benchmark



IBM SAP Alliance Solutions Flash

Internal IBM ONLY Distribution

IBM Sets World Record Running SAP Banking Solution on zEnterprise with DB2 10: 150 Million accounts!

IBM has announced a new world record result in running SAP Banking on IBM zEnterprise™ System with DB2® 10 for z/OS®. The outcome of the benchmark underlines that the zEnterprise is the most scalable mainframe ever, and the most appropriate platform for large enterprises. A core bank system with 150 million banking accounts, based on SAP for Banking 7.0, reached record results with typical workload for both day and night processing scenarios:

- Day processing (online usage that generally occurs during the daytime) achieved throughput of more than 59 million account postings per hour
- Night processing (account balancing that generally occurs overnight in batch mode) settled more than 37 million accounts per hour balanced in night processing scenarios.

Benchmark Summary: http://www.ibm.com/solutions/sap/us/en/news/

Announcement Support and Resources:
Benchmark marketing resources are being developed. Stay tuned for:

- SAP Radio Webcast - Date TBD. Join this webcast **(to be scheduled at the end of October)** to get the information you need to discuss the benchmark results and what they mean for your Banking Clients. Speakers: David Zimmerman, Global Solutions Executive, IBM Global Banking, IBM Sales & Distribution, Finance Sector and Dr. Paul Lekkas, Distinguished Engineer; zSeries performance and capacity planing IBM Sales & Distribution.
- IBM SAP Core Banking Sales Kit (internal and available now -- benchmark results to be added shortly)
- IBM 150 Million SAP Banking Solution Benchmark Solution Brief (external)

World record running SAP banking solution on zEnterprise with DB2 10

[Huge SAP database load of 150 million accounts **and based on SAP for Banking 7.0]**

Day processing **achieved throughput of** more than 3X **the number of account postings per hour than prior capabilities.**

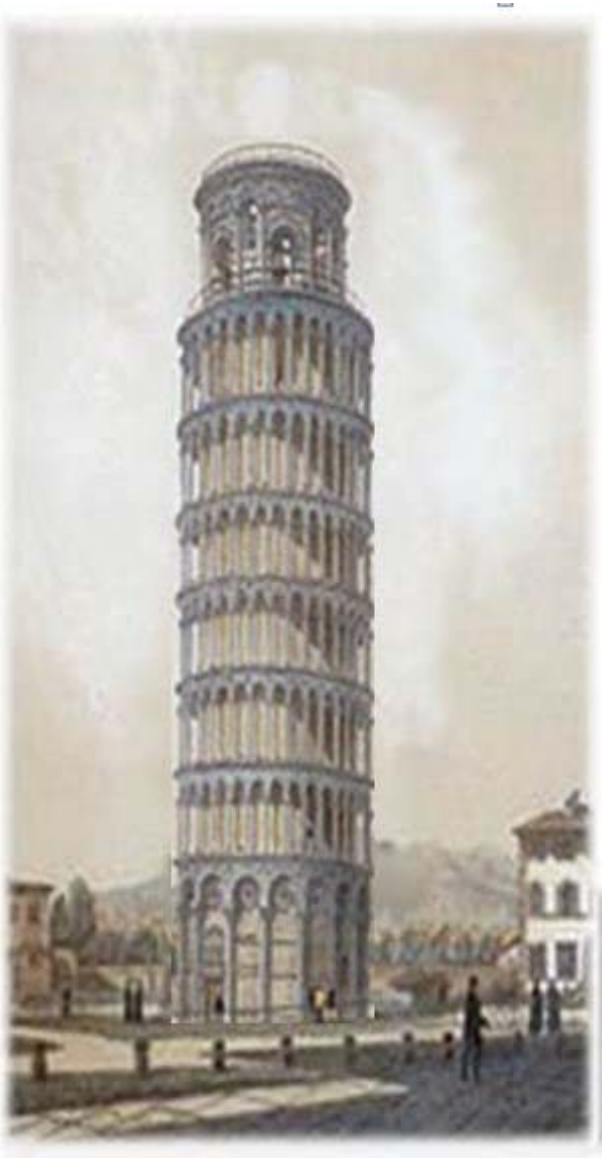
Night processing **settled** more than 3X **the number of accounts balanced per hour than prior capabilities.**

zEnterprise is the ideal platform for handling scalability with ease.

INFRASTRUCTURE:

SOONER OR LATER,

IT MATTERS.



