Tivoli & zEnterprise

Integrated Service Management and Cloud Computing

Paola Monteferri
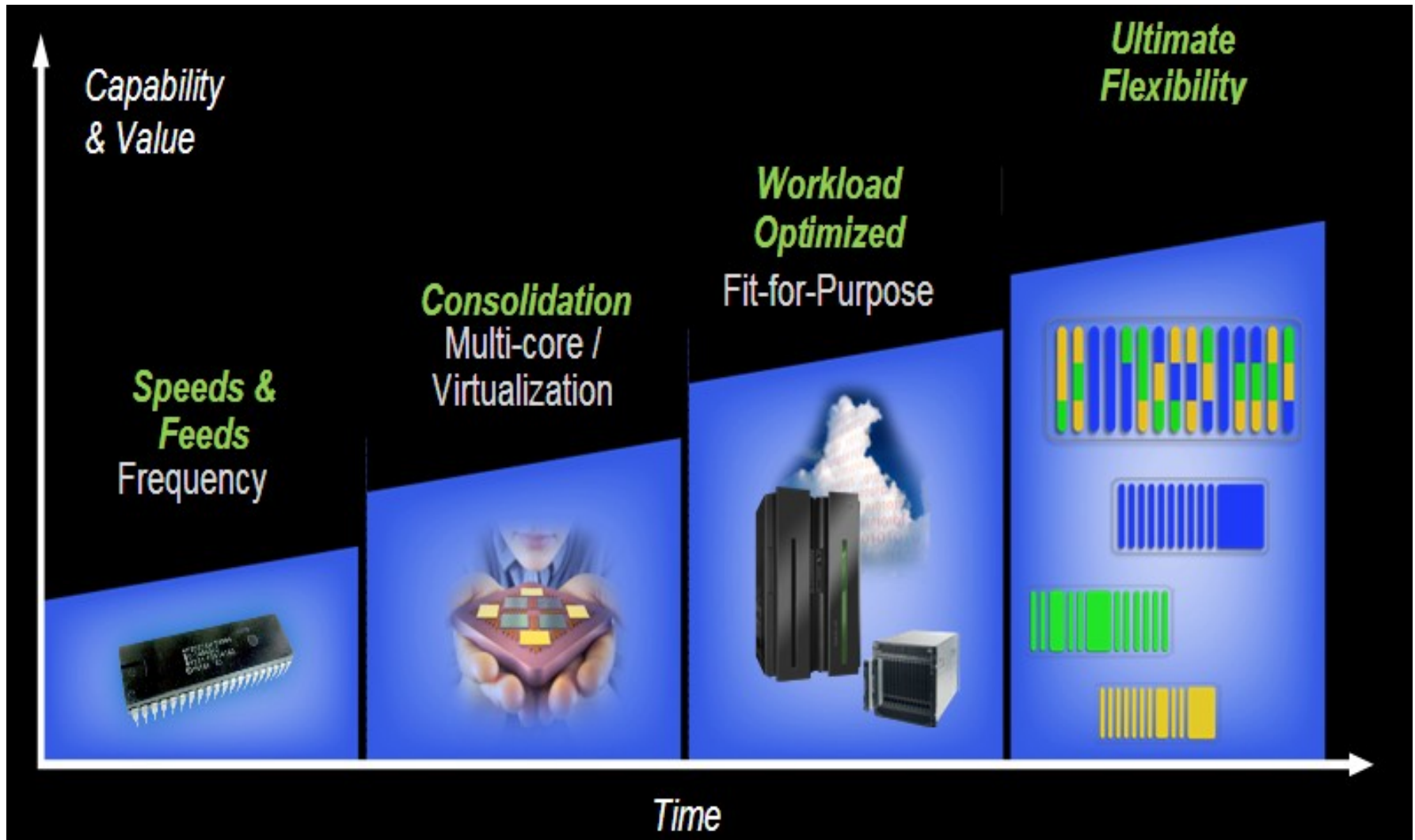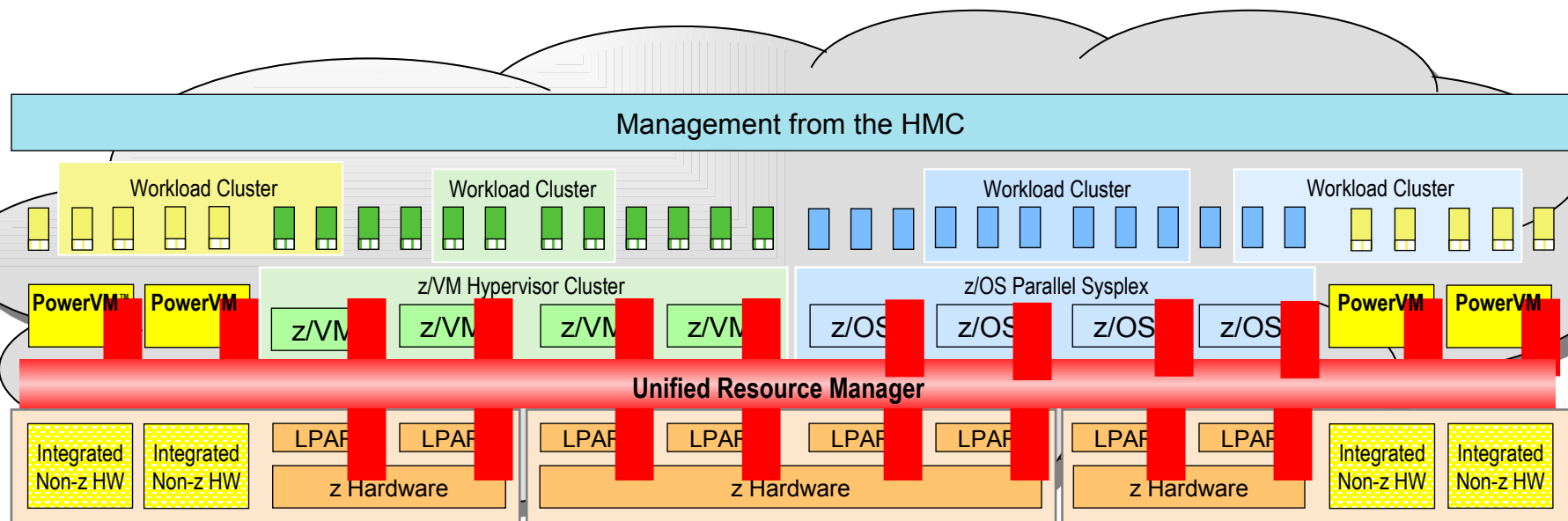Domenico Chillemi

Agenda

- zEnterprise history

- zEnterprise introduction

- Integrated Service Management (ISM) introduction

- Fit for Purpose Approach

- ISM in action on zEnterprise

- Cloud Computing on zEnteprise

zEnterprise history

- **System z : hosting a federation of platform management functions, including:**
  - Resource monitoring
  - Workload management
  - Availability management
  - Image management
  - Energy management

- **Integrates with hardware management and virtualization functions**
- **Controls hypervisors and management agents on blades**
- **Open integration to enterprise-level management software**

Management from the HMC

Workload Cluster | Workload Cluster | Workload Cluster | Workload Cluster

PowerVM™ | PowerVM | z/VM Hypervisor Cluster | z/OS Parallel Sysplex | PowerVM | PowerVM

z/VM | z/VM | z/VM | z/VM | z/OS | z/OS | z/OS | z/OS

Unified Resource Manager

Integrated Non-z HW | Integrated Non-z HW | LPAR | LPAR | LPAR | LPAR | LPAR | LPAR | LPAR | LPAR | Integrated Non-z HW | Integrated Non-z HW

z Hardware | z Hardware | z Hardware

= Code that interfaces with Unified Resource Manager

zEnterprise introduction

Tivoli. software

IBM zEnterprise System Summary
Best in Class Systems and Software Technologies
A system of systems that unifies IT for predictable service delivery

The world's fastest and most scalable system:
IBM zEnterprise™ 196 (z196)

Unified management for a smarter system:
zEnterprise Unified Resource Manager (zManager)

Scale out to a trillion instructions per second:
**IBM zEnterprise BladeCenter® Extension (zBX)**

z/OS
z/VM
z/VSE
z/TPF
Linux
HMC

AIX
Linux
(Windows)

IBM zEnterprise System – For consolidating application in a strong z system
A mid size system with the same architecture and porewful for service delivery

The best IBM consolidation system: **IBM zEnterprise™ 114 (z114)**

Unified management for a smarter system: **zEnterprise Unified Resource Manager**

Scale out to a trillion instructions per second: **IBM zEnterprise BladeCenter® Extension (zBX)**
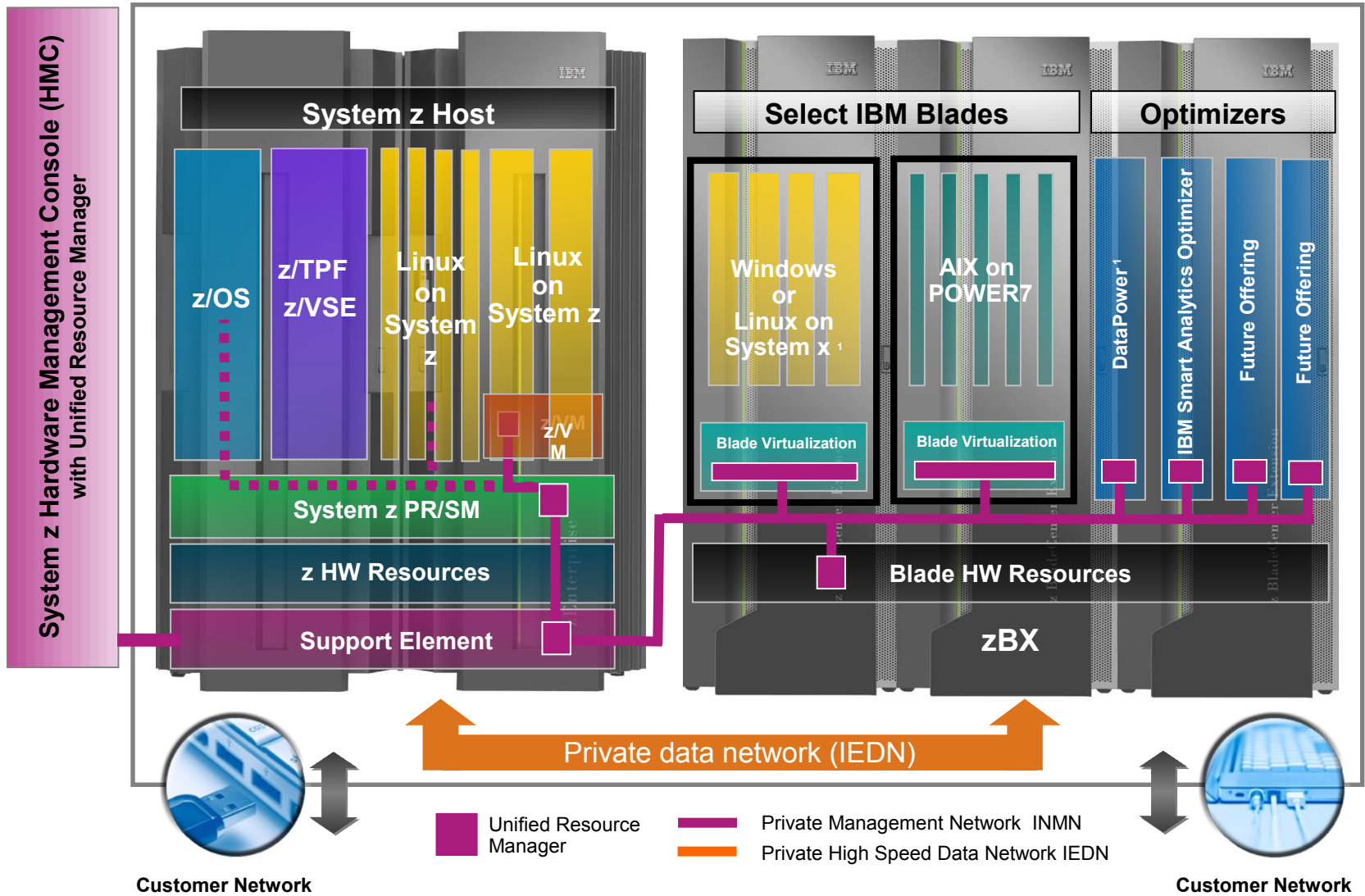
z/OS

New Z114

z/VM

z/VSE

z/TPF

Linux

HMC

AIX

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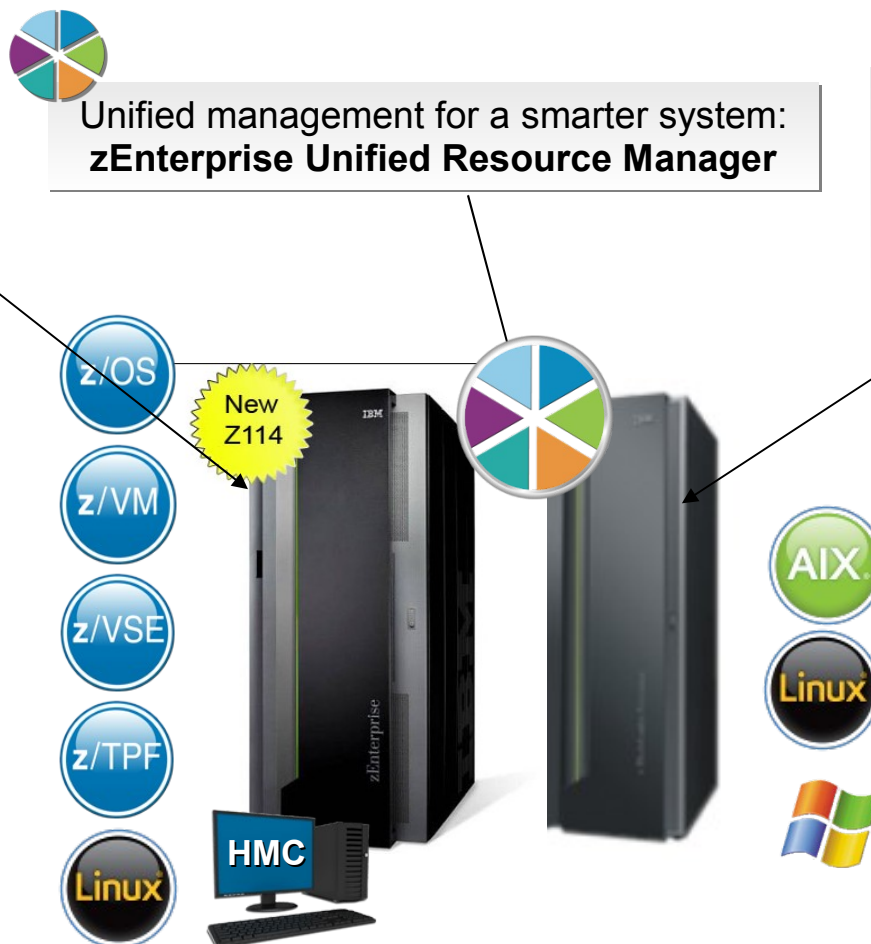
[1] All statements regarding IBM future direction and intent are subject to change or withdrawal without notice, and represents goals and objectives only.

