

# IBM System z Technology Summit



Gaining an edge on management for the  
zEnterprise

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*2011*



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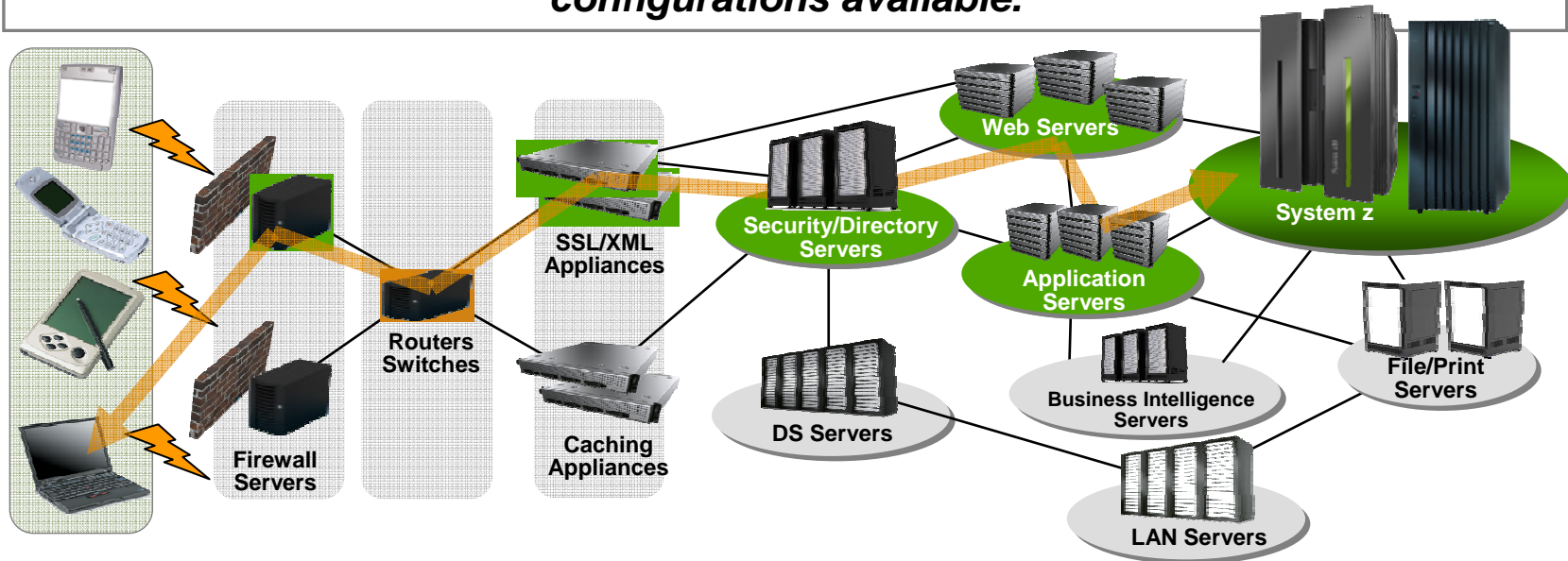
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## Agenda –

- 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..

## Where we are Today: Limitations impact Management

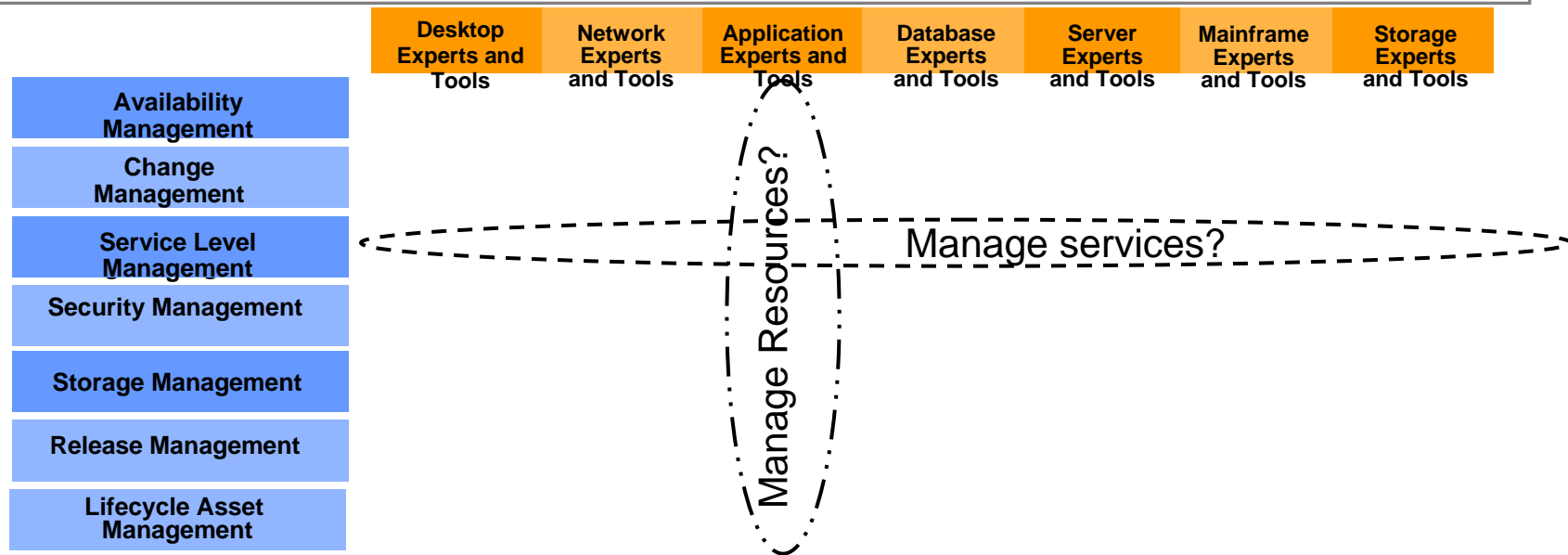
*Information technology today is limited by the technology and architecture configurations available.*