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Any performance data contained in this document was determined in a controlled environment. Actual results may vary significantly and are dependent on many factors including system hardware configuration and software design and configuration. Some measurements quoted in this document may have been made on development-level systems. There is no guarantee these measurements will be the same on generally-available systems. Some measurements quoted in this document may have been estimated through extrapolation. Users of this document should verify the applicable data for their specific environment.

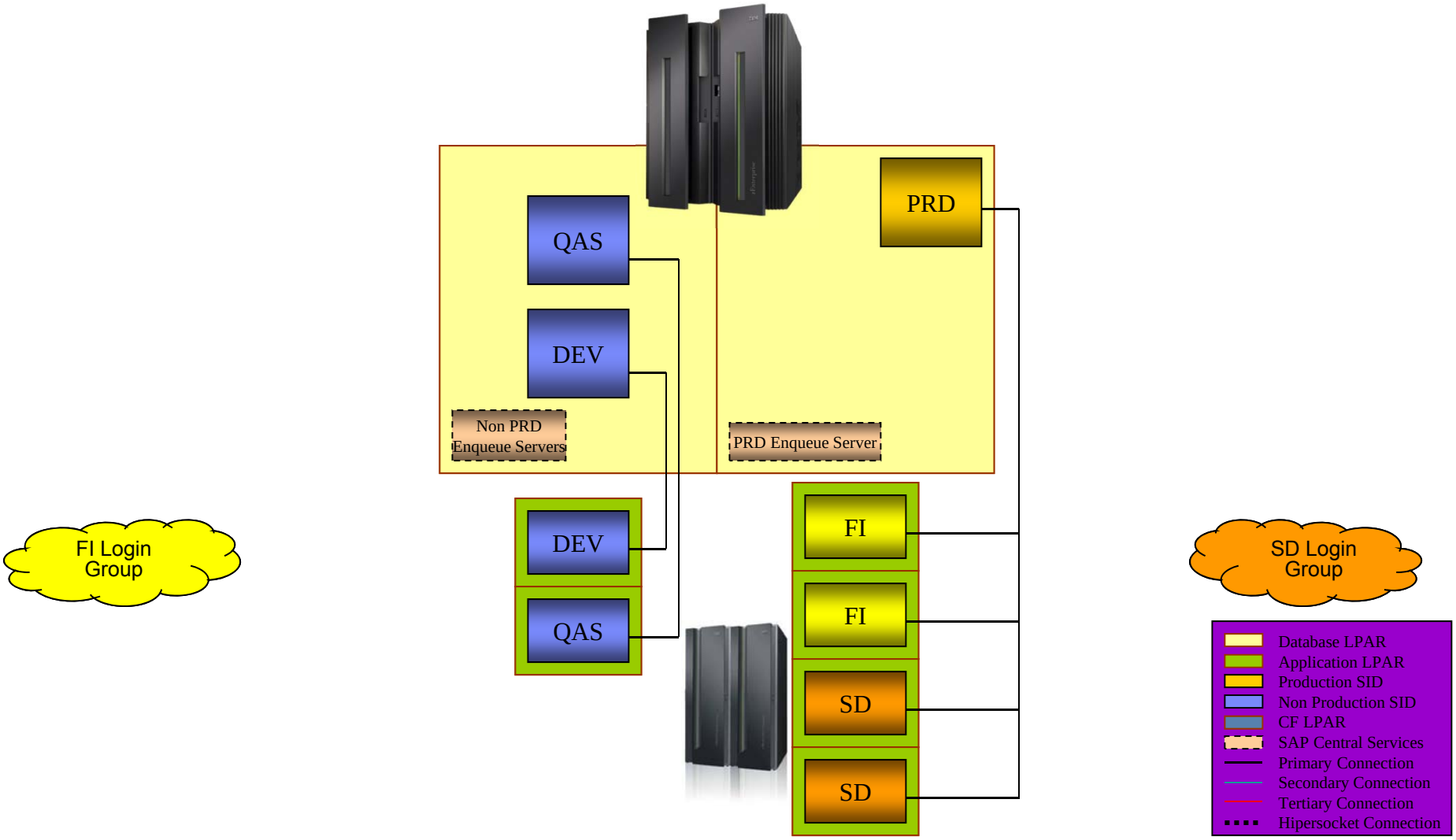
Revised February 6, 2004

Special notices (cont.)

