IBM System z Technology Summit

Integrated service management can improve overall visibility into your zEnterprise using OMEGAMON XE for z/OS

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Agenda –

- A point in time…. Where we are today..
- looking back 6 months ago
- What does the zBX mean to you.
- What is available today for zEnterprise to help you.
- Where we will be a year from now..

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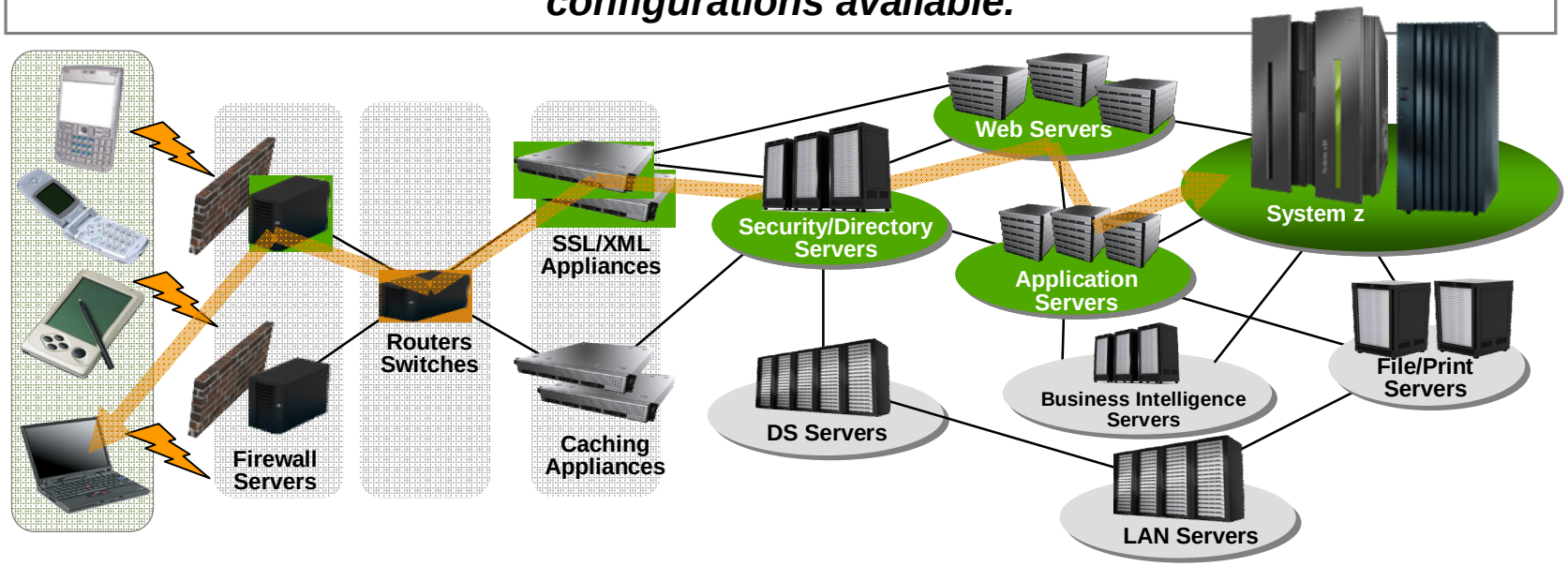
Where we are Today: Limitations impact Management

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



- We manage resources really well today, more service oriented concepts, perhaps focused on services or looking at Cloud based computing. Virtualize everything for cost savings amid concerns with power limitations.
- IT Organizations and budgets have different approaches which react to these concerns which are based on business initiatives and the applications that support them.
- **The mission is to manage the IT infrastructure and Business Applications as an integrated Service.**

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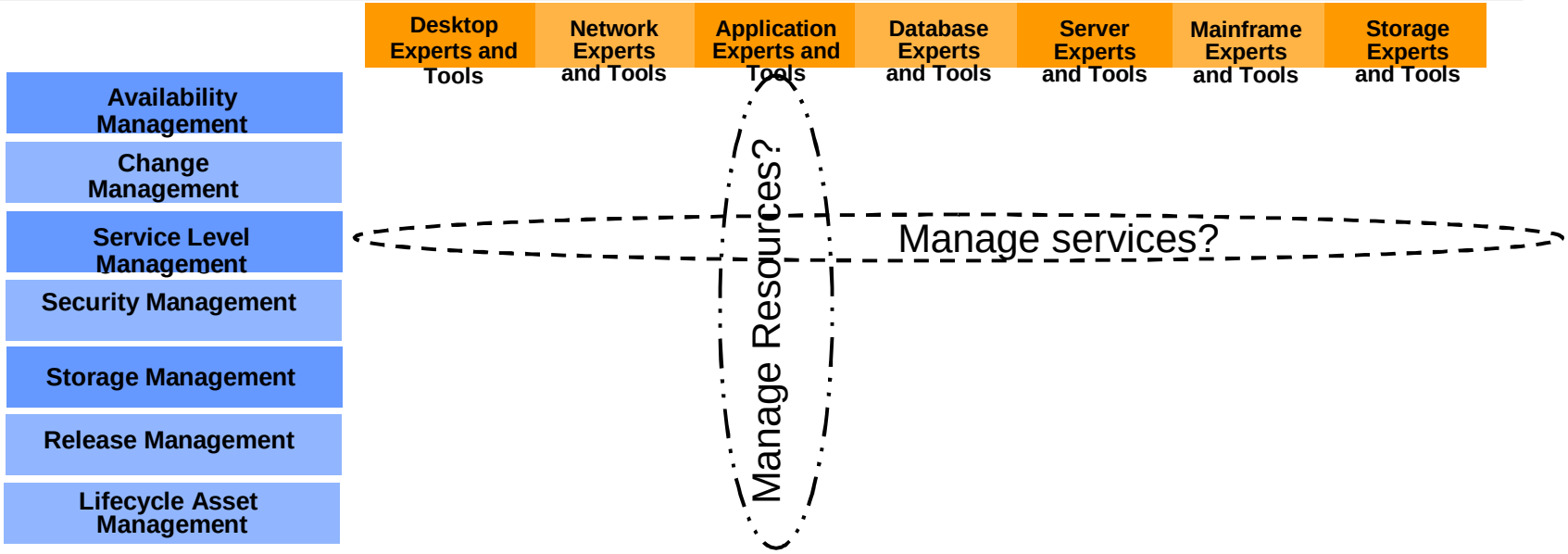
Management Technology Today: Limitations

Are IT management decisions based much on the needs of the few versus the requirements of the enterprise?



- We are still very Silo'd with views of what needs to be managed and how it is managed..
- Silo'd why? Budgets? Organizations? With zEnterprise and the system of systems what or how does all this change?
- Is it all about reducing the cost of technology?

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Looking at managing the systems of systems

A pragmatic strategy for Integrated Service Management of the zEnterprise.

Looking at the Managed Resources

different

Operating Systems

Databases

Blades

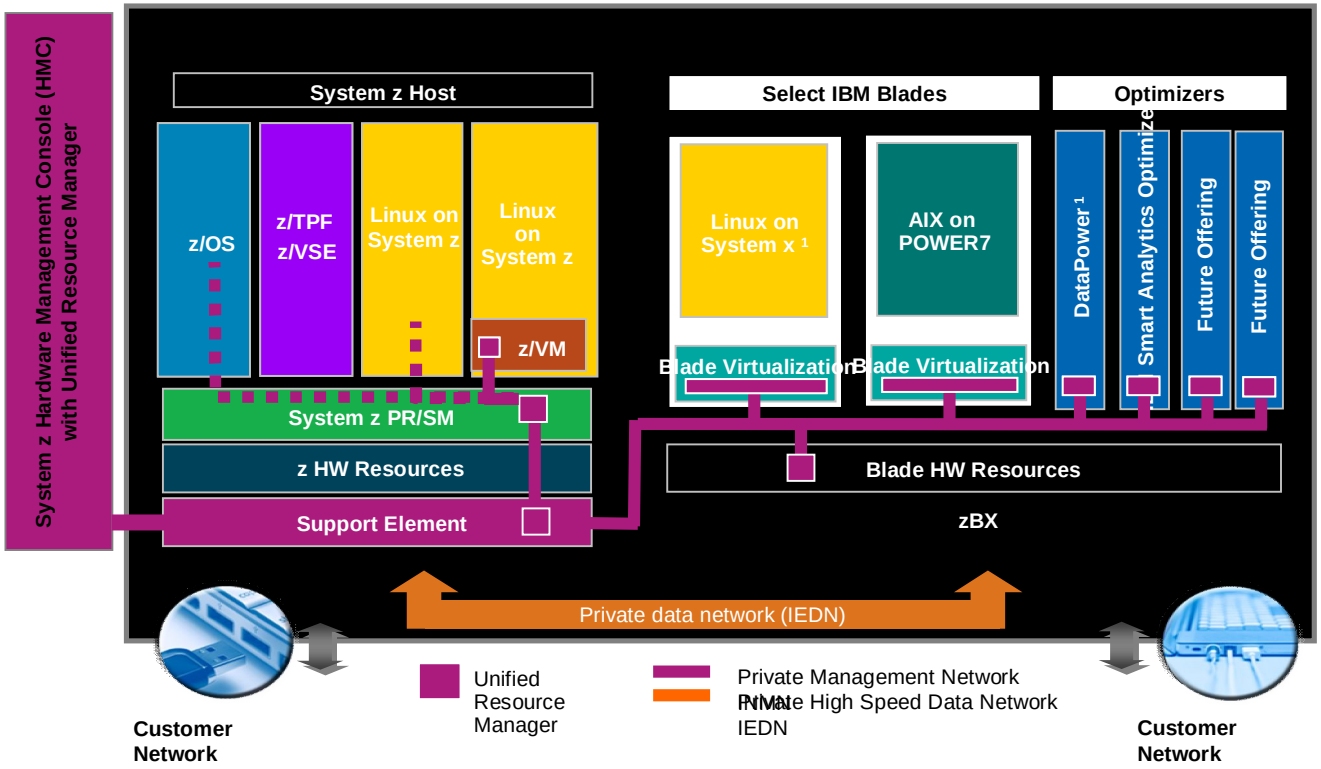
Firmware

Network

Applications

Workload

In one frame.



The Next Challenge - zBX

Manage the combination of z computing resources tightly coupled with distributed resources to provide a higher business value and reduce the Total Cost of Ownership.