Putting zEnterprise System to the task
Use the smarter solution to improve your application design

System z Hardware Management Console (HMC) with Unified Resource Manager

System z Host

z/OS

z/TPF z/VSE

Linux on System z

Linux on System z

z/VM

System z PR/SM

z HW Resources

Support Element

Select IBM Blades

Windows or Linux on System x [1]

AIX on POWER7

Blade Virtualization

Blade Virtualization

Optimizers

DataPower[1]

IBM Smart Analytics Optimizer

Future Offering

Future Offering

Blade HW Resources

zBX

Private data network (IEDN)

Unified Resource Manager

Private Management Network INMN

Private High Speed Data Network IEDN

Customer Network

Customer Network

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

zEnterprise Unified Resource Manager
Transforming the way resources are managed and deployed

What is it?

*Unified Resource Manager provides **workload awareness** to optimize the system resources in accordance with understanding the policies assigned to that particular workload.*

Functions are grouped into two suites of tiered functionality that enable different levels of capability - Manage suite and Automate suite.

How is it different?

- **Heterogeneous management:** Total systems management across heterogeneous resources

- **Integration:** Single point of control, common skills for resources, reduced complexity of day to day operations.

- **Monitoring.** New dashboard for CPU resources and energy management.

- **Simplified installation:** Auto discovery and configuration of resources and workloads with single interface

- **Secure:** Improved network security with lower latency, less hops and less complexity. Improved control of access due to management of hypervisors as firmware.

- **Service and support management:** Virtual machines and blades able to perform hardware problem detection, reporting and call home

zEnterprise hardware management and platform management

Simplified installation of hypervisors

Gain significant time to market with improved speed of deployment

and

Manage and control communication between virtual server operating systems and the hypervisor.

Simplified energy management

Energy cost savings

Save time, cost and simplify asset management

Decrease problem determination and resolution time for cross-platform resources

Improve and simplify cross-platform availability procedures

Enable broader and more granular view of resource consumption

Allow critical workloads to receive resources and priority based on goal-oriented policies established by business requirements

**Smart business adjustments based on workload insight**

Provide deep insight into how IT resources are being used

policies

- Hypervisors
- Energy
- Operations
- Performance
- Networks
- Virtual Servers

HMC

Factory installed and configured network

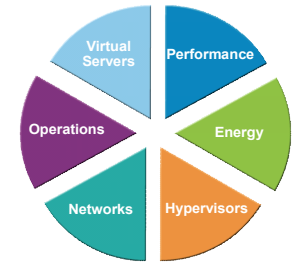**Improved network security with lower latency, less complexity, no encryption/decryption**

Gain flexibility, consistency and uniformity of virtualization

Provide the business with faster time to market

Simplified network management for applications

- ge suite
- Automate suite
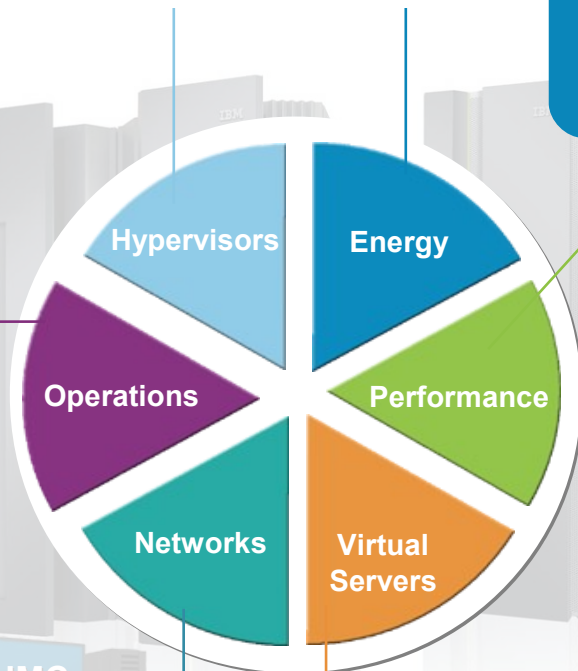
Unified Resource Manager
Two suites of tiered functionality

- *Manage*
    - Monitor and trend reporting of CPU energy efficiency.
    - New dashboard interface enabling a broader view of system resource consumption.
    - Integrated hardware / asset management across all elements of the system.
    - Private and physically isolated connections for secure support and data sharing.
    - Administrative simplification (wizard) for virtual server provisioning and enablement of integrated storage and network across hypervisors.

- *Automate*
    - Additional wizard function to set up resources associated with a workload the capability to associate those resources with a named business process.
    - Ability to manage to a user defined performance service level policy and enable performance monitoring, reporting and resource optimization.
    - Static power savings and energy management capabilities.

ISM introduction

With ONE Service Management Engine
Leveraging the Strengths of ONE System

Integrated Service Management

Service Management
Visibility, control, and automation from System z across your business

- IBM Service Management on system z is uniquely architected to extend the value of zEnterprise

- New offerings from Tivoli make it easier to acquire service management

Tivoli and System z "*partnership*"

For clients deploying fit for purpose **business services** to a zEnterprise infrastructure, Integrated Service Management extends the Unified Resource Manager capabilities with the **visibility, control and automation** required to manage in the context of the overall business service objectives.

Tivoli and System z are collaborating to define the business context, setting the pace for all management providers.
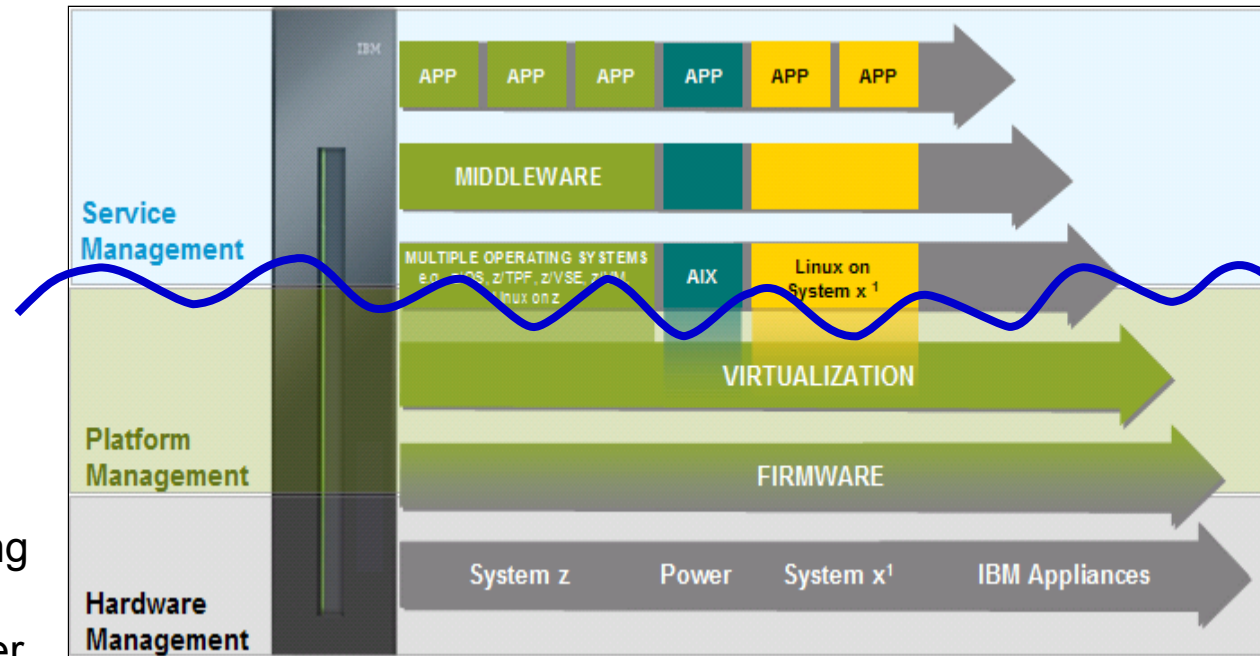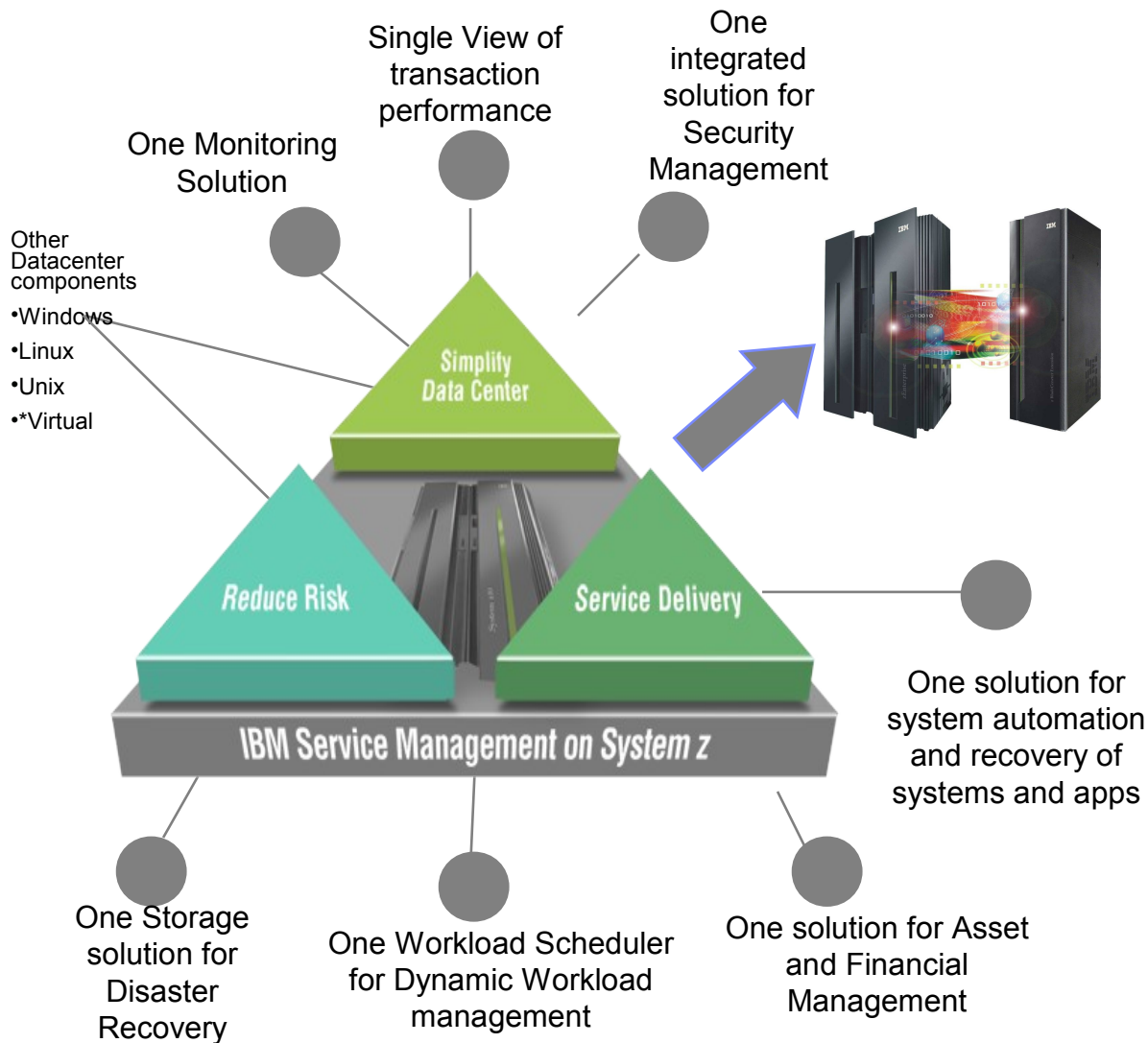
Integrated Service Management is the Tivoli answer for managing zEnterprise

WHY?...

- System z is providing a strong case for centralizing management of the hardware, firmware and hypervisor management across z, Power and x86

- Integrated Service Management provides the capabilities for centralizing management of the operating systems, middleware, storage, networks, and other resources composed to deliver *business services*
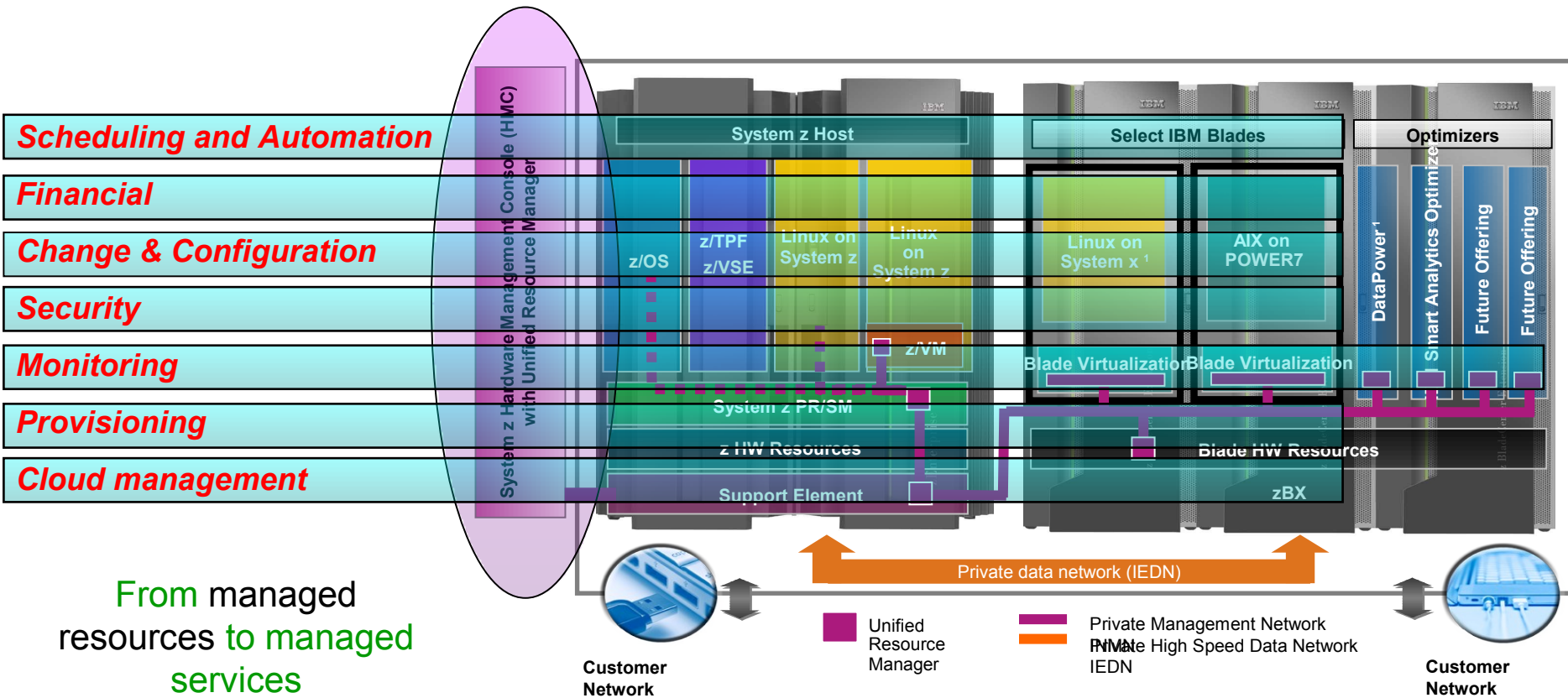
Tivoli and zEnterprise: SAME 1 to 1 approach

