Oracle Solutions on IBM System z Servers

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Agenda

- **Current Status of Oracle availability on System z**

- **Oracle on zEnterprise**
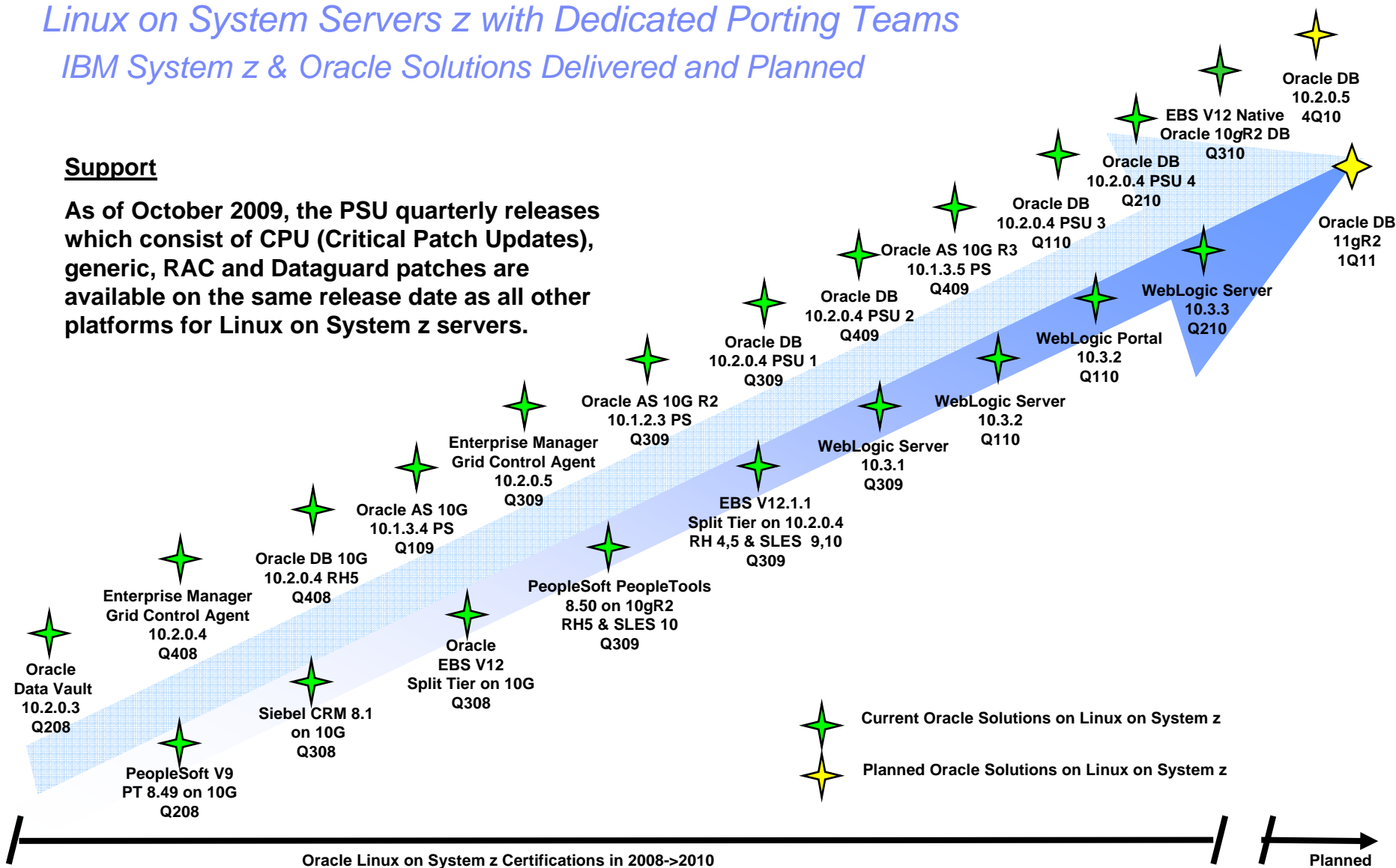
- **Using System z as a Smart Data Cloud**

Agenda

- **Current Status of Oracle availability on System z**

- **Oracle on zEnterprise**

- **Using System z as a Smart Data Cloud**

Linux on System Servers z with Dedicated Porting Teams
IBM System z & Oracle Solutions Delivered and Planned

Support

As of October 2009, the PSU quarterly releases which consist of CPU (Critical Patch Updates), generic, RAC and Dataguard patches are available on the same release date as all other platforms for Linux on System z servers.

Oracle DB
10.2.0.5
4Q10

EBS V12 Native
Oracle 10gR2 DB
Q310

Oracle DB
10.2.0.4 PSU 4
Q210

Oracle DB
10.2.0.4 PSU 3
Q110

Oracle DB
11gR2
1Q11

Oracle AS 10G R3
10.1.3.5 PS
Q409

WebLogic Server
10.3.3
Q210

Oracle DB
10.2.0.4 PSU 2
Q409

WebLogic Portal
10.3.2
Q110

Oracle DB
10.2.0.4 PSU 1
Q309

WebLogic Server
10.3.2
Q110

Oracle AS 10G R2
10.1.2.3 PS
Q309

WebLogic Server
10.3.1
Q309

Enterprise Manager
Grid Control Agent
10.2.0.5
Q309

EBS V12.1.1
Split Tier on 10.2.0.4
RH 4,5 & SLES 9,10
Q309

Oracle AS 10G
10.1.3.4 PS
Q109

Oracle DB 10G
10.2.0.4 RH5
Q408

PeopleSoft PeopleTools
8.50 on 10gR2
RH5 & SLES 10
Q309

Enterprise Manager
Grid Control Agent
10.2.0.4
Q408

Oracle
EBS V12
Split Tier on 10G
Q308

Oracle
Data Vault
10.2.0.3
Q208

Siebel CRM 8.1
on 10G
Q308

PeopleSoft V9
PT 8.49 on 10G
Q208

Current Oracle Solutions on Linux on System z

Planned Oracle Solutions on Linux on System z

Oracle Linux on System z Certifications in 2008->2010

Planned

Oracle E-Business Suite for LINUX on z

What are we announcing?

