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Getting Started with the Unified Resource Manager (zManager) APIs for zEnterprise Monitoring and Discovery

SHARE in Anaheim – Session 11630

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IBM Advanced Technical Skills

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Abstract

The IBM Unified Resource Manager, or zManager, now provides a set of application programming Interfaces (APIs) to carry out tasks to manage the zEnterprise platform. Using these APIs allows management of the virtual server platforms and the lifecycle of virtual servers running across the zEnterprise to be automated. This session provides an understanding of these APIs, and illustrates an example of their usage via monitoring and discovery functions in IBM Tivoli products.

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Agenda

- Unified Resource Manager overview and integrated Service Management positioning
- zManager Web Services API overview and functions
- IBM Tivoli Service Management product API users
  - zEnterprise Monitoring Agent
  - System Automation for z/OS (SA for z/OS)
  - System Automation Application Manager (SA AppMan)
  - Tivoli Application Dependency Discovery Manager (TADDAM)*

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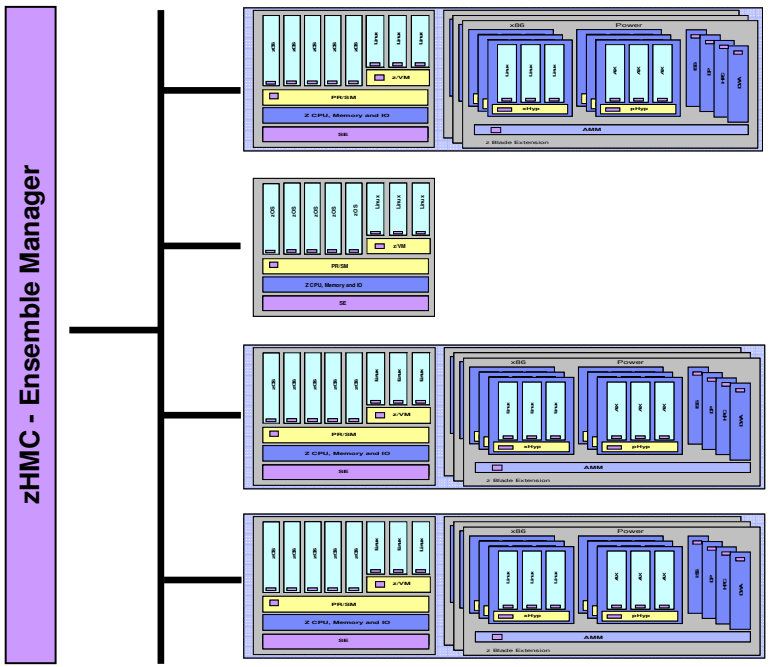
Unified Resource Manager (zManager)

- Runs on zEnterprise Hardware Management Console (zHMC)
- Management and control of zEnterprise ensembles (z196 and connected zBX racks)
  - Operational Controls
  - Hypervisor Management
  - Virtual Server Lifecycle Management
  - Network Management
  - Workload Awareness and Platform Performance Management
- Administration, not monitoring, oriented
  - Dynamic information saved for a brief period
  - Restricted access to zHMC
- No integration with management data “within” the virtual servers, other than the Guest Platform Management Provider (GPMP)



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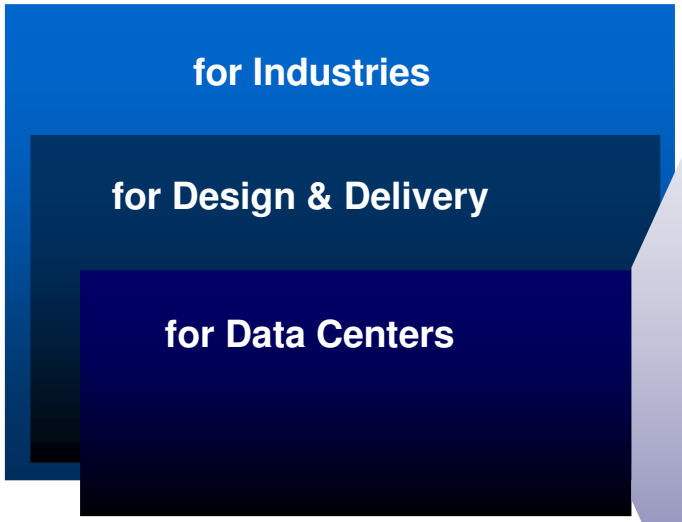
zEnterprise and Integrated Service Management

Workload & Service

Visibility. Control. Automation.™

Integrated Service Management



Integrated Service Management compliments zEnterprise workload optimization and extends the visibility, control and automation across not only workloads, but end-to-end business and IT services for maximum business value.

Tivoli Integrated Service Management

Heterogeneous Management

- Align IT management with business goals
- Service availability and performance management
- Service delivery and IT process automation
- Virtualization and ensemble management - server, mainframe, storage
- Security Management & Compliance
- Asset, facilities and energy management
- Network Management

zEnterprise Unified Resource Manager (zManager)

Platform Management for Z, P & X Series

- **Workload based resource allocation and provisioning**
- **Physical and virtual resource management**
- **Goal oriented resource management**
- **Ensemble, Network and Storage management**
- **External management APIs**

Hardware Management for Z, P & X Series

- **Configuration management for hardware/firmware**
- **Operational control for hardware/firmware**
- **Service and support for hardware/firmware**
- **Lifecycle management for the platforms virtual resources**

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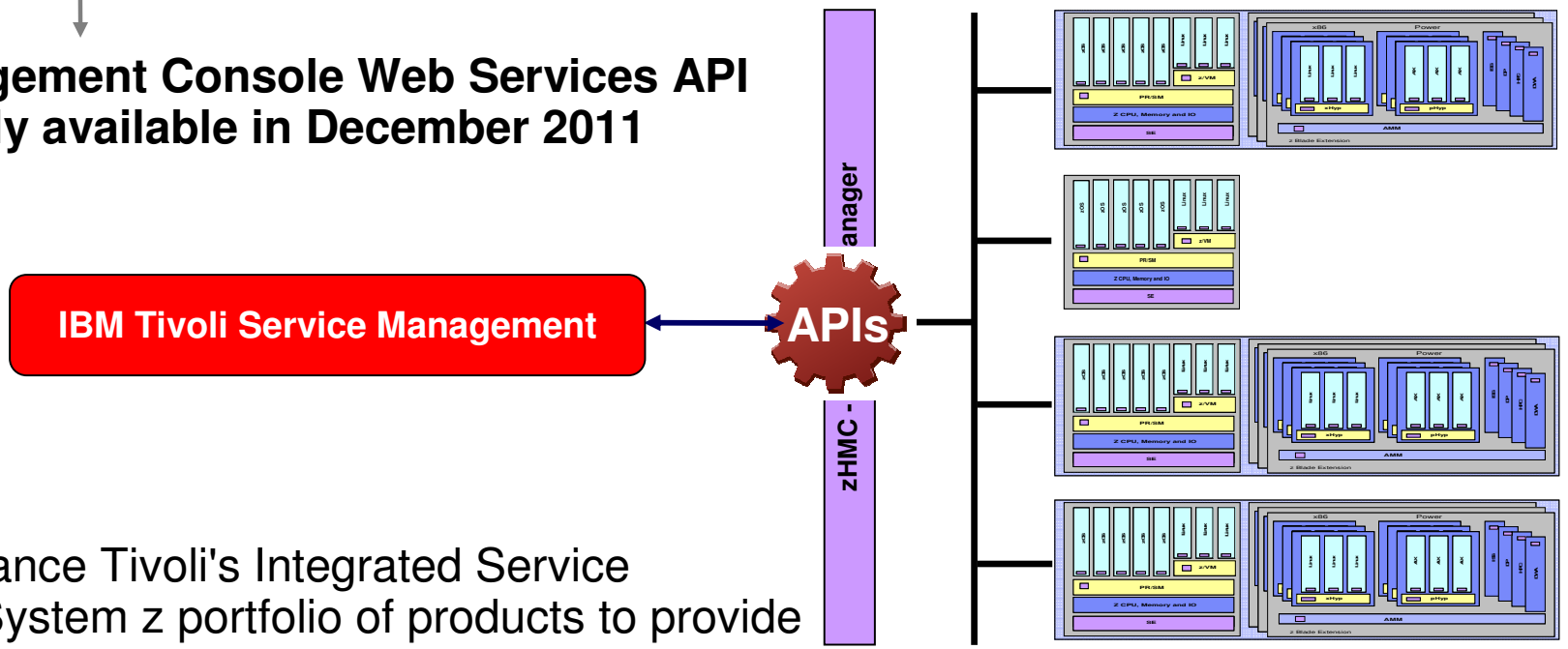
zManager APIs to Support Integrated Service Management

"IBM intends to offer Application Program Interfaces (APIs) for IBM zEnterprise Unified Resource Manager. These APIs provide access to the same underlying functions that support the Unified Resource Manager user interface"

Hardware Management Console Web Services API became generally available in December 2011



"IBM plans to enhance Tivoli's Integrated Service Management for System z portfolio of products to provide integrated end-to-end **monitoring**, **alerting**, **discovery**, **automation**, storage, and security solutions to take advantage of the zEnterprise ensemble monitoring and management capabilities provided by the API support" (July 2011)

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Current Tivoli zEnterprise zManager API Solutions at a Glance

Statement of Direction in
July 12, 2011 announcement

Monitoring
ITM 6.2.3
zEnterprise Monitoring
Agent and
Enterprise Common Collector

Available Now!

Availability
SA z/OS V3.4
SA Application Manager V3.2.2

SA z/OS V3.4: Available Now!
SA AppMan 3.2.2: Available Now!