- 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.**

## 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?

# 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*

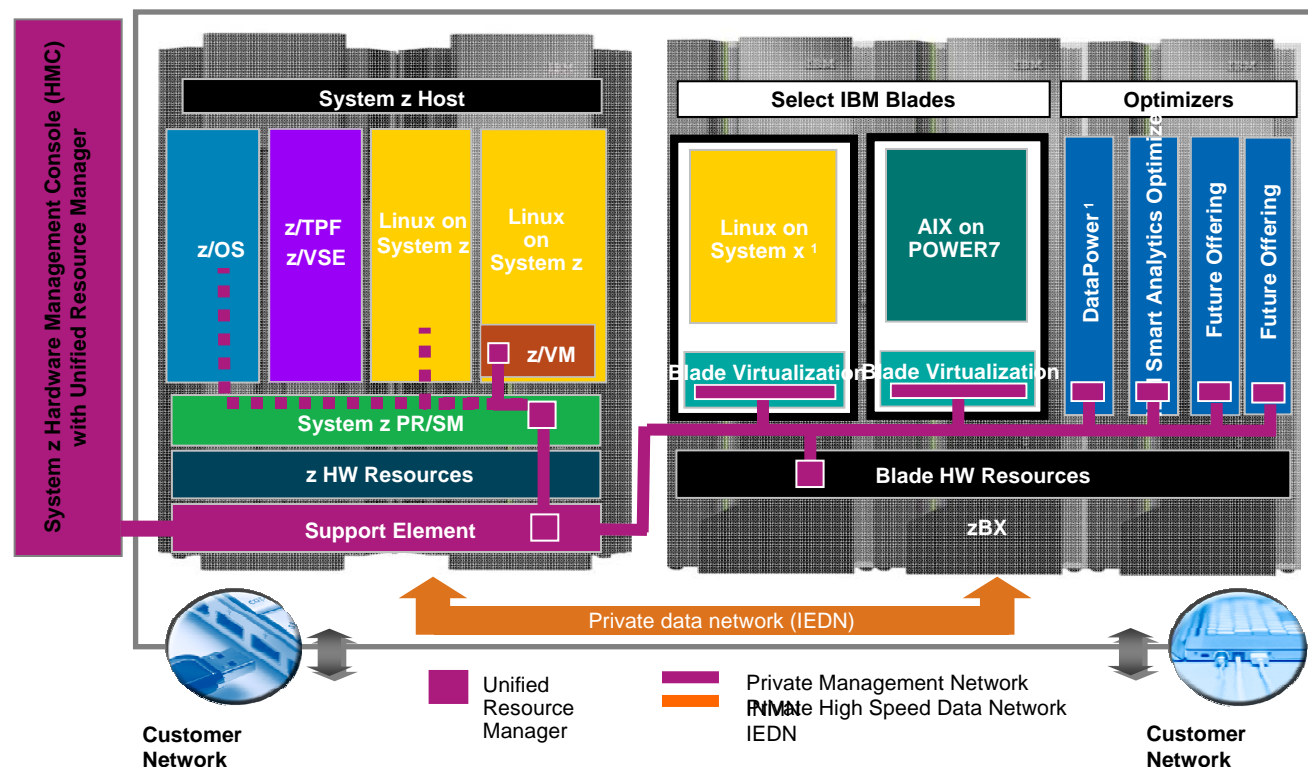
*Firmware*

*Network*

*Applications*

*Workload*

*In one frame.*

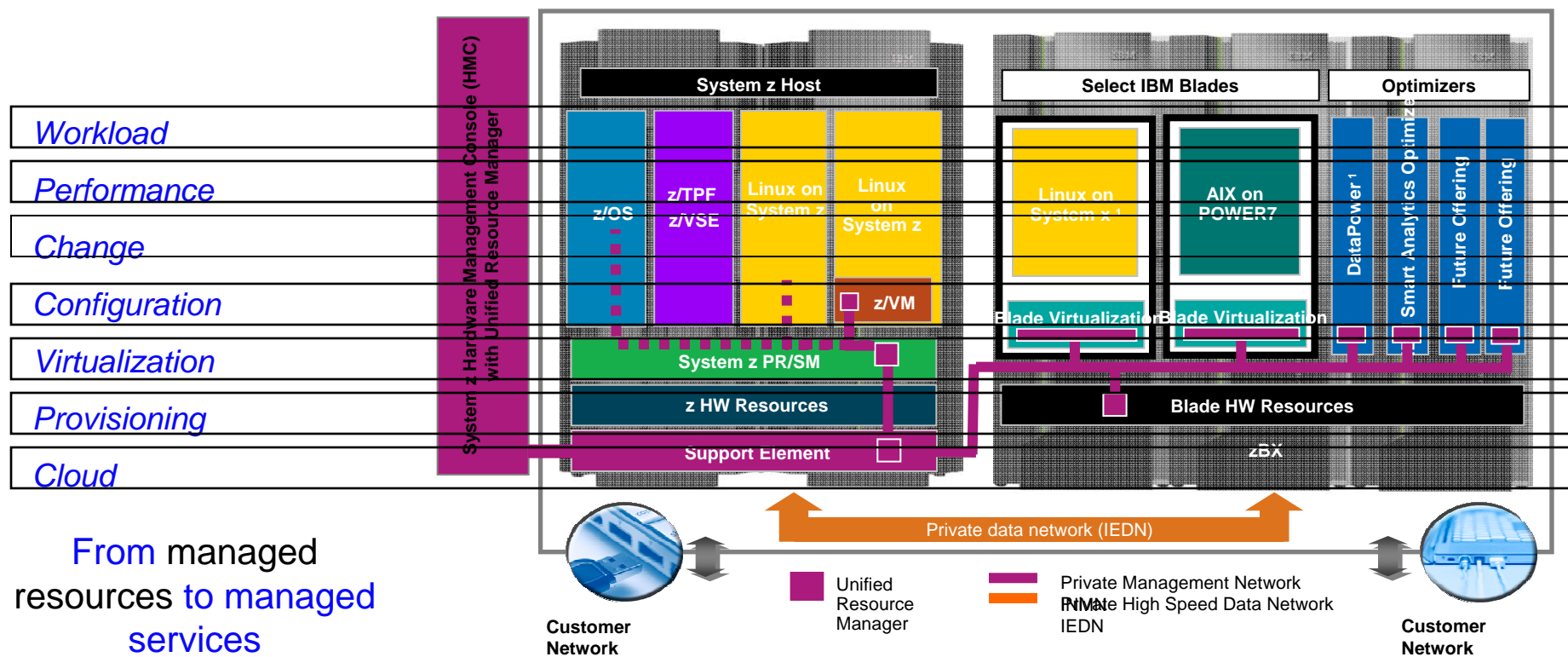


### The Next Challenge - zBX

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.

# Looking at managing the systems of systems

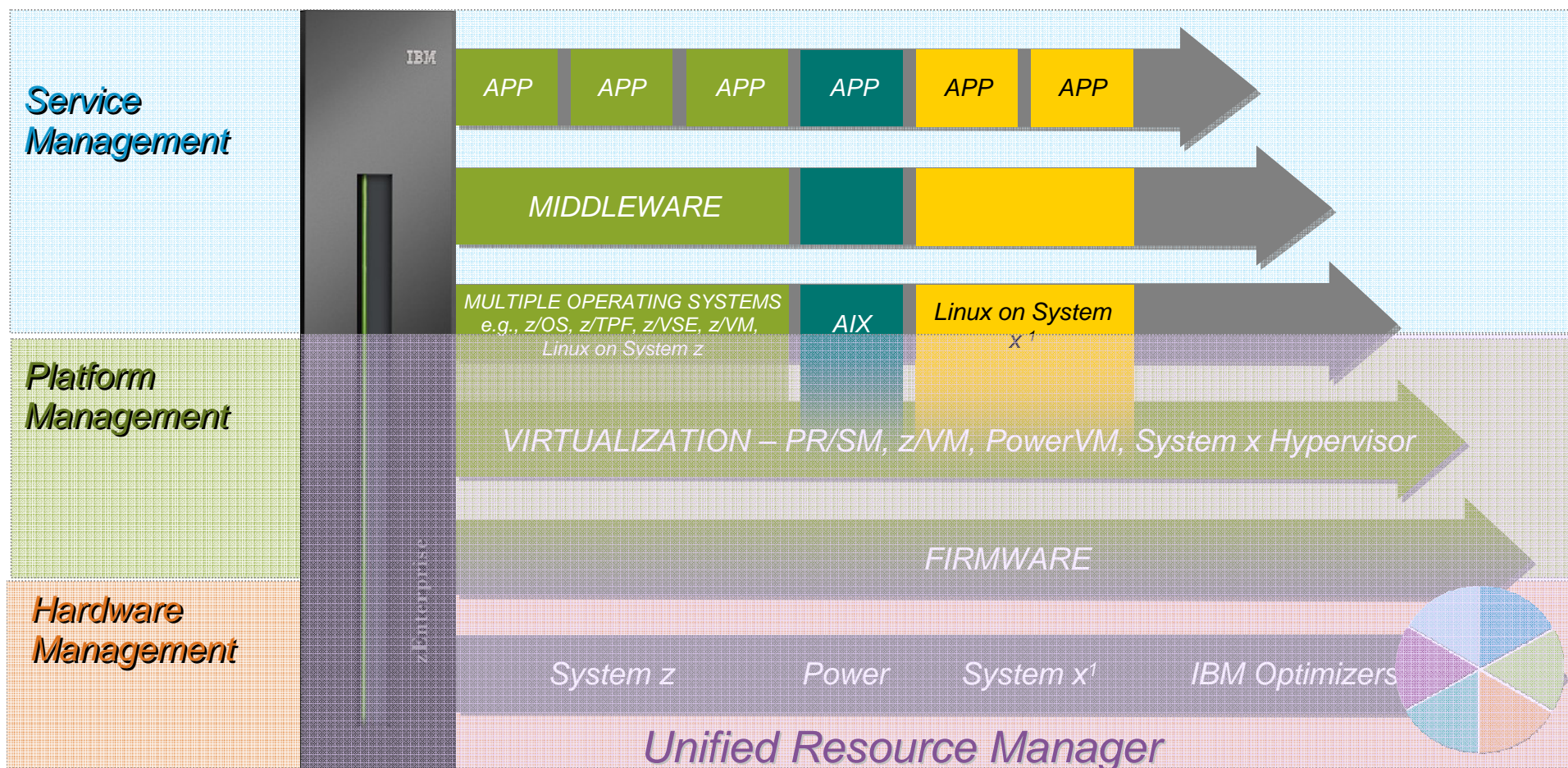
A pragmatic strategy for Integrated Service Management of the zEnterprise.



**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.

## zEnterprise will generate a new management perspective on IT organizations



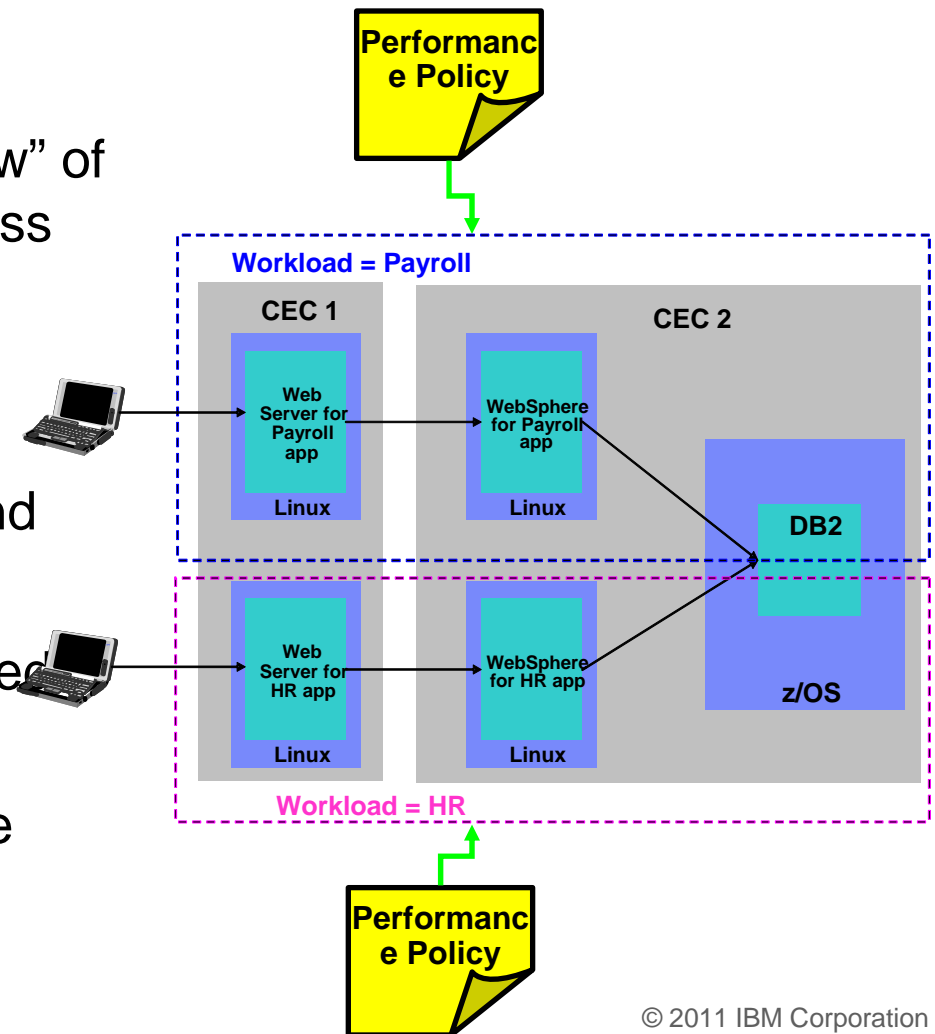
*A “zEnterprise” management approach is focused on a combination of resources working as a business process with a dedicated service level and expectation for users.*