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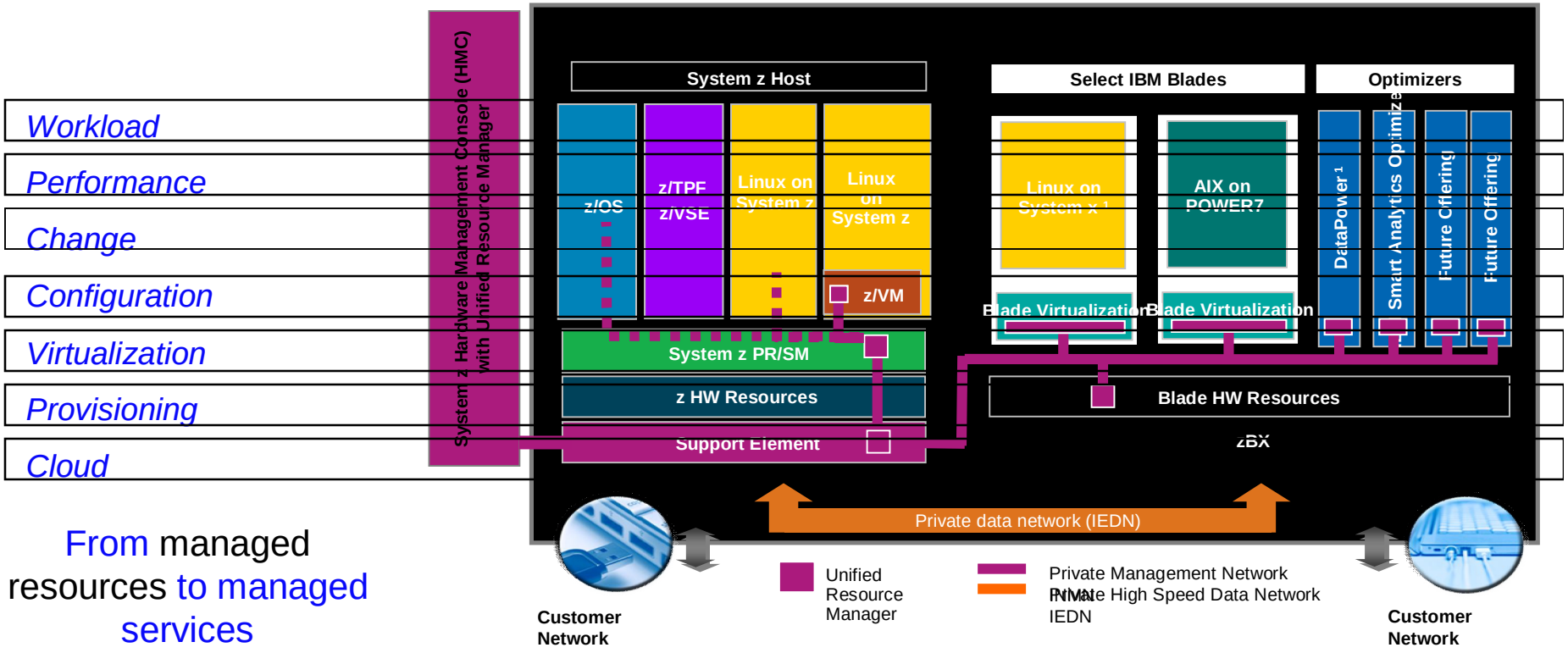
Looking at managing the systems of systems

A pragmatic strategy for Integrated Service Management of the zEnterprise.



The Mission - Refocus on Services vs silo'd resources

The zEnterprise with zManager will require a more integrated use of distributed and z IT skills for IT organizations.

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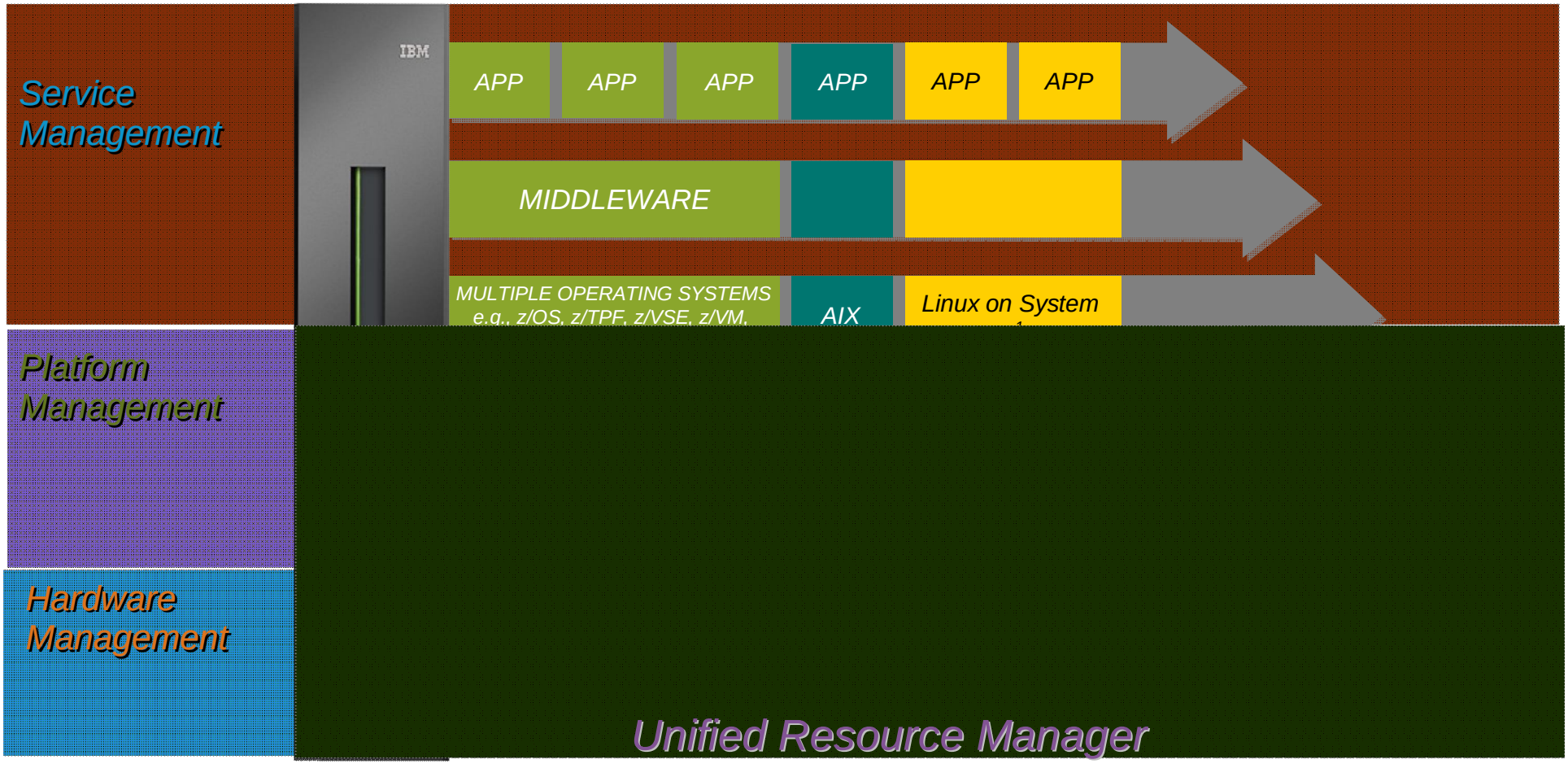
zEnterprise will generate a new management perspective on IT organizations



A "zEnterprise" management approach is focused on a combination of resources working as a business process with a dedicated service level and expectation for users.

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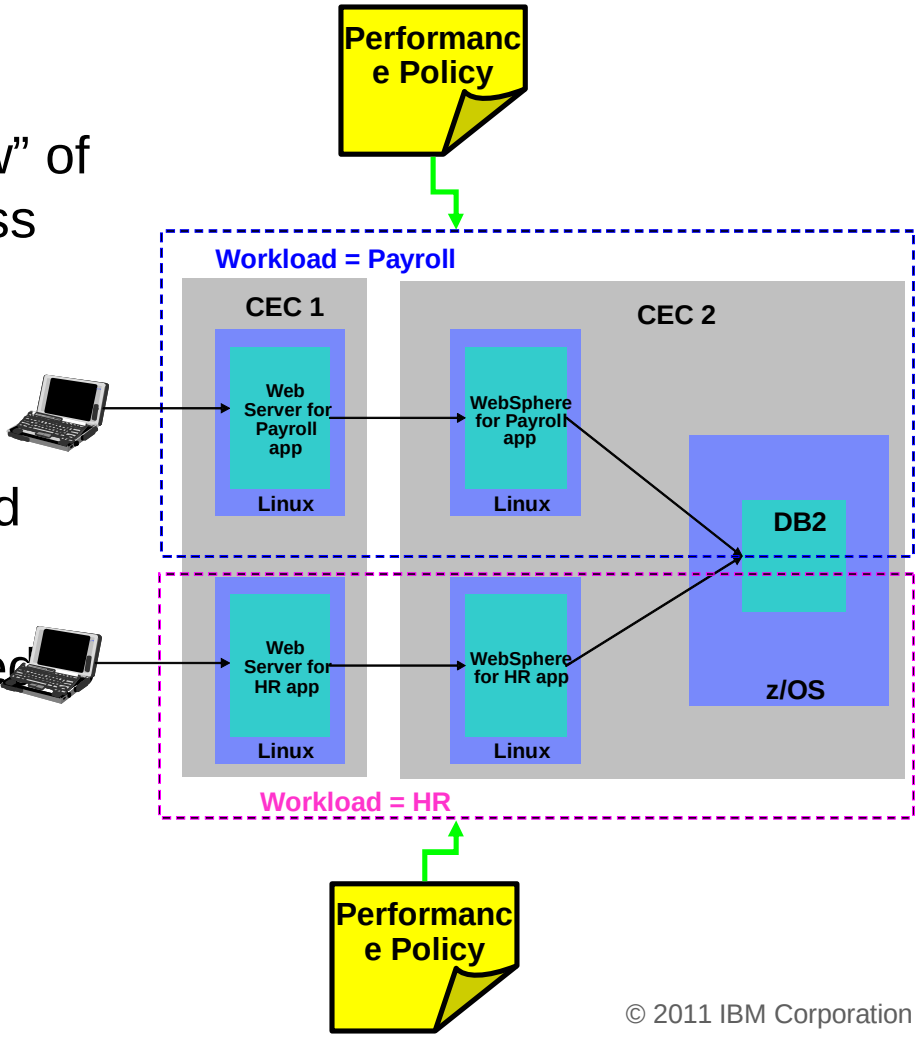
An example –

a zEnterprise will enable management of diverse resources across diverse platforms as a single Workload

- A Platform Workload is a grouping mechanism and “management view” of virtual servers supporting a business application
- Provides the context within which associated platform resources are presented, monitored, reported, and managed
- Management policies are associated to Platform Workload
  - Currently supports Performance Policy