We are pleased to announce that the Oracle E-Business Suite (EBS) Release 12 is now available on a new fully certified EBS platform - Linux on IBM System z. This IBM platform (i.e. Linux running on an IBM mainframe) is also known as 'Linux on System z' and appears in our Oracle systems (My Oracle Support, aru, bug, etc.) as 'IBM: Linux on System z'.

The Linux on System z platform was previously a 'database tier only' platform (for EBS 11*i* and 12.0) and will continue to be supported as such on those releases. With this announcement for 12.1, we are supporting the platform as a fully certified EBS platform (i.e. for both application and database tiers).

The release is based on the 12.1.2 EBS codeline and includes a Rapid Install wizard to support new installations as well as 11*i* upgrades (from a certified EBS 11*i* platform) to Release 12 on Linux on System z. This first release includes the Oracle Database 10gR2 on the database tier, and Application Server versions 10gR2 and 10gR3.

Various technology certifications are planned as well for the currently available versions of technology products on the platform (such as 10.1.2.3 OID/SSO, 10.1.2.3 Discoverer, AS 10gR3 Patchset 5, etc.) or those expected at some point in the future (such as Oracle Database 11gR2). Separate announcements for these certifications will be sent out as they become available.

The operating systems certified with EBS on this platform are:

> **Red Hat Enterprise Linux (RHEL) version 5 (64-bit)**
>
> **Novell SUSE Linux Enterprise Server (SLES) version 9 (64-bit)**
>
> **Novell SUSE Linux Enterprise Server (SLES) version 10 (64-bit)**

Please review the documents below for all requirements and additional details on the use of EBS Release 12 on IBM: Linux on System z. All general documentation pertaining to EBS Release 12.1.1 (such as the Rapid Install Guide and the Upgrade Guide) are relevant as well to this release of 12.1.2 as the general functionality of EBS is the same on this platform.

The release is available now on our public edelivery web site for download - information on this new platform is in the process of being updated in the Certifications tab of My Oracle Support.

Where can I find more information?

Note 1116895.1 -	*Oracle E-Business Suite Installation and Upgrade Notes Release 12 (12.1.2) for IBM: Linux on System z*
Note 790942.1 -	*Oracle E-Business Suite Documentation Resources, Release 12.1*
	Oracle E-Business Suite Installation Guide: Using Rapid Install, Release 12 (12.1.1)
	Oracle E-Business Suite Upgrade Guide, Release 11i to 12.1.1

Oracle Server Technology Available or Planned
For Linux on IBM System z Servers

	Oracle Solution	*Version Available*	*Technology Status - Planned*
Database	**Oracle Database 10gR2**	Oracle DB 10gR2 10.2.0.4 PS 3	Oracle DB 10gR2 10.2.0.5 PS Planned – Q4 2010
	Oracle Data Vault 10gR2	Oracle Data Vault 10.2.0.4	
	Oracle Database 11gR2		Oracle DB 11gR2 Planned – Q1 2011
Fusion Middleware	**Oracle FMW 10gR2/10gR3 Application Server**	Oracle Application Server 10gR2 10.1.2.3 10gR3 10.1.3.5	
	Oracle FMW WebLogic	Oracle FMW WebLogic Server 10.3.2, 10.3.3 WebLogic Portal 10.3.2	
Enterprise Manager	**Oracle Enterprise Manager Agent**	Oracle Enterprise Grid Control Agent 10.2.0.5	

Note: Oracle Database Components
- Oracle Real Application Clusters
- Oracle OLAP
- Oracle Spatial
- Oracle Label Security
- Oracle Partitioning
- Oracle Data Mining
- Oracle Advanced Security
- Oracle Data Guard