Discovery
TADDM*
and
Enterprise Common Collector

in Beta*

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zManager Web Services API

See "IBM System z Hardware Management Console Web Services API Version 2.11.1 (SC27-2616-00) for the details

- Representational state transfer (REST) format via HTTP 1.1
  - Conceptual data model with defined objects
    - URI in HTTP defines operation and target object

```
GET /api/virtual-servers/{vs-object-id}/virtual-disks/{disk-id}
```

  - Input parameters and returned response are in JavaScript Object Notation (JSON) format

```
{"api-major-version":1,"hmc-version":"2.11.1","hmc-name":"TSYSENSA","api-minor-version":1}
```

    - Can be synchronous or asynchronous
      - *Asynchronous requests are assigned a "job" ID*
- Includes an JMS based asynchronous notification facility
  - Receive messages for certain predefined management events

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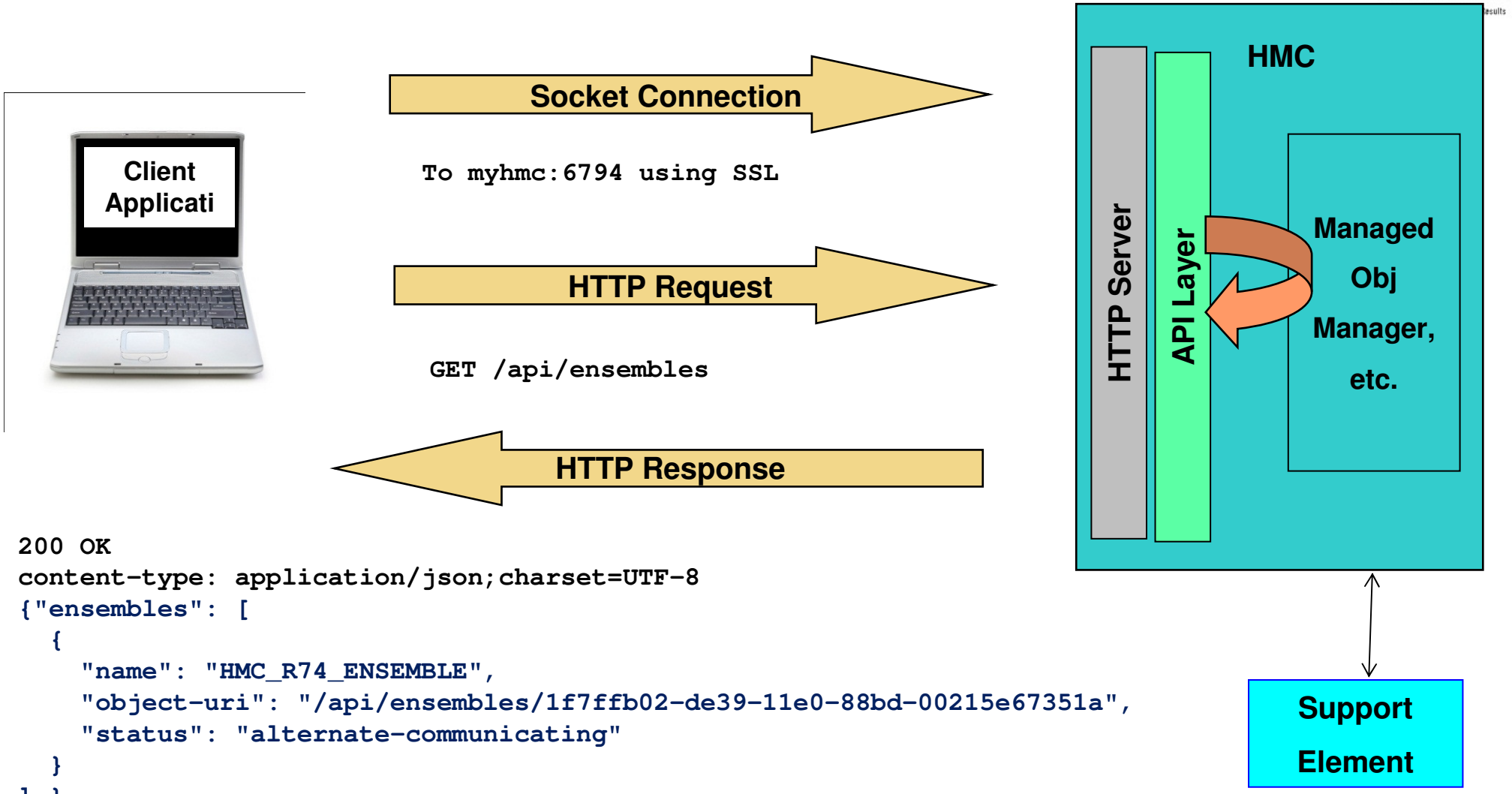
API Request Flow (Simplified Example)




```
200 OK
content-type: application/json;charset=UTF-8
{"ensembles": [
   {
     "name": "HMC_R74_ENSEMBLE",
     "object-uri": "/api/ensembles/1f7ffb02-de39-11e0-88bd-00215e67351a",
     "status": "alternate-communicating"
   }
] }
```

JSON notation used for request and response bodies

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API Functional Groups

See "IBM System z Hardware Management Console Web Services API Version 2.11.1 (SC27-2616-00) for the details

General services	logon, logoff, query version, query/delete job status
Ensemble composition	list, get/update properties, add/get/remove nodes
zBX infrastructure	zBX, Top-of-Rack Switch, Racks, BladeCenters, Blades, IEDN
Energy management	Control CPC, BladeCenter, Blade power characteristics
Virtualization management	Control virtualization hosts properties, manage virtual servers life cycle
Storage management	Create/list/get physical storage resource properties (for supported storage resources) and manage virtualization host storage
Virtual network management	list/get/create/update/delete virtual networks
Workload resource group	Workload resources groups and associated performance policies and virtual servers
Core System z resources	HMC/SE console, groups, CPC, logical partitions, activation profiles, capacity records
Inventory and metrics services	create/delete metrics contexts, retrieve ensemble information and properties

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API Custom Usage

- Any programming language that supports TCP/IP socket programming
  - Much easier if it supports higher level constructs (HTTPS, SSL, JSON)
  - Python, Java good choices to start
- Programming Model
  - Set up SSL certificates – varies by language
    - e.g. Java – import HMC SSL certificate into truststore and set properties for access
  - Use API logon command to authenticate
    - A session ID is returned that must be used in subsequent calls
  - Issue desired API commands
  - Use API logoff command to end session
- Sample Python code available on IBM ResourceLink
  - (Services->API->Web Services API Samples)

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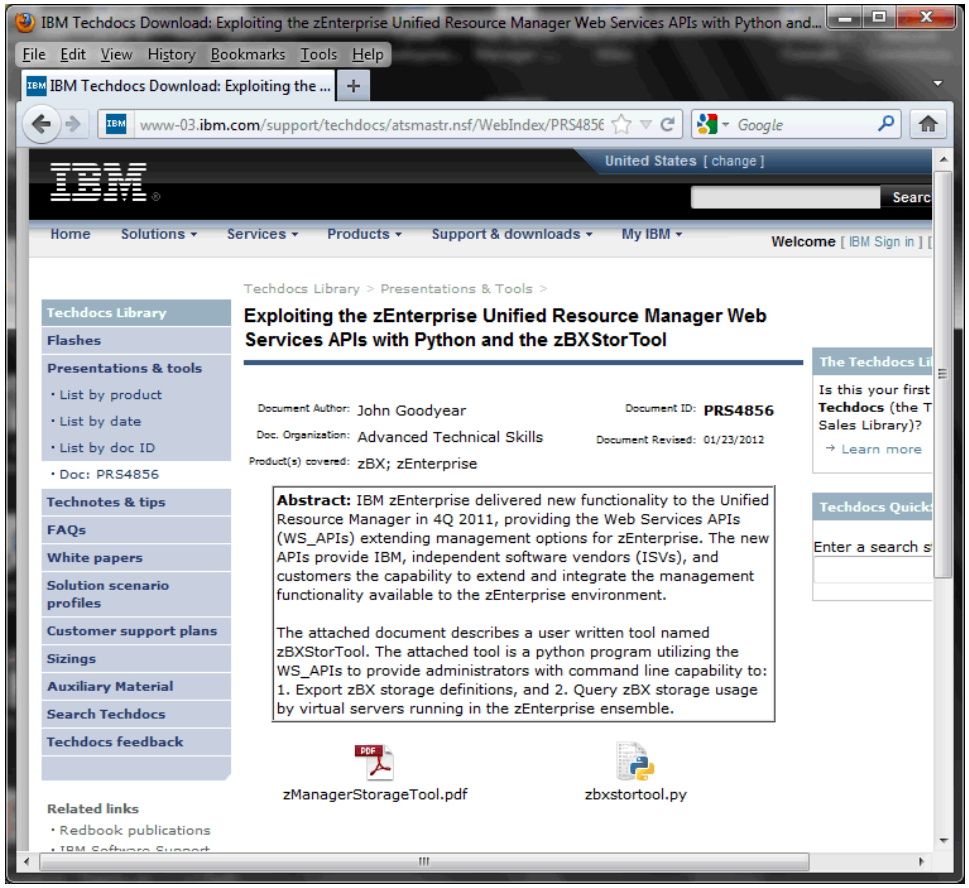
Usage Example: zBXStorTool

- Developed by John Goodyear of the IBM Washington Systems Center
- Provides functions that simplify storage administration for zEnterprise zBX:
  - Export storage definitions for entire ensemble or filtered by hypervisor
  - Show relationship between virtual servers and the storage resources they use
- Python script and whitepaper with client programming hints and tips



- Provides a more comprehensive example of WS API usage

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API Usage by the IBM Tivoli zEnterprise Monitoring Agent