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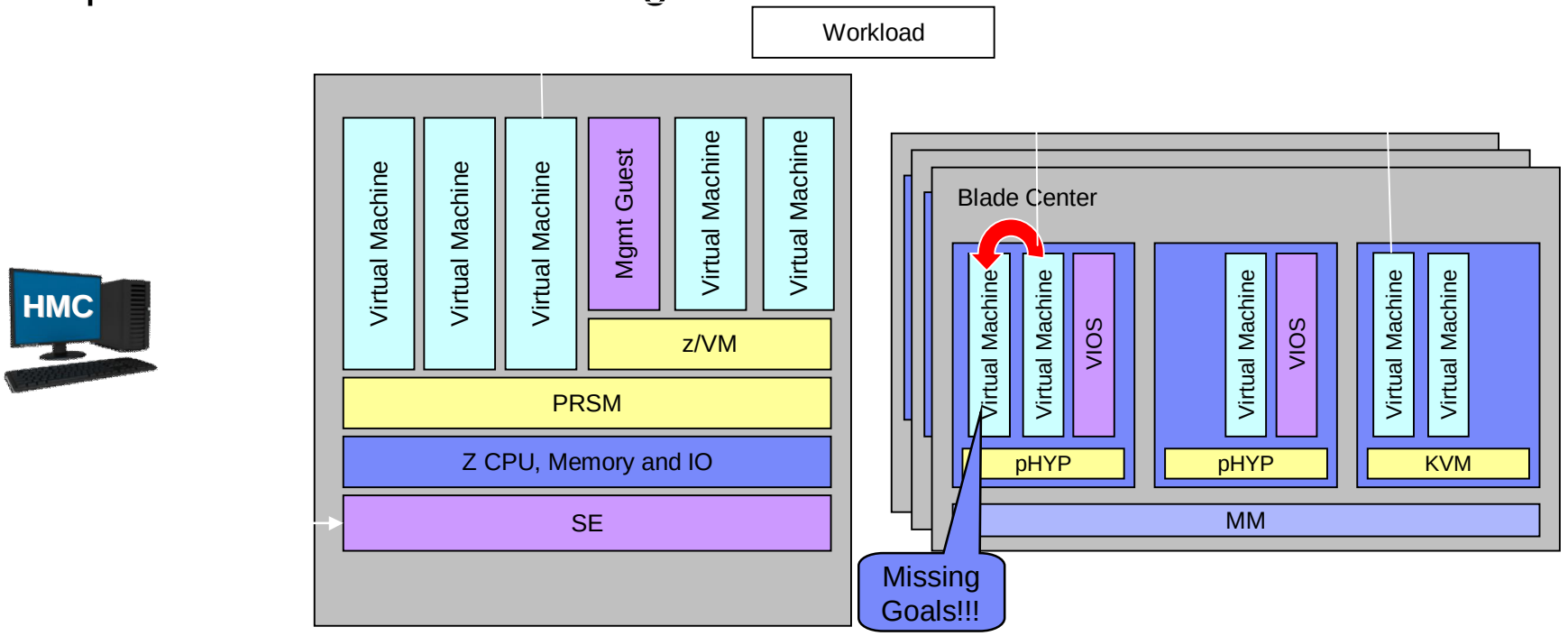
An example –
zEnterprise will enable the management of Resources across Virtual Servers



- **Manage resources across virtual servers to achieve workload goals**
  - Detect that a virtual server is part of Workload not achieving goals
  - Determine that the virtual server performance can be improved with additional resources
  - Project impact on all effected Workloads of moving resources to virtual server
  - If good trade-off based on policy, redistribute resources
  - Initially support CPU management

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Looking at managing the systems of systems
What will be required across an IT enterprise

Visibility *See your Business*

As a zBX is combined with a z196 how can an IT staff used to managing both z and distributed resources, collectively combine skills and views to provide a single enterprise view of all resources?

Control *Manage service risk and compliance*

How does IT manage a coordinated cross platform, cross resource integrated approach to monitor service levels, workload and performance using today's management capabilities?

Automation *Optimize business service delivery*

With a combination of different platforms and different resources, what capabilities exist to provide reflex and automated actions for the expected availability for the system of systems?

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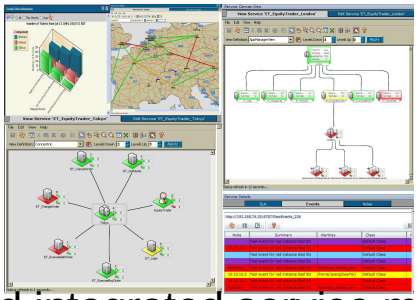
zEnterprise management – different skills (personas), different Visibility

one size does not fit all

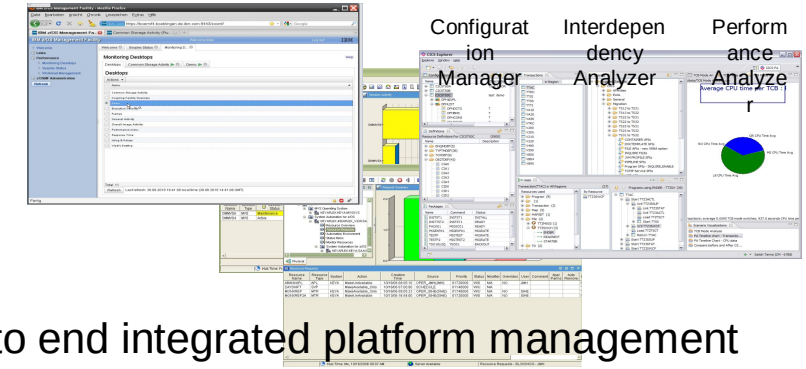
Business Views



End to end integrated service management

Manage
Cash funds,
Payroll,
Stock Trades
Online Shopping
Etc.

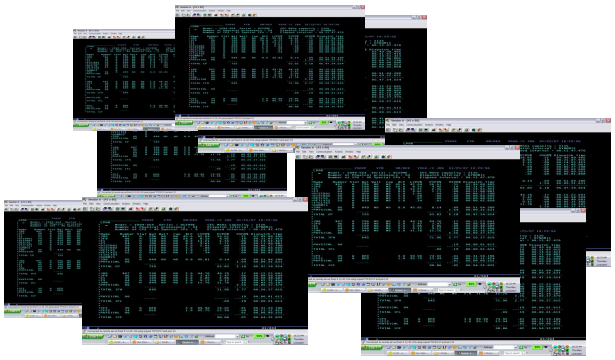
Portals – Service Views
zOS MF
CICS Explorer
Tivoli Enterprise Portal,
Etc.



End to end integrated platform management

Manage end to end
Workload
Performance
Transactions
Etc.

Resource Management Views
green screens, consoles.
Web browsers. zHMC,
Etc.



Individual Resource management

Manage Resources
Servers, Networks,
Firewalls, databases,
applications, etc.

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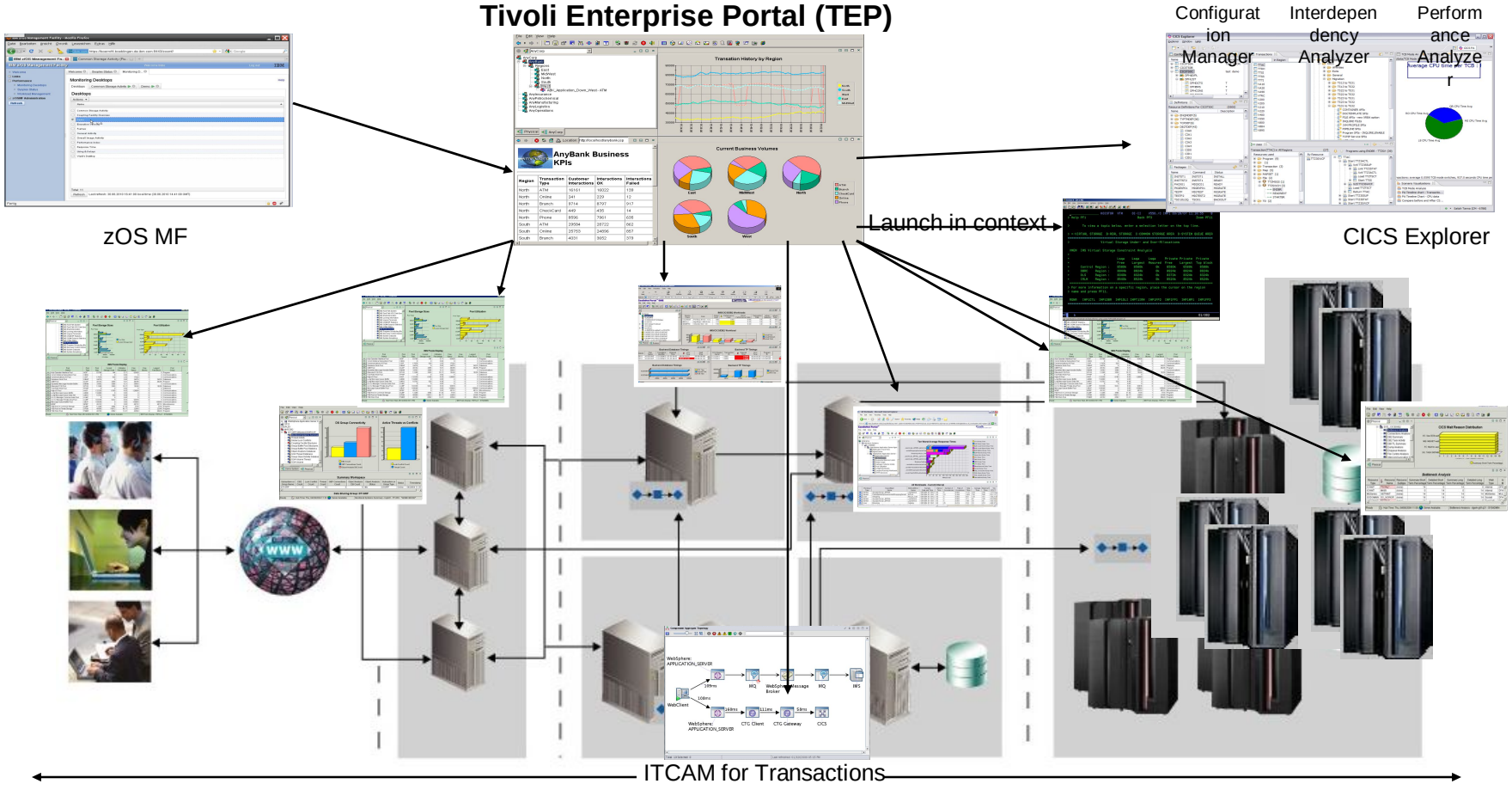
Visibility - Provide the basic end to end views for IT users – today.



The Tivoli Enterprise Portal provides a common end to end view for diverse zEnterprise IT users