IBM Advantage

Single View of transaction performance

One integrated solution for Security Management

One Monitoring Solution

Other Datacenter components
- Windows
- Linux
- Unix
- *Virtual

Simplify Data Center

Reduce Risk

Service Delivery

IBM Service Management on System z

One solution for system automation and recovery of systems and apps

One Storage solution for Disaster Recovery

One Workload Scheduler for Dynamic Workload management

One solution for Asset and Financial Management

✓ Visibility. Control. Automation™ with a *SINGLE POINT OF CONTROL on a common infrastructure*

✓ *Consolidated view of the IT infrastructure*

✓ *Lower training and maintenance costs*

✓ *Integrated, consolidated reporting*

✓ *Asset optimization*

Positioning Tivoli ISM with zManager

Scheduling and Automation

Financial

Change & Configuration

Security

Monitoring

Provisioning

Cloud management

System z Hardware Management Console (HMC) with Unified Resource Manager

| System z Host | Select IBM Blades | Optimizers |

z/OS | z/TPF z/VSE | Linux on System z | Linux on System z | Linux on System x [1] | AIX on POWER7

DataPower [1] | Smart Analytics Optimizer | Future Offering | Future Offering

z/VM

Blade Virtualization | Blade Virtualization

System z PR/SM

z HW Resources | Blade HW Resources

Support Element | zBX

Private data network (IEDN)

From managed resources to managed services

Customer Network

Unified Resource Manager

Private Management Network
PHMN
Private High Speed Data Network
IEDN

Customer Network

The Challenge – Complete zManager mission

zManager is all you need for all zEnterprise internal management tasks…

but requires Integrated Service Management when dealing with applicative world across zEnterprise

Management Stack

Building an architectural construct of hardware, software, services

Integrated Service Management

Service Management
- End-to-End Workload and Security Management that align IT Management with Business Goals
- Common Usage and Accounting for business management
- Dynamic Management of Application Workloads based on Policies

Platform Management
- Workload based Resource Allocation and Provisioning
- Physical and Virtual Resource Management
- Goal Oriented Resource Management of zEnterprise

+

Hardware Management
- Configuration management
- Operational controls
- Lifecycle management for the platform's virtual resources

+

PLUS zManager:
- Virtualization management – single view of virtualization across z platform
- Hypervisor management and creation of virtual networks
- Operational controls, service and support
- Workload awareness and platform performance management
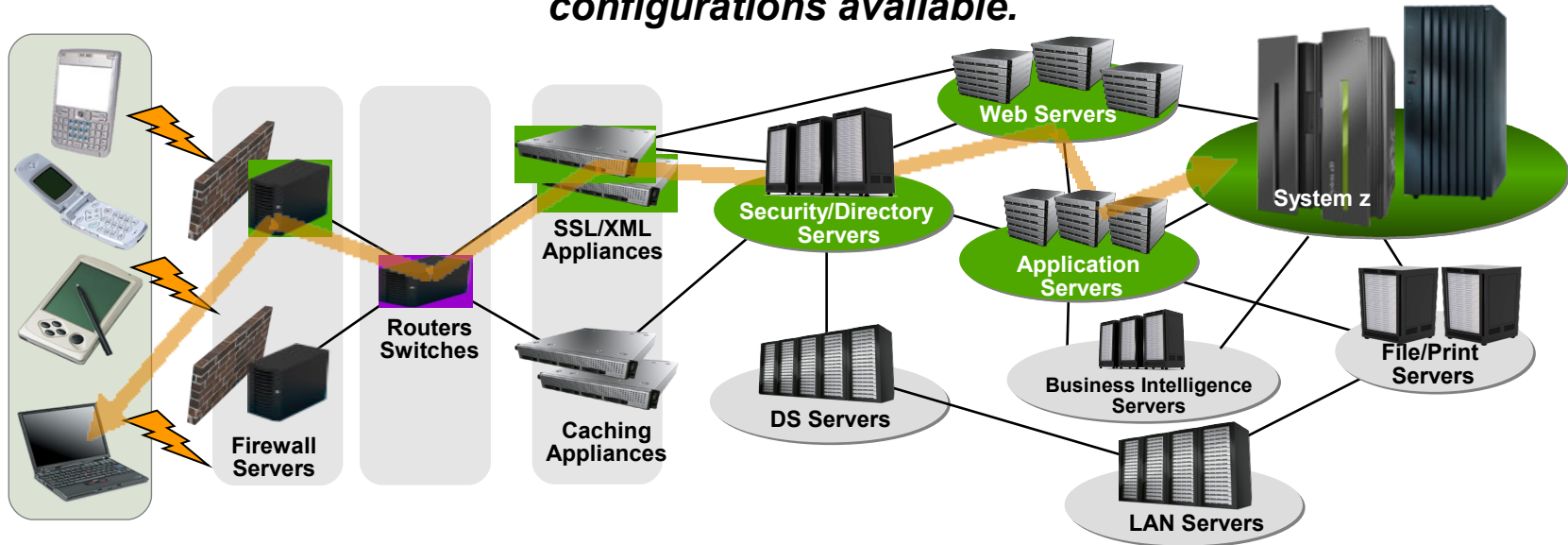- Energy Monitoring and Mgmt

Fit for Purpose Approach

## Information Technology Today: Limitations

Information technology today is limited by the technology and architecture configurations available.

- Business processes and the applications that support them are becoming more service oriented, modular in their construction, and integrated.

- The components of these services are implemented on a variety of architectures and hosted on heterogeneous IT infrastructures.

- Approaches to managing these infrastructures along the lines of platform architecture boundaries cannot optimize: alignment of IT with business objectives; responsiveness to change; resource utilization; business resiliency; or overall cost of ownership.

- **Customers need better approach: The ability to manage the IT infrastructure and Business Application as an integrated whole.**

Fit for Purpose approach
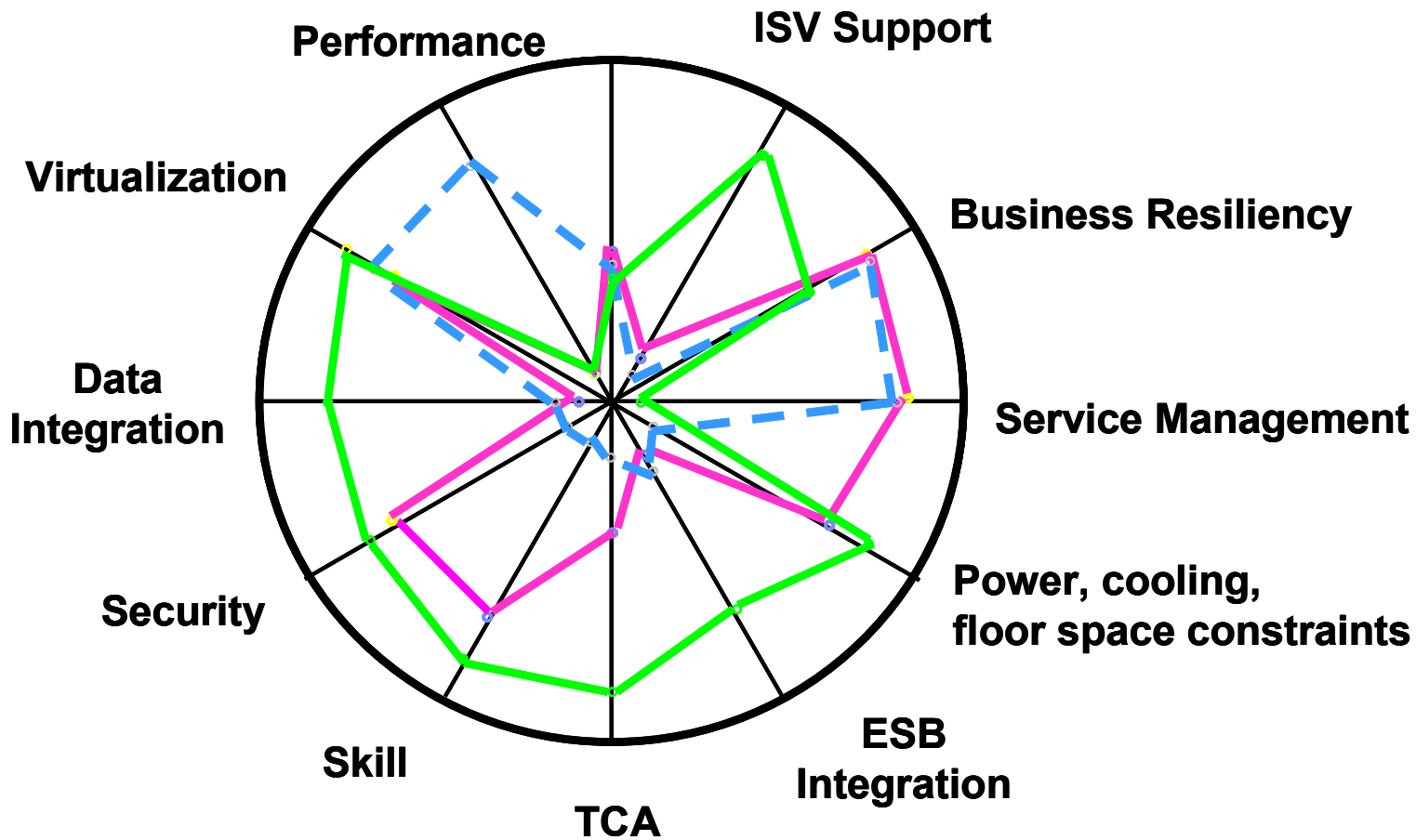
Scenario 1

Scenario 2

Scenario 3

Recognizable workload patterns

Core Applications

Database (z)	Database (z)
✓ DB2® for z/OS®, IMS™	✓ DB2 for z/OS ✓ Oracle on Linux for z
Application (z) ✓ CICS®, IMS ✓ COBOL ✓ WebSphere®	**Application (z)** ✓ WebSphere

SAP

Database (z)	Database (z)
✓ DB2 for z/OS	✓ DB2 for z/OS
Application (z) ✓ Linux® for z	**Application (x86)** ✓ Linux for x86 ✓ Windows

Database (z)
✓ DB2 for z/OS

Application (Power)
✓ AIX®

Multi-Tier Web Serving

Database (z) •DB2 for z/OS	Database (z) •DB2 for z/OS
Application (z) •WebSphere **Application (x86)** •WebSphere •Apache / Tomcat	**Application (Power / UNIX)** •WebSphere •JBoss
Database (z) •DB2 for z/OS, IMS **Transaction Processing (z)** •CICS, IMS, MQ **Application (Power /UNIX)** •WebSphere •JBoss •WebLogic **Presentation (x86)** •WebSphere •Windows	Database (z) •DB2 for z/OS or IMS **Application (Power /UNIX)** •WebSphere •JBoss **Presentation (x86)** •WebSphere •Apache / Tomcat •Windows

Data Warehouse

Master Data Management
Database (z)
▪ DB2 for z/OS
Application (z)
▪ WebSphere MDM (AIX, Linux on z)

Analytics & Business Intelligence

Analytics
▪ System z/OS
  ▪ DB2
  ▪ Cognos®
  ▪ SAS
▪ Linux for System z
  ▪ Cognos
  ▪ SPSS
  ▪ InfoSphere™ Warehouse
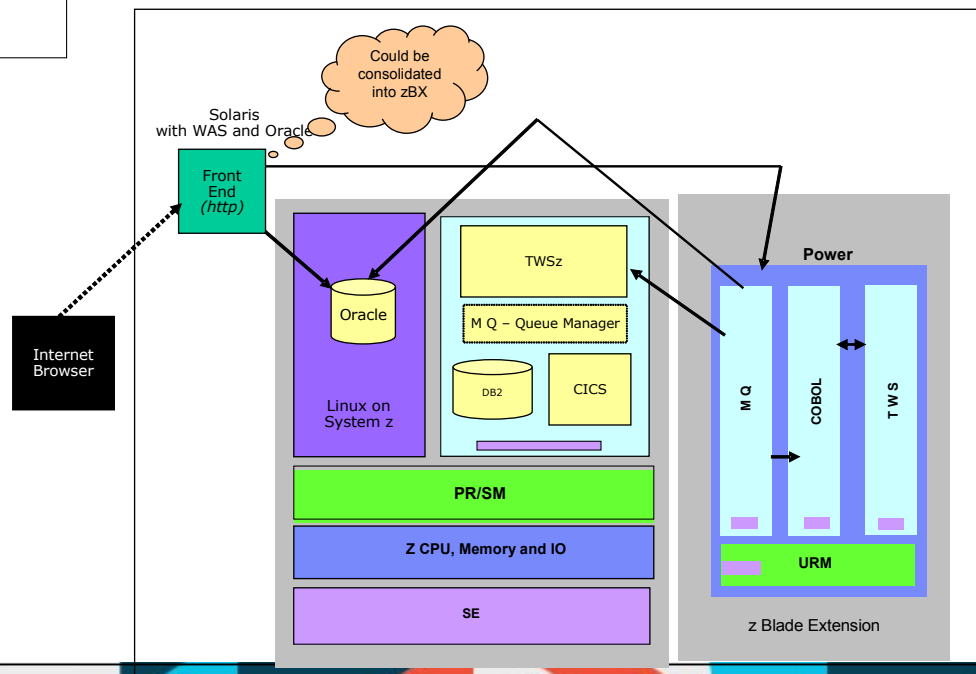
IBM **Tivoli.** software