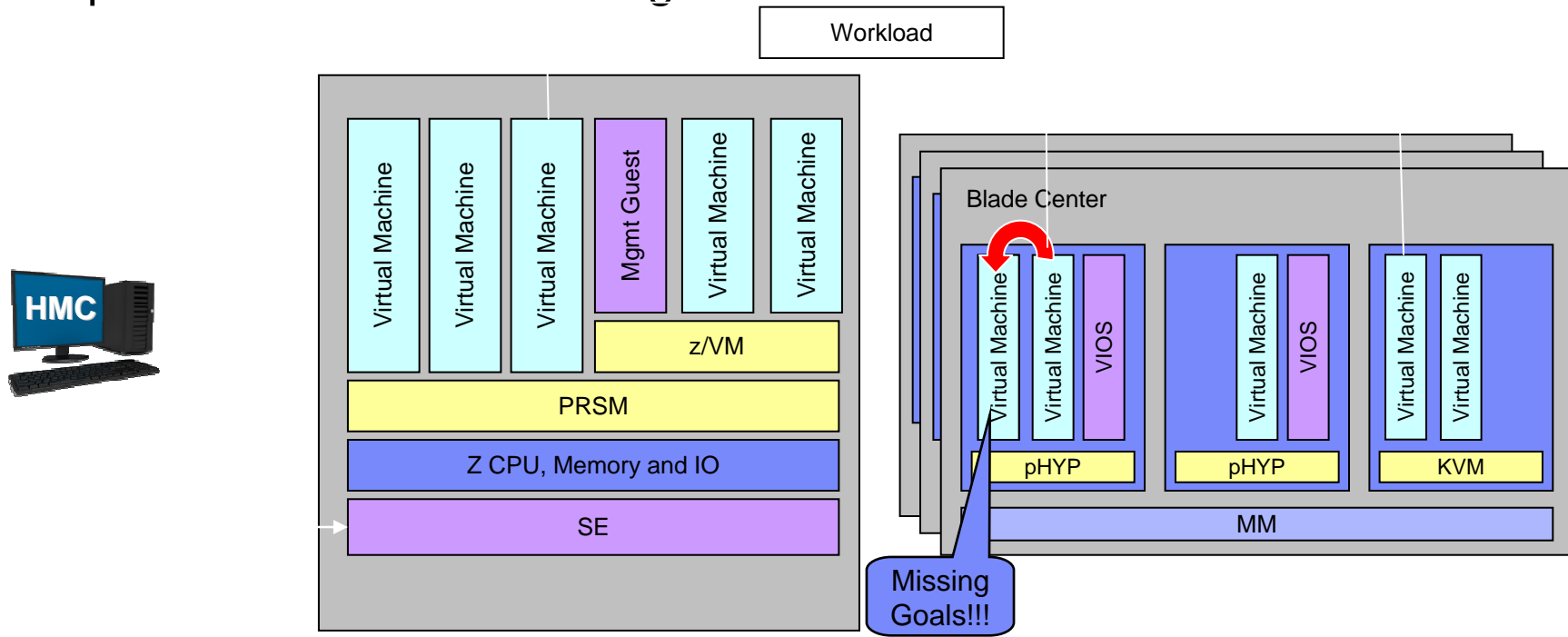
An example –

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 with Platform Workload
  - Currently supports Performance Policy



## 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

## 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*

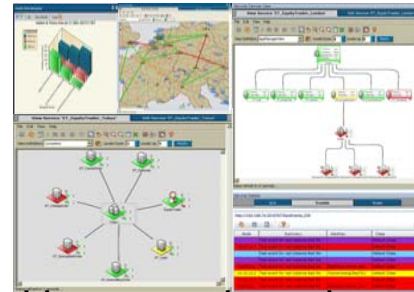
How does IT manage a coordinated cross platform, cross resource integrated approach to monitor service levels, workload and performance using today's management capabilities?

### *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?

zEnterprise management – different skills (personas), different Visibility  
*one size does not fit all*

**Business Views**

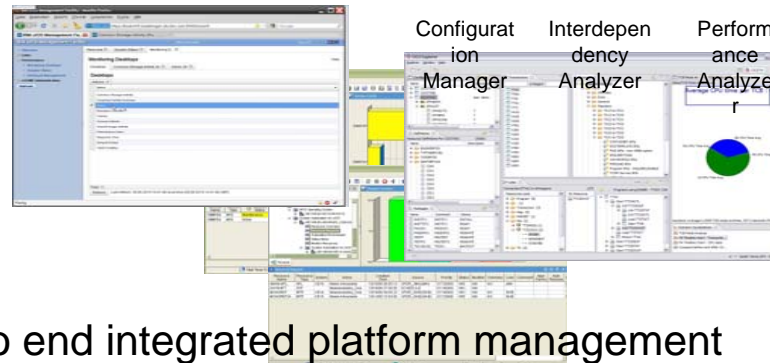


End to end integrated service management

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

**Portals – Service Views**

zOS MF  
 CICS Explorer  
 Tivoli Enterprise Portal,  
 Etc.

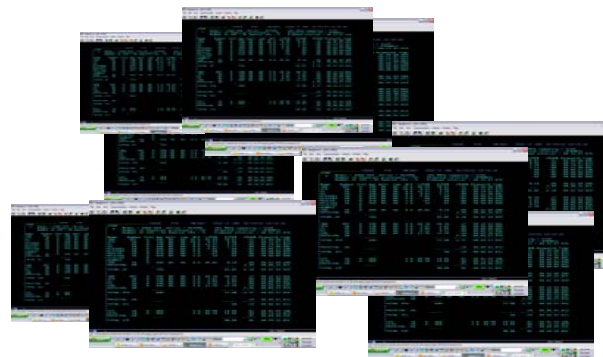


End to end integrated platform management

**Manage end to end**  
 Workload  
 Performance  
 Transactions  
 Etc.

**Resource Management Views**

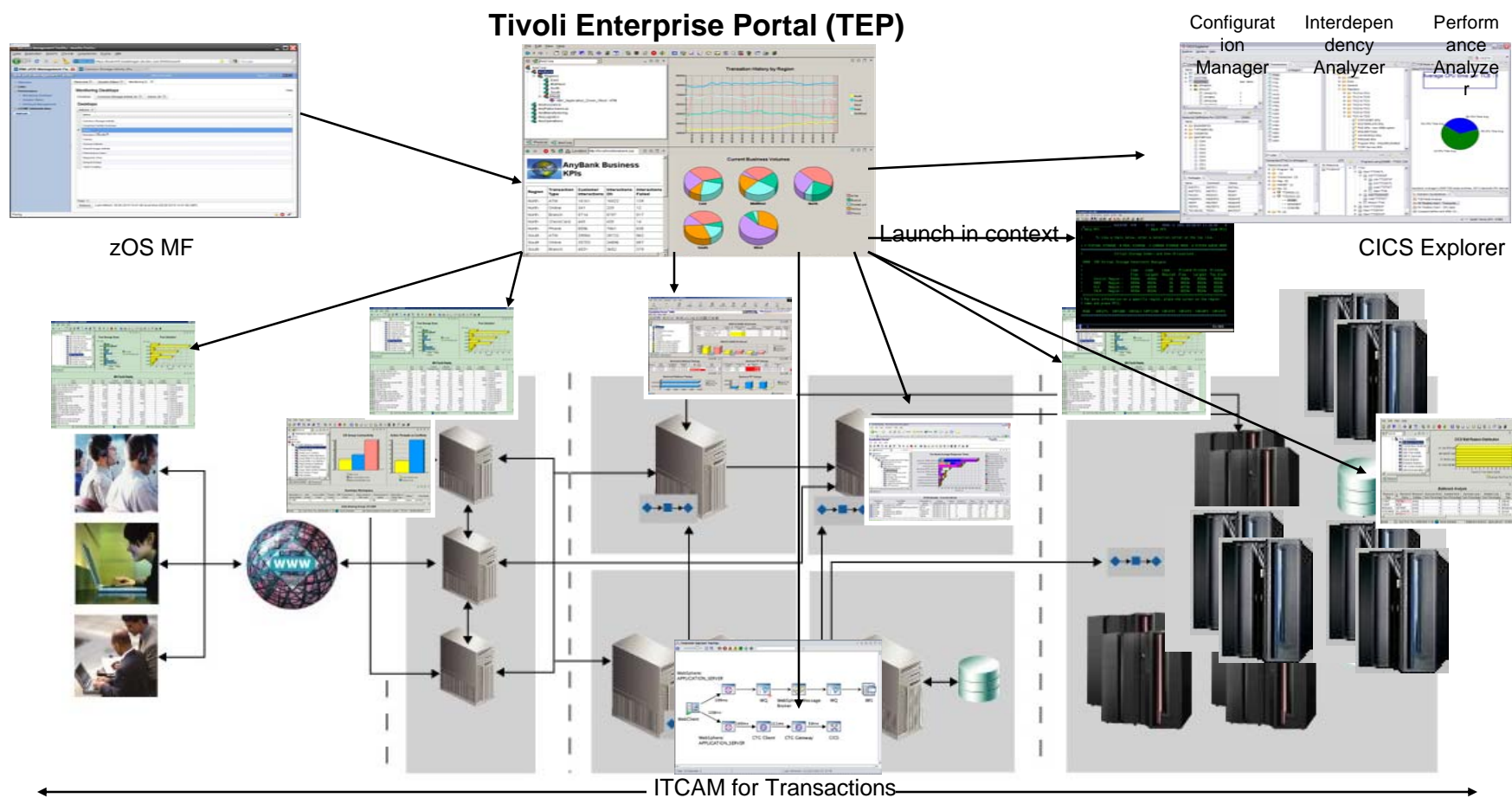
green screens, consoles.  
 Web browsers. zHMC,  
 Etc.



Individual Resource management

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

**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***

# Tivoli Enterprise Portal - Consistent View of different resources

The screenshot displays the Tivoli Enterprise Portal interface for monitoring OS/390 UNIX Processes for WebSphere. The interface includes a navigation tree on the left, a main content area with two charts (UNIX Run Time and CPU Times), and a table of process details at the bottom. Callouts highlight various features: 'Easy to use Browser controls' points to the top toolbar; 'Selectable Chart Options' points to the chart's toolbar; 'Personalized Views' points to the chart's view options; 'View Zoom' points to a zoom control; 'Splitter controls' points to window management icons; 'Intelligent Linking' points to the process table; and 'Supports the zEnterprise Resources' is overlaid on the charts.