Monitor and manage System z Hosts, Blades, Optimizers, Network. zManager

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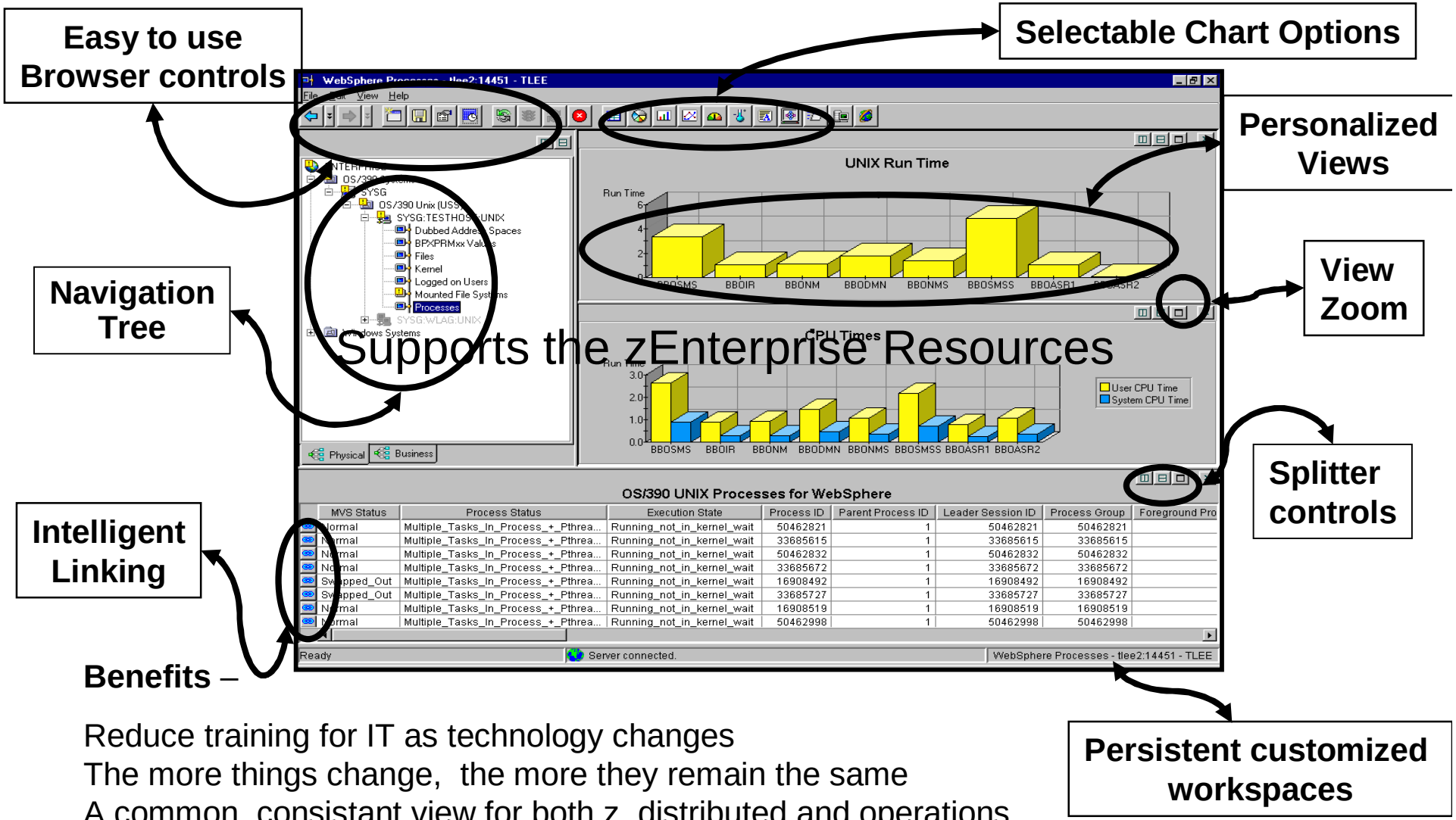
Tivoli Enterprise Portal - Consistent View of different resources



Benefits –

Reduce training for IT as technology changes
The more things change, the more they remain the same
A common, consistant view for both z, distributed and operations
Think adding more blades, optimizers, ensembles…

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Visibility as a value for the business today.

"*And if it weren't for OMXE/TEPS monitoring the zOS systems resources, these type of problems would have gone unnoticed in production centers. Everyone would be oblivious of any looping conditions and problems would likely to continue on for* ***years and years and not being discovered****.*

Clearly, the ***OMXE/TEPS has demonstrated the added value many times over****.*

The value and benefits speak for itself and we got our money worth hundreds times over. Because of this proactive monitoring, ***application quality no doubt has improved****.* ***Applications are now running more efficiently and effectively which in turn translates to hard dollars in CPU cycles, mips and resources savings****.*

This is not just one single case. Already, there are quite a few cases that OMXE/TEPS alerted the problems and Performance group diligently follow-up with the applications."

- North American Financial Institution - 2010

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Control – situations which are available for the zEnterprise are deployed as a constant pair of eyes and ears to provide proactive monitoring and management.

- Situations are the building blocks of systems management logic in the Tivoli Enterprise Portal (TEP)
- Situations may be used to highlight performance problems or resource usage within zEnterprise resources such as
  - Operating Systems, Optimizers, Networks, zManager, DB2 with the ability to combine conditions of different resources to act as a single proactive policy.
- Situations may be used to identify problems that impact availability or performance for the different resources that make up a zEnterprise
  - Monitor SubSystems, Workloads, Applications, Databases, Networks, Optimizers across the different platforms and resources.

Provide Proactive Monitoring by deploying situations for automated actions from zEnterprise Resources

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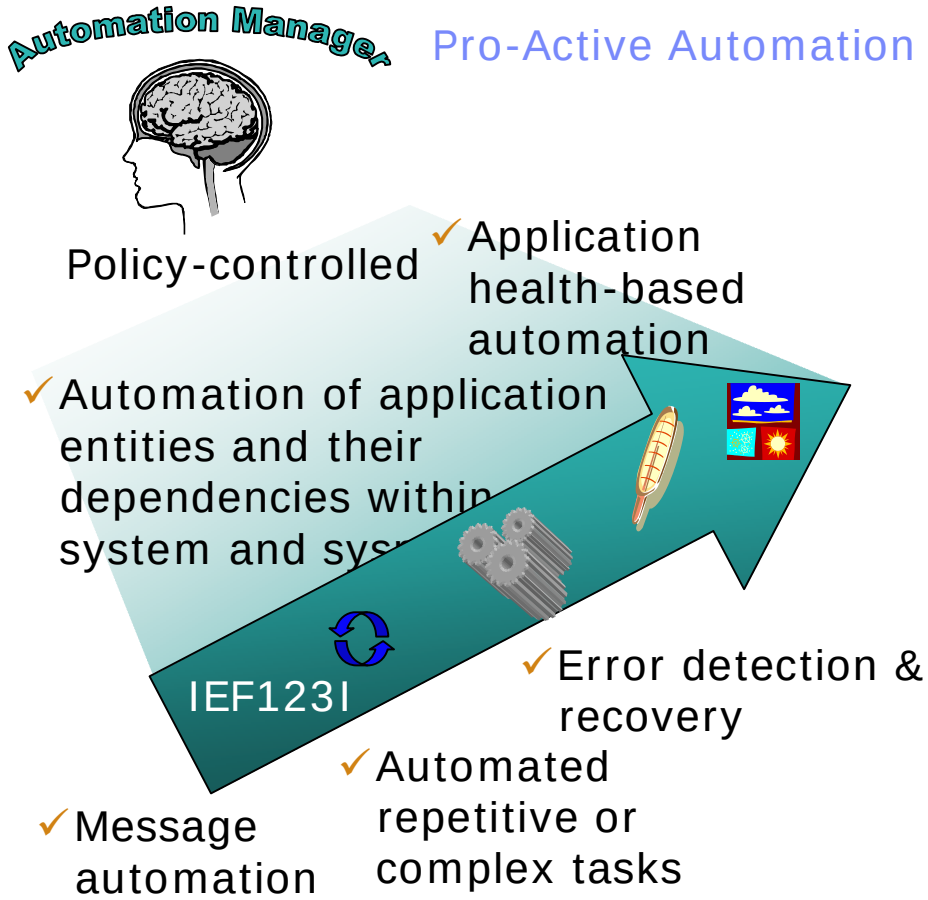
Automation – leverage the out of the box provided situations for a proactive approach from basic reflex automation, to a complete DR solution.

- **Message filtering**
- **Message automation**
- **Error detection and recovery**
- **Resource management**
  - Start, stop, recycle
  - Dependencies between resources
- **High availability for business processes**
- **Predictive Analytics**
  - Understanding the trend of the health of system and applications



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Visibility, Control, Automation

- The value of this approach with Integrated Services Management from Tivoli
  - Provides a consistent view of all resources into a single GUI regardless of the technology base.
  - Provides the capability to deploy proactive monitoring across different technologies being used to deliver a single service for the enterprise.
  - Provides capability for notification of out of policy conditions to different users, different management platforms which can be escalated based on severity, time, staffing etc.
  - Provides the capability for automated actions whether it is reflex automation (if this occurs, then do x), or conditional (if this or this and this occur then do x) or even by using time (if this occurs 4 times in 5 minutes, then do)
  - Can be used in junction with other automated platform management applications such as Tivoli Systems Automation, Systems Automation for Multiplatforms.

And provides this capability today and can be exploited for the zEnterprise.

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Looking at managing the systems of systems
What can we do today?

Visibility

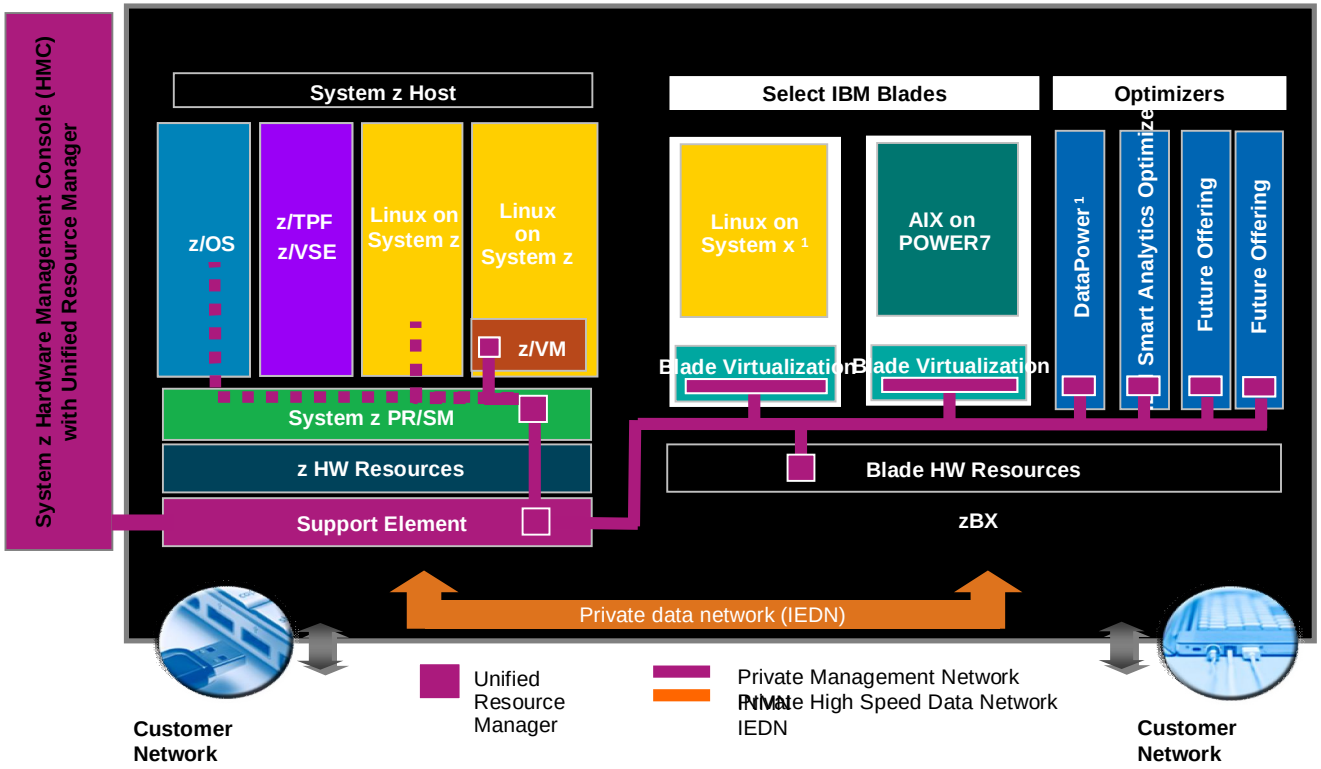
See your Business

Control

Manage service risk and compliance

Automation

Optimize business service delivery



So let us look at the different resources that an IT organization would need to be aware of to manage across the system of systems