Fit for Purpose Example 1
DB batch Consolidation
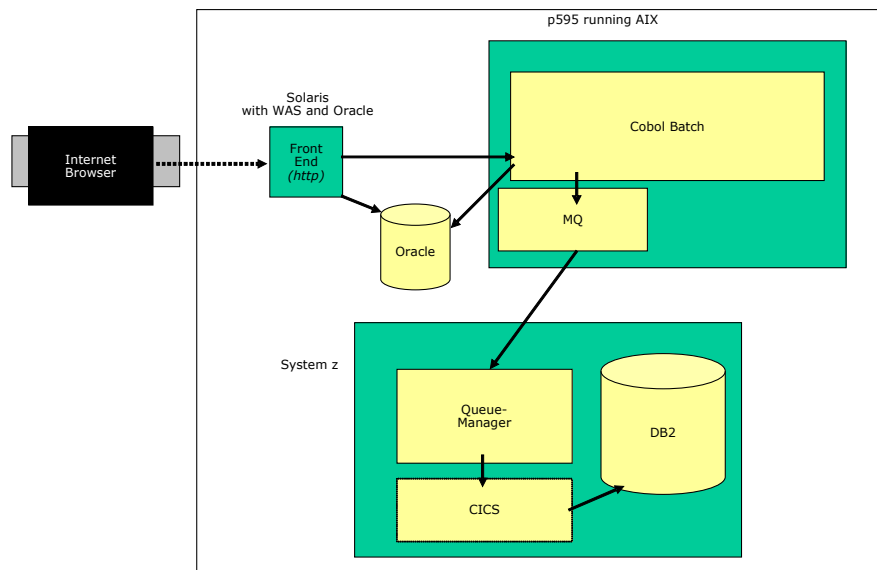
p595 running AIX

Solaris with WAS and Oracle

Internet Browser

Front End (http)

Oracle

Cobol Batch

MQ

System z

Queue-Manager

DB2

CICS

- *Lower Total Cost*
  - *Fit for purposes*

- *Best efficiency*

- *Better business continuity capabilities*
  - *Mutual takeover in campus*

- *Better disaster recovery capabilities*
  - *z196 is already on DR site*

- *Better usability and management*

- *Highly open to further consolidations*
  - *x86 Blades for Front End Applications*
  - *Oracle to DB2 with DB consolidation on z/OS*
  - *Tivoli Workload Scheduler as unique batch consolidator*

Could be consolidated into zBX

Solaris with WAS and Oracle

Front End (http)

Internet Browser

Oracle

Linux on System z

TWSz

M Q – Queue Manager

DB2

CICS

PR/SM

Z CPU, Memory and IO

SE

Power

M Q

COBOL

T W S

URM

z Blade Extension

25

© 2011 IBM Corporation

Fit for Purpose Example 2
Web & CTG
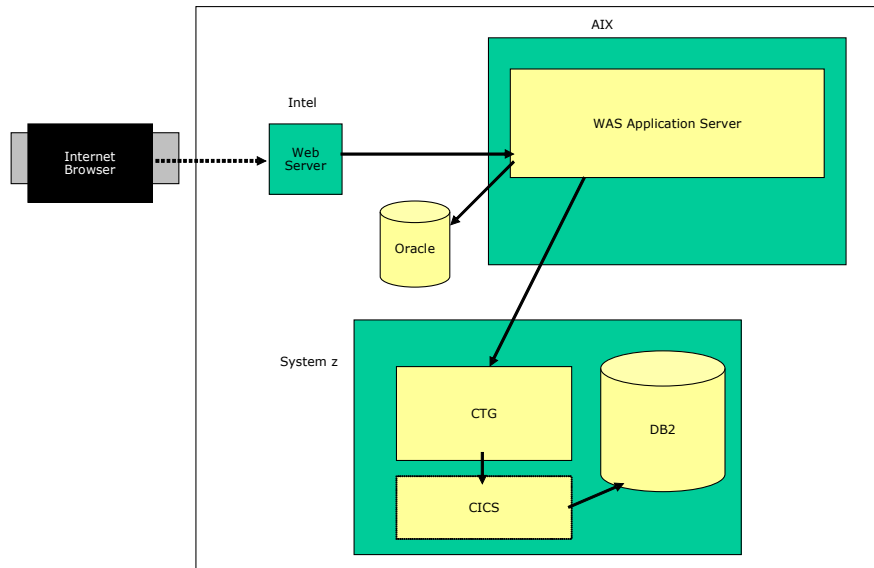
AIX

Intel

Internet Browser

Web Server

WAS Application Server

Oracle

System z

CTG

DB2

CICS

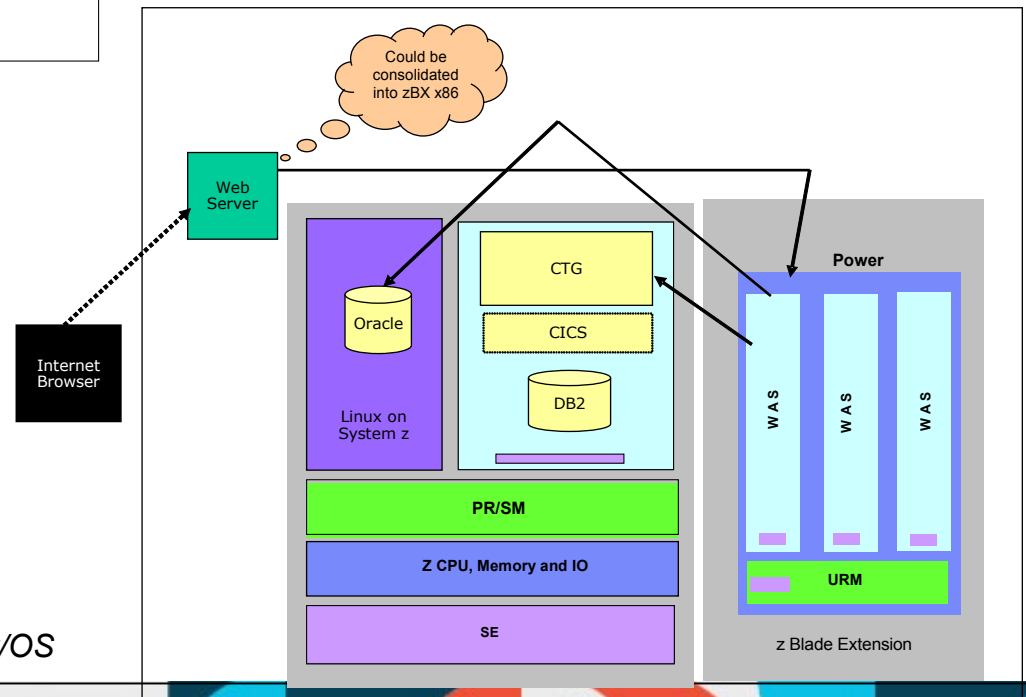- *Lower Total Cost*
  - −*Fit for purposes*

- *Best efficiency*

- *Better business continuity capabilities*
  - −*Mutual takeover in campus*

- *Better disaster recovery capabilities*
  - −*z196 is already on DR site*

- *Better usability and management*

- *Highly open to further consolidations*
  - −*x86 Blades for Web Server*
  - −*Oracle to DB2 with DB consolidation on z/OS*

Could be consolidated into zBX x86

Web Server

Internet Browser

Power

CTG

CICS

Oracle

DB2

Linux on System z

W A S

W A S

W A S

PR/SM

Z CPU, Memory and IO

URM

SE

z Blade Extension

Fit for Purpose Example 3 Data Warehouse
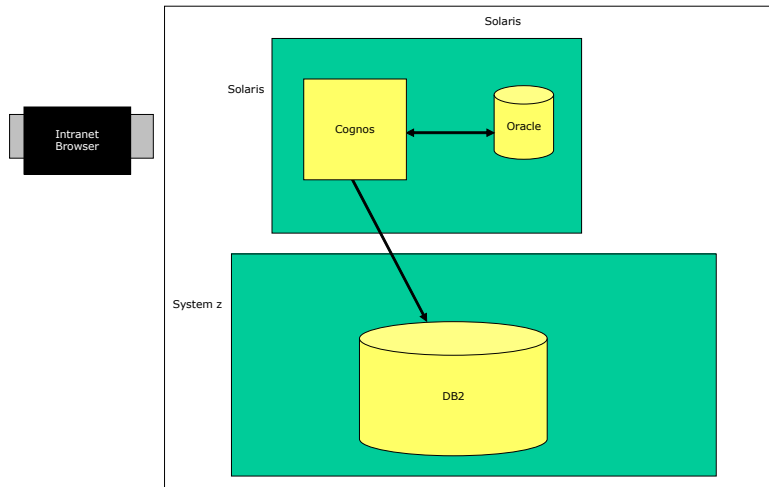
Solaris

Solaris

Cognos

Oracle

Intranet Browser

System z

DB2
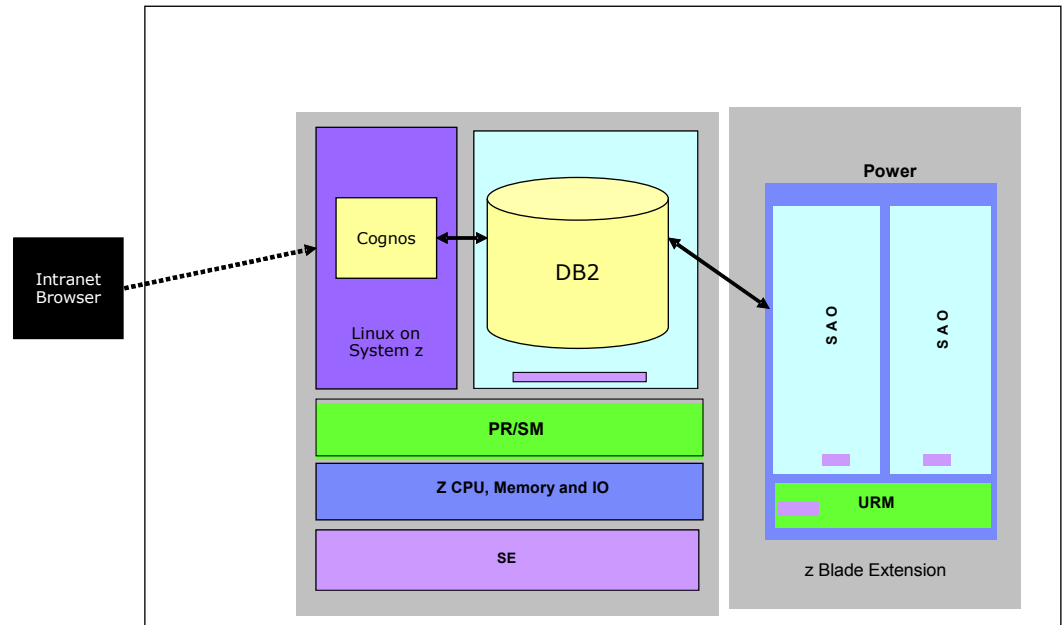
- *Lower Total Cost*
  - *Fit for purposes*

- *Best efficiency*

- *Better business continuity capabilities*
  - *Mutual takeover in campus*

- *Better disaster recovery capabilities*
  - *z196 is already on DR site*

- *Better usability and management*

- *Highly open to further consolidations*
  - *Cognos consolidation on zLinux*
  - *Cognos DB will be DB2 on z/OS*

- *Exploit of Accelerator*
  - *ISAO will be used to highly improve performance*

Intranet Browser

Cognos

DB2

Linux on System z

PR/SM

Z CPU, Memory and IO

SE

Power

S A O

S A O

URM

z Blade Extension

ISM in action on zEnterprise

Tivoli scenarios for zEnterprise

There are a number of Integrated Service Management Scenarios that will drive significant customer value in the zEnterprise era

Tivoli Application Resilience for zEnterprise
• Automated high availability and disaster recovery operations across multi-tier environments
• Central view and management of critical business processes

Tivoli Application Management for zEnterprise
• Ability to view, monitor and manage applications for physical and virtual machines
• Alerting capabilities for early detection of costly slow downs or outages

Tivoli Asset and Financial Management for zEnterprise
• Visibility into software usage and compliance across heterogeneous resources
• Greater efficiency of resource usage
• Central view and management of requirements and costs

Tivoli Security for zEnterprise
• Security and compliance spread across heterogeneous resources
• Island o security efficiently managed
• End to end vulnerability highly lowered

Tivoli and zEnterprise on Cloud
• Service Catalog across all zEnterprise Cloud Infrastructure
• Cost management for all resources

Enable innovation and maximize performance with real-time service visibility and intelligence

Tivoli Application Resilience for zEnterprise

For customers who have deployed critical **business service application workload** such as SAP ERP or Internet Banking to their zEnterprise environment and who need similar **automation** functionality that they have long enjoyed for z/OS applications, the Tivoli Application Resilience scenario provides **end-to-end automation** to reduce manual effort and risk of error
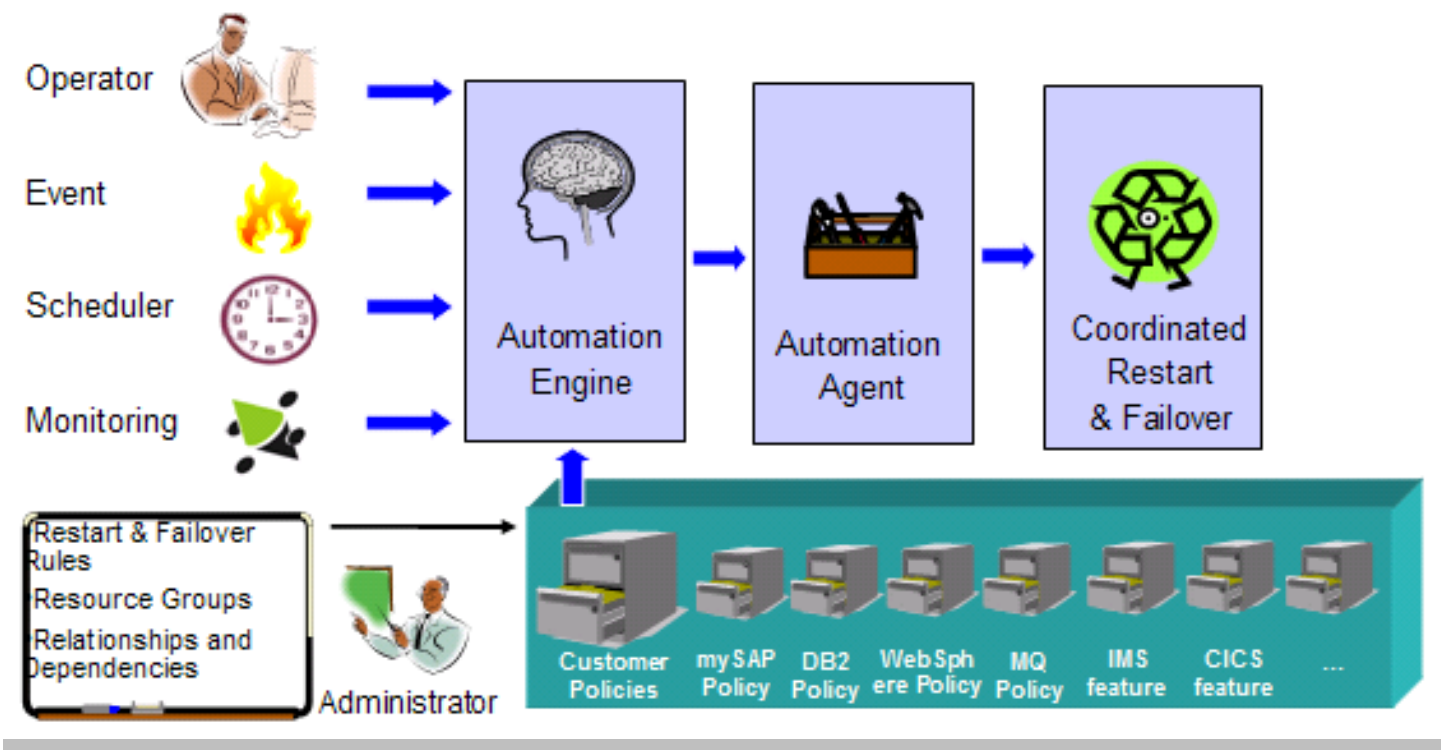
End-to-end Scheduling solution