**UNIX Run Time**

Process	Run Time
BBOSMS	~4.5
BBOIR	~1.5
BBONM	~1.5
BBODMN	~1.5
BBONMS	~1.5
BBOSMS	~5.5
BBOASR1	~1.5
BBOASR2	~1.5

**CPU Times**

Process	User CPU Time	System CPU Time
BBOSMS	~2.5	~0.5
BBOIR	~1.0	~0.5
BBONM	~1.0	~0.5
BBODMN	~1.0	~0.5
BBONMS	~1.0	~0.5
BBOSMS	~2.5	~0.5
BBOASR1	~1.0	~0.5
BBOASR2	~1.0	~0.5

**OS/390 UNIX Processes for WebSphere**

MVS Status	Process Status	Execution State	Process ID	Parent Process ID	Leader Session ID	Process Group	Foreground Pro
Normal	Multiple_Tasks_In_Process_+Pthrea...	Running_not_in_kernel_wait	50462821	1	50462821	50462821	
Normal	Multiple_Tasks_In_Process_+Pthrea...	Running_not_in_kernel_wait	33685615	1	33685615	33685615	
Normal	Multiple_Tasks_In_Process_+Pthrea...	Running_not_in_kernel_wait	50462832	1	50462832	50462832	
Normal	Multiple_Tasks_In_Process_+Pthrea...	Running_not_in_kernel_wait	33685672	1	33685672	33685672	
Swapped_Out	Multiple_Tasks_In_Process_+Pthrea...	Running_not_in_kernel_wait	16908492	1	16908492	16908492	
Swapped_Out	Multiple_Tasks_In_Process_+Pthrea...	Running_not_in_kernel_wait	33685727	1	33685727	33685727	
Normal	Multiple_Tasks_In_Process_+Pthrea...	Running_not_in_kernel_wait	16908519	1	16908519	16908519	
Normal	Multiple_Tasks_In_Process_+Pthrea...	Running_not_in_kernel_wait	50462998	1	50462998	50462998	

## Benefits –

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

**Persistent customized workspaces**

## 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

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

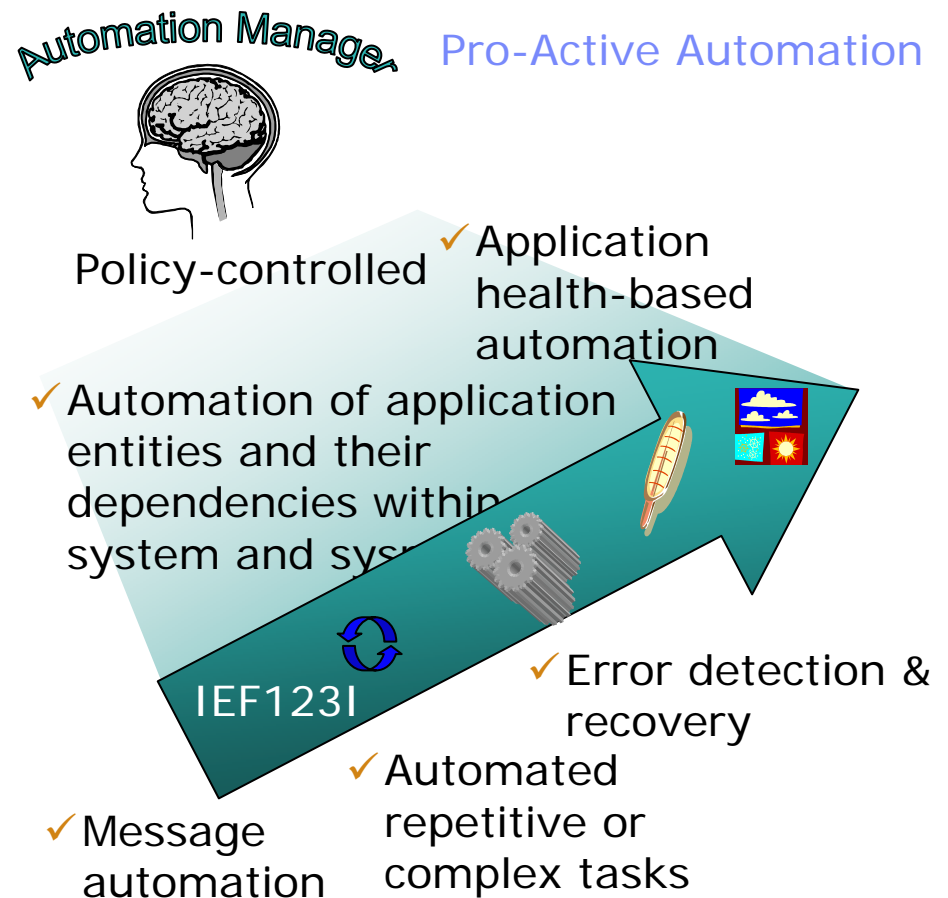
- Situations are the building blocks of systems management logic in the Tivoli Enterprise Portal (TEP)
- Situations may be used to highlight performance problems or resource usage within zEnterprise resources such as
  - Operating Systems, Optimizers, Networks, zManager, DB2 with the ability to combine 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***



**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



## *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.*

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

### Visibility

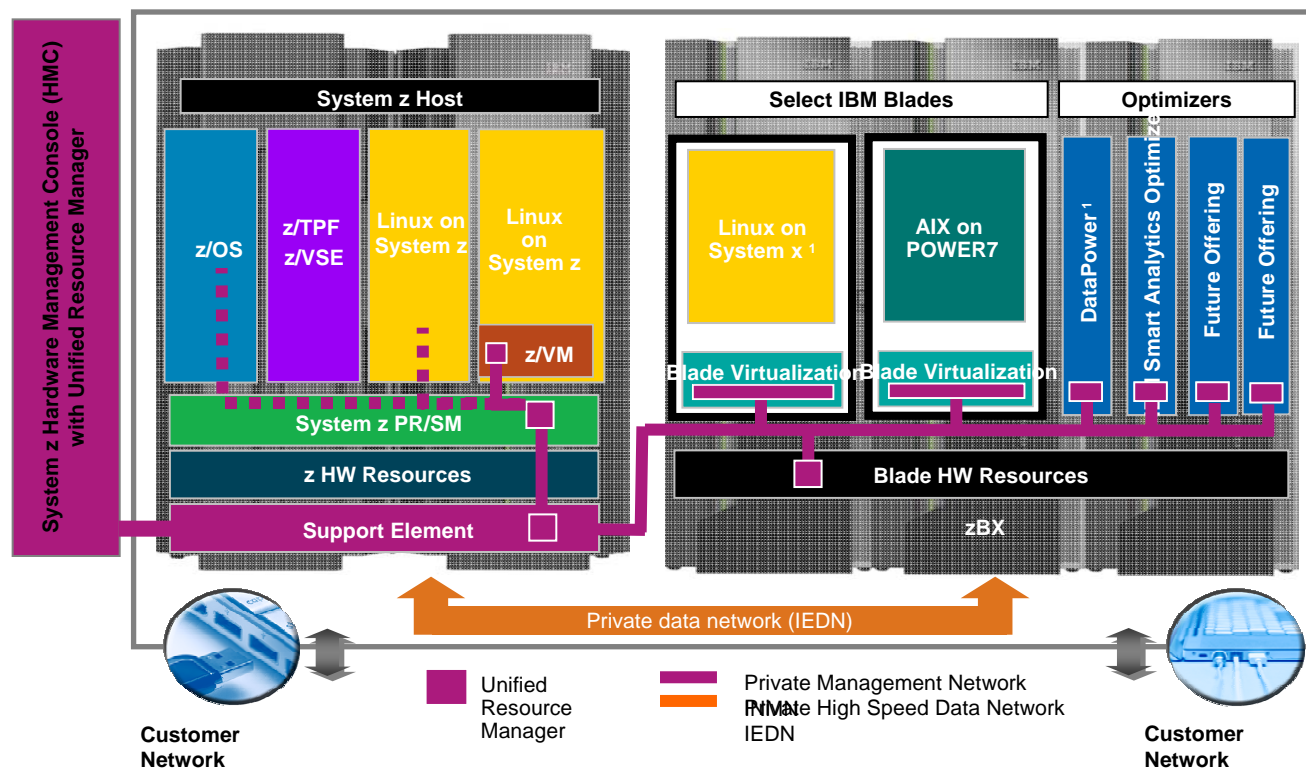
See your  
 Business

### Control

Manage service  
 risk and  
 compliance

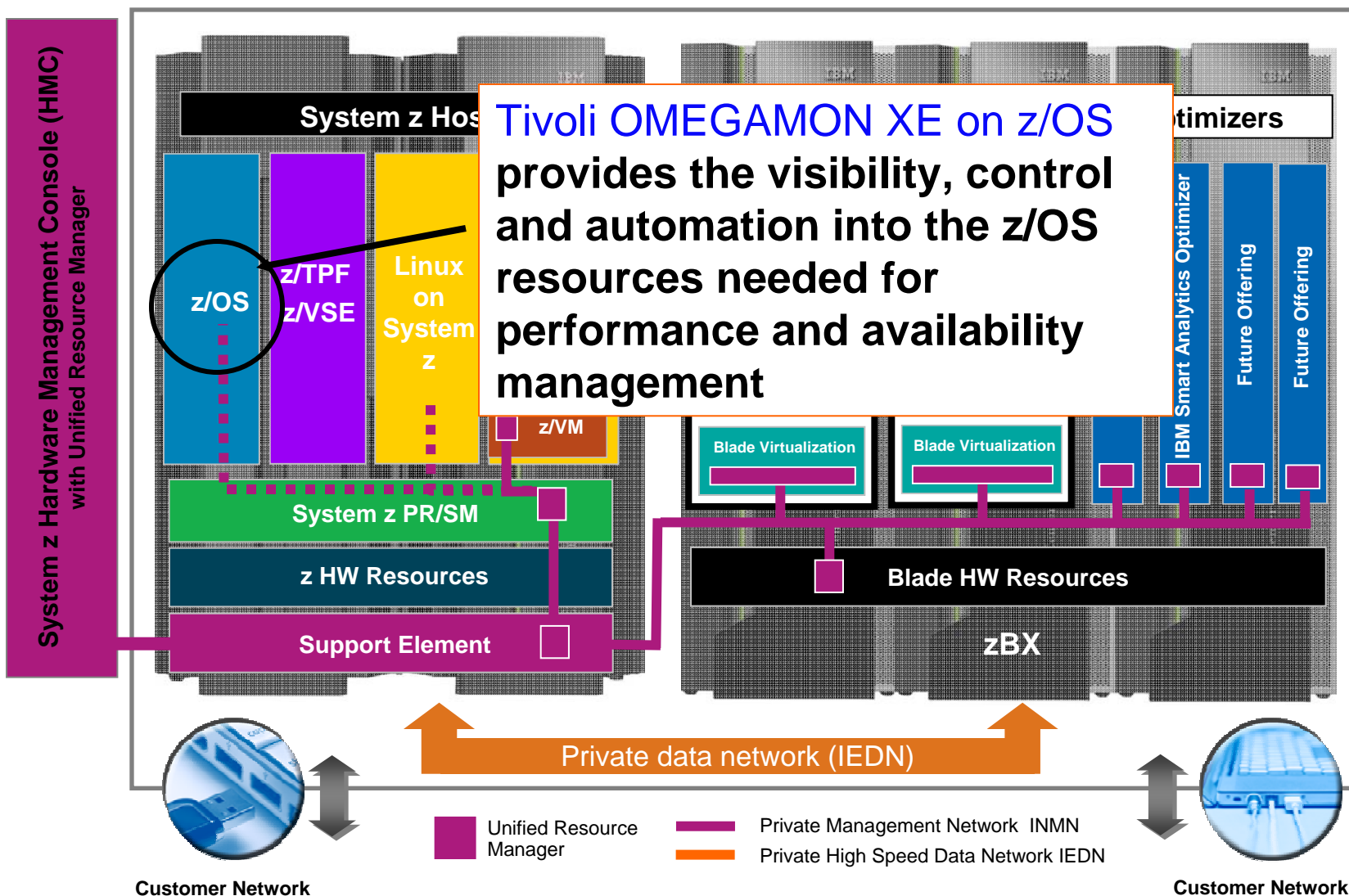
### Automation

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

# 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

# The View from the TEP with a delivered Health workspace

The screenshot displays the z/OS System Overview interface with several key components and annotations:

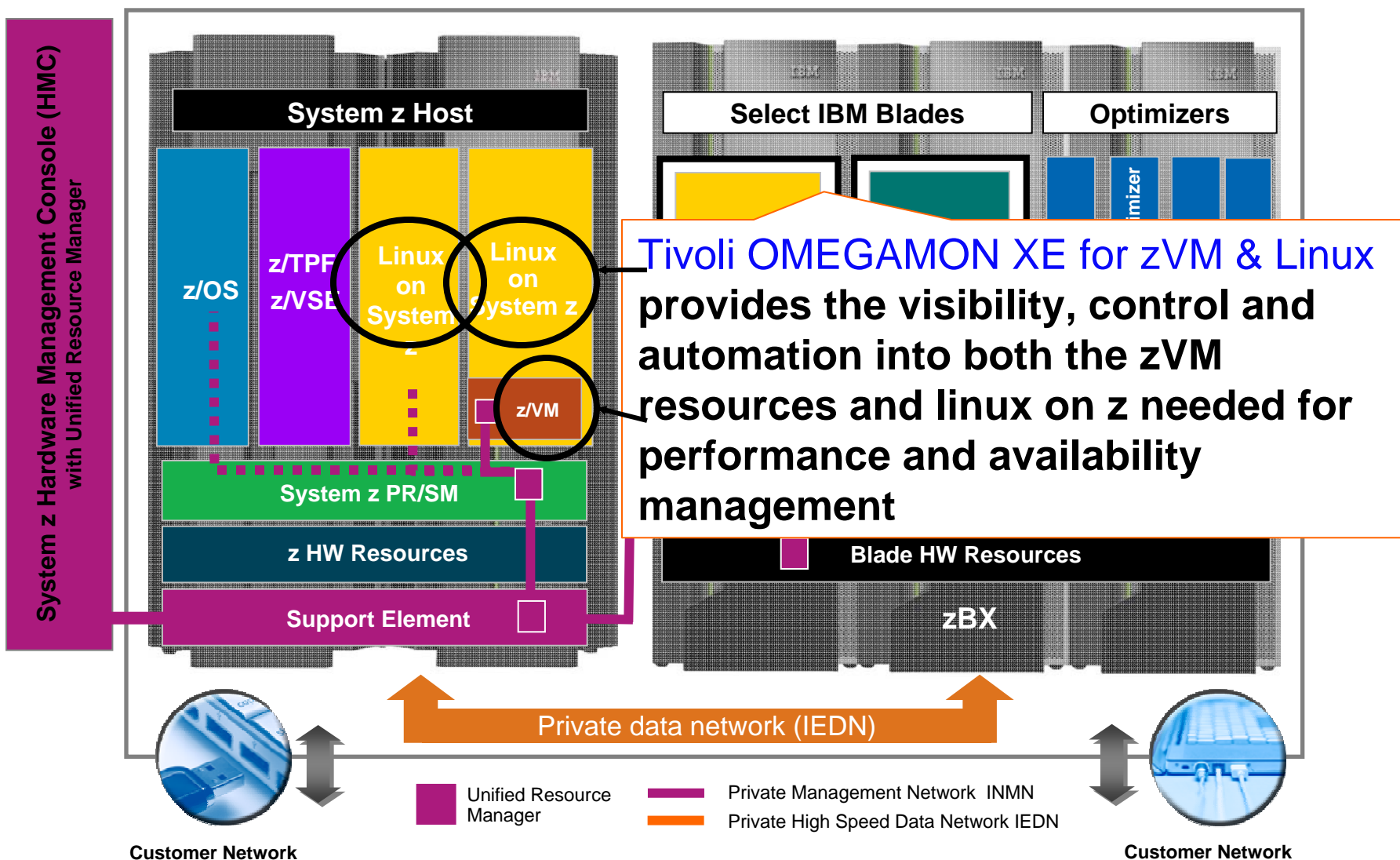
- Workload CPU Usage:** A bar chart showing various CPU metrics. A callout box asks "2) CPU running hot?".
- Common Storage:** A bar chart showing storage usage for OSA, E0SA, S0A, and E50A. A callout box asks "1) Warnings to review".
- Situation Event Console:** Shows two warning events: "OS390\_ECDSA\_Allocation\_Pct\_Warn" and "OS390\_GTF\_Active\_Warn".
- Address Space CPU Utilization:** A table listing jobs and their CPU usage. A callout box asks "3) Which address spaces using CPU the most?".
- Active Users of Common Storage:** A table showing storage usage for various jobs. A callout box asks "5) Common Storage usage issues?".
- Enqueue and Reserve Summary:** A table showing jobs waiting for datasets or other ENQ lock out issues. A callout box asks "4) Any JOBS waiting for datasets or other ENQ lock out issues?".

Job Name	Step Name	Proc Step	SvcClass	SvcClass Period	ASID	JESJOBID	CPU Percent	TCB Percent	SRB Percent	IFA Percent
S8HUB1	S8HUB1	TEMS	STC	2	0X016C	STC11121	6.0	6.0	0.0	0.0
XCFAS	XCFAS	IEFPROG	SYSTEM	1	0X0006		5.0	2.0	3.0	0.0
L241RCMS	L241RCMS	TEMS	STC	2	0X00EB	STC05950	4.0	4.0	0.0	0.0
S4S0DS61	S4S0DS61	TEMS	STC	2	0X0151	STC08238	4.0	4.0	0.0	0.0
M5S042RG	M5S042RG	TEMS	STC	2	0X0153	STC08270	4.0	4.0	0.0	0.0
D1D8M3R	D1D8M3R	TEMS	STC	2	0X015C	STC02436	4.0	4.0	0.0	0.0

Job Name	ASID	CSA Orphaned	CSA In Use	% of Total CSA	ECDSA Orphaned	ECDSA In Use	% of Total ECDSA	SGA Orphaned
*SYSTEM*	0X0000	No	282624	5.4	No	38797312	20.4	No
*MASTER*	0X0001	No	95232	1.8	No	2369536	1.2	No
PCAUTH	0X0002	unavailable	0	0.0	unavailable	0	0.0	unavailable
RASP	0X0003	unavailable	0	0.0	unavailable	0	0.0	unavailable
TI			0	0.0	unavailable	0	0.0	unavailable
DT			30720	0.0	No			
XI			1024	0.0	No			
GI			2048	0.0	No			

Major Name	Minor Name	Owning Task Count	Waiting Task Count
KLVGLOCK	OM542DEM	0	1
SYSDSN	TDSV.VWR.VWCT.VVWACTW@L.RKLVSNAP	0	1
SYSDSN	TDSV.VWR.VWCT.VWADFVW@L.RKLVSNAP	0	1
SYSDSN	TSLS.DS620.I5420.I91A.I2ATF01	1	1