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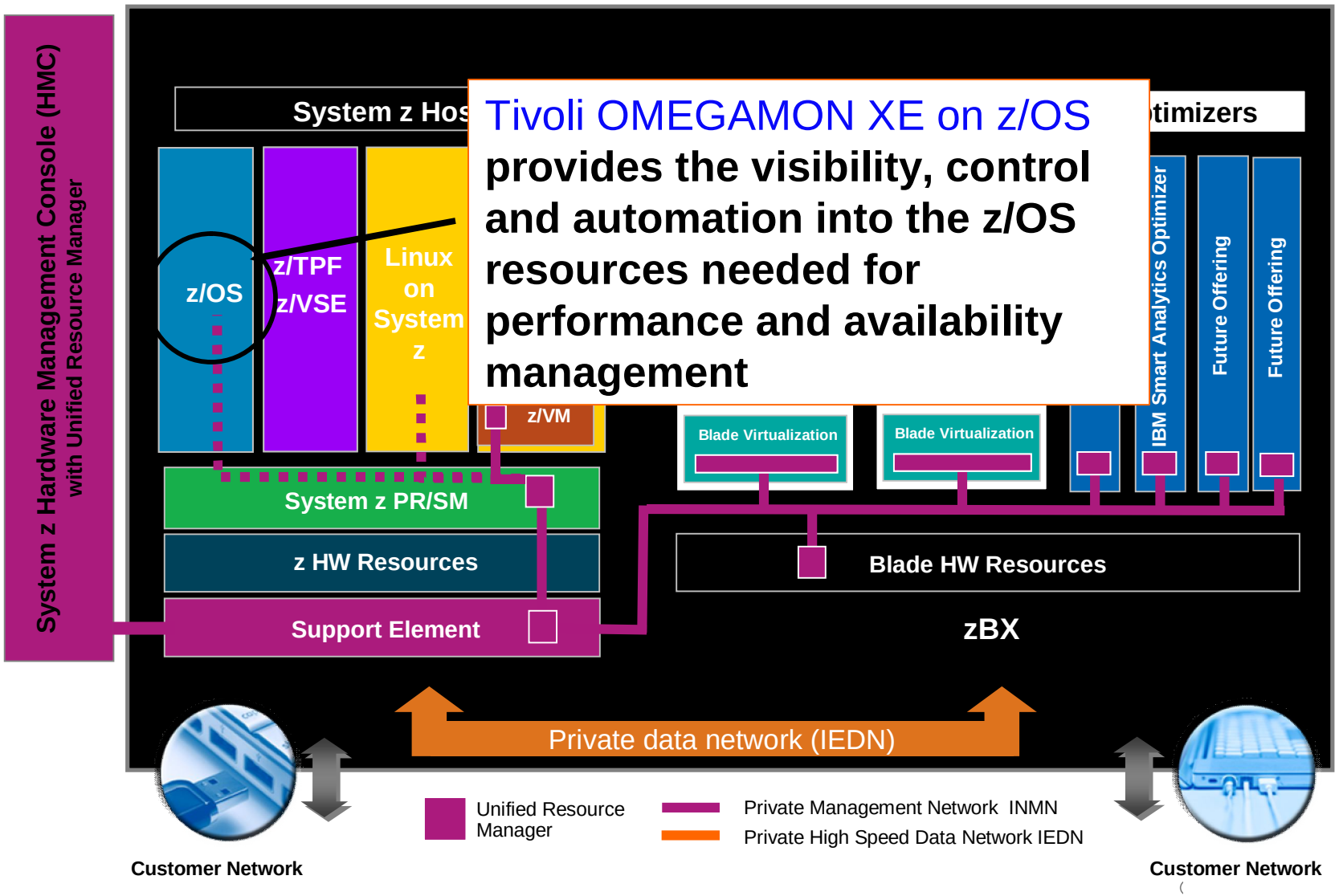
zEnterprise resources



z/OS Examples – What Are Key z/OS Resources That Need To Monitored

z/OS CPU, zIIP/zAAP Processor, Storage

General CP utilization, zIIP and zAAP utilization

Storage, Paging, CSA utilization, ECSA utilization, SQA utilization

z/OS Workload Manager (WLM)

WLM service classes, goals, performance index (PI)

DASD and control unit performance and availability

DASD performance (MSR time)

Sysplex level resources

CF processor utilization and availability

CF storage and structure utilization

CF link performance, utilization, and availability

Key Subsystem and address spaces

Address space availability, Address space CPU utilization and paging activity

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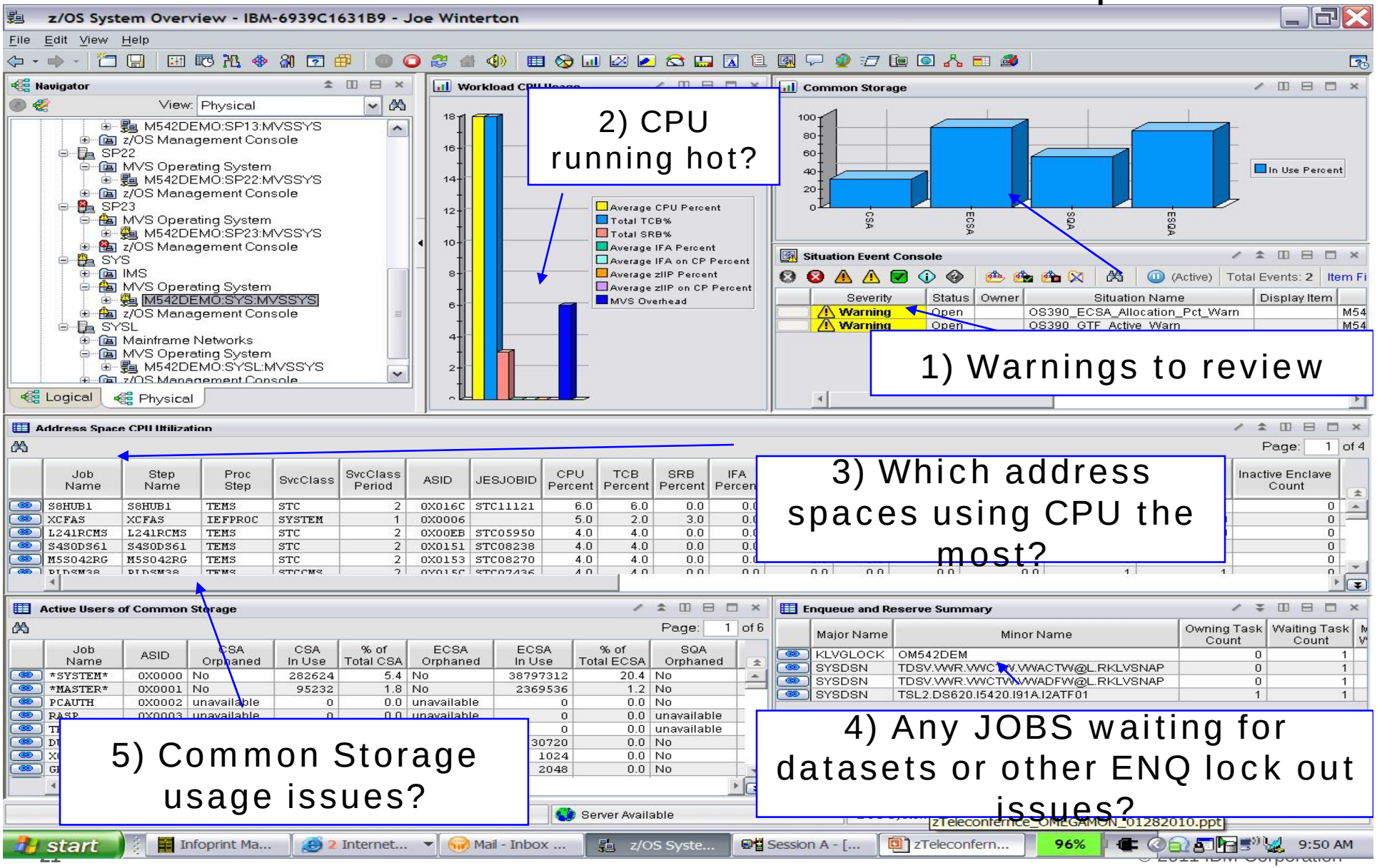
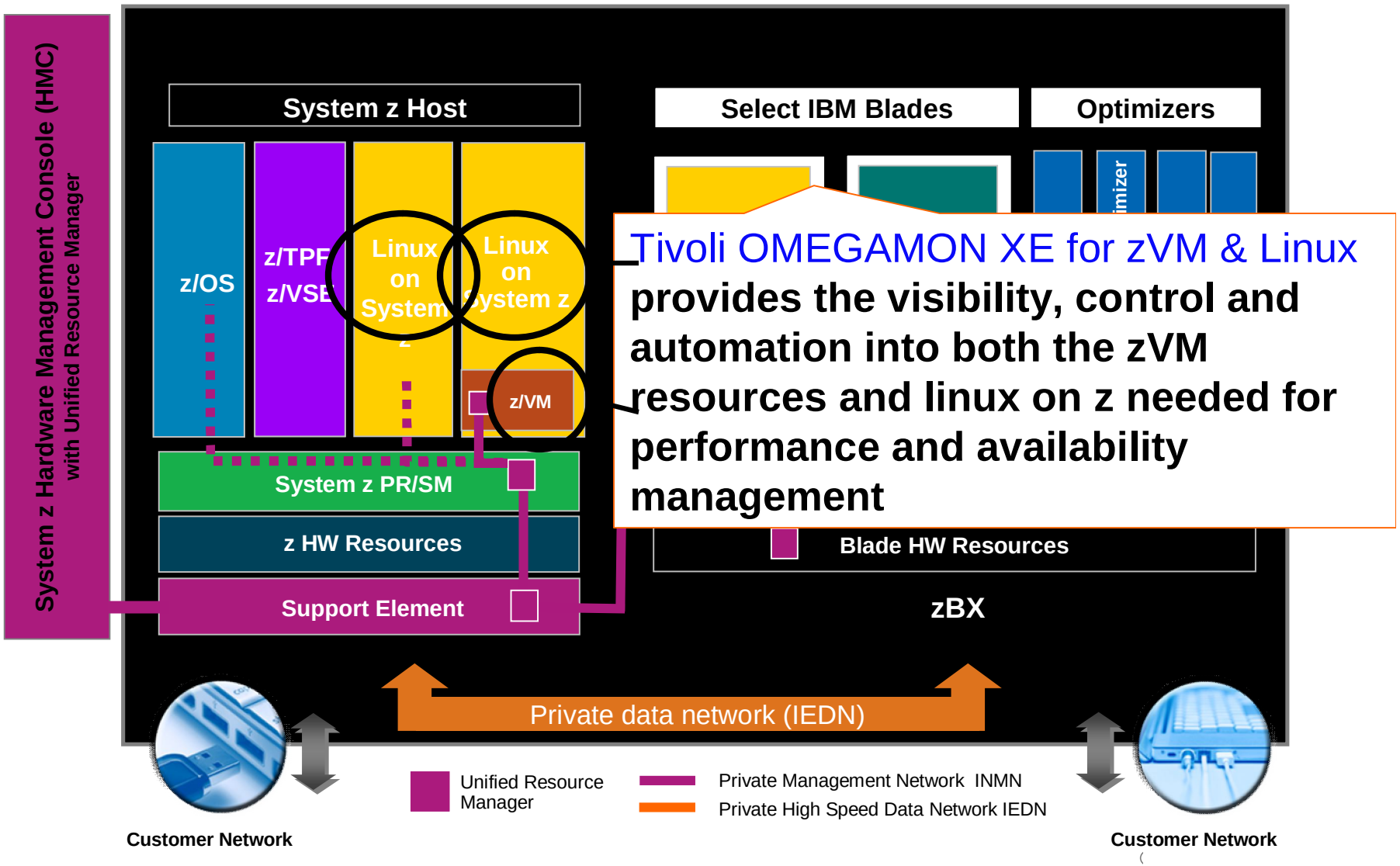
The View from the TEP with a delivered Health workspace



zEnterprise resources



Tivoli OMEGAMON XE for zVM & Linux **provides the visibility, control and automation into both the zVM resources and linux on z needed for performance and availability management**

z/VM and Linux on z Examples – What Are Key Resources That Need To Monitored

z/VM

- PAGING and SPOOLING Utilization
- LPAR Utilization, NETWORK Utilization (Hiper Socket and Virtual Switch), REAL STORAGE Utilization
- TCPIP Utilization for both Servers and Users
- SYSTEM Utilization
- System Terminal Workspace
- Workload (z/VM User ID) Activity
- Linux Workload Workspace
- ApplData Workspace
- DASD