- Central point of control from z/OS

- Manages execution on z/OS and distributed VMs
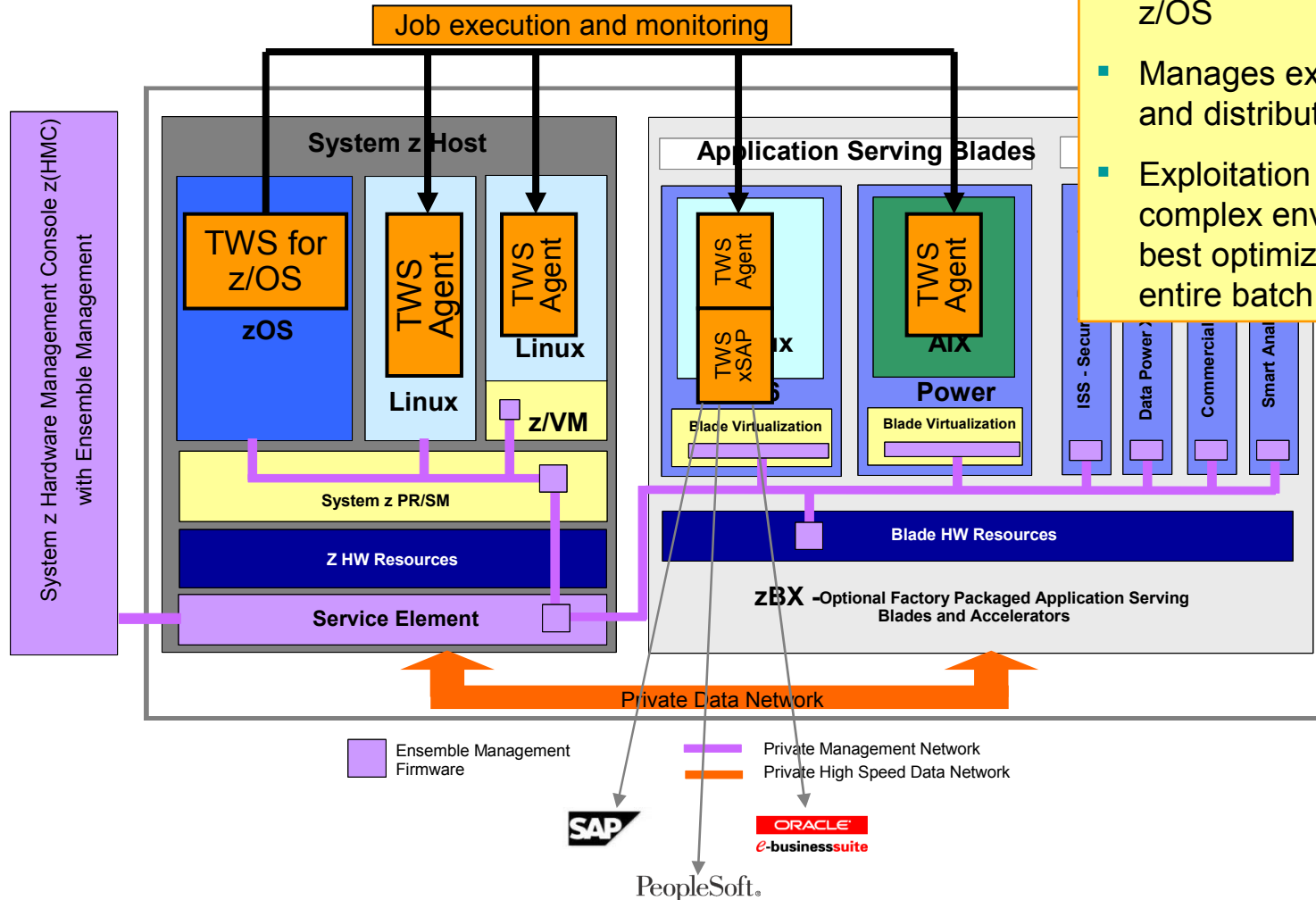
- Exploitation of such a complex environment for a best optimization of the entire batch

Job execution and monitoring

System z Hardware Management Console z(HMC) with Ensemble Management

System z Host

Application Serving Blades

TWS for z/OS

zOS

TWS Agent

Linux

TWS Agent

Linux

TWS Agent

TWS xSAP

Linux

Blade Virtualization

TWS Agent

AIX

Power

Blade Virtualization

ISS - Security

Data Power?

Commercial

Smart Anal

z/VM

System z PR/SM

Z HW Resources

Service Element

Blade HW Resources

zBX –Optional Factory Packaged Application Serving Blades and Accelerators

Private Data Network

Ensemble Management Firmware

Private Management Network
Private High Speed Data Network

SAP

ORACLE
e-businesssuite

PeopleSoft.

Management of virtual server images

- Leverage Broker technology to dynamically distribute job exactions on pool of distributed VMs

- Broker receives load balancing and other policies from the user

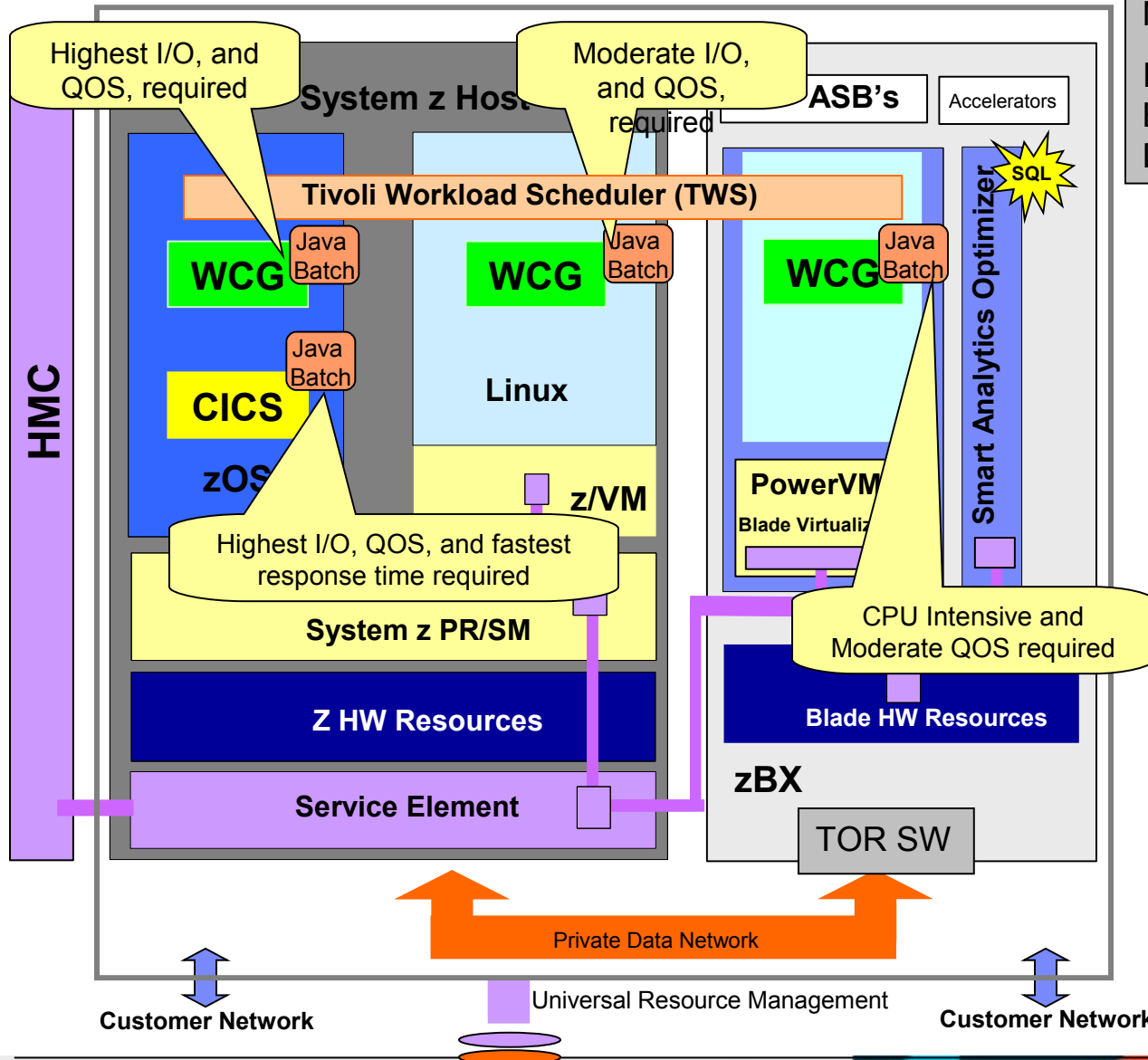- Workload Manager asses the best workload distribution based on workload policy and monitored performances

Job execution and monitoring

System z Hardware Management Console z(HMC) with Ensemble Management

System z Host

TWS for z/OS
zOS

TWS Agent
Linux

TWS Broker
Linux

Application Serving Blades

TWS Agent
TWS xSAP
Linux

TWS Agent
AIX
Power

Blade Virtualization

Blade Virtualization

z/VM

System z PR/SM

Z HW Resources

Blade HW Resources

Service Element

zBX –Optional Factory Packaged Application Serving Blades and Accelerators

Private Data Network

Ensemble Management Firmware

Private Management Network
Private High Speed Data Network

SAP

ORACLE
e-business**suite**

PeopleSoft.

IBM **Tivoli.** software

zEnterprise – Batch Modernization Example

Highest I/O, and QOS, required

Moderate I/O, and QOS, required

System z Host

ASB's

Accelerators

SQL

Tivoli Workload Scheduler (TWS)

WCG — Java Batch

WCG — Java Batch

WCG — Java Batch

Smart Analytics Optimizer

Java Batch

CICS

Linux

zOS

z/VM

PowerVM

Blade Virtualiz

Highest I/O, QOS, and fastest response time required

System z PR/SM

CPU Intensive and Moderate QOS required

Z HW Resources

Blade HW Resources

Service Element

zBX

TOR SW

HMC

Private Data Network

Universal Resource Management

Customer Network

Customer Network

New Capabilities –

Integrate COBOL and Java Batch in a Fit for Purpose Deployment Model

- Leverage MF investments in Java across HW (zAAP), CPU Improvements and Middleware

- Deploy WebSphere Compute Grid (WCG) for parallel processing of Java Batch across heterogeneous resources

- TWS integration with WLM on z/OS allows policy based execution of heterogeneous workloads

- TWS coordinates execution of Java in best fit container

- Transactions and Java batch can call DB2 to Integrate Analytics into framework

IBM **Tivoli.** software

End-to-end automation solution in zEnterprise

Automate end to end systems and applications

System z Hardware Management Console z(HMC) with Ensemble Management

System z Host

TSA for z/OS

zOS

TSA Multiplatform

Linux

TSA MP

Linux

Linux

z/VM

TSA AM

System z PR/SM

Z HW Resources

Service Element

Application Serving Blades

TSA 4 SAP

TSA MP

Blade Virtualization

Acc

Security Processing

Data Power XML Processing

TSA MP

AIX

Power

Blad

TSA AM

Blade HW Resources

zBX –Optional Factory Packaged Application Serving Blades and Accelerators

Private Data Network

Ensemble Management Firmware

Private Management Network
Private High Speed Data Network

- Central point of control from TSA Application Manager
- Automates applications crossing from all the z196 and IBM Blade Extension
- Automation policies independently on where each application part resides
- TSA Automation Manager can reside in any part of the zEnterprise Ensemble

zEnterprise end to end Disaster Recovery with TSA and GDPS

- **zEnterprise Backup and Disaster Recovery solutions**
 - GDPS® offers:
    - Business continuity for Linux applications running on System z
    - Management and coordination of outages across z196 and distributed servers in zBX using clustering solutions
    - Reduce complexity by consolidating multiple open platform backup processes into a single System z-controlled process.
   - Simplify disaster recovery with automated replication to a remote site.