Oracle Solutions Available on IBM System z Servers

IBM Data Server on DB2 z/OS and or Linux   Oracle DB Server on Linux

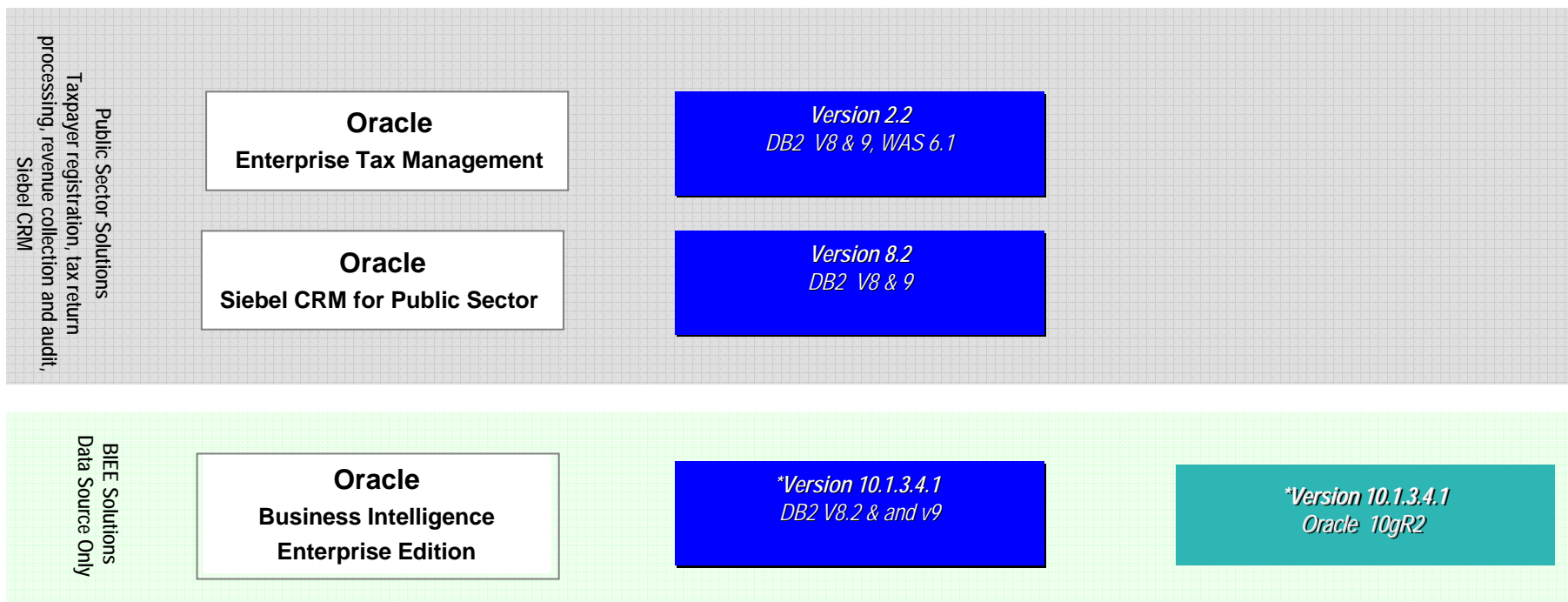*Note: Multi-Platform "Split Tier" Configuration – Only the Database runs on System z Servers*

ERP & CRM Solutions

Oracle PeopleSoft Enterprise	* Version 9.0 & 9.1 /Tools 8.49 & 8.50 DB2 V8, V9 (Database and Batch Server Supported)	* Version 9.0 & 9.1 /Tools 8.49. & 8..50 Oracle 10gR2
Oracle Siebel Enterprise	* Version 8.0 & 8.1.1 DB2 V9.1	* Version 8.0 & 8.1.1 Oracle 10gR2
Oracle E-Business Suite		* Version R12 Oracle 10gR2 EBS V12 Full Port on Oracle 10gR2

Banking & Insurance

Oracle Financial Services	FLEXCUBE Retail Core Banking V2.2.1 WAS 6.1 and DB2 v9.1	FLEXCUBE Retail Core Banking V2.2 Universal Banking (UBS) V10 Oracle 10gR2 on SLES9
Oracle Insurance	Documaker 11.4 DB2 8.2 & 9.1 z/OS	
Oracle Cross Industry		Oracle Policy Automation v10.1 Oracle 10gR2 on SLES10

http://w3-03.ibm.com/support/techdocs/atsmastr.nsf/WebIndex/WP101298

Oracle Solutions Available on IBM System z Servers

IBM Data Server on DB2 z/OS or Linux   Oracle DB Server on Linux

* Note: Multi-Platform "Split Tier" Configuration) – Only the Database runs on System z Servers

Public Sector Solutions
Taxpayer registration, tax return processing, revenue collection and audit, Siebel CRM

| **Oracle** **Enterprise Tax Management** | *Version 2.2* *DB2 V8 & 9, WAS 6.1* |

| **Oracle** **Siebel CRM for Public Sector** | *Version 8.2* *DB2 V8 & 9* |

BIEE Solutions
Data Source Only

| **Oracle** **Business Intelligence** **Enterprise Edition** | **Version 10.1.3.4.1* *DB2 V8.2 & and v9* | **Version 10.1.3.4.1* *Oracle 10gR2* |

Oracle on LINUX on z FAQ

- **Q: Does Oracle have technical support specialists for Linux on System z servers?**

- A: Yes. There is a dedicated Oracle team specially trained to support customers running Oracle with Linux on System z servers.

- **Q: Are Oracle patches and bug fixes handled any differently for Linux on System z servers?**

- A: No. Patches for Linux on System z servers are handled in the same way as any other Oracle certified platform. There is no delay due to the fact that it is System z environment.

- **Q: Are Oracle quarterly Patch Set Updates (PSUs) available for Linux on System z servers?**

- A: Yes, as of October 2009, the PSU quarterly releases which consist of CPU (Critical Patch Updates), generic, RAC and Dataguard patches are available on the same release date as all other platforms for Linux on System z servers.

- **Q: What is the Oracle support policy for security patches for Linux on System z servers?**

- A: Security patches also known as "CPU patches" are now included in the quarterly PSU (Patch Set Updates) for all platforms.