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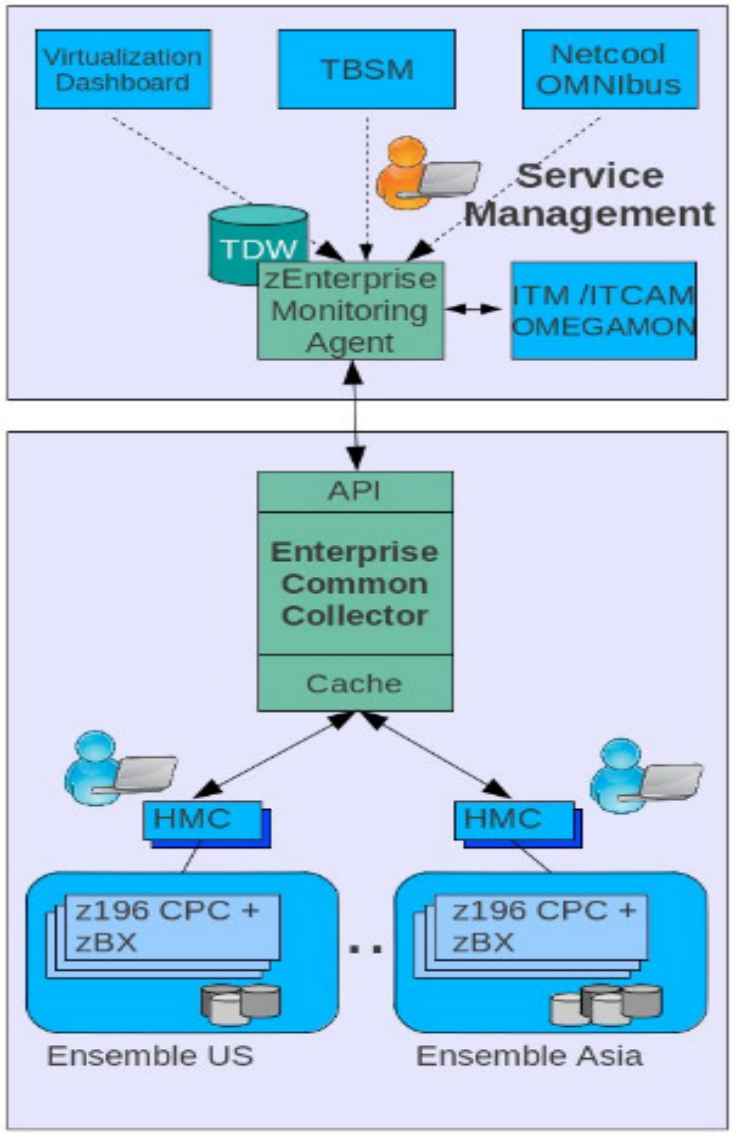
zEnterprise Monitoring Agent

- Provides visibility into the IBM zEnterprise hybrid infrastructure, including hardware resources, hypervisors, virtual servers, and workload resource groups
- Automated discovery of resources within the monitoring environment
- Integrates the information into IBM Tivoli Monitoring infrastructure to provide:
  - information highlighting and alerting capabilities
  - integration with information provided by other agents in the ITM infrastructure
  - Optional long term history collection and reporting/trending with the Tivoli Data Warehouse and Tivoli Common Reporting
  - Optional event integration and Business Service Management with Netcool/OMNIbus and Tivoli Business Service Manager (TBSM)



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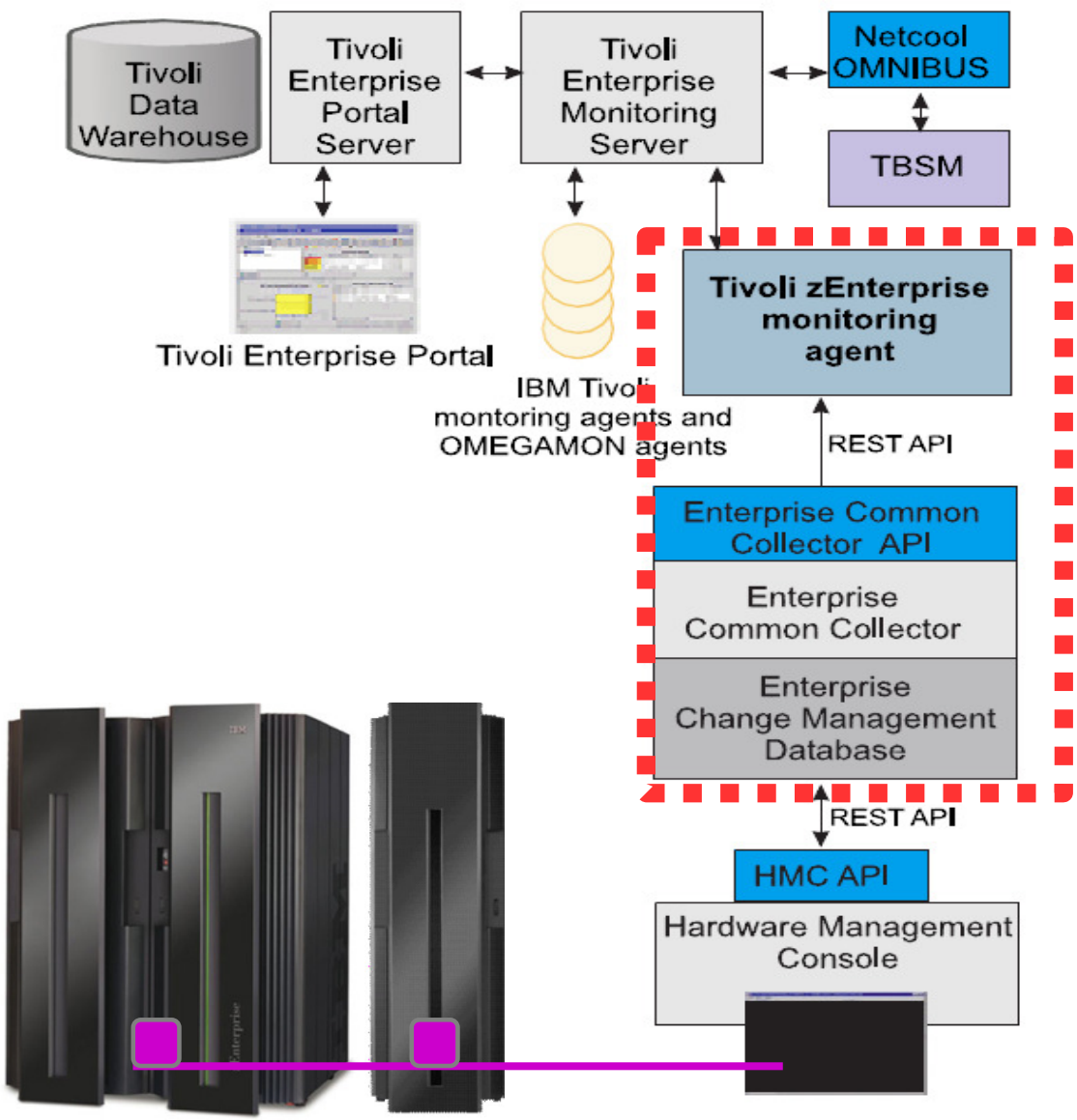
Component Architecture



Enterprise Common Collector (ECC)

- Captures data from Unified Resource Manager via the zManager APIs
- Provides a ReST API to other Tivoli products for access its collected data
- Can connect to multiple zHMCs to consolidate monitoring

IBM Tivoli zEnterprise Monitoring Agent

- Displays captured data in the Tivoli Enterprise Portal
- Records data into the Tivoli Data Warehouse for reporting/trending usage
- Situations to TEP and/or EIF events to Netcool/OMNIbus/TBSM, NetView on z/OS, etc.

ECC and zEnterprise agent can be located on the same or separate servers

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Requirements

- zEnterprise HMC application version 2.11.1 with firmware maintenance bundle 30 or later
- IBM Tivoli Monitoring 6.23 Fixpack 1
- Supported operating system platform for ECC and zEnterprise monitoring agent
  - Linux (x and z), AIX, Windows 2003/2008
- HMC Configuration
  - REST Web Service APIs must be enabled
  - User ID with appropriate object authorities and API authority must be defined
- Optional
  - Tivoli Common Reporting 2.11 (sample reports are provided)
  - Netcool/OMNIbus or NetView for z/OS or any other EIF event receiver (for event integration)

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Installation and Configuration

- Both install via GUI or command line (silent install)
  - ECC installation decisions: install directory, IP ports to use
  - zEnterprise Agent installation decision: ECC to connect to
- ECC configuration
  - Start/Stop via command (or service on Windows)
  - Administered through command line shell or API
  - Administration actions
    - ECC client users, authentication method and authority
    - HMC SSL certificates
    - Collection profiles (data collection and inventory resync intervals)
    - Data sources (HMC connection and collection profile)
    - Logging
- zEnterprise agent configuration
  - Target ECC

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ECC Administration

```
eccAdmin==>certificates create -f /downloads/zeagent/TSYSENSA.DMZ.crt -a
tsysensa
INFO: CTGEZ9810I Command certificates completed.

eccAdmin==>certificates update -t true
INFO: CTGEZ9810I Command certificates completed.

eccAdmin==>clients create -n zeapi -p secretpw -r
Administrator,Operator,Explorer -d "zEnterprise agent on zeapi" -e true
INFO: CTGEZ9810I Command clients completed.

eccAdmin==>collection-profiles create -n colprof1 -s 60 -r 21600 -d "initial
collection profile with history" -l 600 -e true -p true
INFO: CTGEZ9810I Command collection-profiles completed.

eccAdmin==>data-sources create -n tsysensa -u hmcapiuser -p secretpw -h myzhmc
-c colprof1 -d "myzhmc data source" -e true
INFO: CTGEZ9810I Command data-sources completed.

eccAdmin==>data-sources list
name: tsysensa
collection-profile-name: colprof1
enabled: true
status: connected
hmc-user: hmcapiuser
hmc-user-pwd: ********
hmc-hostname: myzhmc
description: myzhmc data source
```