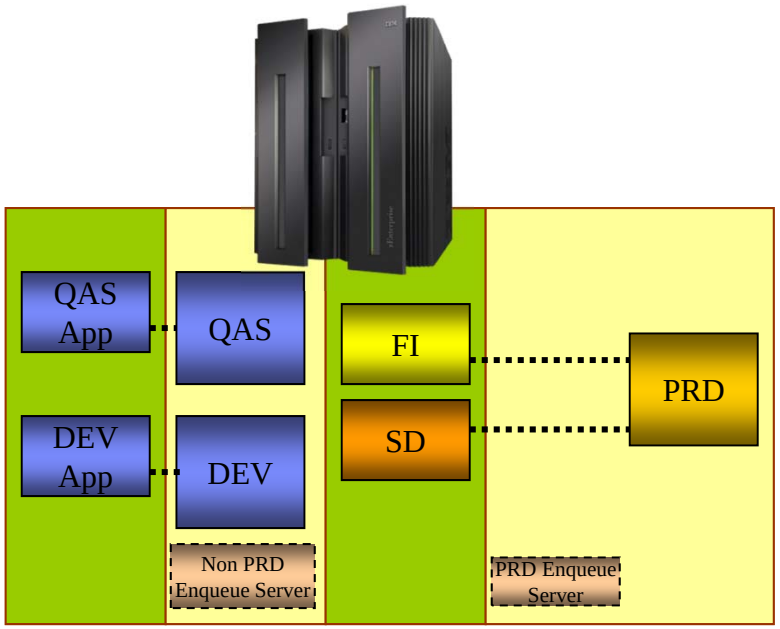
Availability Models

- Simple with external application servers
- Simple with internal application servers
- Failover in a box with external application servers
- Failover in a box with internal application servers
- Two-way Active/Standby with external application servers
- Two-way Active/Standby with internal application servers
- Two-way Active/Active with external application servers
- Two-way Active/Active with internal application servers
- Two-way Active/Active with mixed application servers (best practice
- Continue

Hardware and OS resiliency of a simple ERP implementation with PRD, QA, and DEV SAP Systems using external application servers



Hardware and Operating System resiliency of a simple ERP implementation with production, testing, and development SAP Systems using internal application servers.