TSA AM (e2e Automation) — GDPS System

TSA AM (e2e Automation) — GDPS System

z/OS spanned sysplex

PPRC

AIX & Linux Blades, Ensembles

Linux, AIX, Ensembles
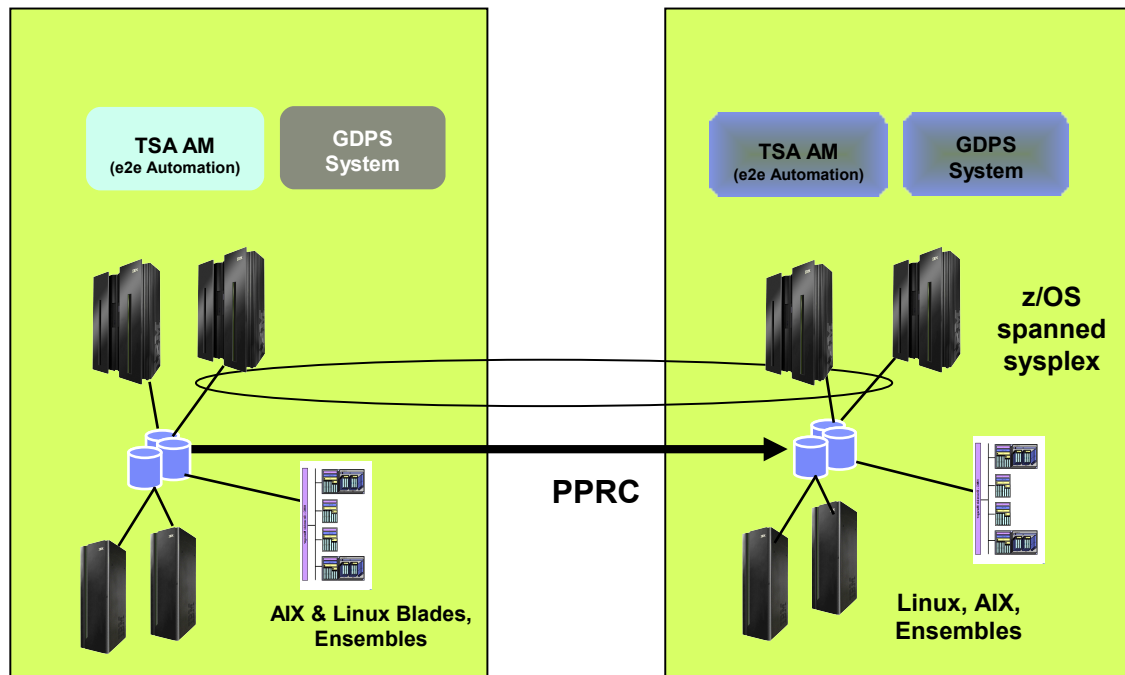
TSA Family completely manages similar configurations, even more complex

Tivoli Application Management for zEnterprise

For customers who have deployed critical **business service application workload** such as SAP or Core Banking to their zEnterprise environment and who need **rapid problem isolation and resolution** to maintain business service levels, the Tivoli Application Performance Management scenario provides a **true end-to-end transaction breakdown across AIX, Linux and z/OS environments**, along with industry-leading integration to deep-dive problem resolution tools.
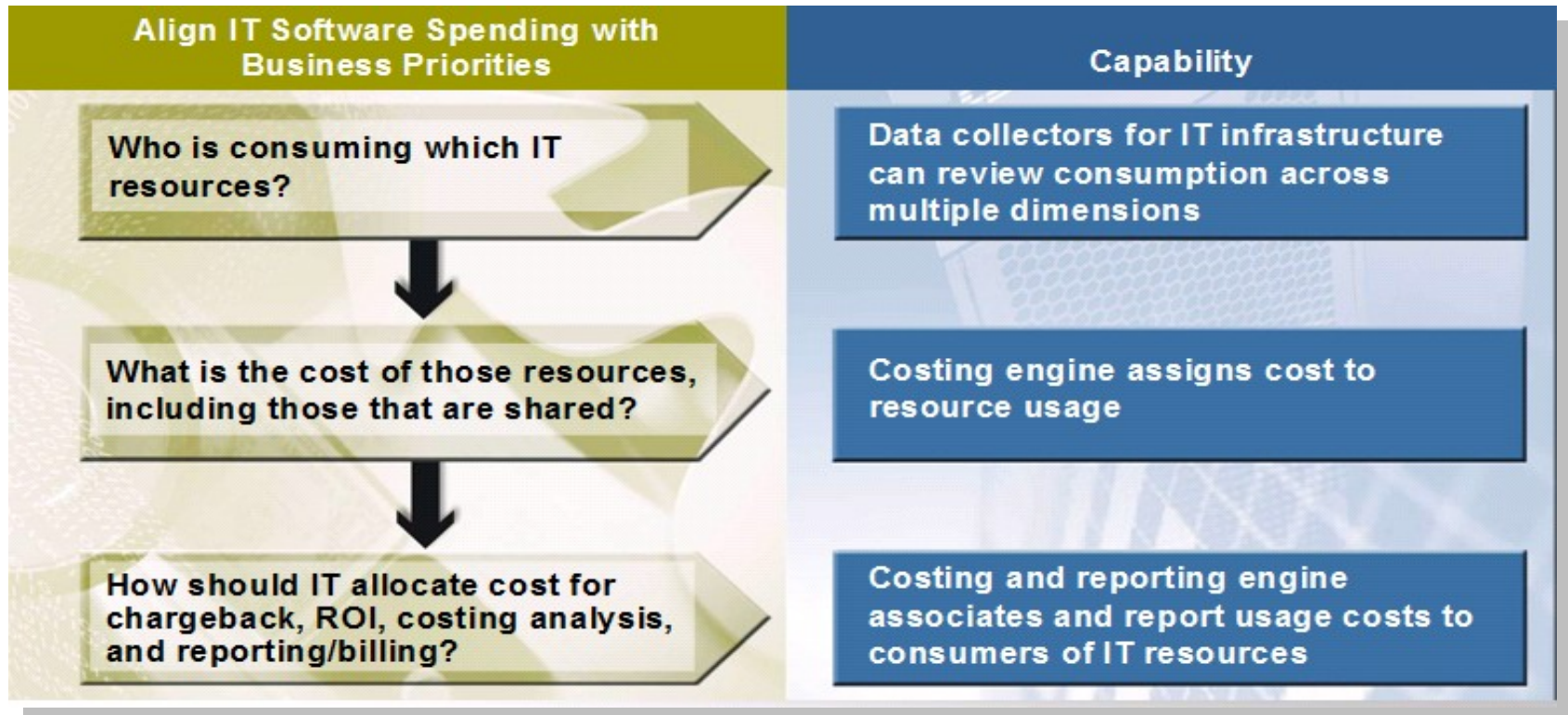
IBM **Tivoli.** software
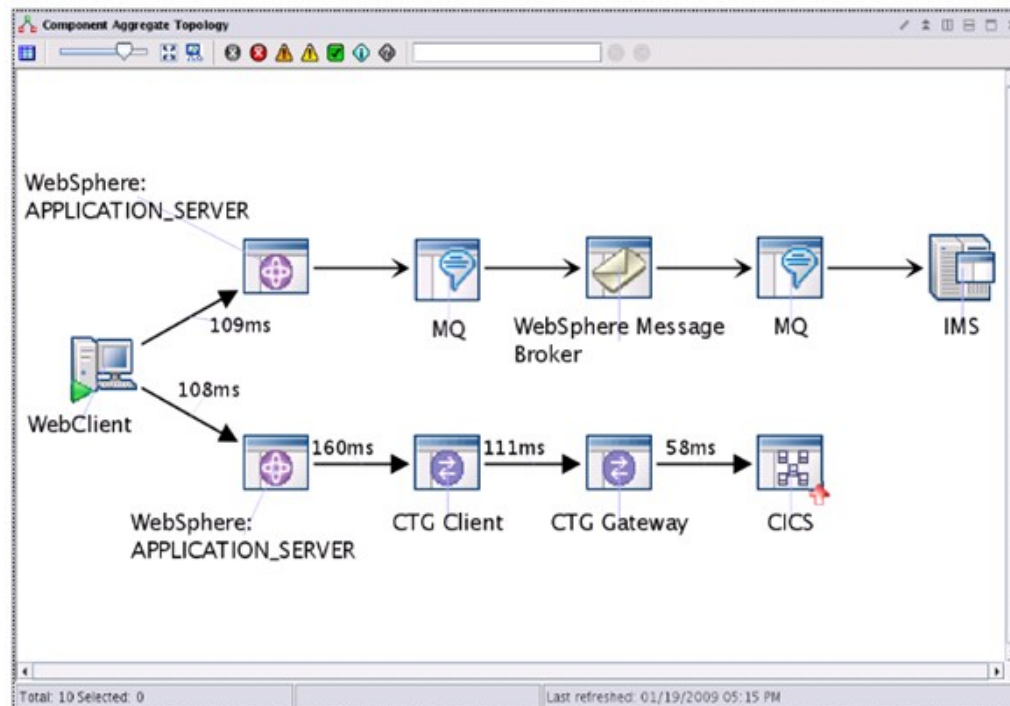
End-to-end application performance solution
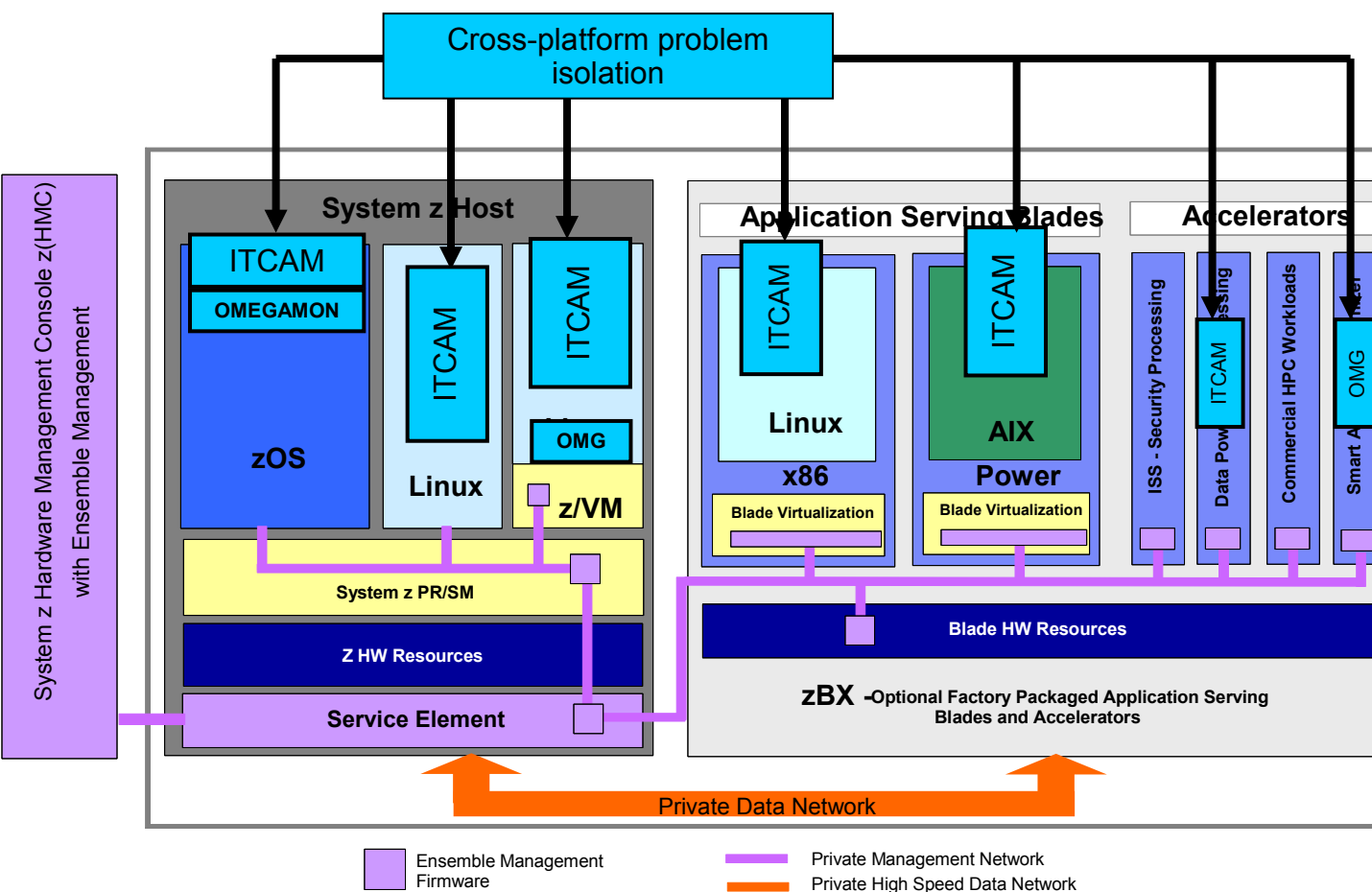
- Cross-platform zEnterprise application performance from a single UI

- Discover, isolate, diagnose and take action to ensure application performance meets SLAs

- Visualize transaction paths and connections with automatically generated transaction topologies

- Provide End to End view of response time across the zEnterprise ensemble

- Quickly identifies and isolates performance problems

- Launch-in-context to deep-dive tools speeds MTTR

Cross-platform problem isolation

System z Hardware Management Console z(HMC) with Ensemble Management

System z Host

ITCAM
OMEGAMON
zOS

ITCAM
Linux

ITCAM
OMG
z/VM

System z PR/SM

Z HW Resources

Service Element

Application Serving Blades

ITCAM
Linux
x86
Blade Virtualization

ITCAM
AIX
Power
Blade Virtualization

Accelerators

ISS - Security Processing

ITCAM
Data Power Processing

Commercial HPC Workloads

OMG
Smart A

Blade HW Resources

zBX – Optional Factory Packaged Application Serving Blades and Accelerators

Private Data Network

Ensemble Management Firmware

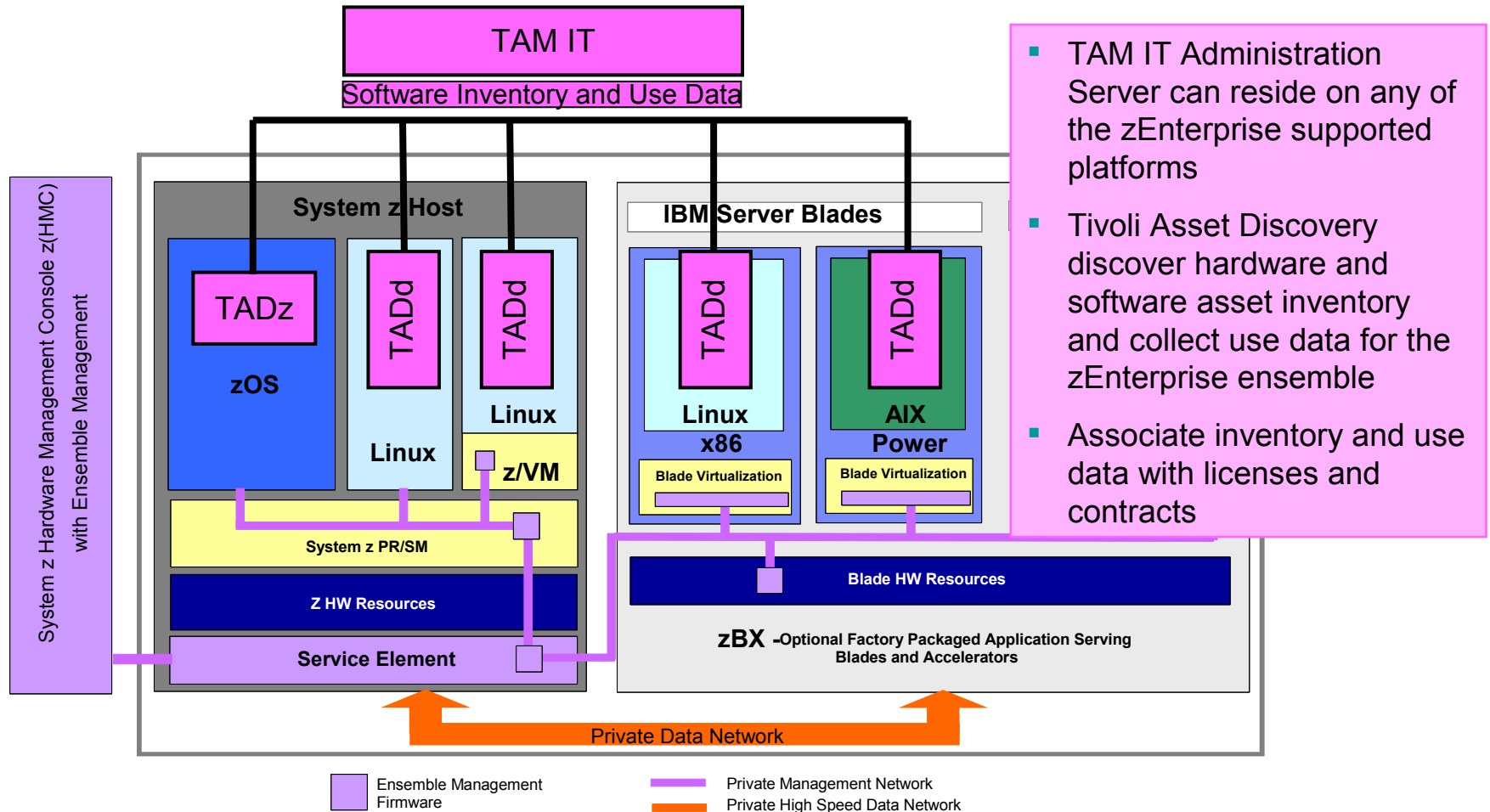Private Management Network
Private High Speed Data Network

Tivoli Asset and Financial Management for zEnterprise

For clients who need to measure the **costs of business services**, including resource usage, software and vendor contracts, Tivoli Asset and Financial Management provides the **visibility into consumption** by resource type and **transforms that data into clear, fair and auditable reports** for cost recovery or client billing and prepares clients for software license audits.