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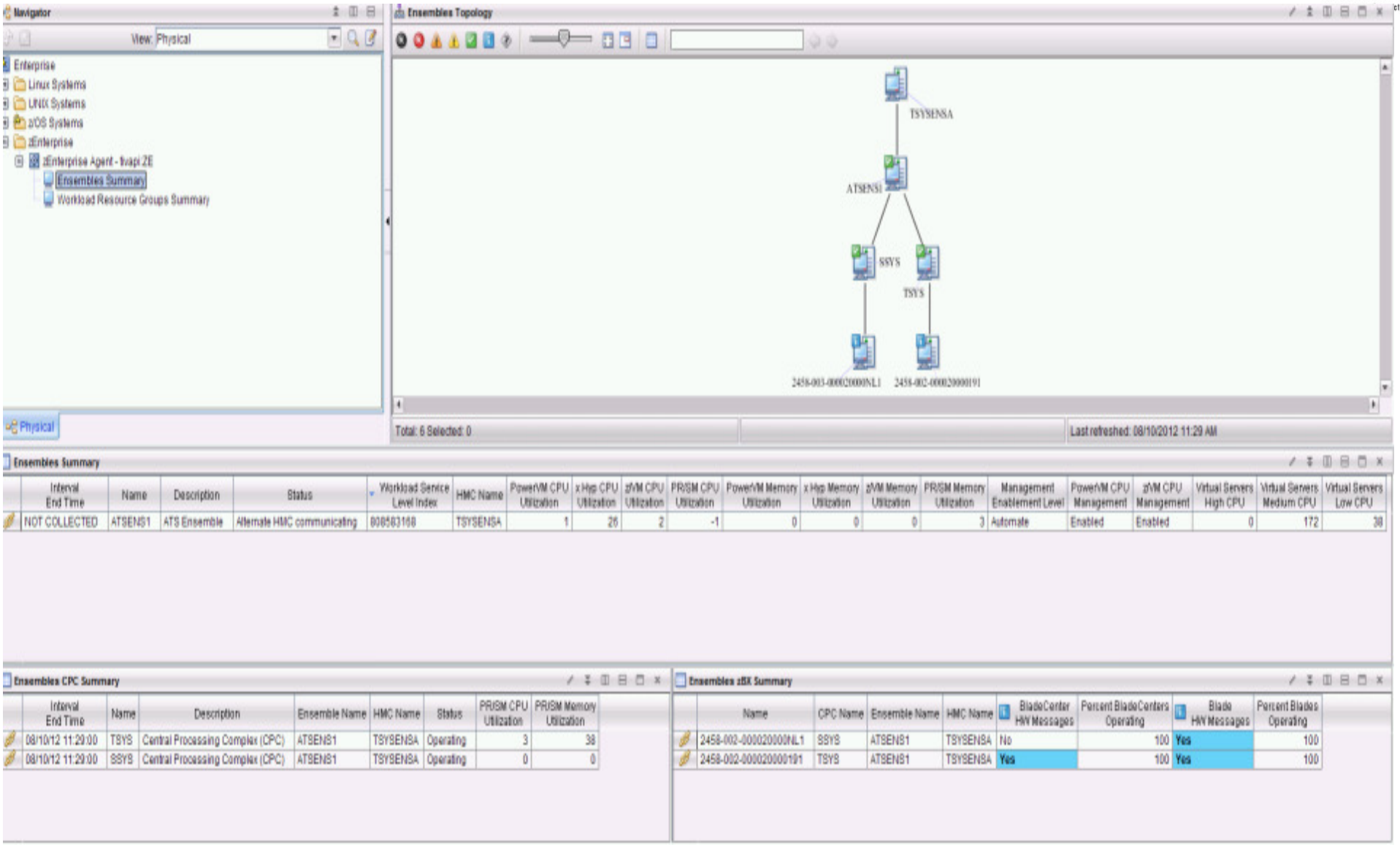
Ensembles Summary



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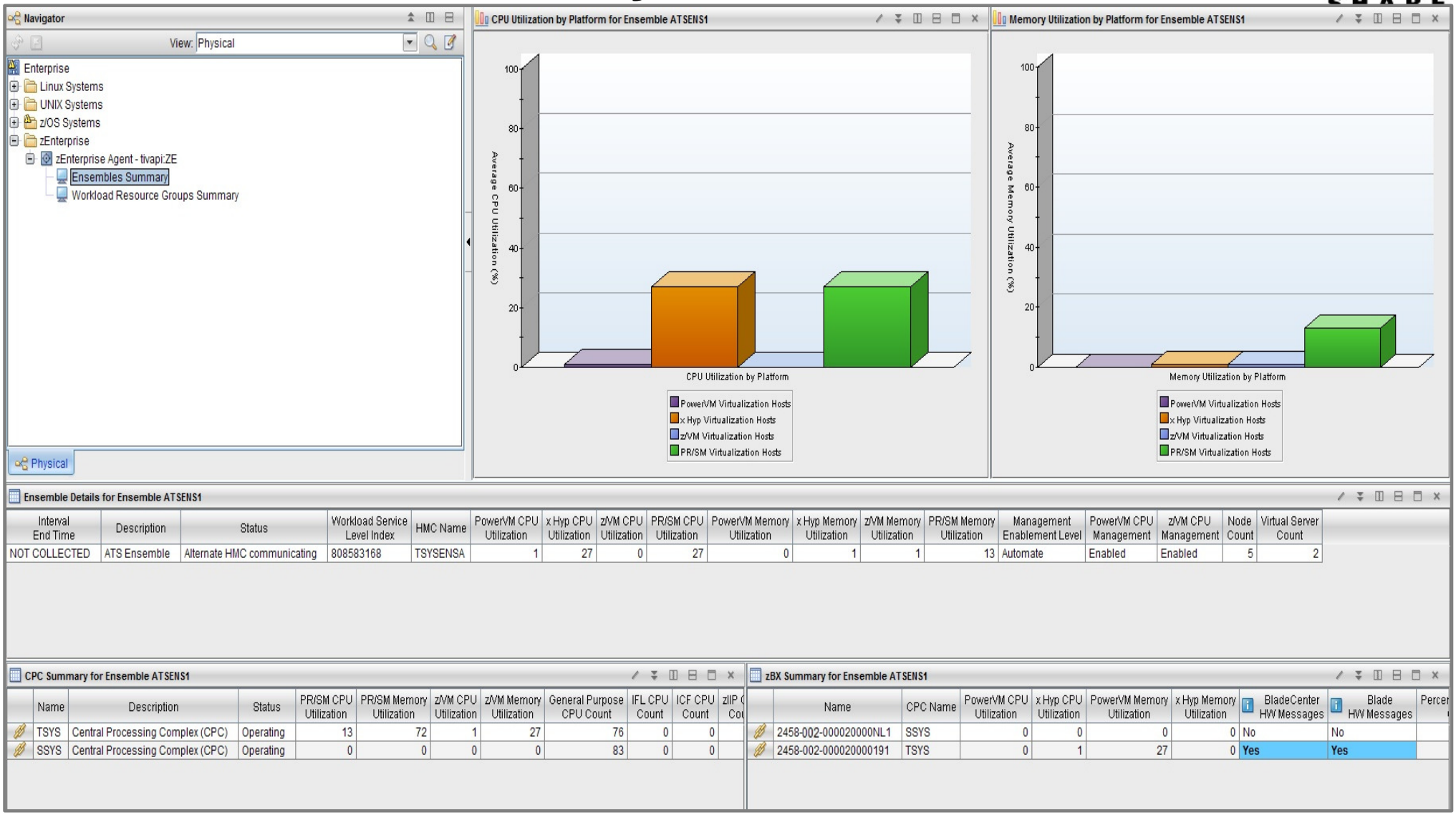
Ensembles Summary



Ensemble Details for Ensemble ATSENS1

Interval End Time	Description	Status	Workload Service Level Index	HMC Name	PowerVM CPU Utilization	x Hyp CPU Utilization	z/VM CPU Utilization	PR/SM CPU Utilization	PowerVM Memory Utilization	x Hyp Memory Utilization	z/VM Memory Utilization	PR/SM Memory Utilization	Management Enablement Level	PowerVM CPU Management	z/VM CPU Management	Node Count	Virtual Server Count
NOT COLLECTED	ATS Ensemble	Alternate HMC communicating	808583168	TSYSENSA	1	27	0	27	0	1	1	13	Automate	Enabled	Enabled	5	2

CPC Summary for Ensemble ATSENS1

Name	Description	Status	PR/SM CPU Utilization	PR/SM Memory Utilization	z/VM CPU Utilization	z/VM Memory Utilization	General Purpose CPU Count	IFL CPU Count	ICF CPU Count	zIIP Cou
TSYS	Central Processing Complex (CPC)	Operating	13	72	1	27	76	0	0	
SSYS	Central Processing Complex (CPC)	Operating	0	0	0	0	83	0	0	

zBX Summary for Ensemble ATSENS1

Name	CPC Name	PowerVM CPU Utilization	x Hyp CPU Utilization	PowerVM Memory Utilization	x Hyp Memory Utilization	BladeCenter HW Messages	Blade HW Messages	Percer
2458-002-000020000NL1	SSYS	0	0	0	0	No	No	
2458-002-000020000191	TSYS	0	1	27	0	Yes	Yes	

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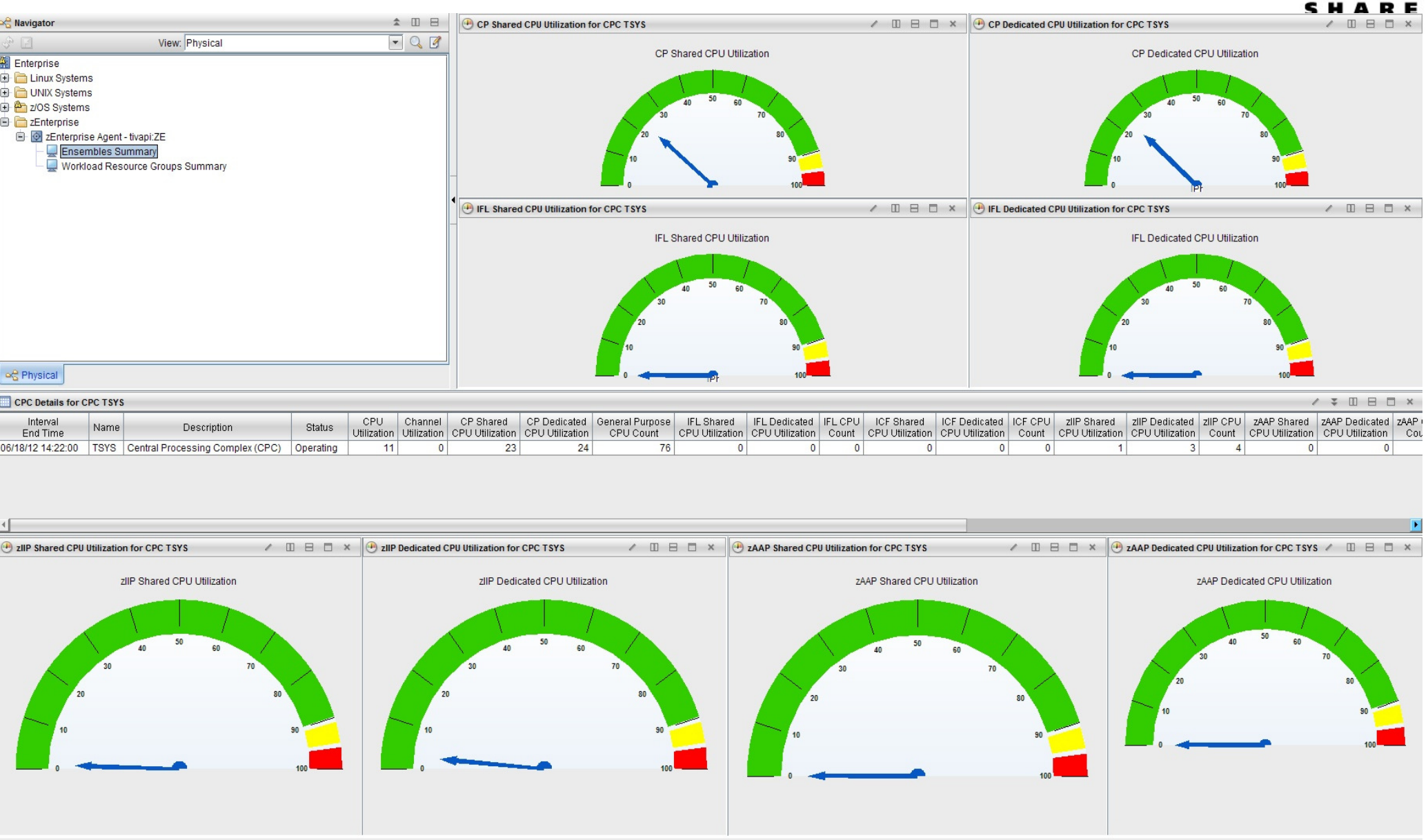
CPC Information