Linux on z

- Linux OS
- Capacity Usage
- Disk Usage
- File Information
- Network
- Process
- System Information
- Users

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The View from the TEP with a delivered Health workspace

Top 5 Workloads Waiting for Resources

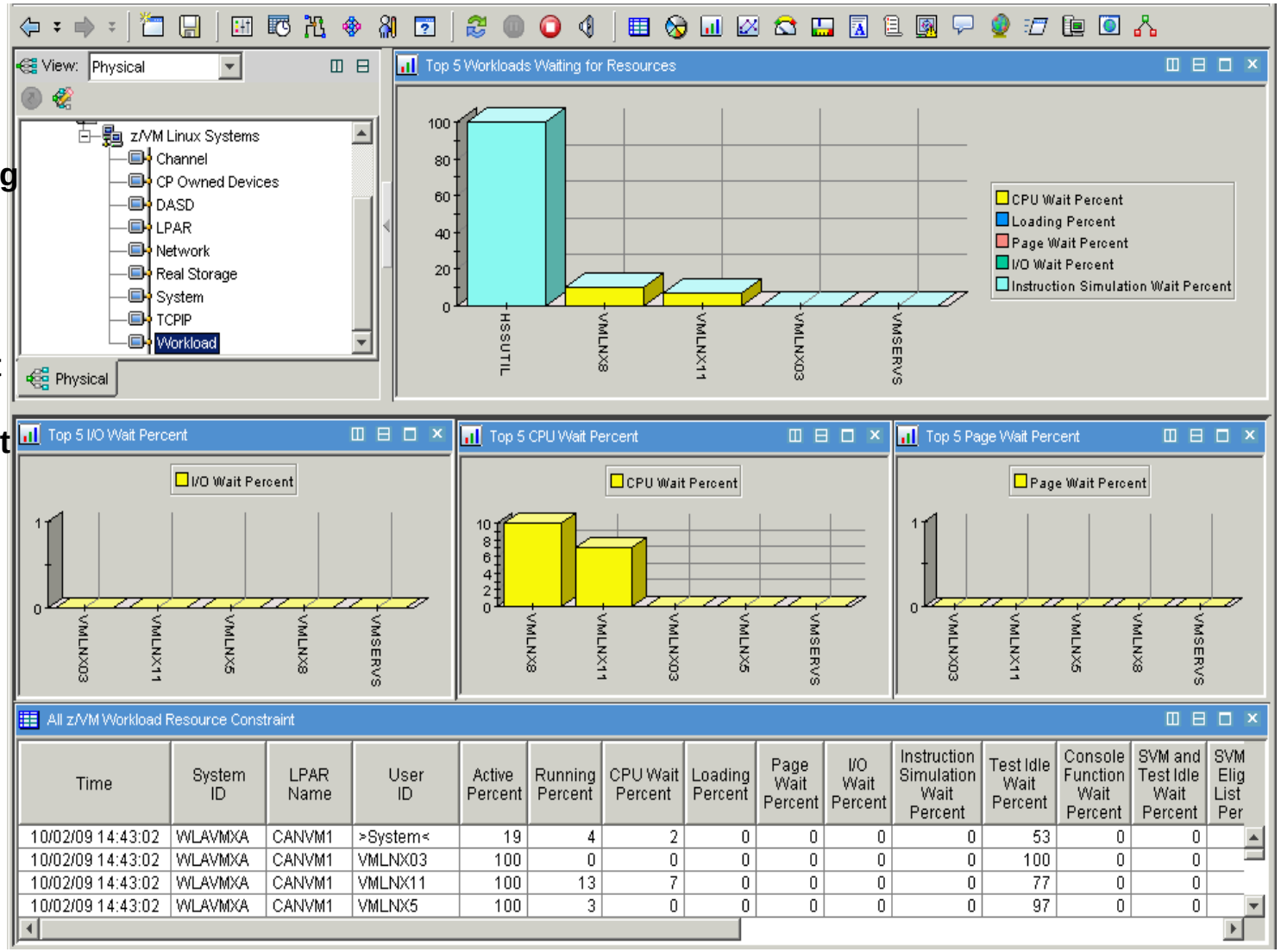
Top 5 I/O Wait Percent

Top 5 CPU Wait Percent

Top 5 Page Wait Percent

All z/VM Workload Resource Constraint

A virtual constraint health workspace....



Time	System ID	LPAR Name	User ID	Active Percent	Running Percent	CPU Wait Percent	Loading Percent	Page Wait Percent	I/O Wait Percent	Instruction Simulation Wait Percent	Test Idle Wait Percent	Console Function Wait Percent	SVM and Test Idle Wait Percent	SVM Elig List Per
10/02/09 14:43:02	WLAVMXA	CANVM1	>System<	19	4	2	0	0	0	0	53	0	0	
10/02/09 14:43:02	WLAVMXA	CANVM1	VMLNX03	100	0	0	0	0	0	0	100	0	0	
10/02/09 14:43:02	WLAVMXA	CANVM1	VMLNX11	100	13	7	0	0	0	0	77	0	0	
10/02/09 14:43:02	WLAVMXA	CANVM1	VMLNX5	100	3	0	0	0	0	0	97	0	0	

Why is virtual machine not running (i.e. waiting)?

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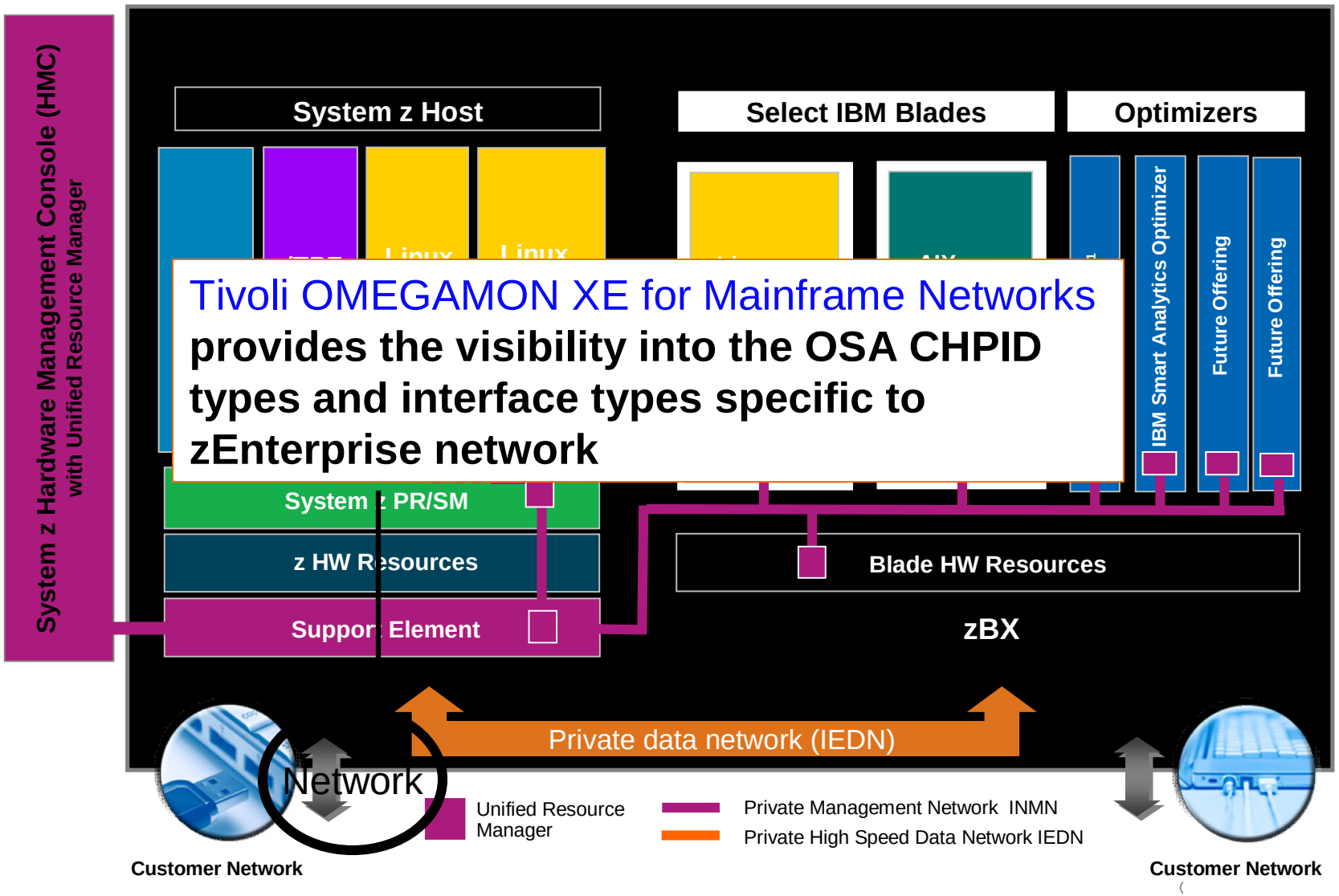
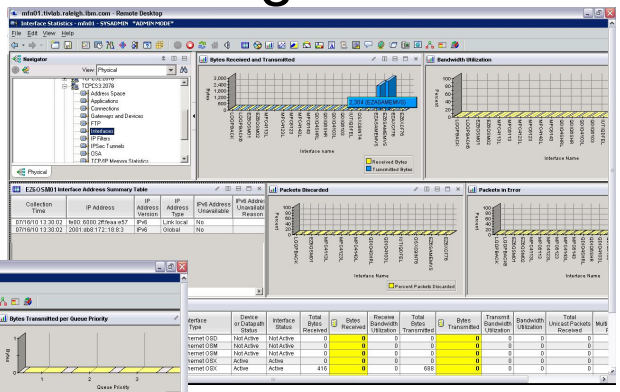
zEnterprise resources



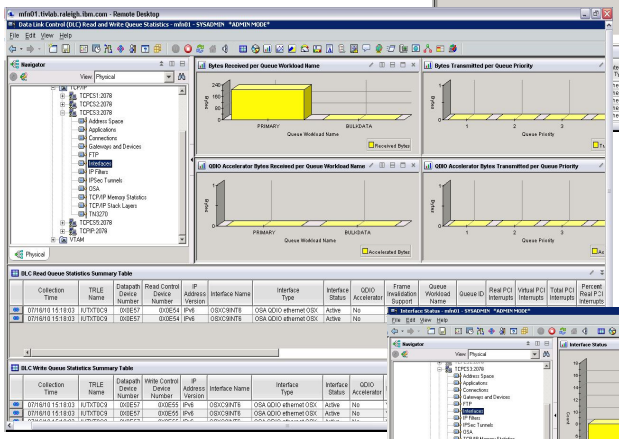
Network Examples –
What Are The Key Resources that need to be managed

OMEGAMON XE for Mainframe Networks provides visibility into the zEnterprise intranode management network (INMN) and zEnterprise intraensemble data network (IEDN) interface types specific to zEnterprise Management Network.