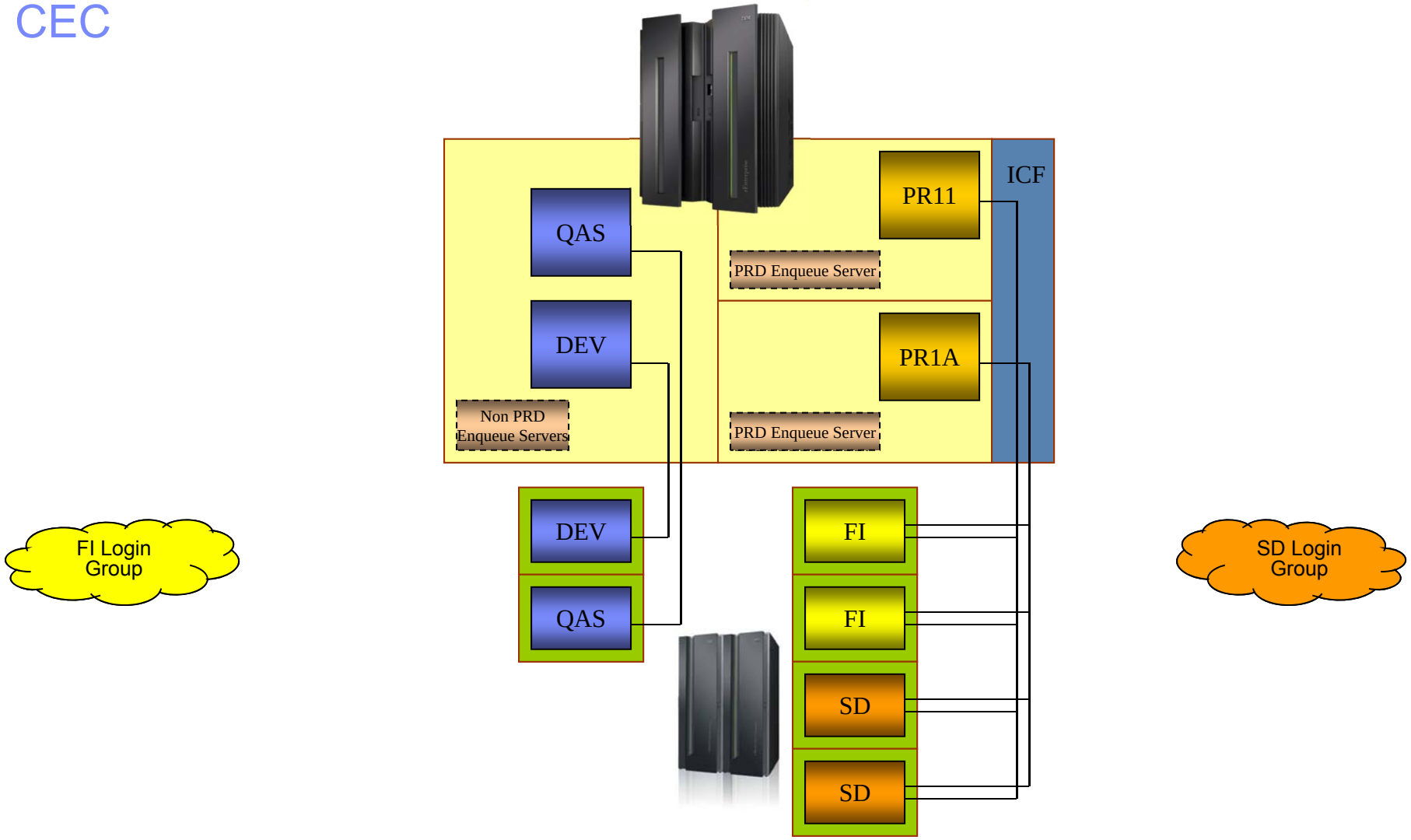


FI Login Group

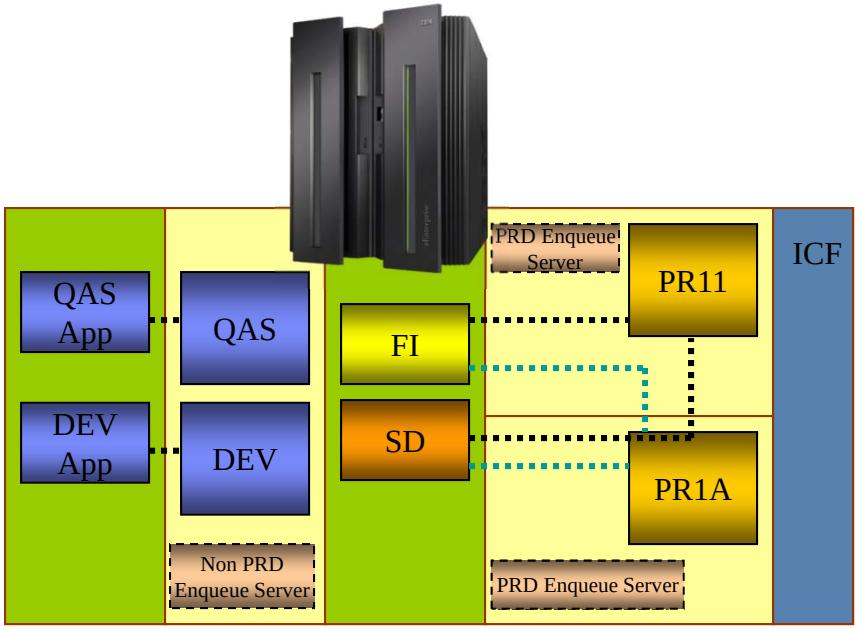
SD Login Group

- Database LPAR
- Application LPAR
- Production SID
- Non Production SID
- CF LPAR
- SAP Central Services
- Primary Connection
- Secondary Connection
- Tertiary Connection
- Hipersocket Connection

Parallel Sysplex “in a box” provides failover of the SAP enqueue and the active SAP database to a secondary member within the same CEC



With internal application servers--Parallel Sysplex “in a box” provides failover of the SAP enqueue and the active SAP database to a secondary member within the same CEC