Interval End Time	Name	Description	Status	CPU Utilization	Channel Utilization	CP Shared CPU Utilization	CP Dedicated CPU Utilization	General Purpose CPU Count	IFL Shared CPU Utilization	IFL Dedicated CPU Utilization	IFL CPU Count	ICF Shared CPU Utilization	ICF Dedicated CPU Utilization	ICF CPU Count	zIIP Shared CPU Utilization	zIIP Dedicated CPU Utilization	zIIP CPU Count	zAAP Shared CPU Utilization	zAAP Dedicated CPU Utilization	zAAP Cou
06/18/12 14:22:00	TSYS	Central Processing Complex (CPC)	Operating	11	0	23	24	76	0	0	0	0	0	0	1	3	4	0	0	

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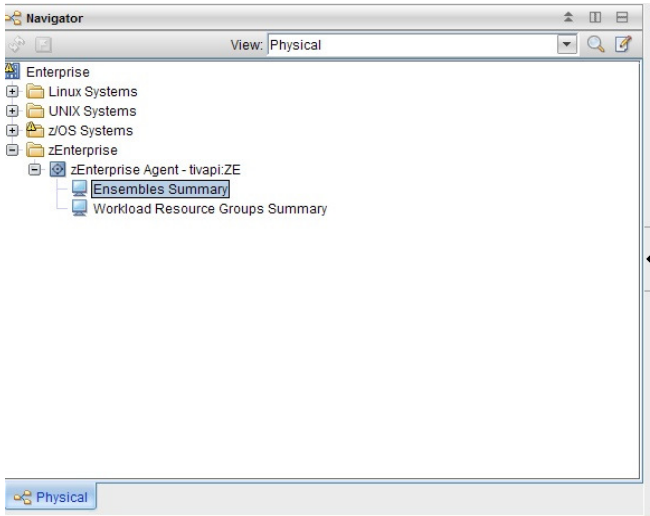
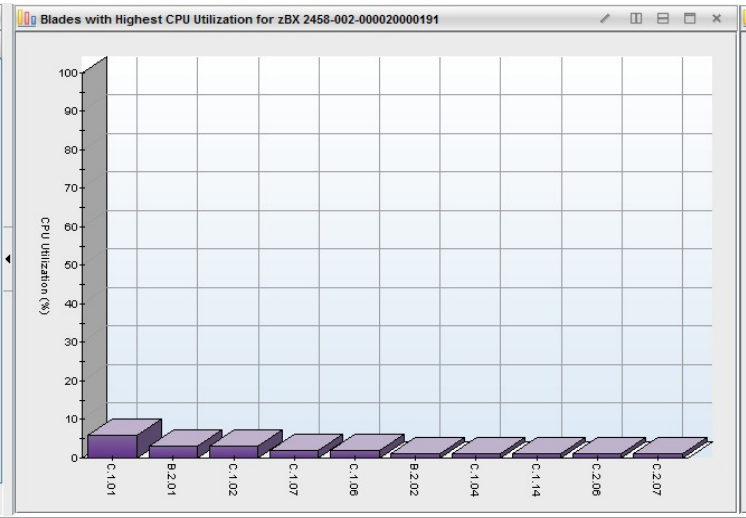
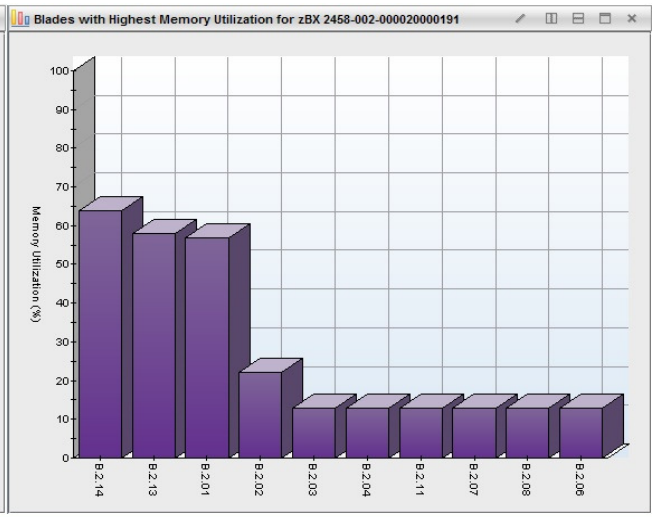
zBX Information







zBX Configuration and Status Summary for zBX 2458-002-000020000191

Rack Count	BladeCenter Count	BladeCenters with Hardware Messages	Blade Count	Blades with Hardware Messages	POWER Current Entitlements	System x Current Entitlements	ISAOPT Current Entitlements	DPXI50Z Current Entitlements
2	4	4	35	3	10	21	14	2

Blades Summary for zBX 2458-002-000020000191

Name	Platform Type	Status	Blade CPU Utilization	Blade Memory Utilization	CPU Count	Memory Size (MB)	ISAOPT Mode	Blade HW Messages	Machine Type	Machine Model	Machine Serial Number	Location
C.1....	System x	Operating	6	0	2	131072	Not Applicable	No	7873	AC1	06CFM76	C10BBS01
B.2.01	POWER	Operating	3	57	1	131072	Not Applicable	No	8406	71Y	10ACC4A	B01BBS01
C.1....	System x	Operating	3	0	2	131072	Not Applicable	No	7873	AC1	06CFM77	C10BBS02
C.1....	System x	Operating	2	0	2	131072	Not Applicable	No	7873	AC1	06CFM92	C10BBS07
C.1....	System x	Operating	2	0	2	131072	Not Applicable	No	7873	AC1	06CFM91	C10BBS06
C.2....	System x	Operating	1	0	2	262144	Not Applicable	No	7873	AC1	06LAB37	C01BBS03
C.1....	System x	Operating	1	0	2	131072	Not Applicable	No	7873	AC1	06LAB50	C10BBS14
C.1....	System x	Operating	1	0	2	131072	Not Applicable	No	7873	AC1	06LAB48	C10BBS13
C.1....	System x	Operating	1	0	2	131072	Not Applicable	No	7873	AC1	06LAB43	C10BBS12
C.1....	System x	Operating	1	0	2	131072	Not Applicable	No	7873	AC1	06LAB41	C10BBS11
C.1....	System x	Operating	1	0	2	131072	Not Applicable	No	7873	AC1	06LAB36	C10BBS09
C.1....	System x	Operating	1	11	2	131072	Not Applicable	No	7873	AC1	06CFM88	C10BBS03
C.2....	System x	Operating	1	0	2	262144	Not Applicable	No	7873	AC1	06LAB44	C01BBS07
C.2....	System x	Operating	1	0	2	262144	Not Applicable	No	7873	AC1	06LAB42	C01BBS06
C.2....	System x	Operating	1	0	2	262144	Not Applicable	No	7873	AC1	06KYK11	C01BBS01
C.1....	System x	Operating	1	0	2	131072	Not Applicable	No	7873	AC1	06CFM90	C10BBS05
C.1....	System x	Operating	1	0	2	131072	Not Applicable	No	7873	AC1	06CFM89	C10BBS04

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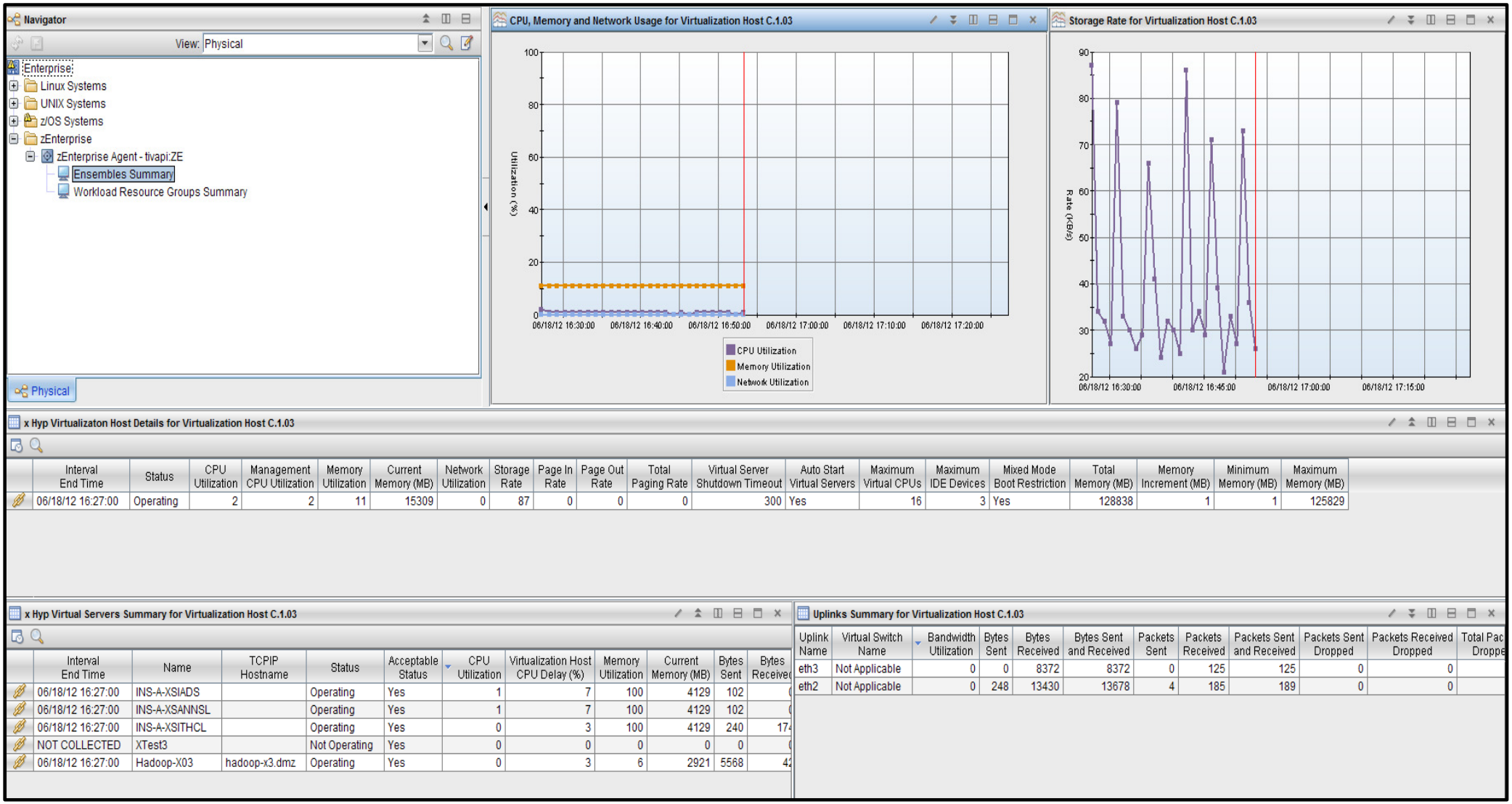
Virtualization Hosts