# zEnterprise resources



# 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



# The View from the TEP with a delivered Health workspace

**Top 5 Workloads Waiting for Resources**

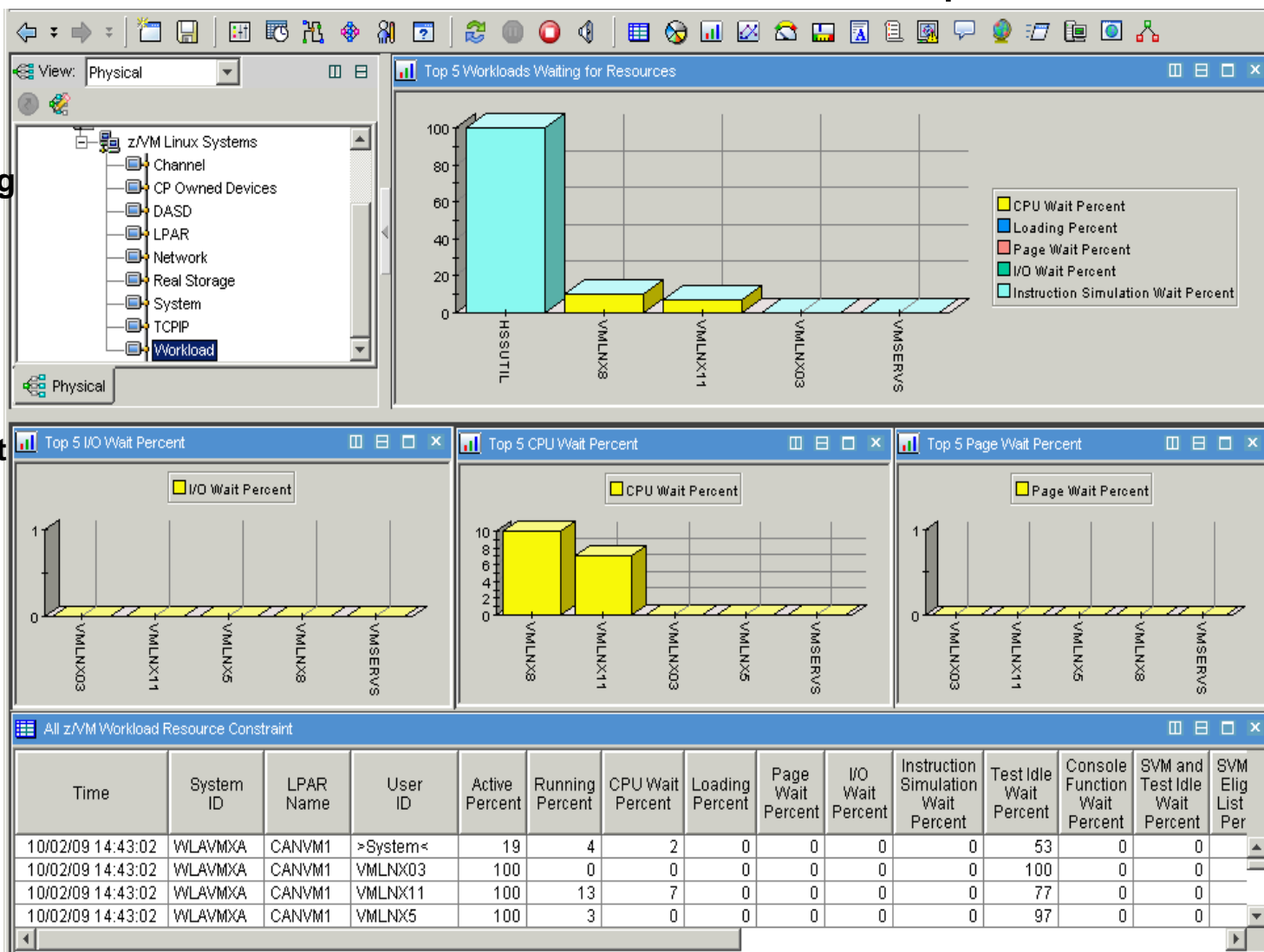
**Top 5 I/O Wait Percent**

**Top 5 CPU Wait Percent**

**Top 5 Page Wait Percent**

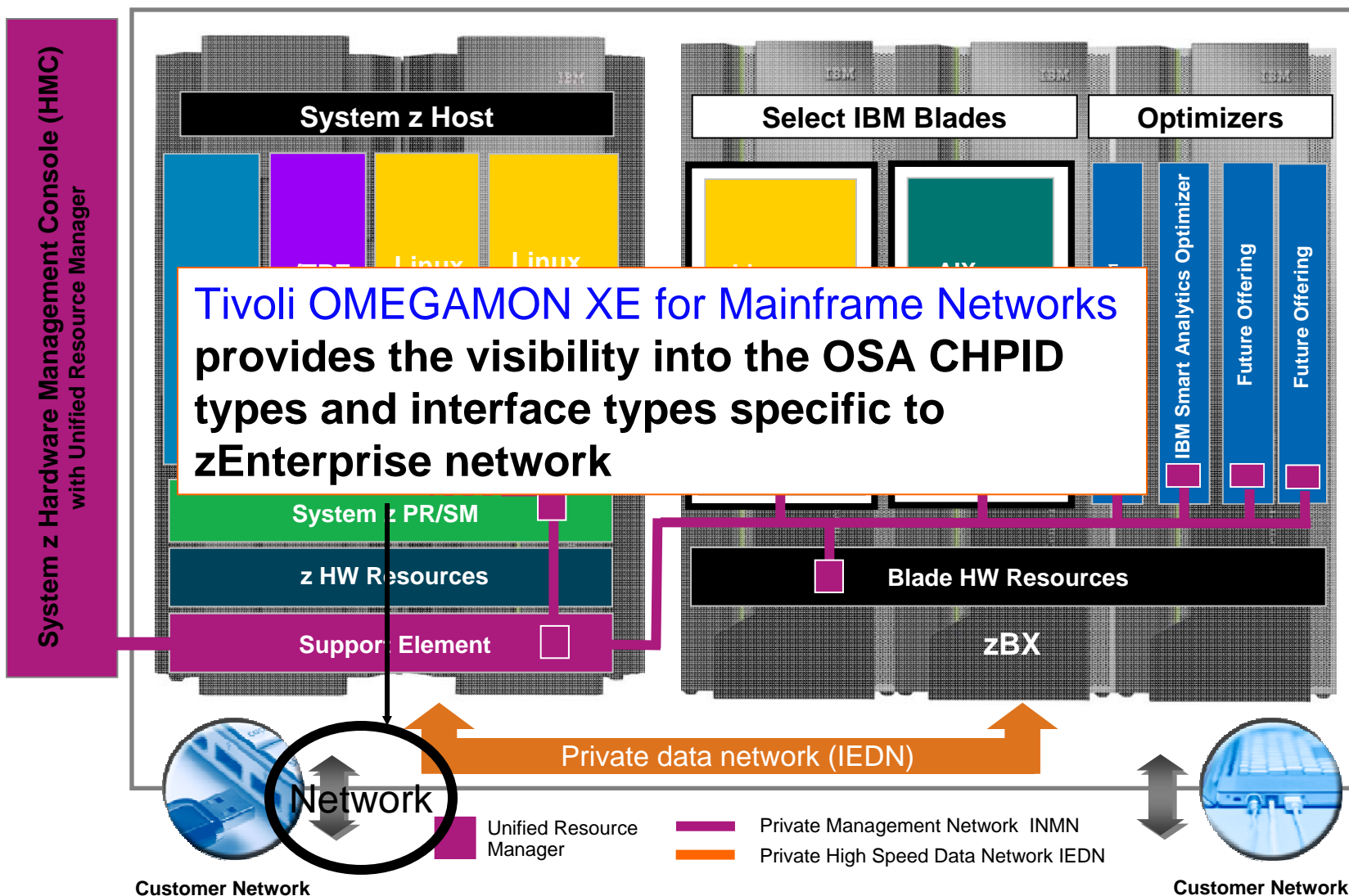
**All z/VM Workload Resource Constraint**