- **Q: What is Oracle's support policy for products certified for Linux on System z servers?**

- A: Products ported to Linux on System z servers will be supported according to the Oracle Lifetime Support Policy (see link) Oracle Lifetime Support Policy.
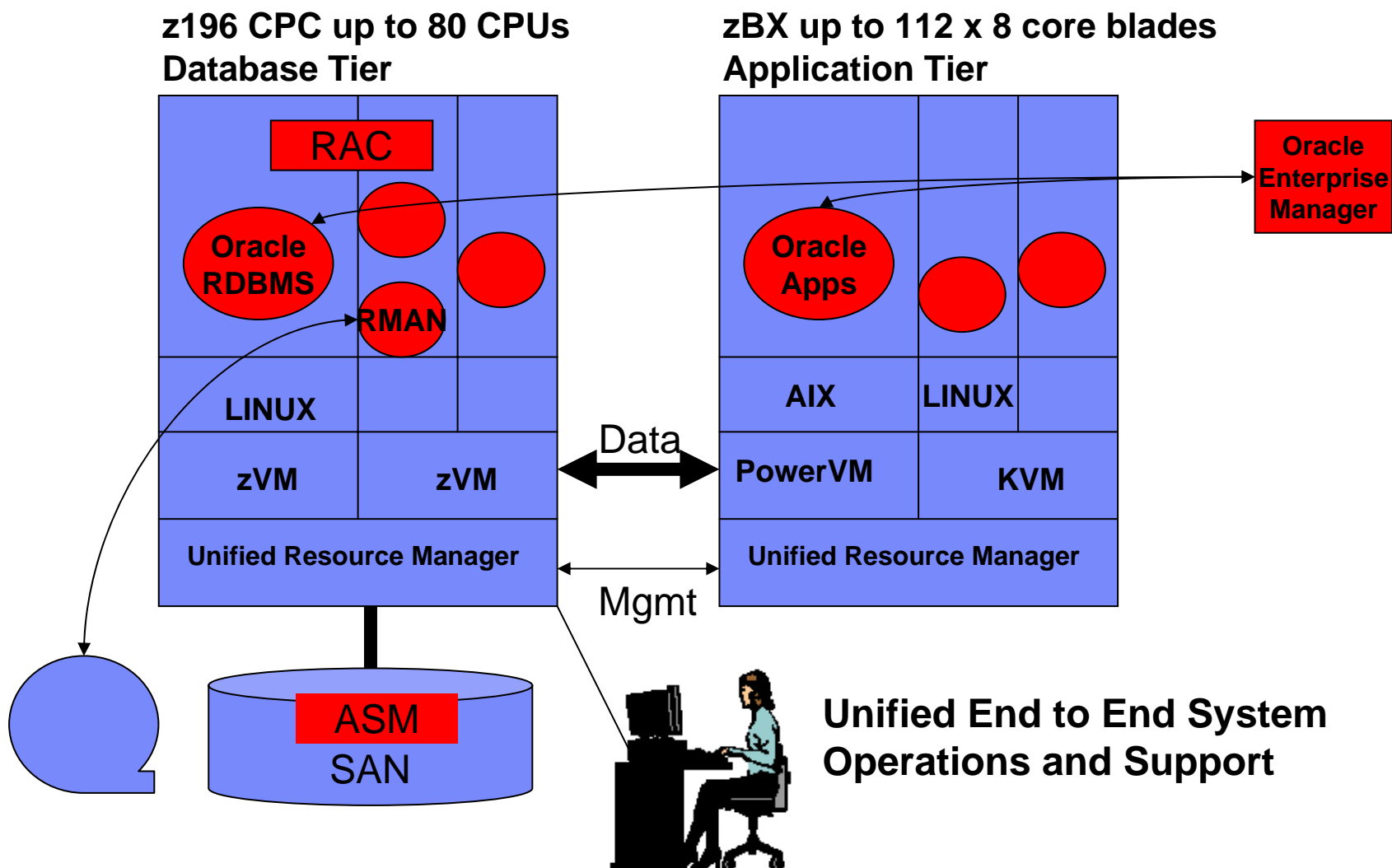
Agenda

- **Current Status of Oracle availability on System z**

- **Oracle on zEnterprise**

- **Using System z as a Smart Data Cloud**

Oracle on zEnterprise

- **zEnterprise is ideally suited to running Oracle software solutions.**
  - Solutions can either be ISV developed or in-house written applications using Oracle database(s).

- **Database Tier on z196**
  - Security
  - Availability
  - Performance
  - Flexibility

- **Application Tier on zBX**
  - Wide software availability
    - Power/AIX or System x*/LINUX

- **Centralised Management and Control via URM**

* IBM has issued a Statement of Direction regarding support for System x blades in the zBX. All statements regarding IBM future direction and intent are subject to change or withdrawal without notice, and represents goals and objectives only.
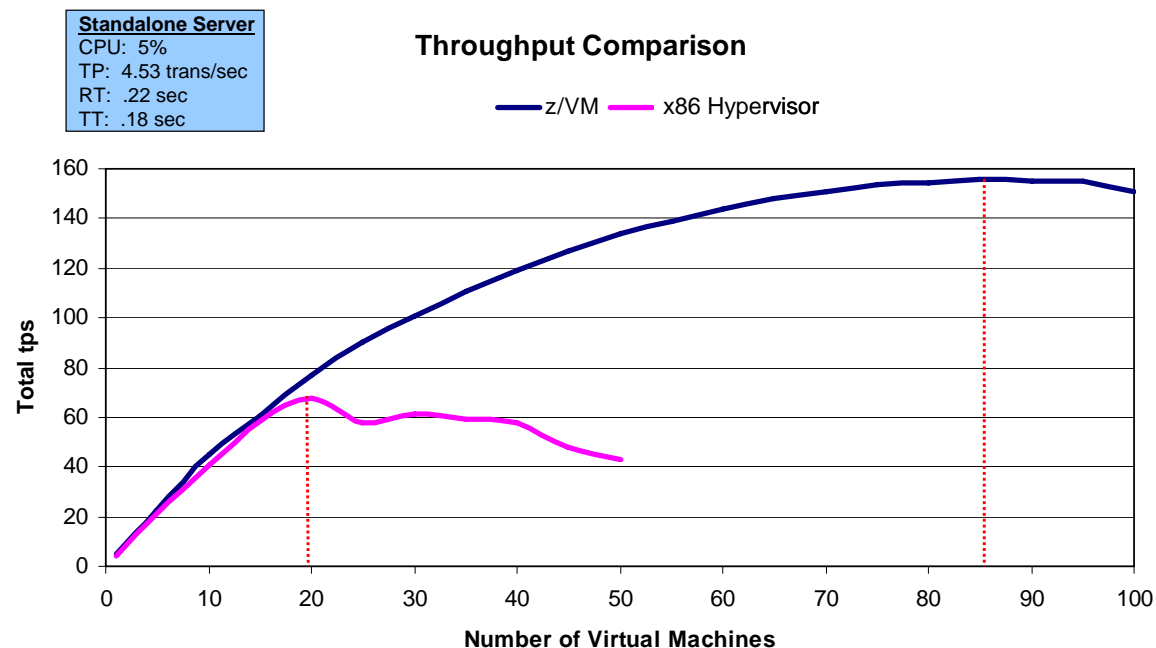
High Level Architecture of Oracle on zEnterprise