Interval End Time	Status	CPU Utilization	Management CPU Utilization	Memory Utilization	Current Memory (MB)	Network Utilization	Storage Rate	Page In Rate	Page Out Rate	Total Paging Rate	Virtual Server Shutdown Timeout	Auto Start Virtual Servers	Maximum Virtual CPUs	Maximum IDE Devices	Mixed Mode Boot Restriction	Total Memory (MB)	Memory Increment (MB)	Minimum Memory (MB)	Maximum Memory (MB)
06/18/12 16:27:00	Operating	2	2	11	15309	0	87	0	0	0	300	Yes	16	3	Yes	128838	1	1	125829

Interval End Time	Name	TCPIP Hostname	Status	Acceptable Status	CPU Utilization	Virtualization Host CPU Delay (%)	Memory Utilization	Current Memory (MB)	Bytes Sent	Bytes Receive
06/18/12 16:27:00	INS-A-XSIADS		Operating	Yes	1	7	100	4129	102	
06/18/12 16:27:00	INS-A-XSANNSL		Operating	Yes	1	7	100	4129	102	
06/18/12 16:27:00	INS-A-XSITHCL		Operating	Yes	0	3	100	4129	240	174
NOT COLLECTED	XTest3		Not Operating	Yes	0	0	0	0	0	
06/18/12 16:27:00	Hadoop-X03	hadoop-x3.dmz	Operating	Yes	0	3	6	2921	5568	42

Uplink Name	Virtual Switch Name	Bandwidth Utilization	Bytes Sent	Bytes Received	Bytes Sent and Received	Packets Sent	Packets Received	Packets Sent and Received	Packets Sent Dropped	Packets Received Dropped	Total Pac Droppe
eth3	Not Applicable	0	0	8372	8372	0	125	125	0	0	
eth2	Not Applicable	0	248	13430	13678	4	185	189	0	0	

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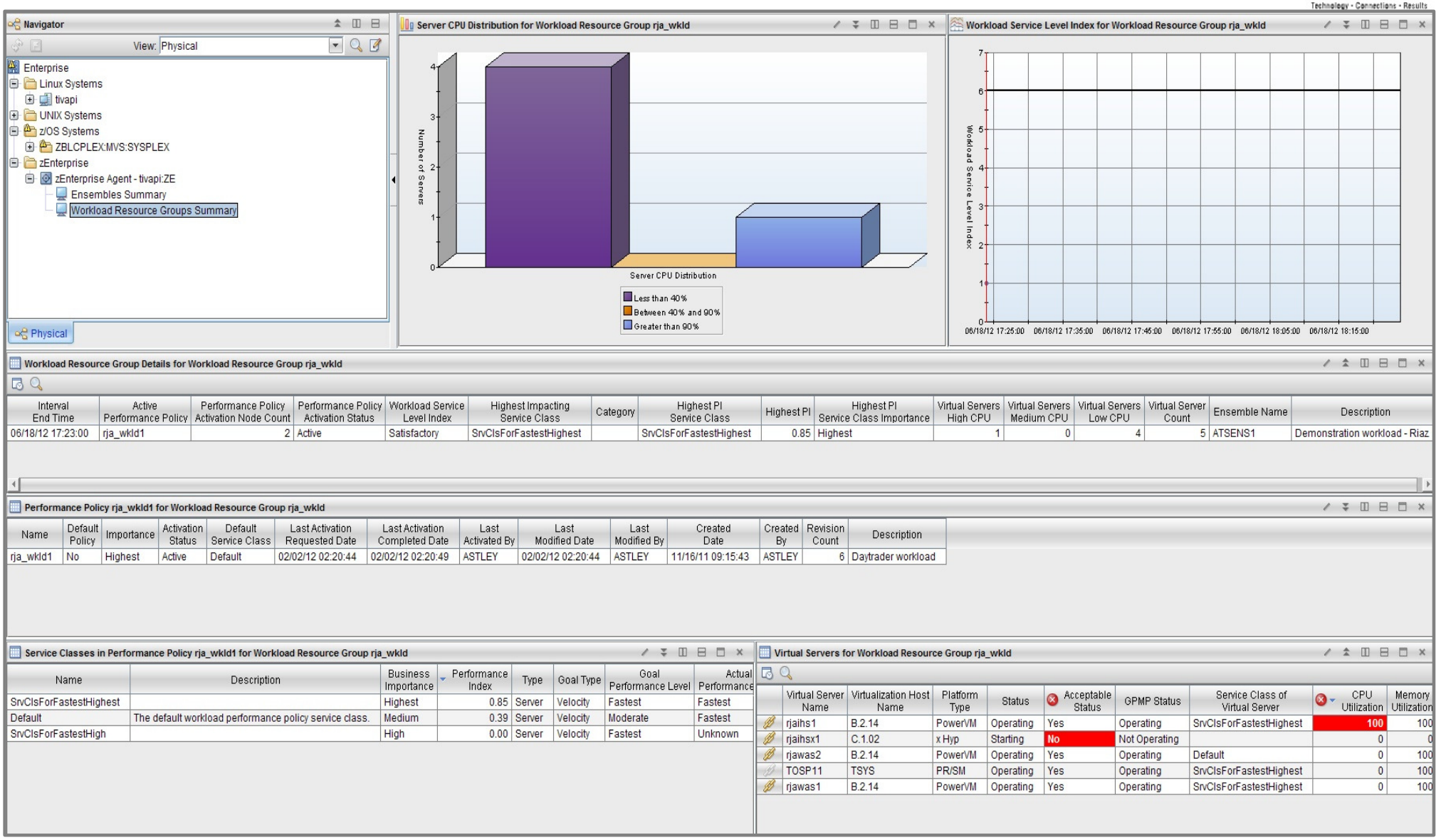
Workload Resource Groups



Workload Resource Group Details for Workload Resource Group rja_wkld

Interval End Time	Active Performance Policy	Performance Policy Activation Node Count	Performance Policy Activation Status	Workload Service Level Index	Highest Impacting Service Class	Category	Highest PI Service Class	Highest PI	Highest PI Service Class Importance	Virtual Servers High CPU	Virtual Servers Medium CPU	Virtual Servers Low CPU	Virtual Server Count	Ensemble Name	Description
06/18/12 17:23:00	rja_wkld1	2	Active	Satisfactory	SrvClsForFastestHighest		SrvClsForFastestHighest	0.85	Highest	1	0	4	5	ATSENS1	Demonstration workload - Riaz

Performance Policy rja_wkld1 for Workload Resource Group rja_wkld

Name	Default Policy	Importance	Activation Status	Default Service Class	Last Activation Requested Date	Last Activation Completed Date	Last Activated By	Last Modified Date	Last Modified By	Created Date	Created By	Revision Count	Description
rja_wkld1	No	Highest	Active	Default	02/02/12 02:20:44	02/02/12 02:20:49	ASTLEY	02/02/12 02:20:44	ASTLEY	11/16/11 09:15:43	ASTLEY	6	Daytrader workload

Service Classes in Performance Policy rja_wkld1 for Workload Resource Group rja_wkld

Name	Description	Business Importance	Performance Index	Type	Goal Type	Goal Performance Level	Actual Performance
SrvClsForFastestHighest		Highest	0.85	Server	Velocity	Fastest	Fastest
Default	The default workload performance policy service class.	Medium	0.39	Server	Velocity	Moderate	Fastest
SrvClsForFastestHigh		High	0.00	Server	Velocity	Fastest	Unknown

Virtual Servers for Workload Resource Group rja_wkld

Virtual Server Name	Virtualization Host Name	Platform Type	Status	Acceptable Status	GPMP Status	Service Class of Virtual Server	CPU Utilization	Memory Utilization
rjaihs1	B.2.14	PowerVM	Operating	Yes	Operating	SrvClsForFastestHighest	100	100
rjaihsx1	C.1.02	x Hyp	Starting	No	Not Operating		0	0
rjawas2	B.2.14	PowerVM	Operating	Yes	Operating	Default	0	100
TOSP11	TSYS	PR/SM	Operating	Yes	Operating	SrvClsForFastestHighest	0	100
rjawas1	B.2.14	PowerVM	Operating	Yes	Operating	SrvClsForFastestHighest	0	100