**A virtual constraint health workspace....**



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

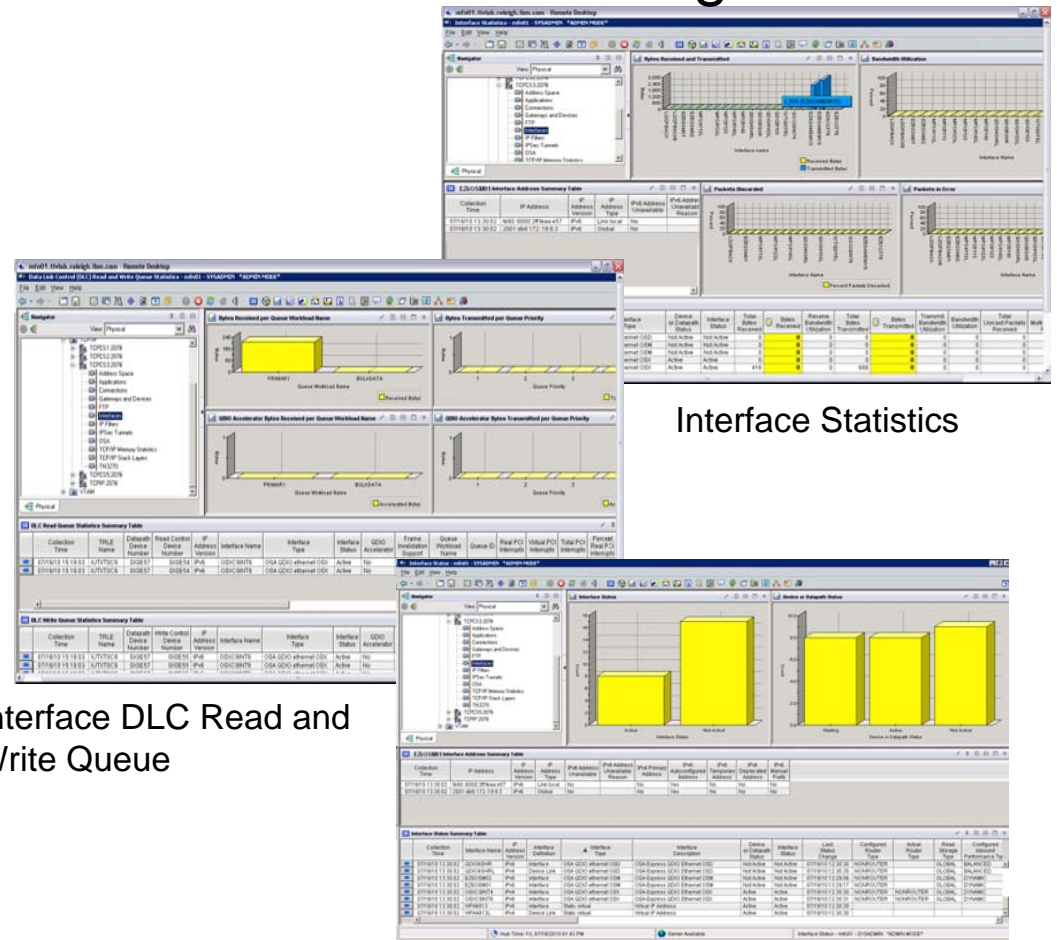
# zEnterprise resources



# 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

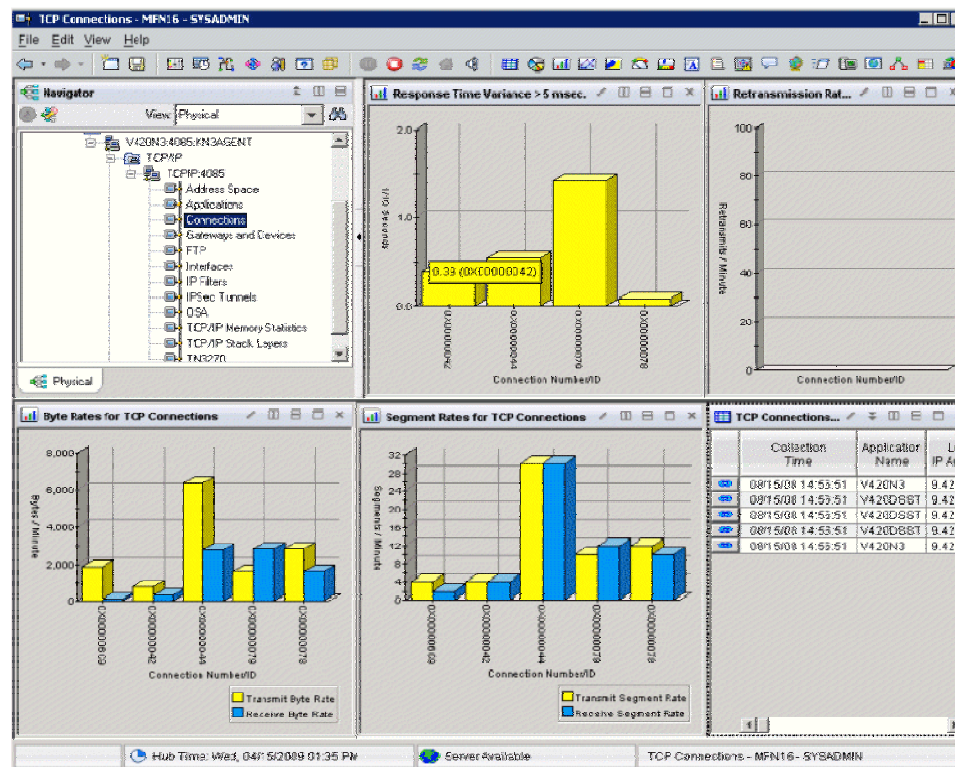
Interface Status

## 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

## 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?

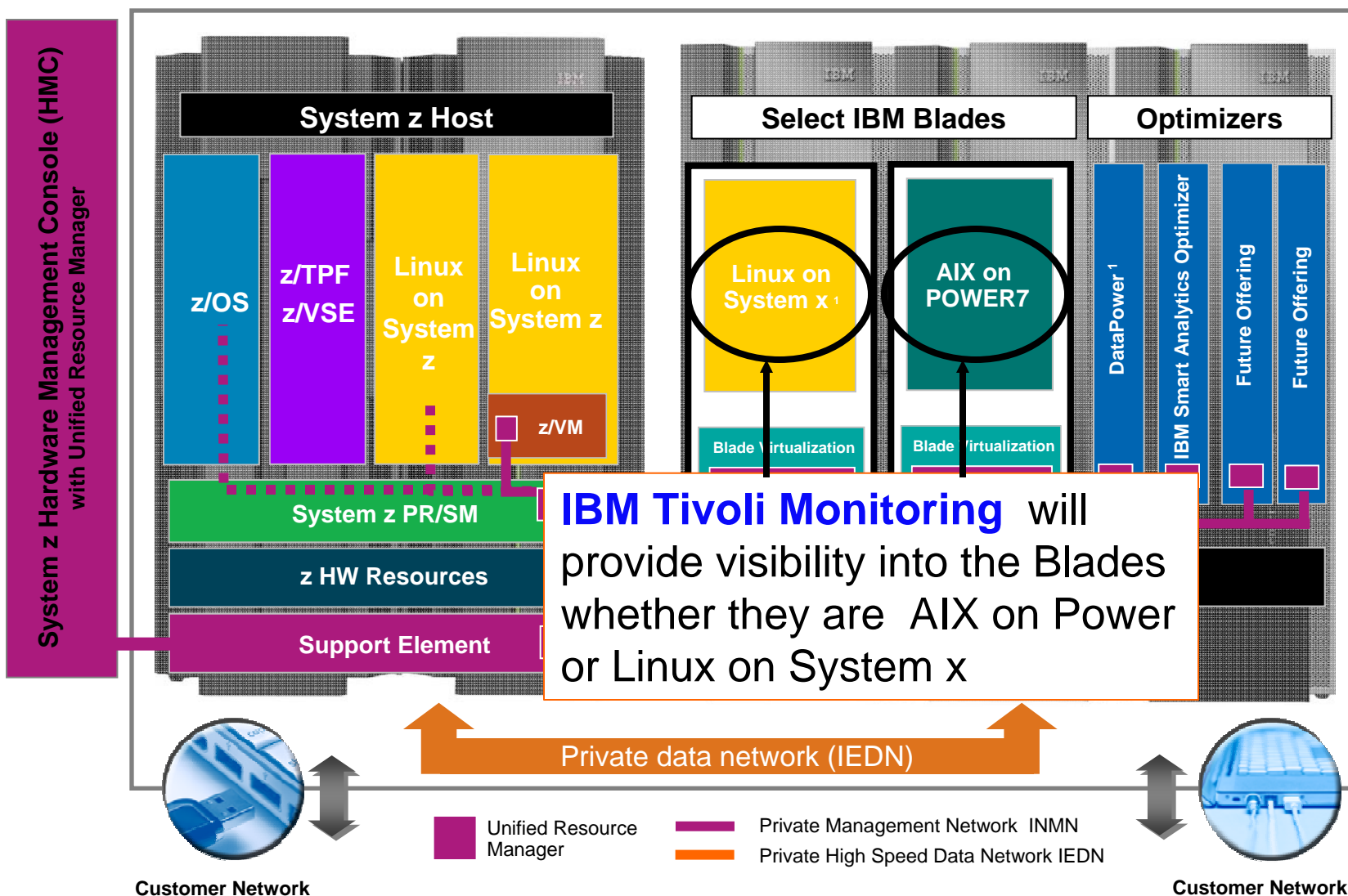
*OMEGAMON XE for Messaging*

*ITCAM for SOA (WebSphere)*

*ITCAM for Transactions*

Visibility, Control and Automation  
with Situations for Performance and  
Availability