Align IT Software Spending with Business Priorities	Capability
Who is consuming which IT resources?	Data collectors for IT infrastructure can review consumption across multiple dimensions
What is the cost of those resources, including those that are shared?	Costing engine assigns cost to resource usage
How should IT allocate cost for chargeback, ROI, costing analysis, and reporting/billing?	Costing and reporting engine associates and report usage costs to consumers of IT resources

Mainframe to Distributed Software Asset and License Management

- TAM IT Administration Server can reside on any of the zEnterprise supported platforms

- Tivoli Asset Discovery discover hardware and software asset inventory and collect use data for the zEnterprise ensemble

- Associate inventory and use data with licenses and contracts

Mainframe to Distributed IT Resource Usage and Accounting solution
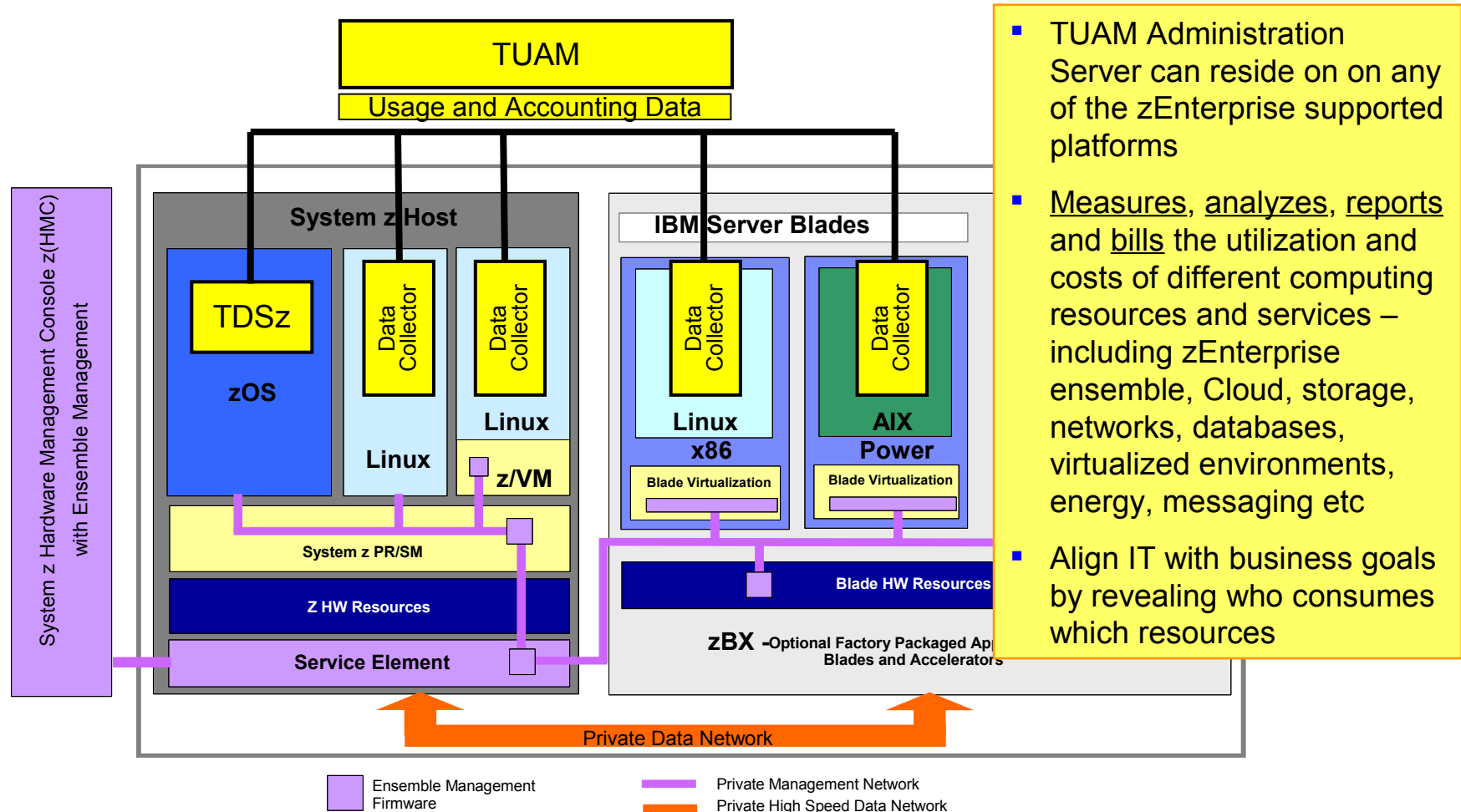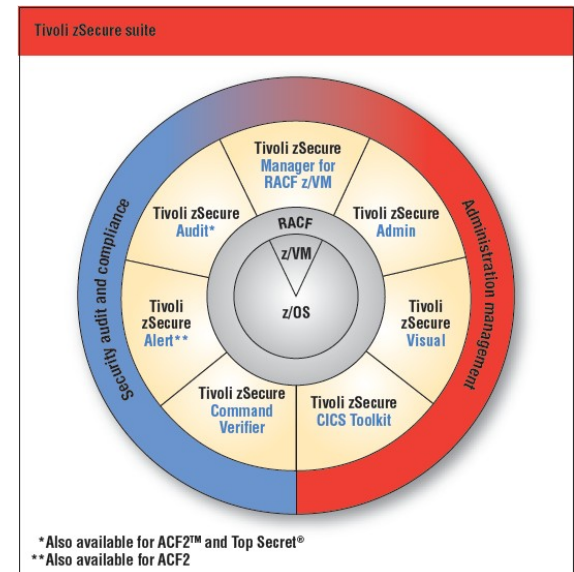

- TUAM Administration Server can reside on on any of the zEnterprise supported platforms

- <u>Measures</u>, <u>analyzes</u>, <u>reports</u> and <u>bills</u> the utilization and costs of different computing resources and services – including zEnterprise ensemble, Cloud, storage, networks, databases, virtualized environments, energy, messaging etc

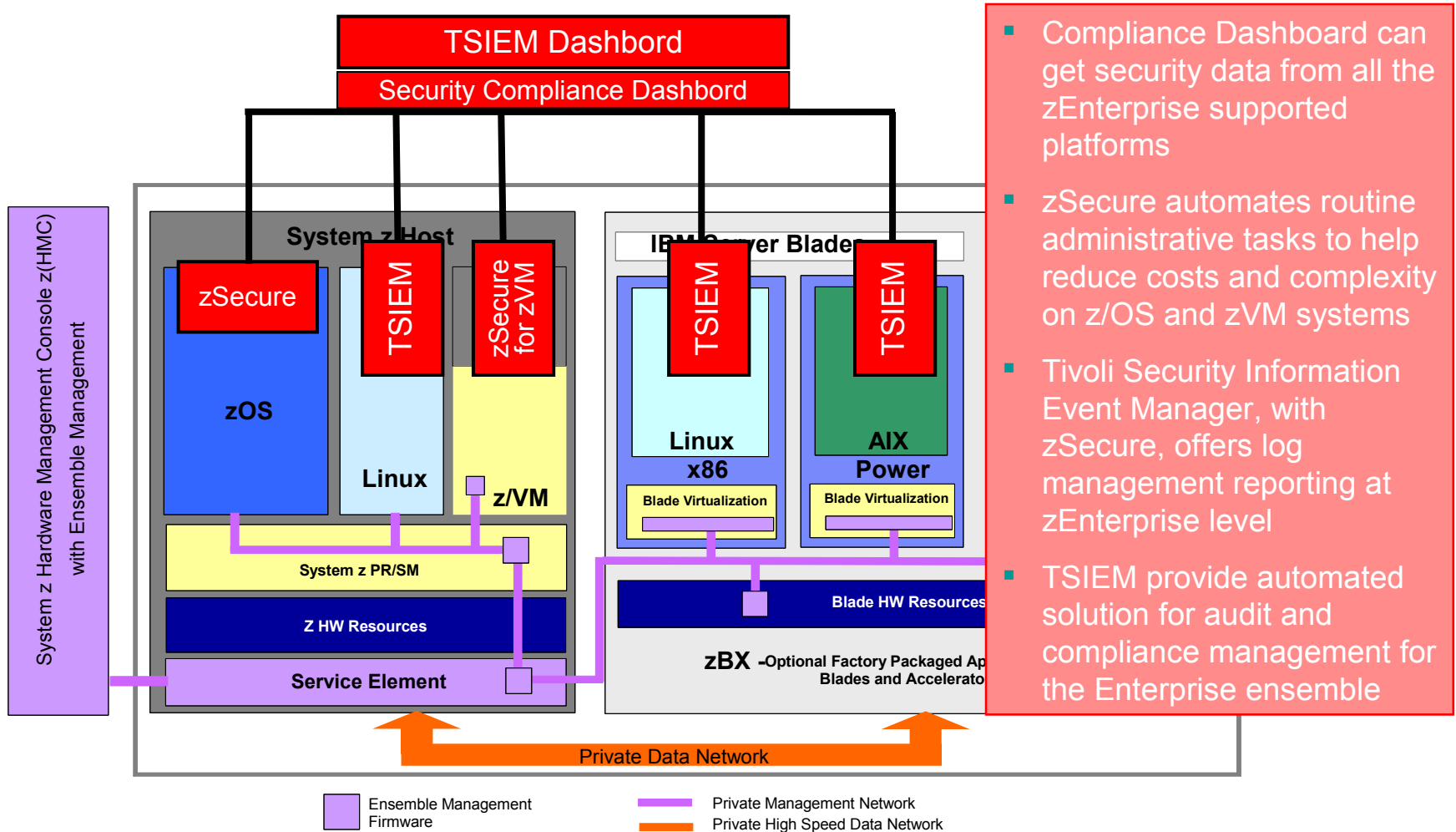- Align IT with business goals by revealing who consumes which resources

Tivoli Security for zEnterprise

- zSecure continues to grow in parallel with System z Announcements
  - new zSecure Suite V1R13 (same as z/OS release) just announced
  - LDAP support

- End to End compliance management
  - TSIEM (Tivoli Security Information and Event Management)
  - Tivoli Security Management for z/OS

Tivoli zSecure suite

Security audit and compliance / Administration management

Tivoli zSecure Manager for RACF z/VM
Tivoli zSecure Audit*
Tivoli zSecure Admin
RACF z/VM z/OS
Tivoli zSecure Alert**
Tivoli zSecure Visual
Tivoli zSecure Command Verifier
Tivoli zSecure CICS Toolkit

*Also available for ACF2™ and Top Secret®
**Also available for ACF2

Tivoli Security for zEnterprise

- Compliance Dashboard can get security data from all the zEnterprise supported platforms

- zSecure automates routine administrative tasks to help reduce costs and complexity on z/OS and zVM systems

- Tivoli Security Information Event Manager, with zSecure, offers log management reporting at zEnterprise level

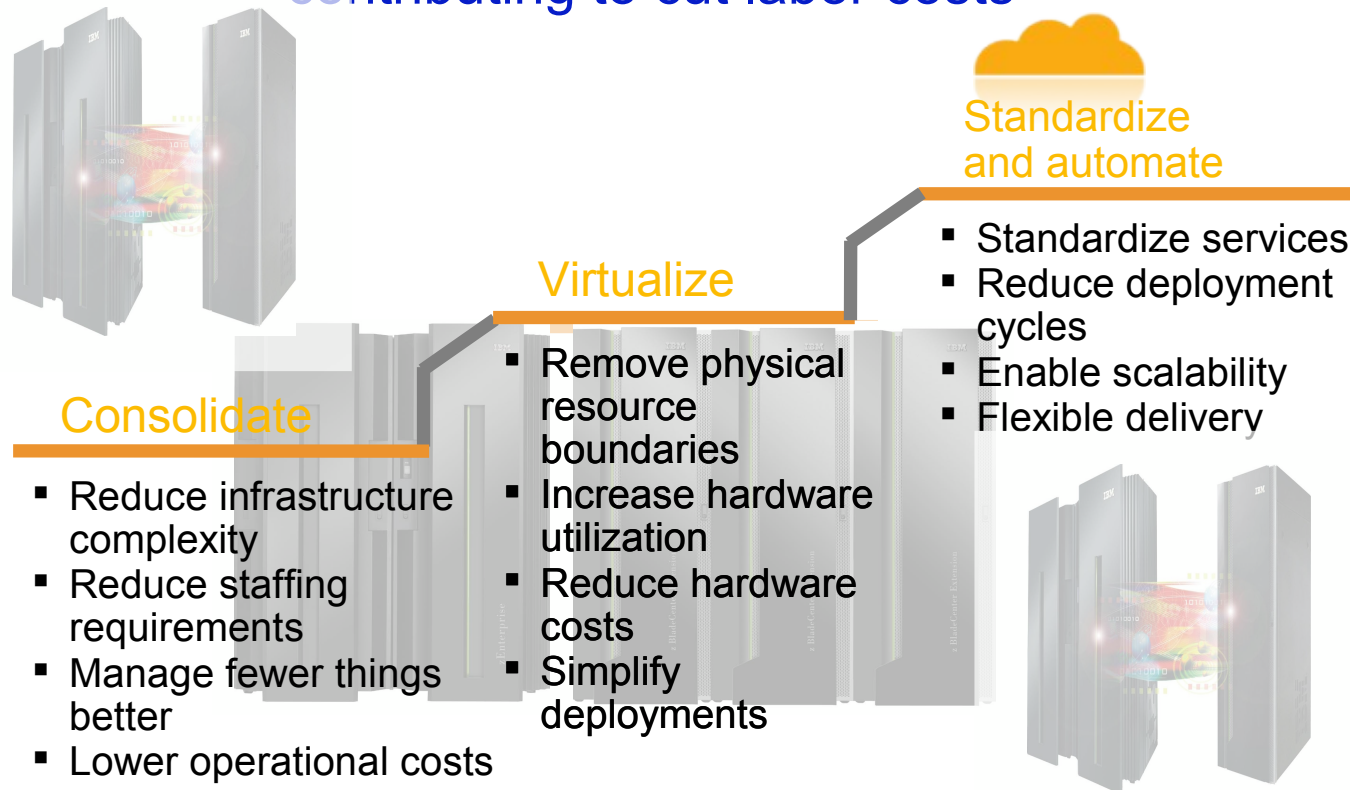- TSIEM provide automated solution for audit and compliance management for the Enterprise ensemble