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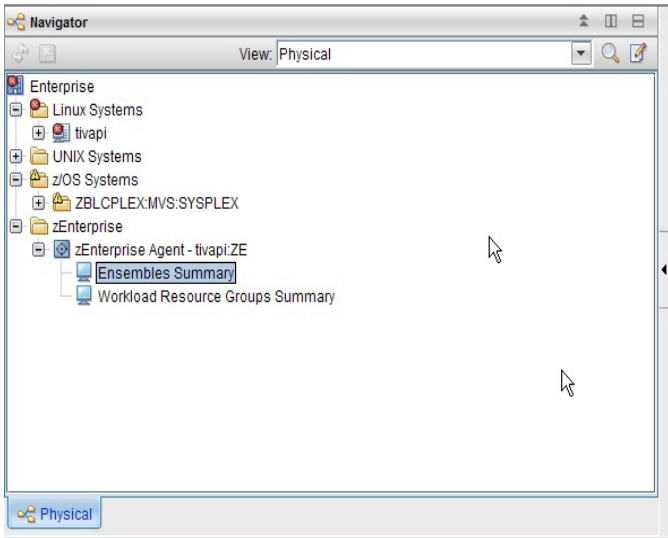
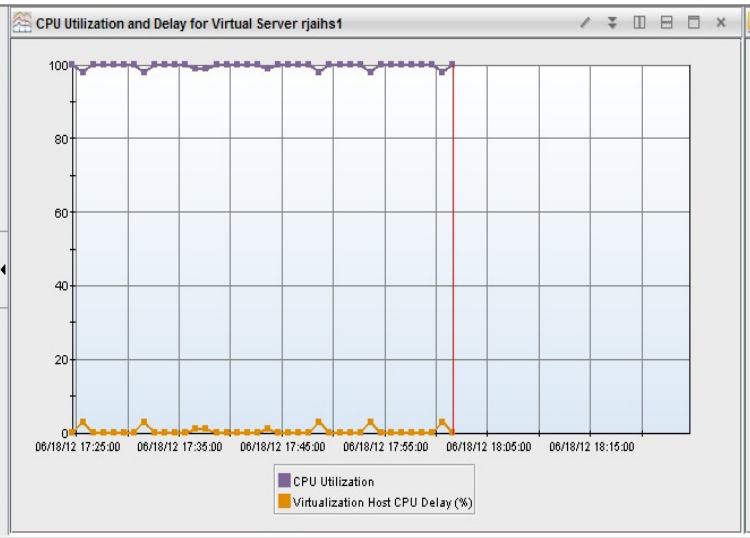
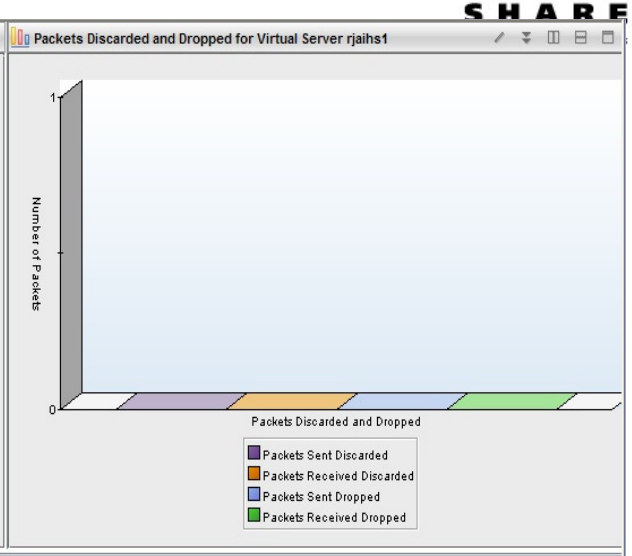
Virtual Servers







PowerVM Virtual Server CPU and Memory Details for Virtual Server rjaihs1

Interval End Time	TCPIP Hostname	Status	Acceptable Status	CPU Utilization	Virtualization Host CPU Delay (%)	Current Processing Units	Memory Utilization	Current Memory (MB)	Sampling Rate	Processing Mode	Minimum Dedicated CPUs	Initial Dedicated CPUs	Maximum Dedicated CPUs	Minimum Virtual CPUs	Initial Virtual CPUs	Maximum Virtual CPUs	Minimum Processing Units	Initial Processing Units	Maximu Processing
NOT COLLECTED	rja_ihs1.dmz	Operating	Yes	100	0	20.00	100	8192	4	Shared	0	0	0	1	2	7	0.10	0.20	

PowerVM Virtual Server Network Summary for Virtual Server rjaihs1

Interval End Time	Bytes Sent	Bytes Received	Bytes Sent and Received	Packets Sent	Packets Received	Packets Sent and Received	Packets Sent Dropped	Packets Received Dropped	Packets Sent Discarded	Packets Received Discarded	Multicast Packets Sent	Multicast Packets Received	Broadcast Packets Sent	Broadcast Packets Received
NOT COLLECTED	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Workload Resource Groups Summary for Virtual Server rjaihs1

Interval End Time	Workload Name	Service Class of Virtual Server	Workload Service Level Index	Highest Impacting Service Class	Active Performance Policy	Highest PI Service Class	Highest PI	Highest PI Service Class Importance
NOT COLLECTED	rja_wkld	SrvClsForFastestHighest	Satisfactory	SrvClsForFastestHighest	rja_wkld1	SrvClsForFastestHighest	0.85	Highest

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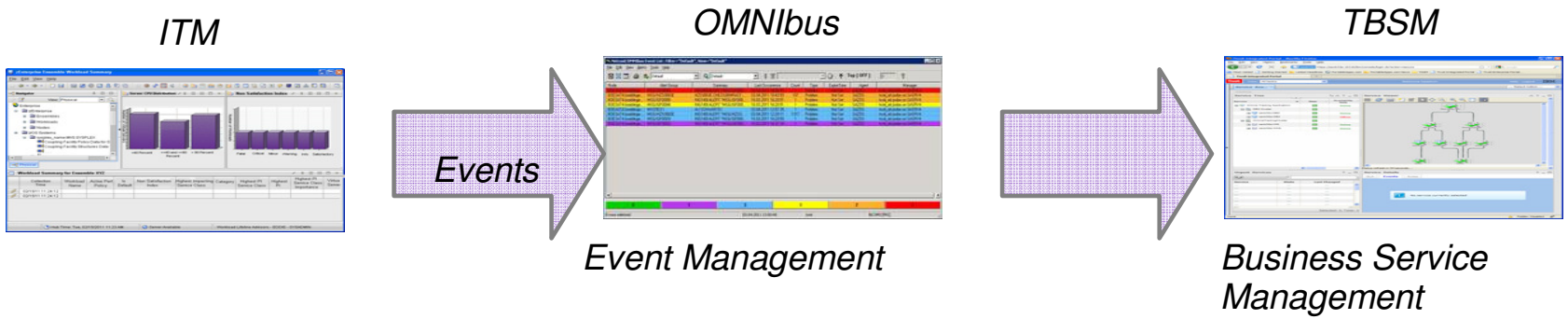
Alerting



- ITM Situations provided to raise alerts based on reported information
  - CPC, blade, and workload warning/minor/critical/fatal status changes
  - Virtual server status acceptable/unacceptable
- Custom situations can be defined based on environment
- Situations can be
  - Correlated with other ITM situations in an ITM workflow policy
  - Forwarded to event managers as Event Integration Facility (EIF) events for viewing and/or correlation outside of ITM. Examples:
    - Netcool/OMNIbus
    - TBSM (via Netcool/OMNIbus) for business service impact
    - NetView on z/OS

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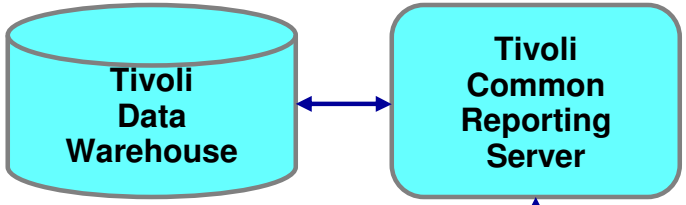
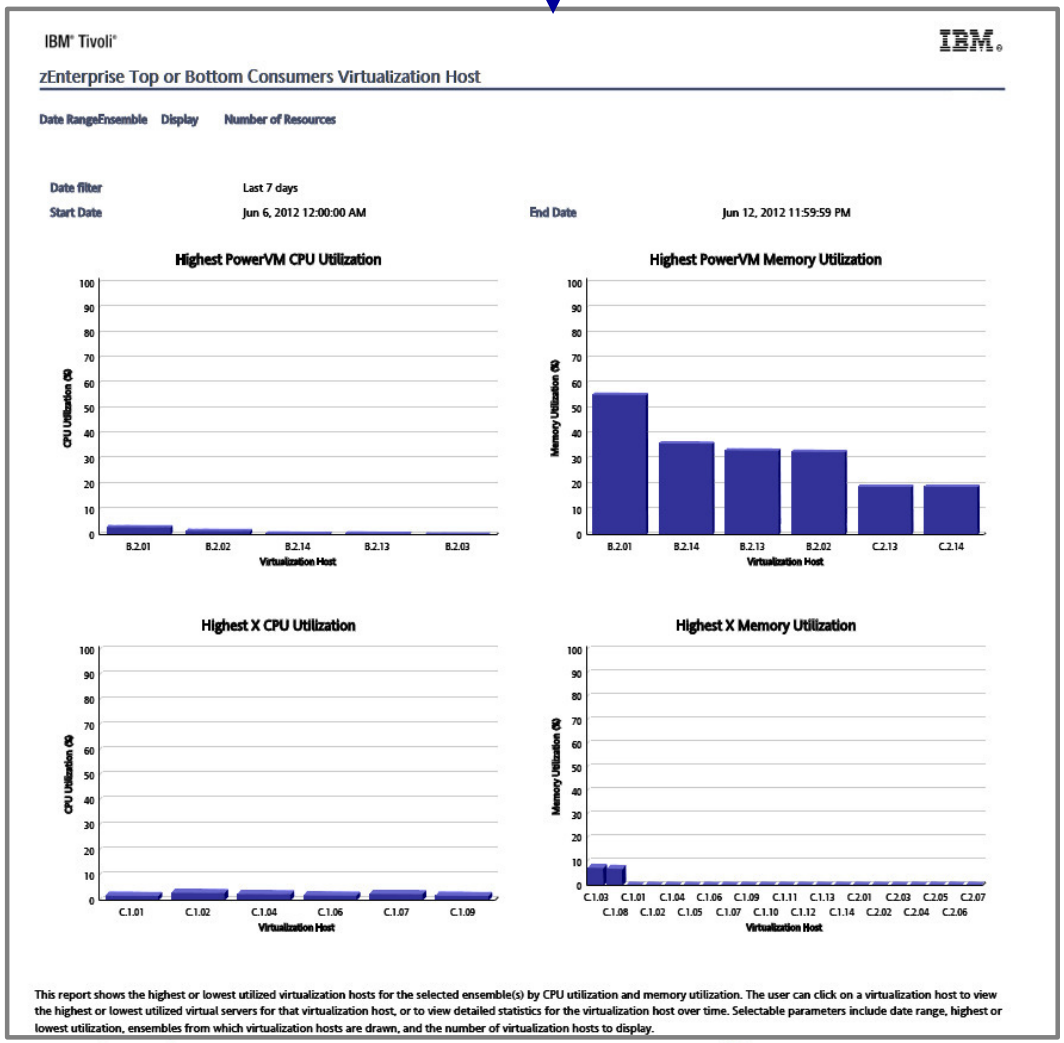
Reporting