FI Login Group

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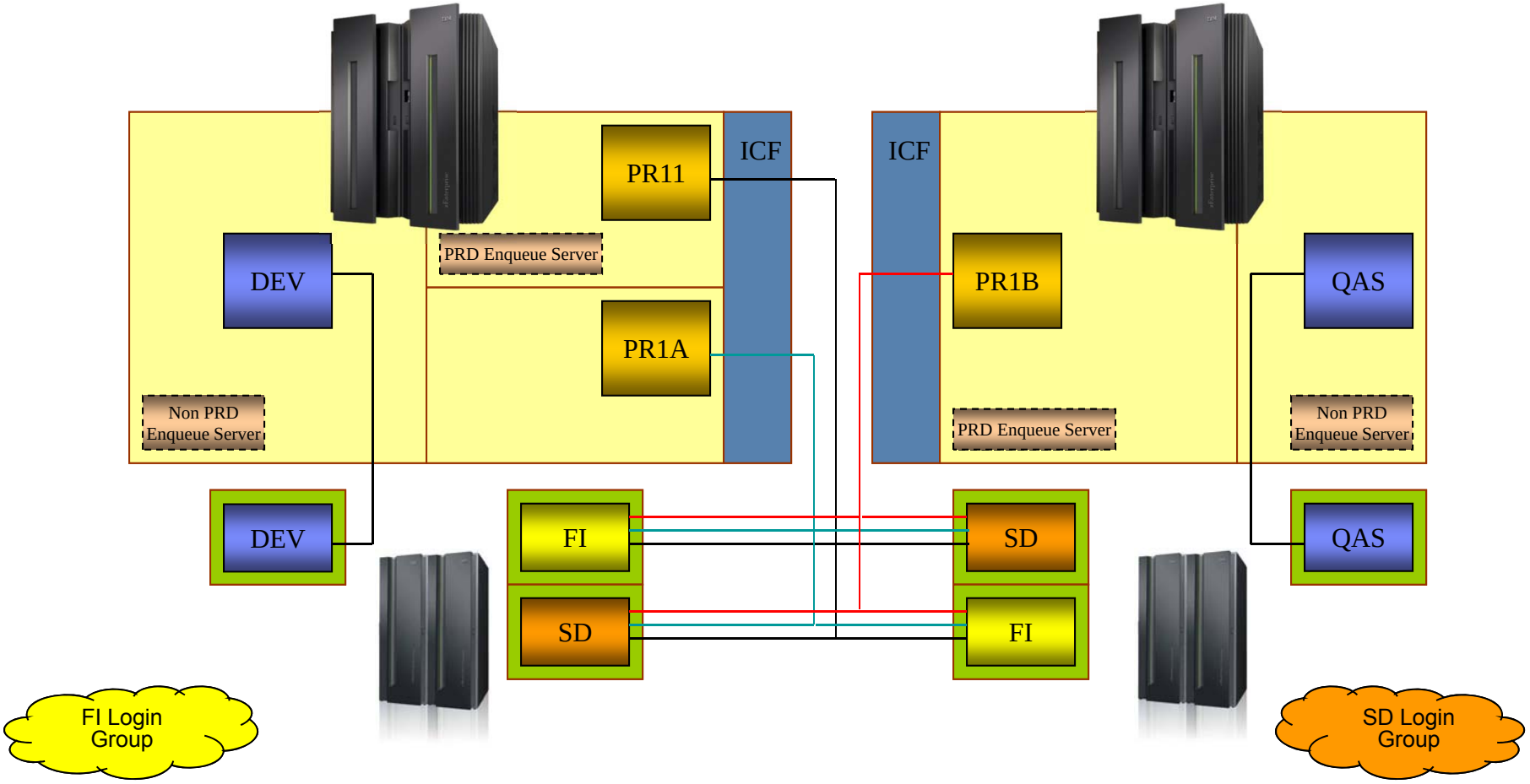
Parallel Sysplex of an active/standby system with cascaded failover provides a failover of the SAP enqueue server, and the failover of the active SAP database.