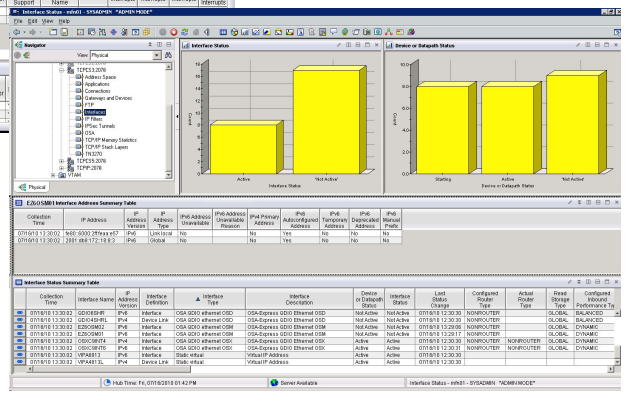
Because Mainframe Networks can segregate data by interface type, traffic passing over new zEnterprise private networks can be isolated and analyzed with these three new Fix Pack 3 workspaces.



Interface Statistics



Interface DLC Read and Write Queue



Interface Status

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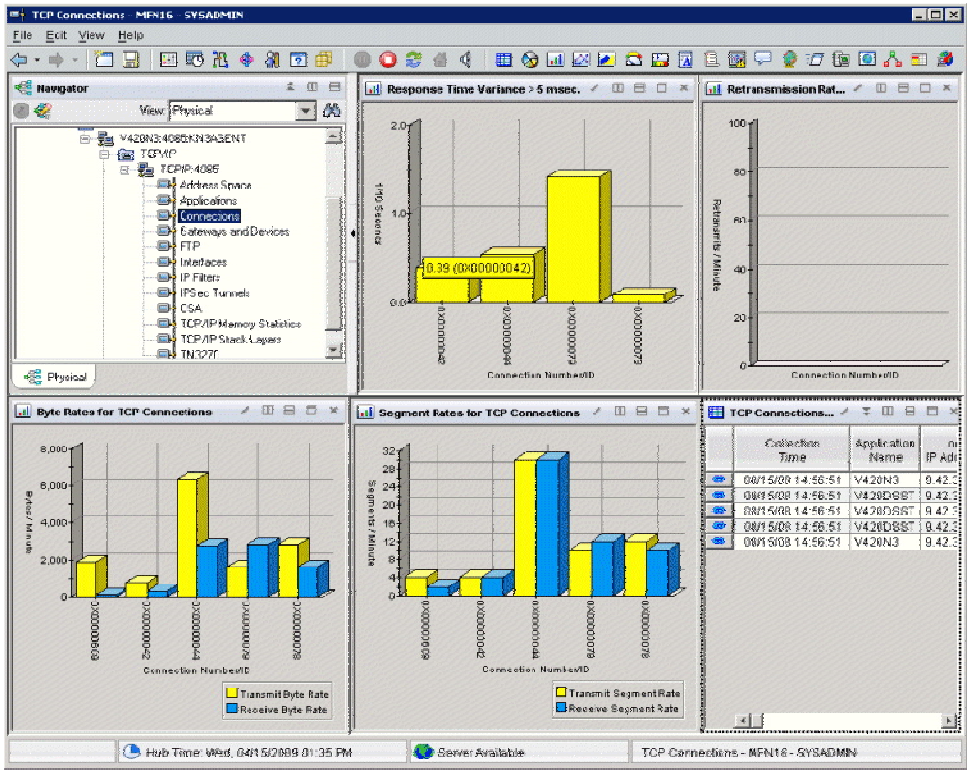
More Support for the zEnterprise mainframe server

TCP Connections workspace displays Application Name and Outbound Interface Name.

Filtering can be used to show connections using the new INMN and IEDN interfaces.

Visibility into the z/OS applications and connections using the new zEnterprise VPN with performance metrics that are useful in debugging problems.



TCP Connections

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zEnterprise resources

Supporting the middleware on z?

OMEGAMON XE for CICS includes CICS TG

OMEGAMON XE for IMS

OMEGAMON XE for Storage

Supporting the middleware on distributed?

ITM for Applications

Supporting End to End management?

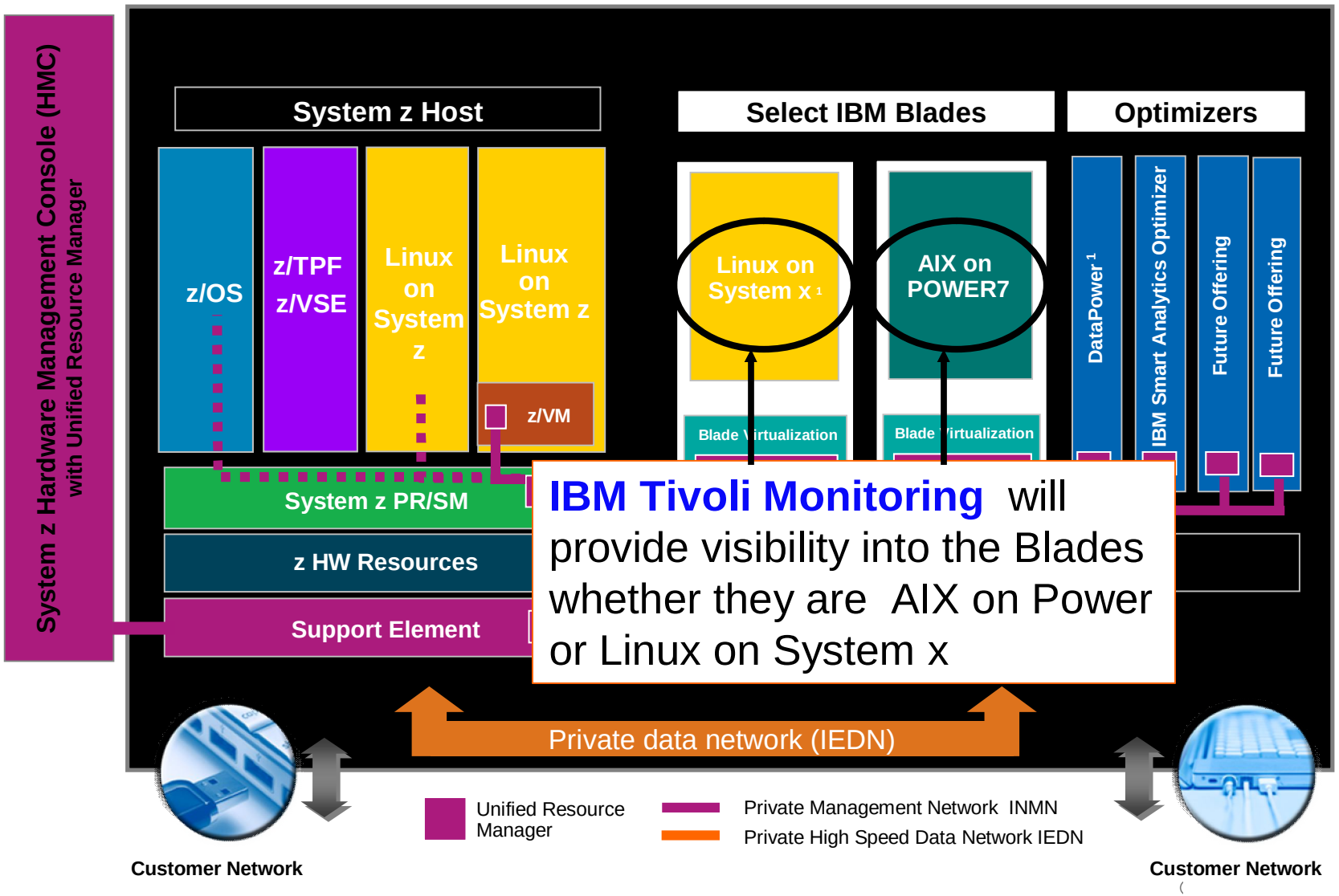
OMEGAMON XE for Messaging

ITCAM for SOA (WebSphere)

ITCAM for Transactions

Visibility, Control and Automation with Situations for Performance and Availability

zEnterprise resources



IBM Tivoli Monitoring

- Lets you easily collect and analyze specific information on your Distributed Operating Systems, including information on:
  - CPU
  - Memory
  - Processes
  - Disk Usage
  - File Information
  - with Situations for Proactive Monitoring of Availability and Performance

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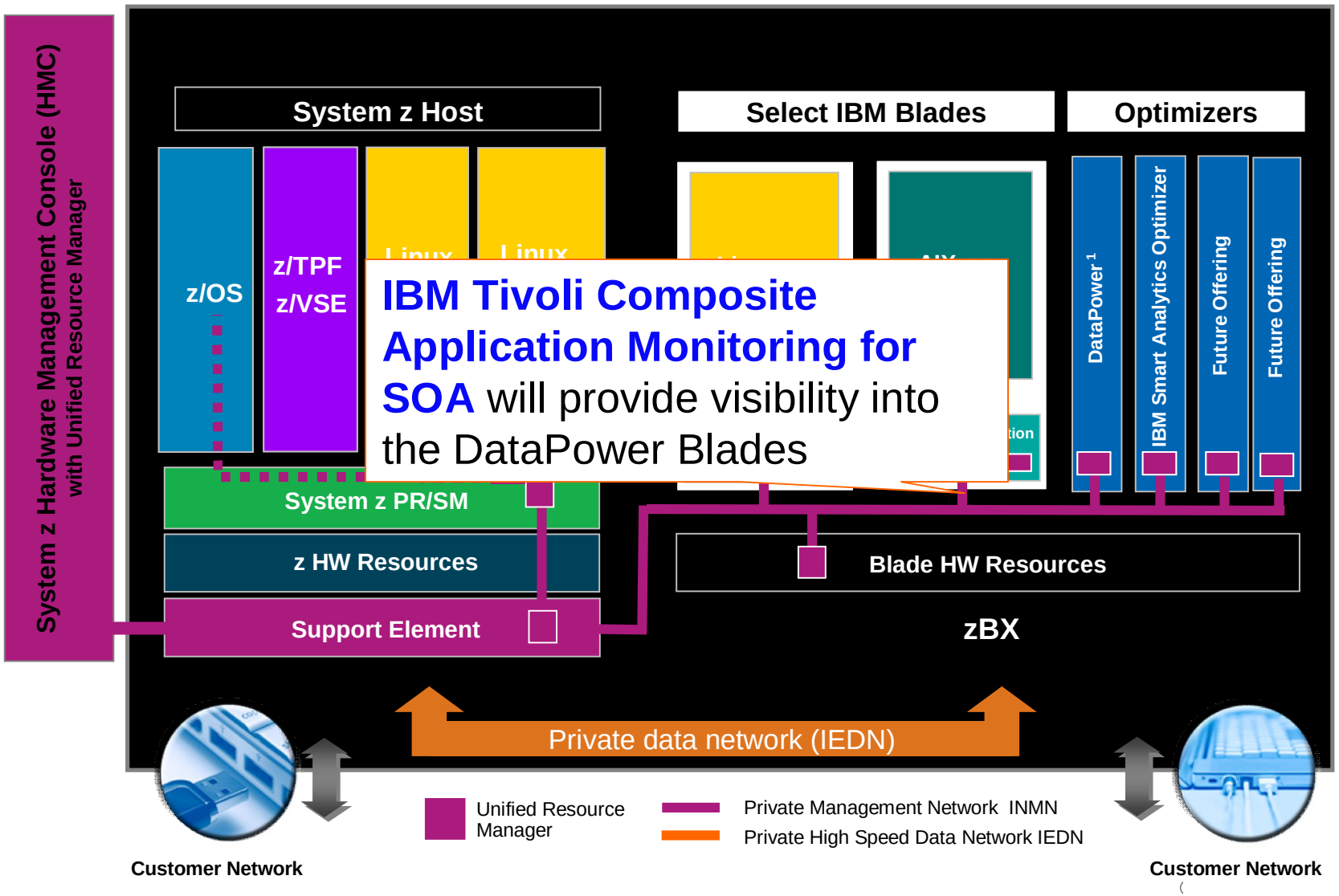
zEnterprise resources