z196 CPC up to 80 CPUs
Database Tier

zBX up to 112 x 8 core blades
Application Tier

RAC

Oracle
RDBMS

RMAN

LINUX

zVM   zVM

Unified Resource Manager

Oracle
Apps

AIX   LINUX

PowerVM   KVM

Unified Resource Manager

Oracle
Enterprise
Manager

Data

Mgmt

ASM
SAN

Unified End to End System
Operations and Support

Agenda

- **Current Status of Oracle availability on System z**

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- **Using System z as a Smart Data Cloud**

Superior efficiency and scalability with z/VM software
A benchmark study on virtualization platforms for private clouds

Throughput Comparison

Standalone Server
CPU: 5%
TP: 4.53 trans/sec
RT: .22 sec
TT: .18 sec

Throughput Comparison

— z/VM   — x86 Hypervisor

Total tps (y-axis: 0, 20, 40, 60, 80, 100, 120, 140, 160)

Number of Virtual Machines (x-axis: 0, 10, 20, 30, 40, 50, 60, 70, 80, 90, 100)

Virtual Machine images running WebSphere Application Server workload were created and placed on:

- An 8-core IBM x3950 (4 @ 3.5GHz dual-core) with 64 GB of total physical memory running x86 hypervisor
- Single z10 EC (8 IFL @ 4.4 GHz) running z/VM software

Consolidated Server Images:
- Online banking application
- Using WebSphere App Server
- 5% average CPU utilization
- 40 ms average response time
- 4.5 transactions per second

VM images supported with acceptable response time
- x86 hypervisor: ~**30**
- z/VM software: **75**

Maximum throughput
- x86 hypervisor: **20**
- z/VM software: **85**

See White Papers at:
- Advantages of a Dynamic Infrastructure: A Closer Look at Private Cloud TCO
- A Benchmark Study on Virtualization Platforms for Private Clouds

National Business Center slashes costs by creating Strategic Enterprise Cloud Platform on IBM System z
Efficient datacenters prove a competitive advantage

Business challenge:

Despite being part of the Department of the Interior, the National Business Center (NBC) does not receive governmental funding and relies on competitive bids to operate. It needed to be able to offer the best service while keeping a sharp eye on costs to succeed.

Solution:

Implemented IBM System z mainframes running Linux and IBM WebSphere SOA. A range of IBM Tivoli products help manage mainframe virtualization, provisioning and balancing workload.

Benefits:

- System z operates at 80-100 percent utilization compared to the 10-20 percent average of distributed servers, maximising ROI

- Offers customers solid and secure service, ensuring maximum satisfaction

- Takes advantage of virtualization capabilities to optimize resource provisioning and workload balancing

Source: Clabby Analytics, August 2009

"System z is our enterprise server of choice due to clear advantages in cost-of-acquisition and operation – these savings are vitally important to us as they ensure NBC remains competitive in bidding situations."

— Doug Bourgeois, Director, National Business Center
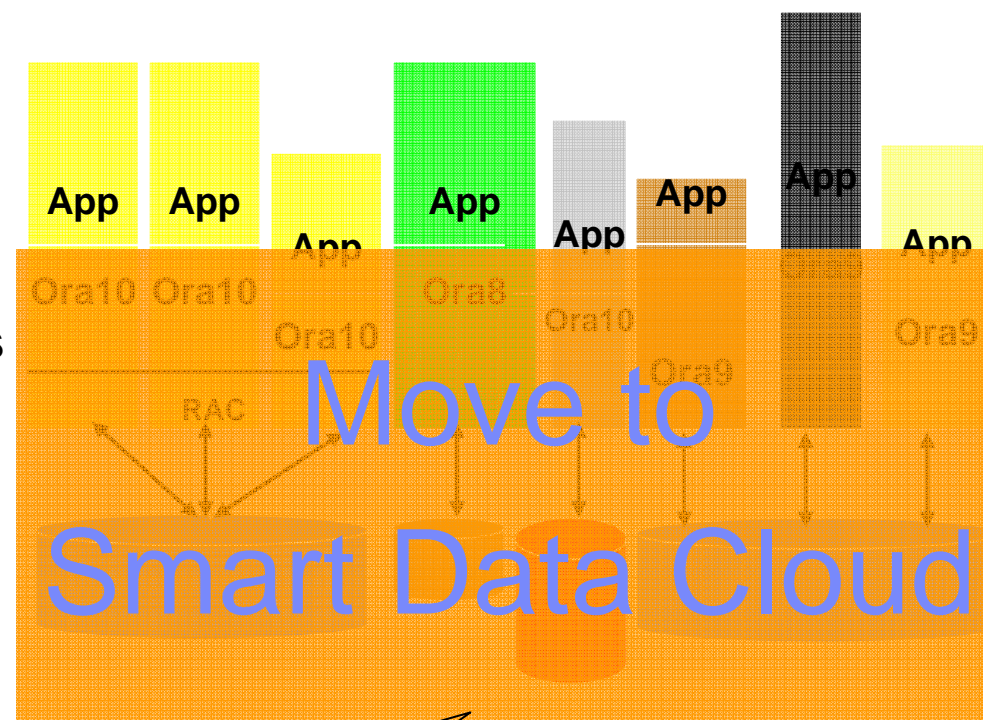
Solution components:

- IBM System z, WebSphere SOA, Linux and IBM Tivoli management products

ZSP03324-USEN-00 (January 2010)

Consider Typical Distributed - Oracle Estate

- **Utilisation less than 30% across estate**
  - Biggest overall consumer of cycles
    - Database
- **For many customers mid range DB is Oracle**
  - 40% of used cycles spent in Oracle
- **Deployed applications running on many versions of Oracle**
  - 7, 8, 9i, 10g and now 11g
  - Older databases tend to be smaller BUT run on older hotter servers
  - 60% of databases < 10GB (80% < 50GB)
- **Storage ranges from DAS, NAS, SAN**
  - Large space/energy footprint for older drives
- **Backups done over network**
  - Reliability of backup is a big issue
  - Peak utilisation often occurs during backup window

App App App App App App App App

Ora10 Ora10 Ora8 Ora10 Ora9

Ora10

RAC

Move to
Smart Data Cloud

- Servers
- DBA functions
- Storage
- Backup
- Multiple Service Levels

Centralise the Data, Virtualise the Applications

Sizing

- IBM **SCON** tool
  - Uses as input *sar* data from UNIX/LINUX systems
  - Analyse concurrent peak load points to determine if tasks can be moved
  - Common peak is nightly backup!
- Use in conjunction with Oracle tooling
  - AWR / STATSPACK

Based on 1 months data
- 100%-tile => 15.3 z10 IFLs.
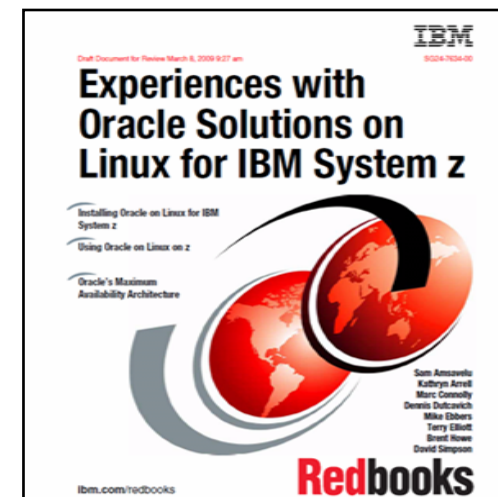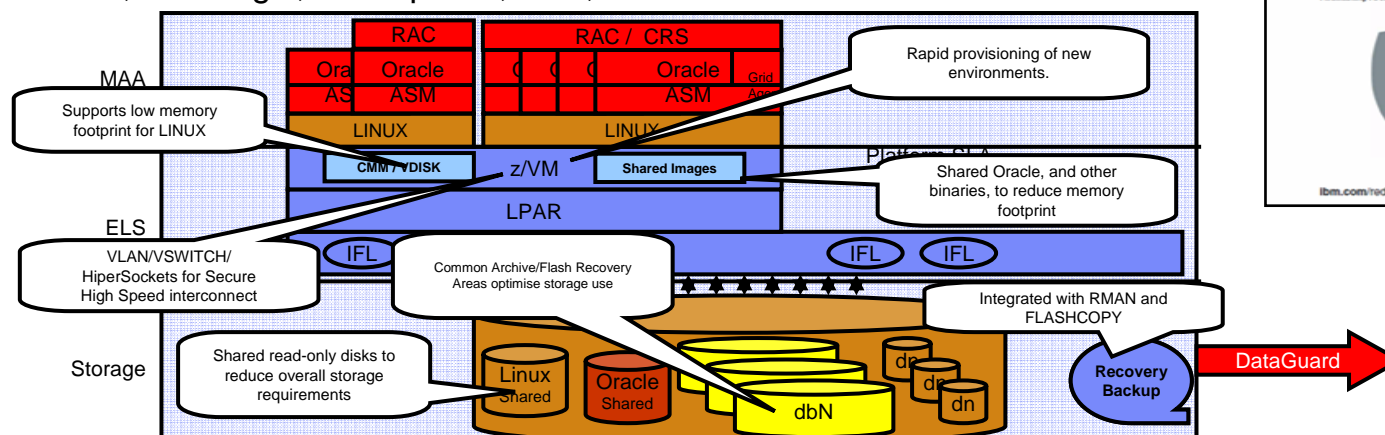- 99%-tile => 13.2
- 95%-tile => 11.3