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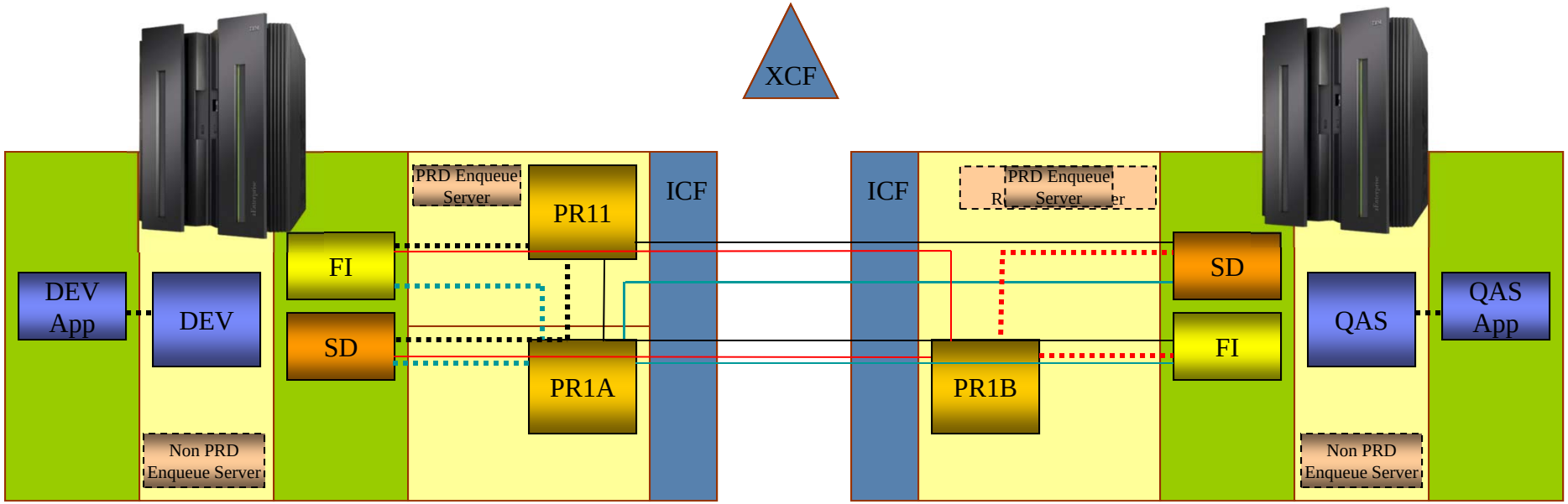