Datapower Monitoring Examples – What Are The Key Resources that need to be managed

- a centralized list of devices
- a centralized firmware repository
- Define device clusters that are intended to share similar configuration
- Automatically synchronizing firmware, sharable device settings, and service domain definitions
- Discover and propagate changes within a cluster
- Manage version control of firmware, sharable device settings, and service domain definitions with roll back capability
- Track of device synchronization and operation state

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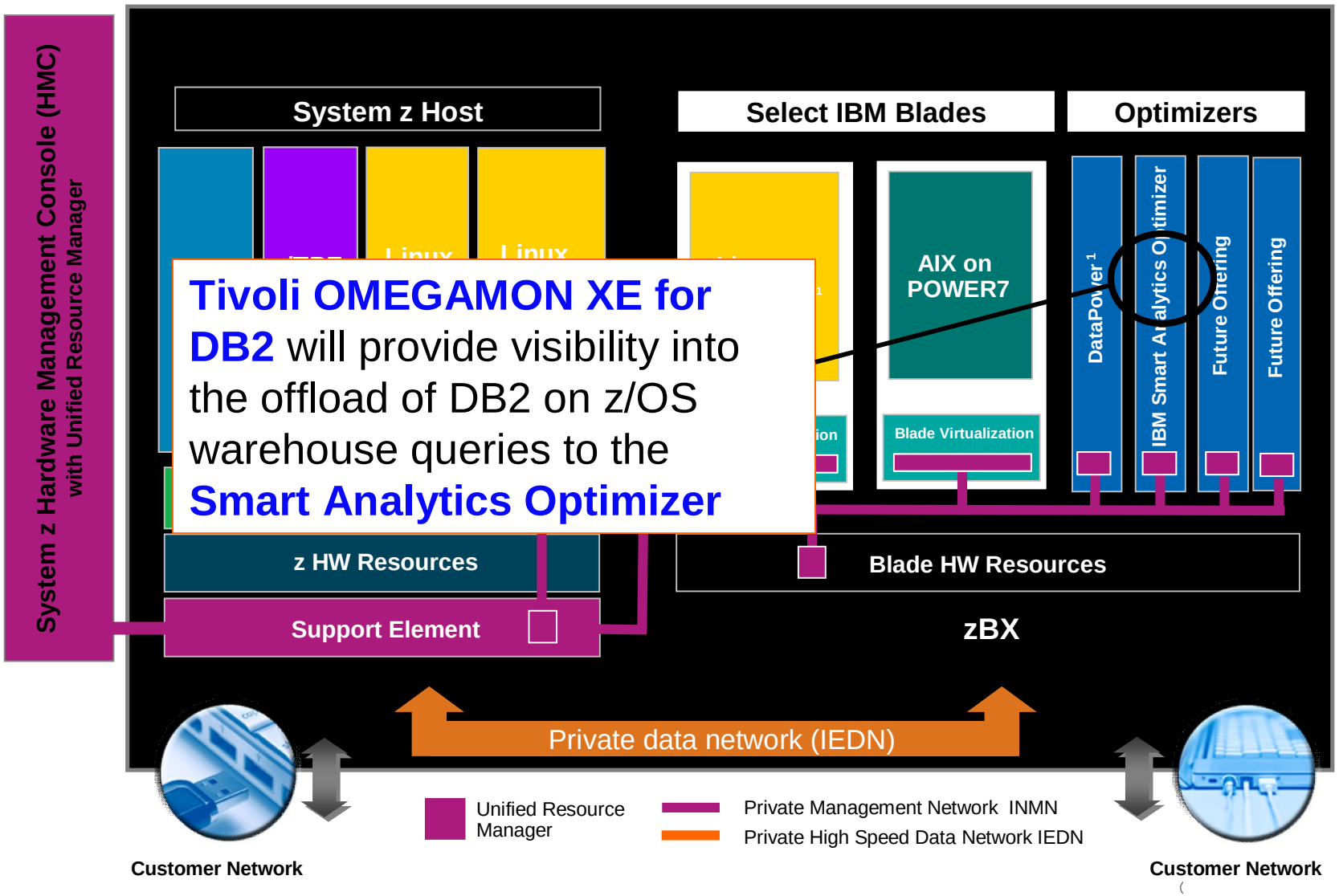
zEnterprise resources



IBM zEnterprise System

A system of systems that unifies IT for predictable service delivery

Unified management for a smarter system:
zEnterprise Unified Resource Manager

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

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

Tivoli

Provides an integrated service management capability for the zEnterprise resources to ensure the systems of systems is working as "the" enterprise system

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Investment Protection

- *A strategy to leverage your current investment in Tivoli's Integrated Service Management Portfolio and is zEnterprise ready.*

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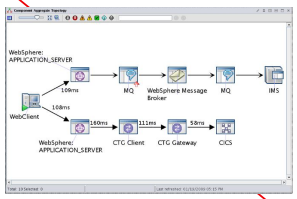
Tivoli Enterprise Management Today

Monitoring with
ITM
OMEGAMON XE
ITCAM



System x
Windows
Web serve

System i

System z
Database/apps

System i
AS/400

System x
Linux
ERP

System x
Windows
Dev apps

System I
CRM

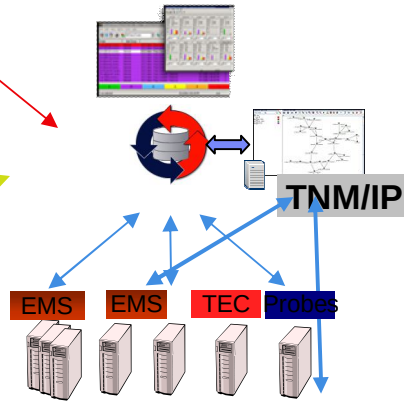
Power 7
Power VM
ERP

Power Blades
AIX, Power VM
Dev/Test

System x
Linux
App Servers

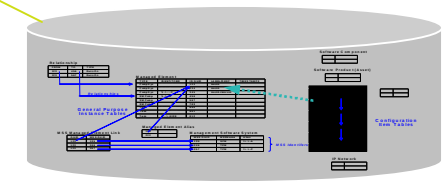
Monitoring
Discovery

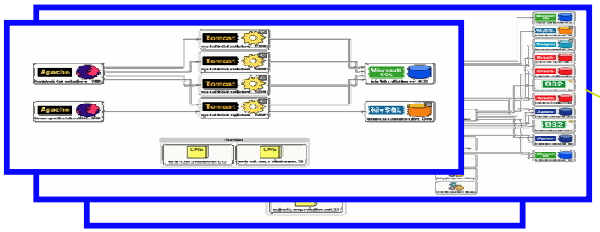
Event Management
OMNIbus solution



Network / Systems

CCMDB Data Store





Discovery with
Tivoli Application Dependency Discovery Manager

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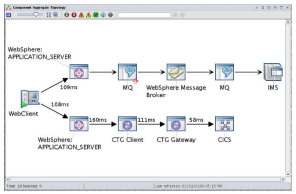
Tivoli Enterprise Management w/ zEnterprise

Tivoli Enterprise Portal

Monitoring with
ITM
OMEGAMON XE
ITCAM



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

Linux on System x

AIX on POWER7

Blade Virtualization

Blade Virtualization

Optimizers

DataPower

Smart Analytics Optimizer

Future Offering

Future Offering

Blade HW Resources

zBX

Private data network (IEDN)

Customer Network

Customer Network

Private Management Network INMN

Private High Speed Data Network IEDN

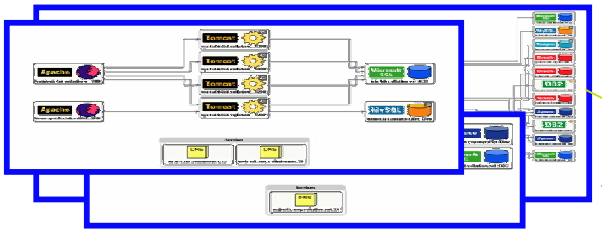
TNM/IP

EMS

EMS

TEC

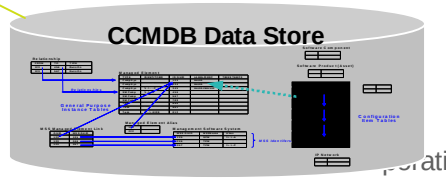
Probes



Monitoring

Discovery

CCMDB Data Store



IBM's Integrated Service Management approach is recognized as best in class

IDC Market Share rankings:
#1 Overall in Systems / Network Management
#1 in Overall Performance and Availability Mgt.
#1 Performance Management
#1 Event Automation
#1 Network Management
#1 Output Management
#1 Archiving
#1 Identity and Access Management
#1 Security and Vulnerability Management
#1 Enterprise Asset Management

VISIBILITY	CONTROL	AUTOMATION
See your business services	*Manage service risk and compliance*	*Optimize business service delivery*

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Important links:

- zAdvisor: http://www-01.ibm.com/software/tivoli/systemz-advisor/2009-12/omegamon-xe-version-420.html
- zWiki: http://www.ibm.com/developerworks/wikis/display/tivoliomegamon/Tivoli%20OMEGAMON%20XE%20on%20zOS
- Information Center: http://publib.boulder.ibm.com/infocenter/tivihelp/v15r1/topic/com.ibm.omegamon_xezos.doc/welcome.htm

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Other references and links

- IBM Tivoli Monitoring (ITM) 6.2.x documentation

  http://publib.boulder.ibm.com/infocenter/tivihelp/v15r1/index.jsp?toc=/com.ibm.itm.doc/toc.xml

- ITM and OMEGAMON XE Product upgrade
  http://publib.boulder.ibm.com/infocenter/tivihelp/v15r1/index.jsp

  … search on term": "upgrade"

Don't forget the OMEGAMON user groups located on Yahoo and also on Linkedin as sources of information from other users.

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