Servers 14/10/2009 10:30 to 23/10/2009 16:0
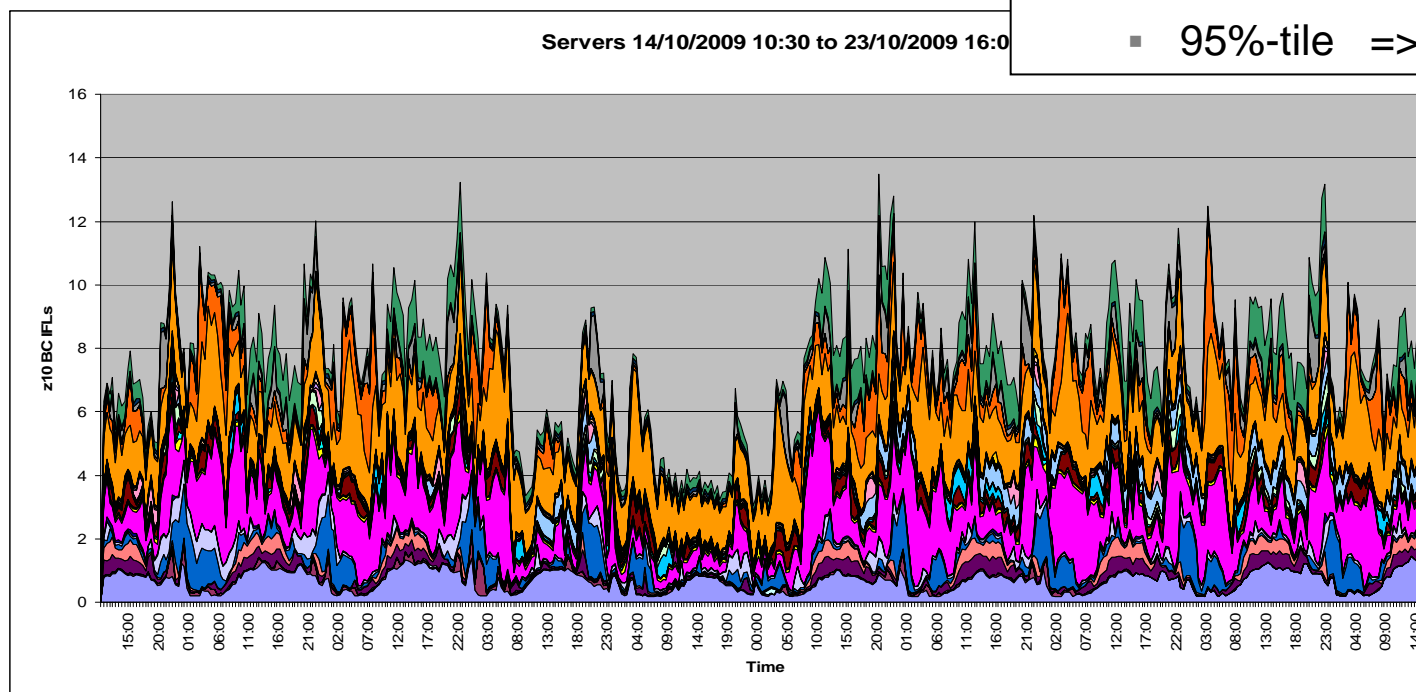
Further 30 – 40% reduction with z196 IFL

Target Architecture

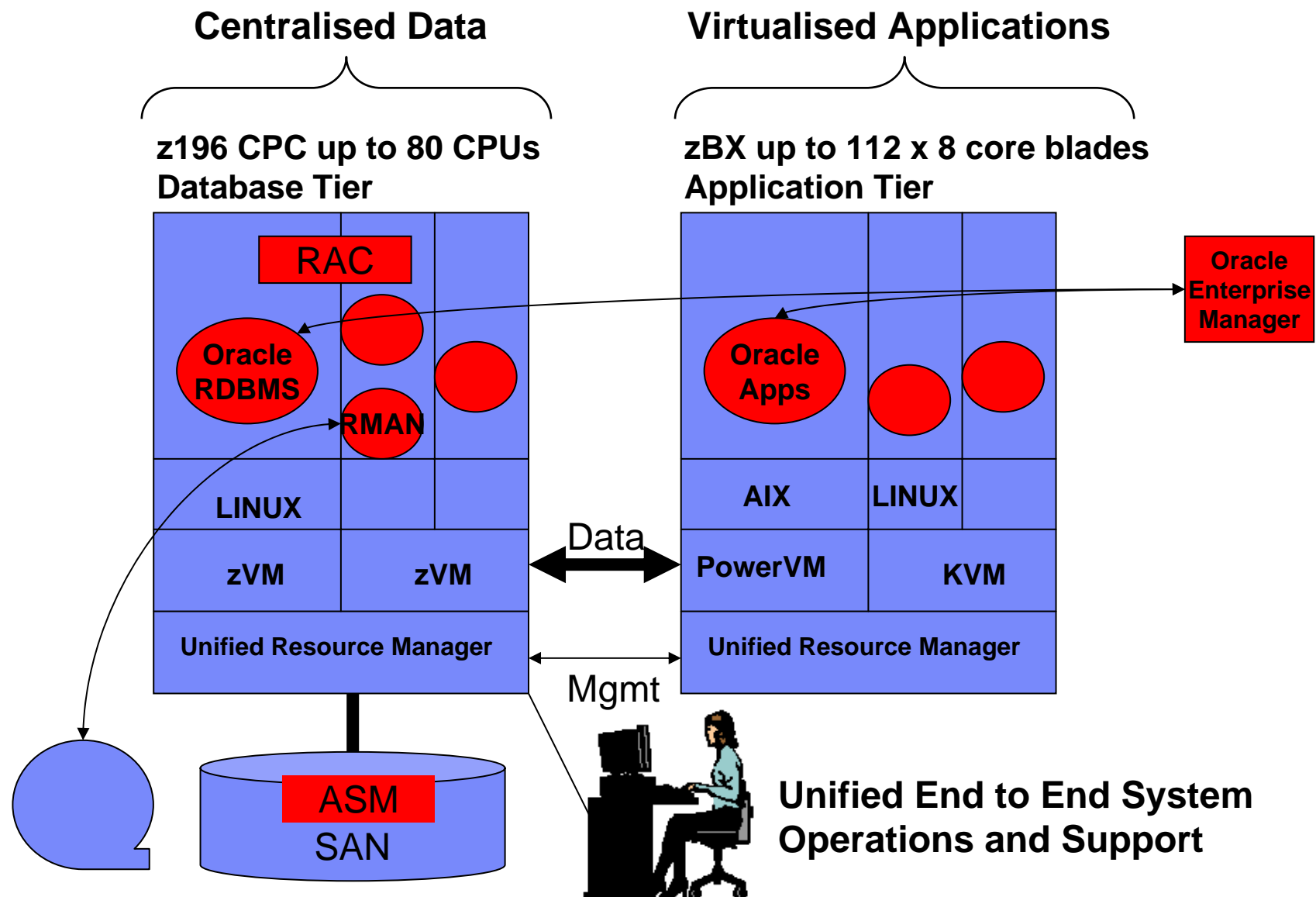- **Reference Architectures**
  - Oracle, WebLogic, WebSphere, DB2, etc.