FI Login Group

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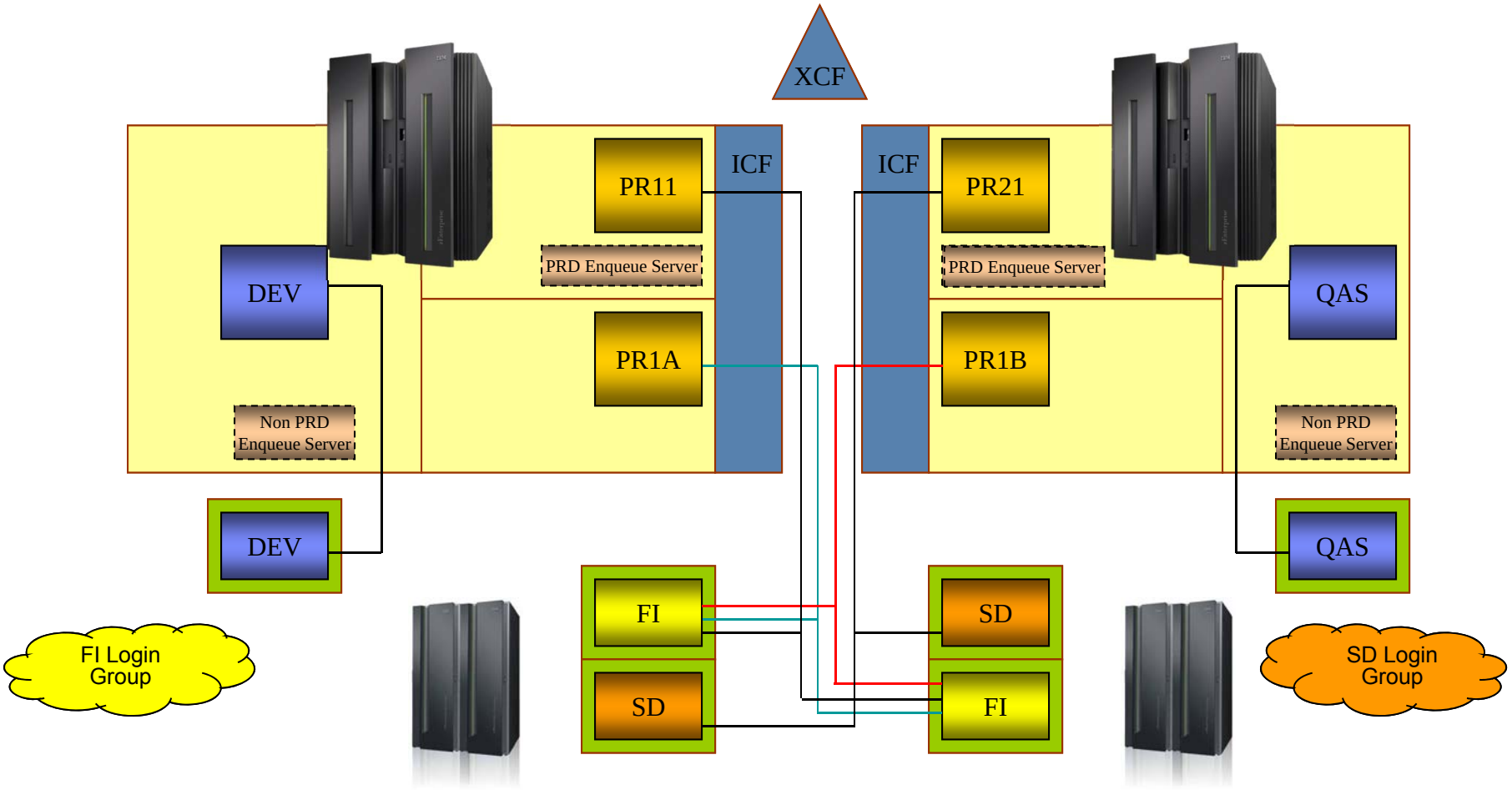
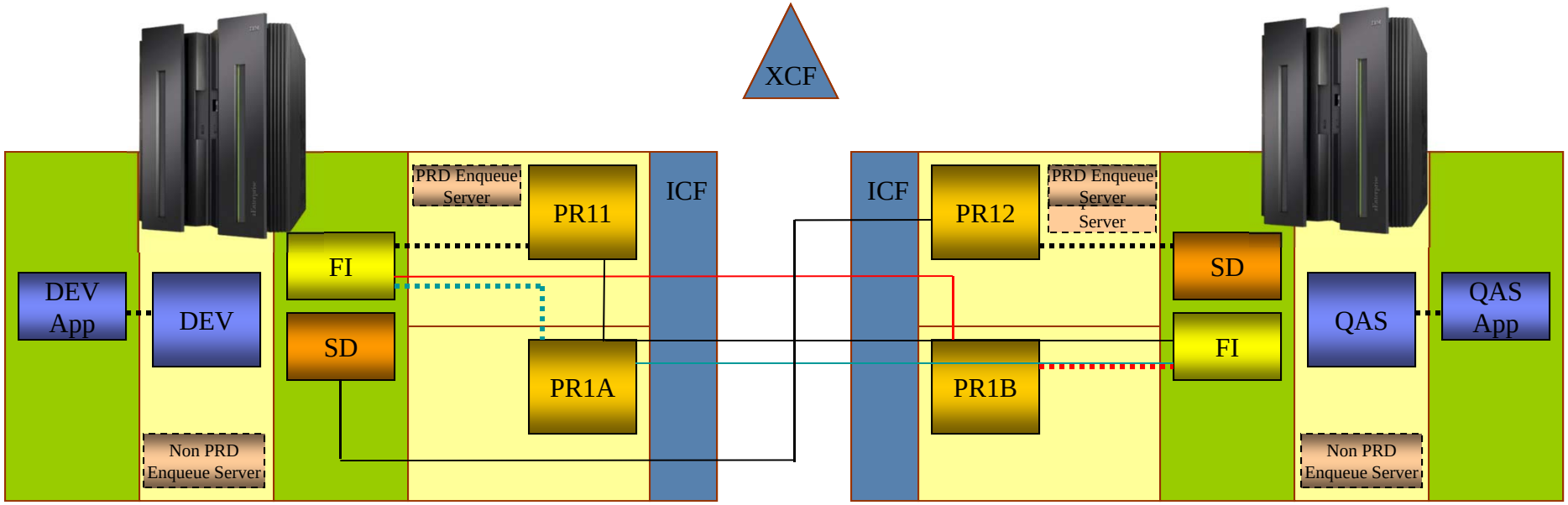
With external application servers--Parallel Sysplex of an active/active parallel system with cascaded failover provides a failover of the SAP enqueue server to a second CEC, and both active SAP databases to standby members within the same CECs. This can be followed by a failover to a secondary standby member in each surviving CEC.