Cloud computing scenario

zEnterprise perfectly fits in the Cloud Computing paradigm contributing to cut labor costs

Standardize and automate

- Standardize services
- Reduce deployment cycles
- Enable scalability
- Flexible delivery

Virtualize

- Remove physical resource boundaries
- Increase hardware utilization
- Reduce hardware costs
- Simplify deployments

Consolidate

- Reduce infrastructure complexity
- Reduce staffing requirements
- Manage fewer things better
- Lower operational costs

- Tivoli Service Automation Manager is perfect for a zEnterprise Service Catalog, where costs are managed by IBM Tivoli Usage and Accounting Manager

A Step-by-Step Approach for Growing Cloud on zEnterprise

Integrate and Optimize

Simplify

STEP 3
Cross-architecture
Workload Optimization

Take Out Cost

STEP 2
Automate and
Manage Better

Image Library

STEP 1
Consolidate and
Virtualize

| Image |
| Image |
| Image |
| App |
| OS |
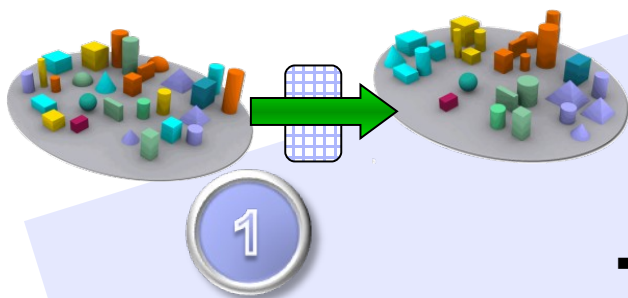
- Exploit the extreme virtualization capabilities of System z and z/VM

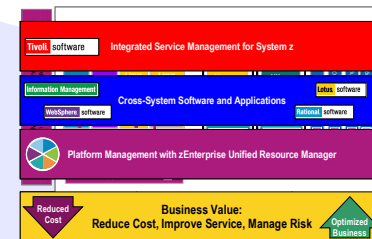- Use basic z/VM features and functions to manage virtual Linux servers
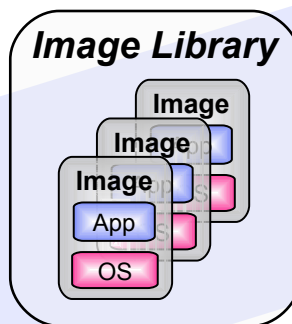
- Use advanced z/VM features and functions for automated operations and service delivery

- Introduce Systems Director for additional image management

- Add Tivoli technologies for greater levels of service management

- zEnterprise is the industry's only multi-architecture cloud solution

- Use a cloud deployment model to host multi-tier solutions across System z, POWER and System x resources

- Use the Unified Resource Manager and Tivoli ISM for optimal workload placement

Tivoli software — Integrated Service Management for System z
Information Management — Cross-System Software and Applications — Lotus software
WebSphere software — Rational software
Platform Management with zEnterprise Unified Resource Manager
Reduced Cost — Business Value: Reduce Cost, Improve Service, Manage Risk — Optimized Business

Cloud Offerings and Products

| Enterprise Linux Server (z10, z196) Solution Edition for Enterprise Linux | IBM Systems Director and VMControl Solution Edition for Cloud Computing | zEnterprise System and zManager Tivoli Integrated Service Management |

Cloud on zEnterprise with Tivoli and Unified Resource Manager

IBM Tivoli Service Management
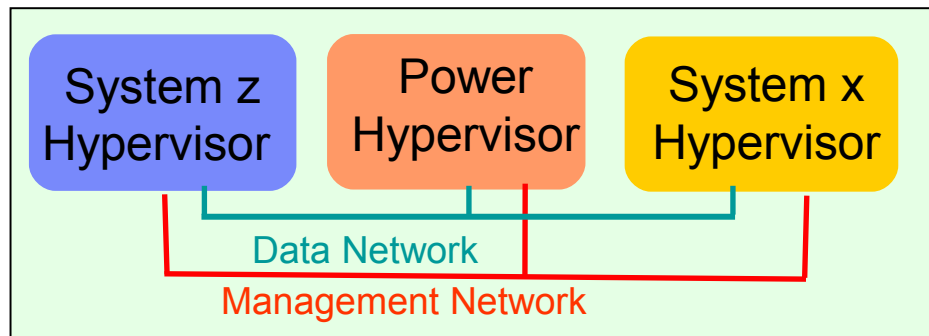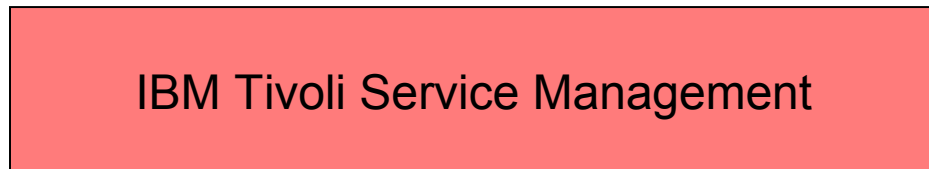
**End-to-End
Service Management**

zEnterprise Unified Resource Manager

**Integrated
Platform Management**

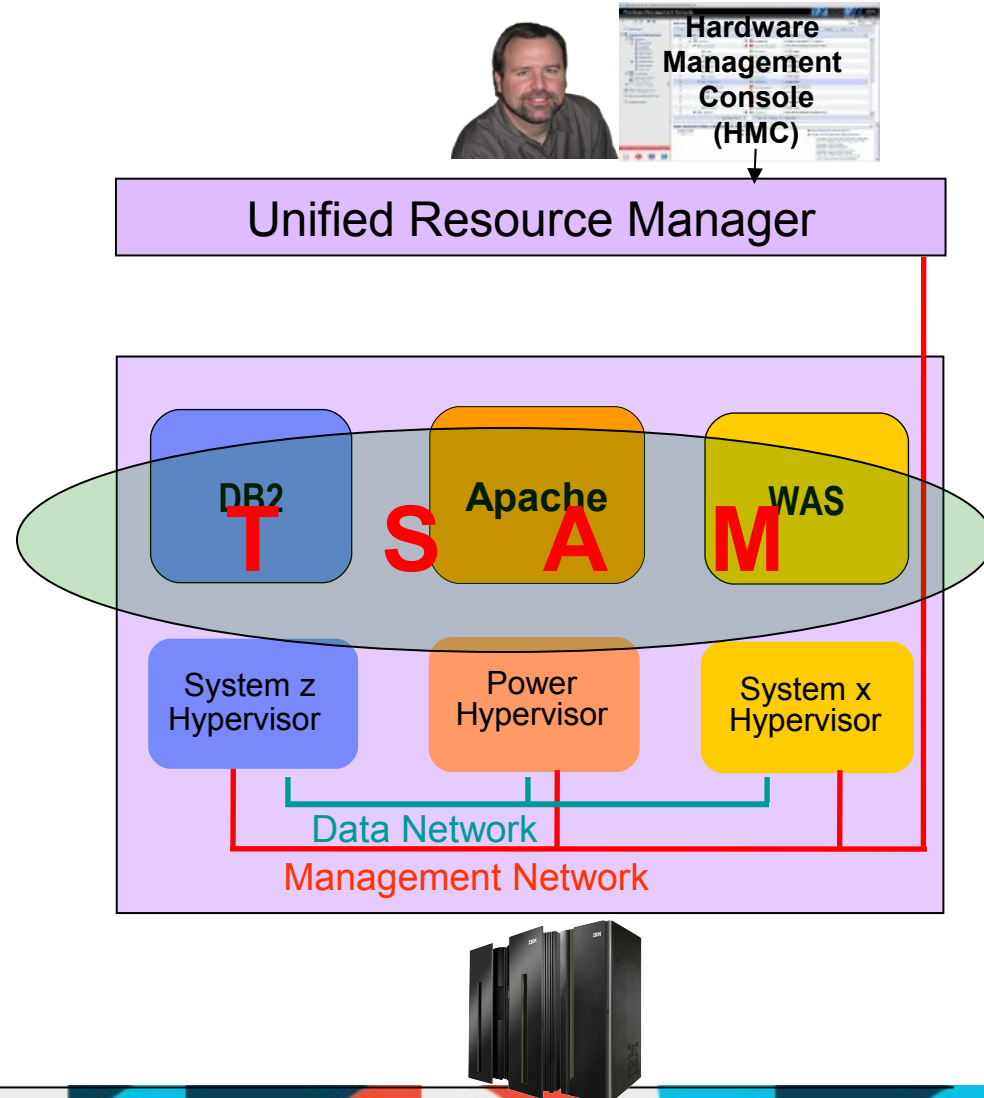| System z Hypervisor | Power Hypervisor | System x Hypervisor |

Data Network

Management Network

**Integrated
Fit-for-Purpose
Platform**

zEnterprise

Unified Resource Manager takes care of cloud hardware resources

- Automatic inventory of all elements

- Update configuration and service

- Create virtual machines across all hypervisors from one console

- Manage performance of virtual machines as a group for a business workload

- TSAM will help deploying the right software in each virtual image

Hardware Management Console (HMC)

Unified Resource Manager

DB2   Apache   WAS

T S A M

System z Hypervisor | Power Hypervisor | System x Hypervisor
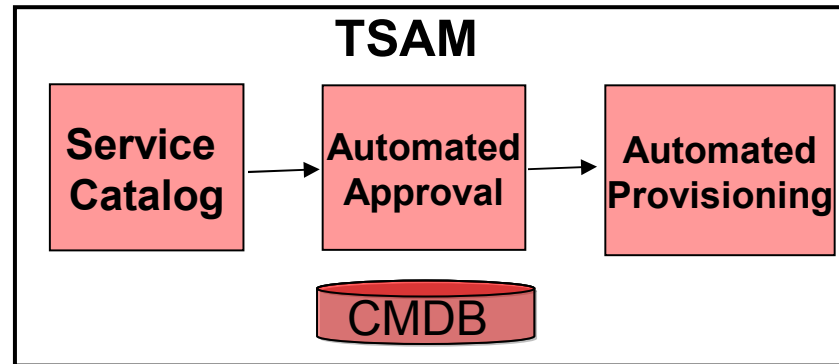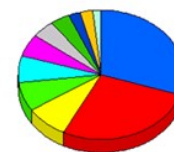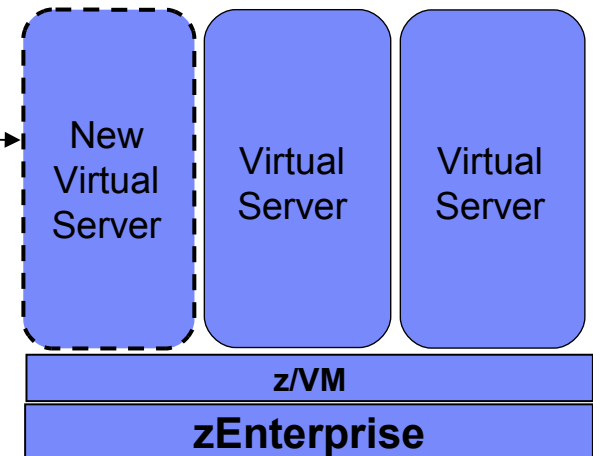
Data Network

Management Network

Tivoli Service Automation Manager (TSAM) perfect for a zEnterprise Service Catalog, where costs are managed by IBM Tivoli Usage and Accounting Manager (TUAM)

TSAM

| Service Catalog | → | Automated Approval | → | Automated Provisioning |

CMDB

User browses service catalog

Adds service to shopping cart

Submits request

TSAM starts the deployment process via **IBM Tivoli Provisioning Manager** workflow

New Virtual Server

Virtual Server

Virtual Server

z/VM

zEnterprise

• TSAM enables **standardization** via a catalog of service offerings
• TSAM provides **automated** approval
• TSAM provides **automated** provisioning*
• TUAM provides **accounting and cost recovery** mechanisms

TUAM for cost measures and recovery

Universita di Bari

Innovative Cloud Solutions

Wine Market

Support for 60 wineries to determine demand and get best market price

Fish Market

Electronic fish auction for fishermen while on boats

MoniCA

Logistics solution tracks and collects data real time

Solution Edition for Cloud Computing

Linux

z/VM

Solve community challenges

BENEFITS to Clients

Cloud computing allows multiple organizations to tap into heavy-duty computing power at minimal cost.

It lowers the barrier for local businesses to benefit from this technology.

UNIVERSITÀ DEGLI STUDI DI BARI ALDO MORO

Università di Bari, established in 1924, is developing cloud-based solutions for a consortium of companies and universities from five regions of southern Italy.

IBM **Tivoli.** software

धन्यवाद
Hindi

Děkuji
Czech

ขอบคุณ
Thai

Спасибо
Russian

Gracias
Spanish

Thank
English

شكراً
Arabic

Obrigado
Portuguese and Brazilian

You

Grazie
Italian

多谢
Chinese

Danke
German

Merci
French

நன்றி
Tamil

ありがとうございました
Japanese

감사합니다
Korean