- **Don't Repeat Mid Range Sprawl in VMs**
  - Management
    - Exploit z/VM capabilities – Dirmaint, PerfToolKit, RACF, Link and Clone
  - Backups
    - Make use of HiperSockets/VM VSWITCH not real wires
    - Consider open source solutions e.g. AMANDA, Bacula
  - Tooling
    - Always ask *"Do we really need it?"* and *"How much is it costing?"*

High Level Architecture of Oracle on zEnterprise

Centralised Data

Virtualised Applications

z196 CPC up to 80 CPUs
Database Tier

zBX up to 112 x 8 core blades
Application Tier

RAC

Oracle RDBMS

RMAN

LINUX

zVM   **zVM**

Unified Resource Manager

Oracle Apps

AIX   **LINUX**

PowerVM   **KVM**

Unified Resource Manager

Oracle Enterprise Manager

Data

Mgmt

ASM
SAN

**Unified End to End System**
Operations and Support

Some Observations for Deploying Oracle Database on LINUX on z

- **Always use zVM**
  - The additional flexibility is well worth the minimal overhead (c. < 1%)
  - Oracle RAC is fully supported on zVM

- **It is generally better to create a new VM rather than squeeze functions together**
  - This simplifies, considerably, future upgrades and day to day administration
  - Critical for offering mixed service levels on single system

- **Exploit RAC for none-disruptive upgrades**
  - Supports upgrade of: zVM, LINUX and/or Oracle

- **Memory sizing for production LINUX VM is:**
  - Advisory SGA + Advisory PGA + ASM (128MB) + LINUX Process/kernel (512MB) + Page Tables
  - Page Table requirement is 2MB per GB of Virtual Memory in use
    - High Estimate => Number concurrent Oracle Processes * (SGA + PGA in GB) * 2 MB
      - E.g. 1GB (SGA + PGA) , 150 Oracle processes => 300MB
  - Advisory SGA and PGA from AWR / STATSPACK

- **Network settings**
  - Maximum Transmission Unit (MTU) to **8992** for Oracle RAC Interconnect Interfaces or large SQL*net
  - With HiperSockets (memory to memory) save CPU cycles and switch check summing off

- **Crypto**
  - Exploit the crypto card with Oracle. Typically, 80% higher throughput and offload SSL cycles from CPU

How IBM and Oracle can help?

- **IBM RACE (**Re-fitting Applications into Consolidated Environments**) tool**
  - Based around Ideas International Competitive Profiles data
  - Uses standardised cost profile as starting point
  - Tailored to use YOUR numbers (where known)
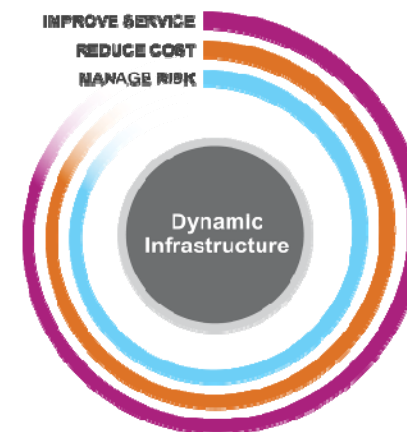 - Provides comparative case for
    - Legacy vs. ELS vs x86 vs others..
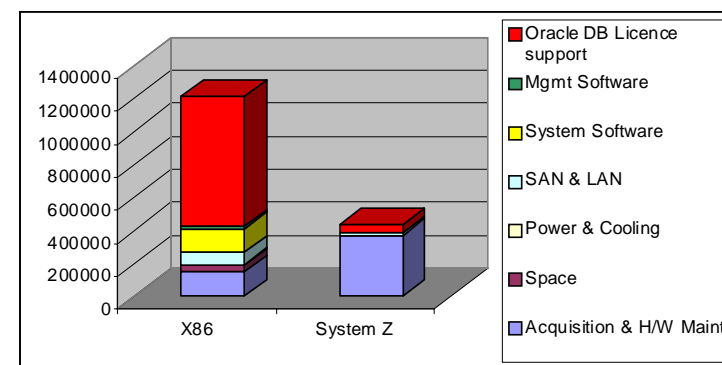
- **IBM / Oracle can help with PoC**
  - Access to zLITE environment in Montpellier via VPN
  - Large scale benchmarking in Montpellier
  - Technical design services
  - Quick start resources
  - Application porting/migration
  - Loan of un-allocated processors

Questions

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INPROVE SERVICE
REDUCE COST
MANAGE RISK

Dynamic
Infrastructure

Do More with Less