With internal application servers--Parallel Sysplex of an active/active parallel system with cascaded failover provides a failover of the SAP enqueue server to a second CEC, and both active SAP databases to standby members within the same CEC. This can be followed by a failover to a secondary standby member in each surviving CEC.



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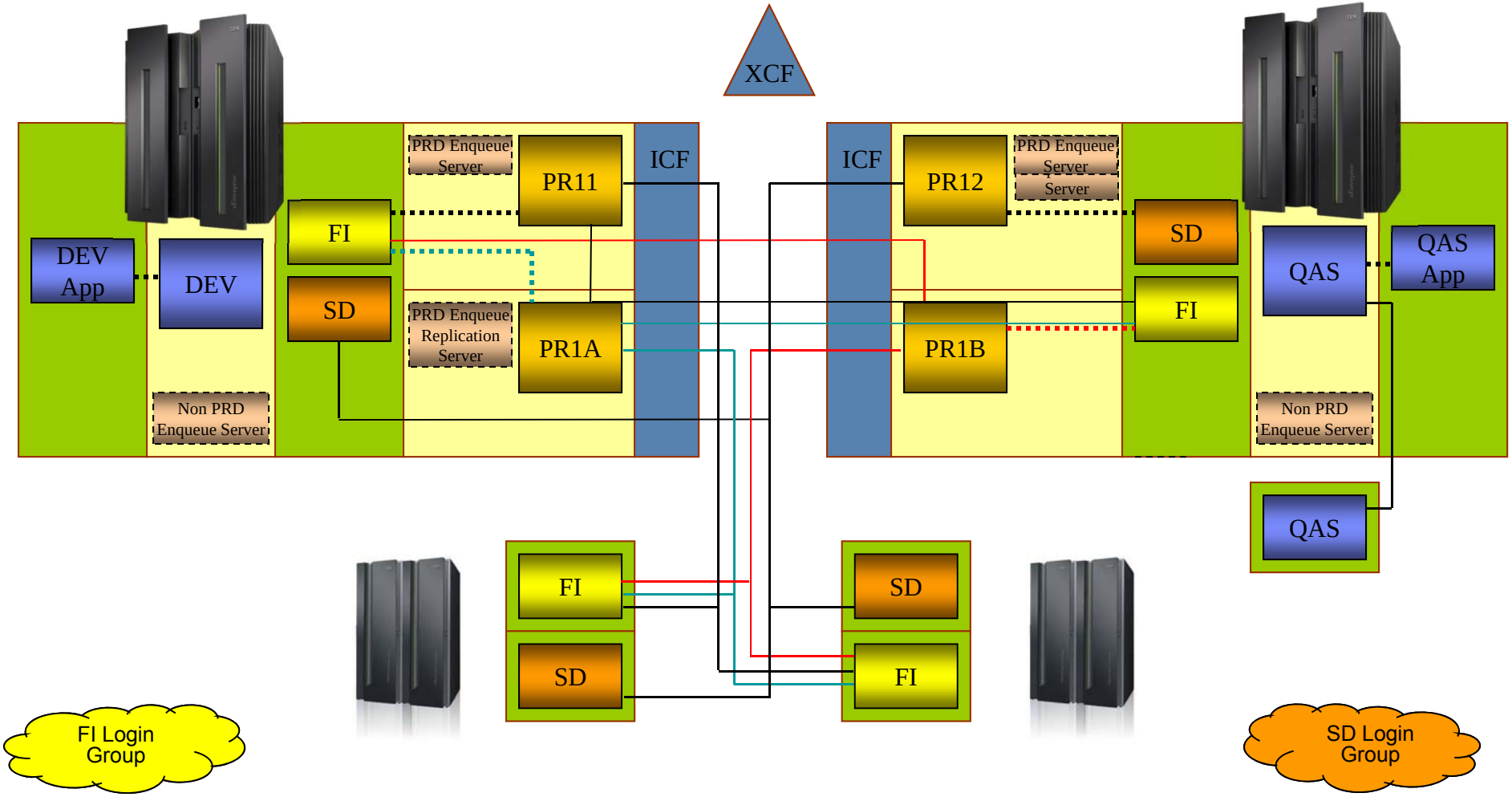
With both internal and external application servers—Parallel Sysplex databases with a percentage of the application servers internal to the System z running on Linux with zVM ensures the fastest recovery in a disaster recovery scenario. Critical business workload can begin immediately while the external application servers complete their DR failover.



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