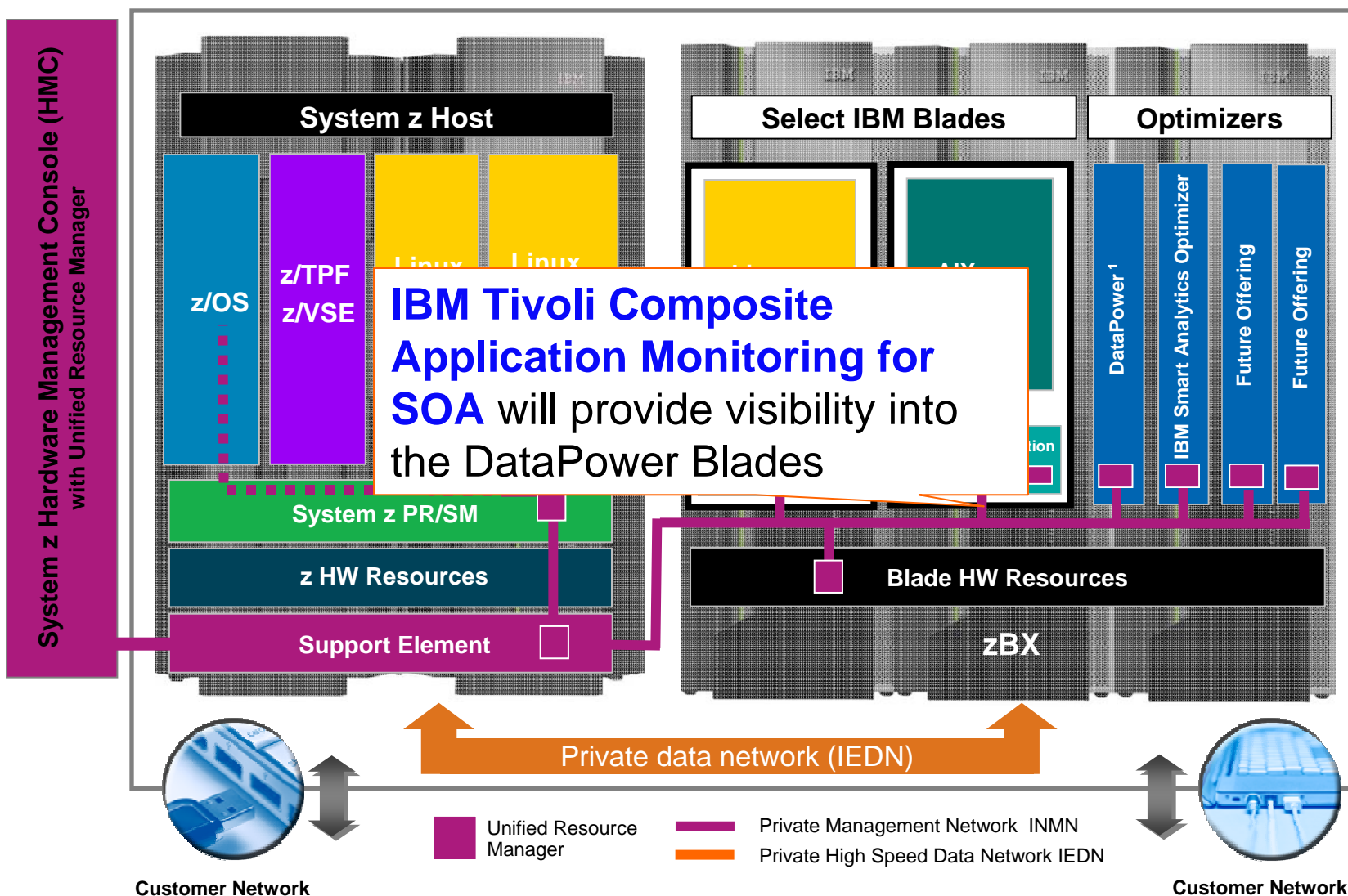
# zEnterprise resources



## 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

# zEnterprise resources

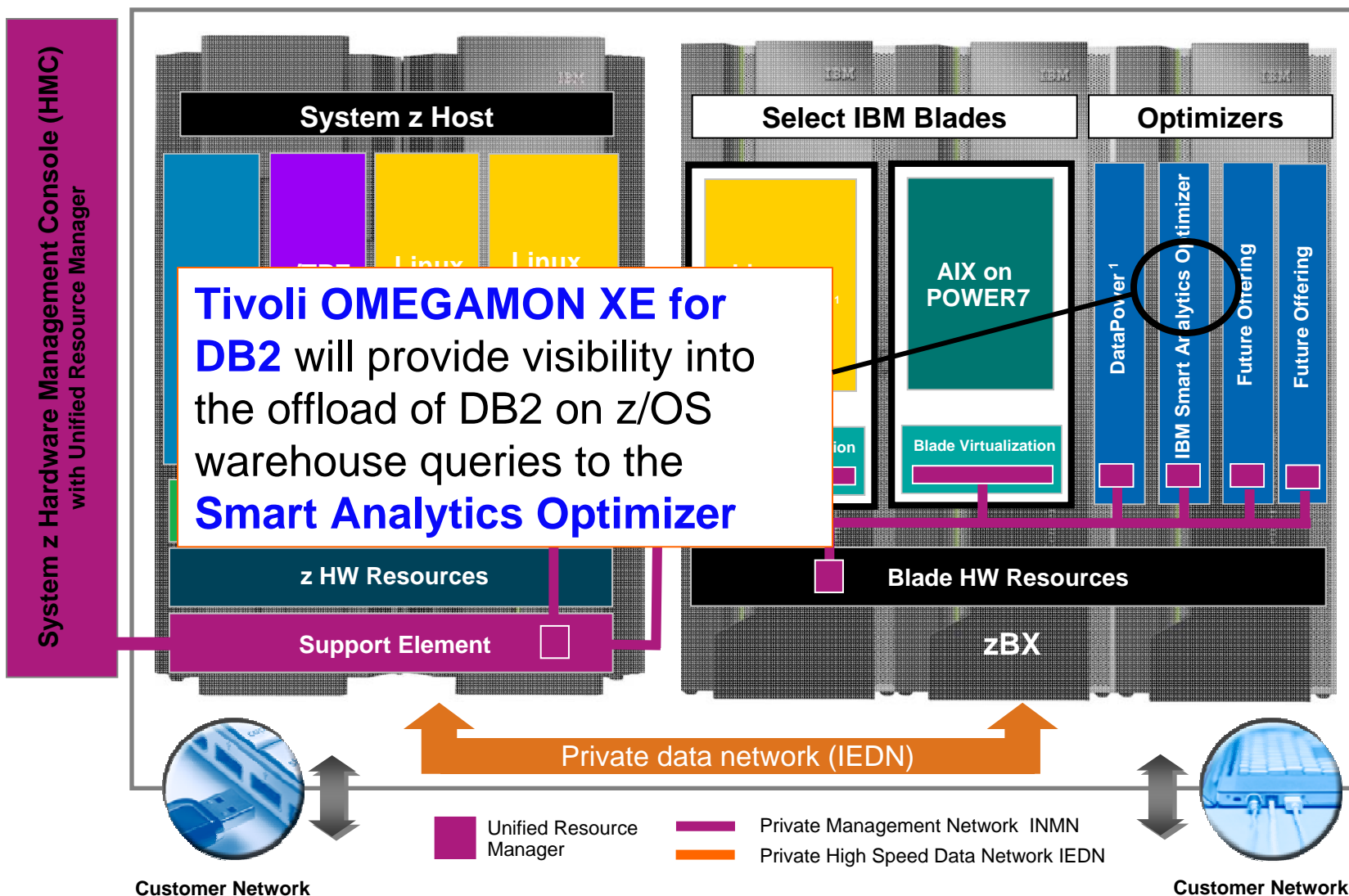




## Datpower Monitoring Examples – What Are The Key Resources that need to be managed

- 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

# 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)**

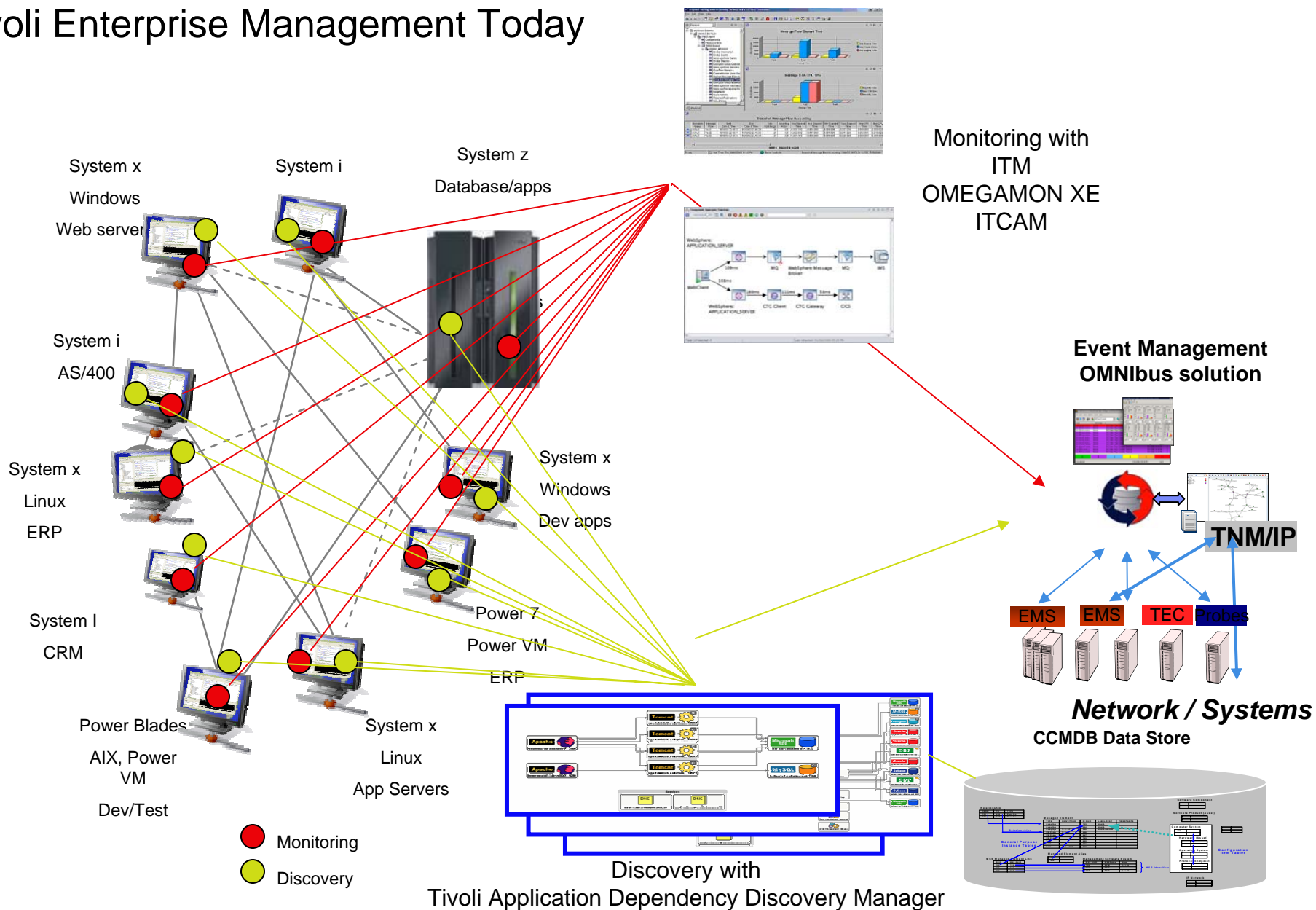
## Tivoli

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

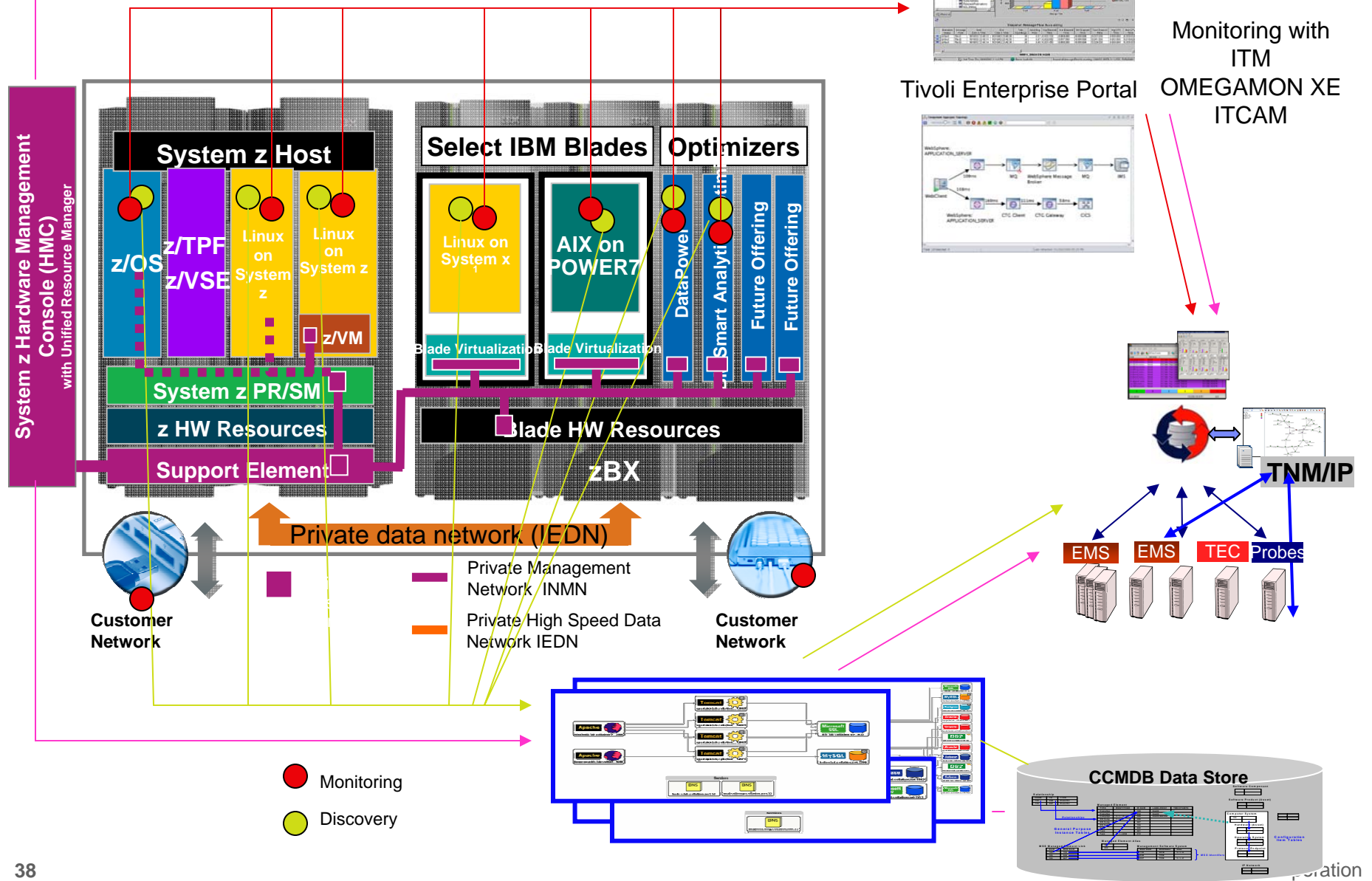
## Investment Protection

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

# Tivoli Enterprise Management Today



# Tivoli Enterprise Management w/ zEnterprise



- Monitoring
- Discovery

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

## Integrated Service Management



## 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



*See your business services*

### CONTROL



*Manage service risk and compliance*

### AUTOMATION



*Optimize business service delivery*

## 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](http://publib.boulder.ibm.com/infocenter/tivihelp/v15r1/topic/com.ibm.omegamon_xezos.doc/welcome.htm)



## 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"

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DataPower*	IBM eServer	RP/SM	z9*	z/VSE
DB2*	IBM (logo)*	RACF*	z10 BC	
FICON*	InfiniBand*	System x*	z10 EC	
GDPS*	Parallel Sysplex*	System z*	zEnterprise	
Geographically Dispersed Parallel Sysplex	POWER*	System z9*	z/OS*	

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