- Data can be stored in Tivoli Data Warehouse for long term reporting/trend analysis/forecasting
- Roll you own reports or use reporting packages
- Predefined reports provided for used with IBM Tivoli Common Reporting
  - Performance trends
  - Workload rightsizing and balancing
- Tivoli Common Reporting allows
  - Report customizing
  - Scheduled report generation in various formats (PDF, HTML,...)
  - Scheduled report mailing/notification

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API Usage by System Automation for z/OS

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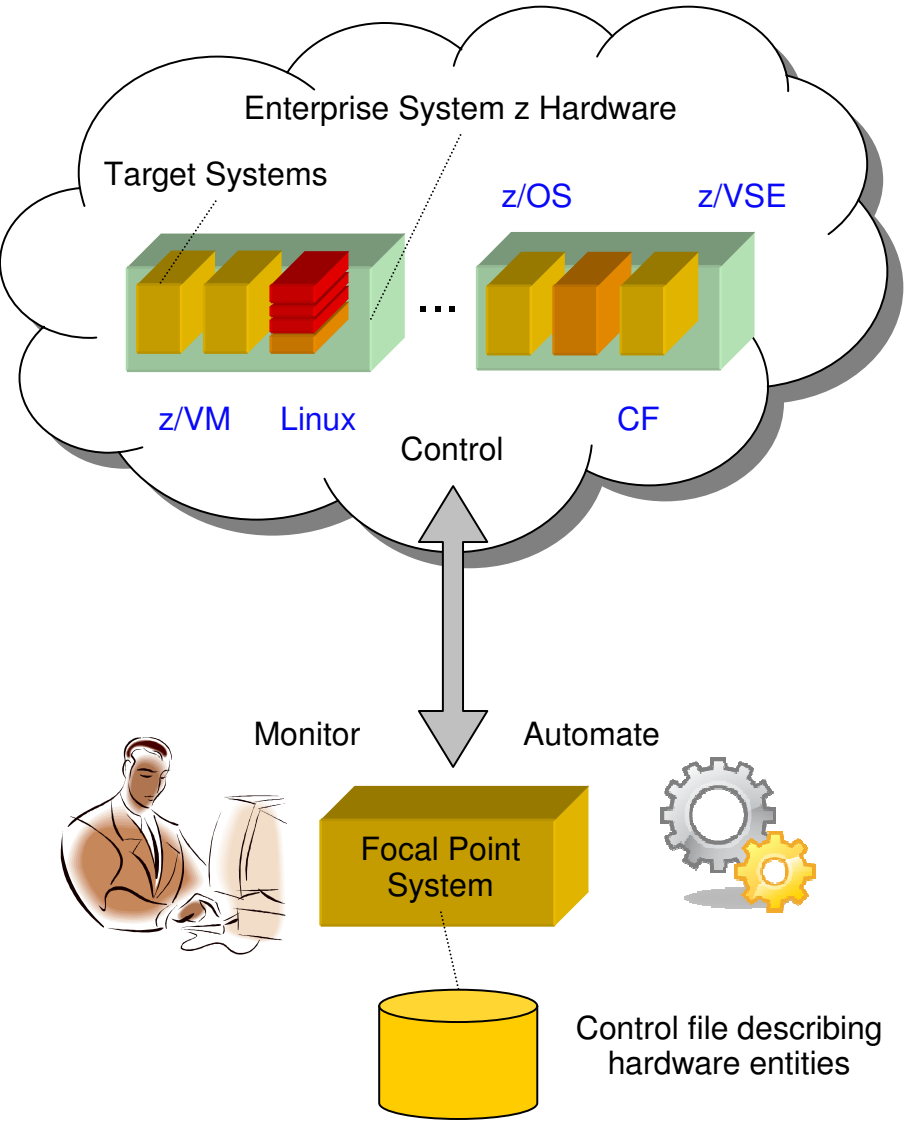
Hardware Operations Today at a Glance



- Hardware operations (HMC / SE) and monitoring
  - Enterprise-wide
  - Central focal point concept
- Automation
  - Product provided standard automation
  - Customer extensions
- Policy
  - Common SA z/OS automation policy for hardware and applications
  - Central administration
- SA z/OS provides two hardware interfaces for
  - Central hardware automation and monitoring
  - LPAR management functions
  - Coupling Facility operations
  - Geographically Dispersed Parallel Sysplex (GDPS)
- SA z/OS provides Processor Operations (ProcOps) Service Machine to operate z/VM guests

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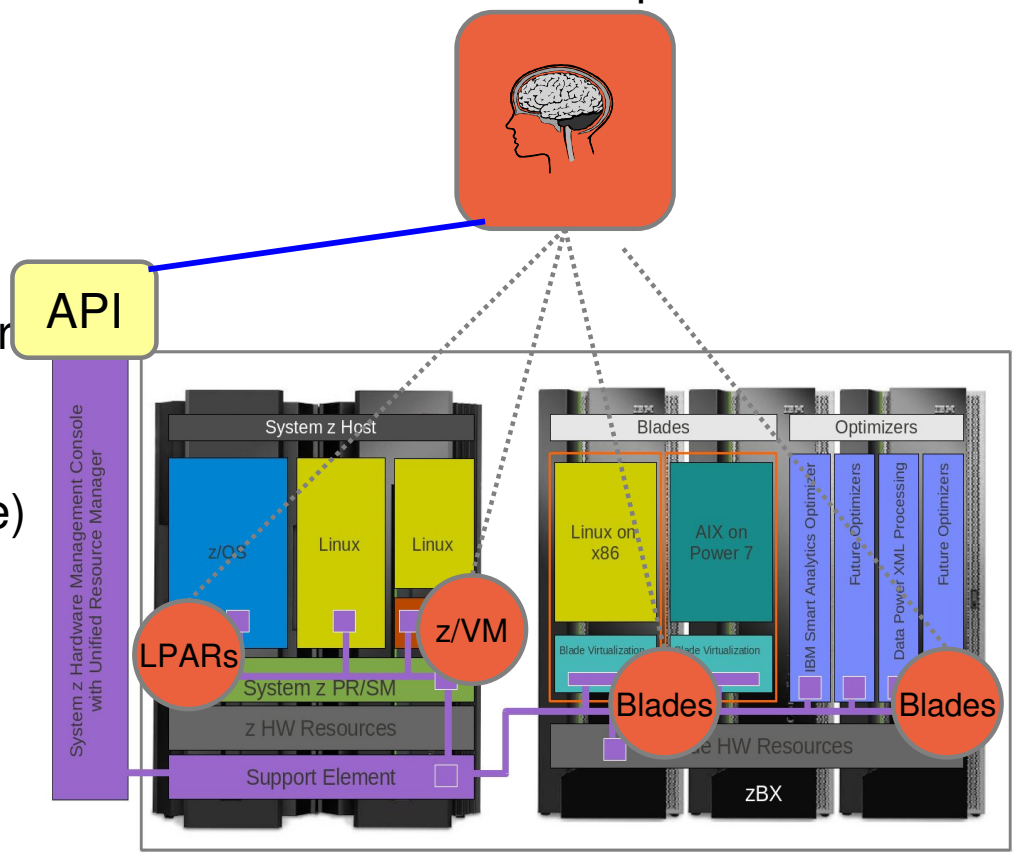
Basic Availability and DR – SA z/OS V3.4

Enhanced hardware automation capabilities

- SA z/OS Processor Operations is used already today to automate hardware operations in System z environments
- Enhancements:
  - Include new elements in policies
  - Awareness of zBX, blades, virtual server and their workload context
  - Informed about changes
  - Similar commands (as much as possible) for zBX elements as exist for CPC
- Value
  - **Reduced operations costs** due to SPOC for zEnterprise automated HW operations
  - Simplified site management for planned and unplanned outages
  - Immediate alerting based on policy in case of failures
  - Foundation for GDPS Application CA/DR solution

SA z/OS ProcOps / GDPS



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SA z/OS Capabilities

Via SA z/OS ProcOps Commands and Messages

- Monitor connection to configured Ensembles
- Monitor status and properties of CPCs, Blades, and Virtual Servers
- List properties of ensemble resources known to SA z/OS
- List Workload Resource Groups and contained virtual servers
- Activate/deactivate blades and virtual servers
- Monitor inventory, status and property changes for
  - Blades
  - CPCs
  - Virtual servers

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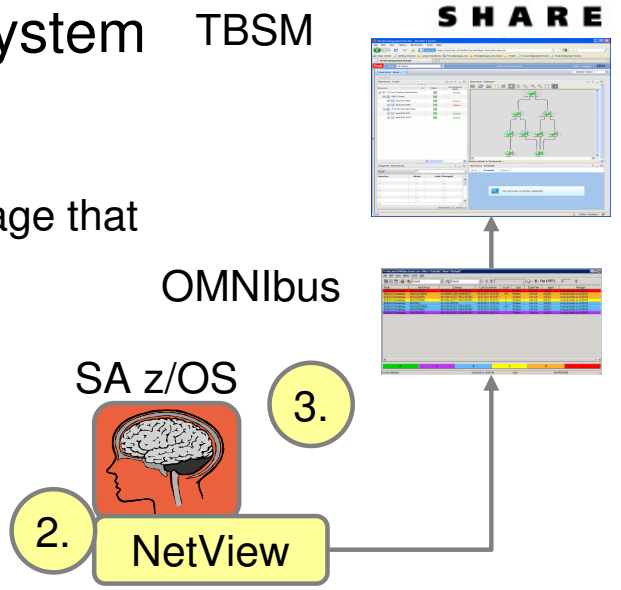
Sample Scenarios

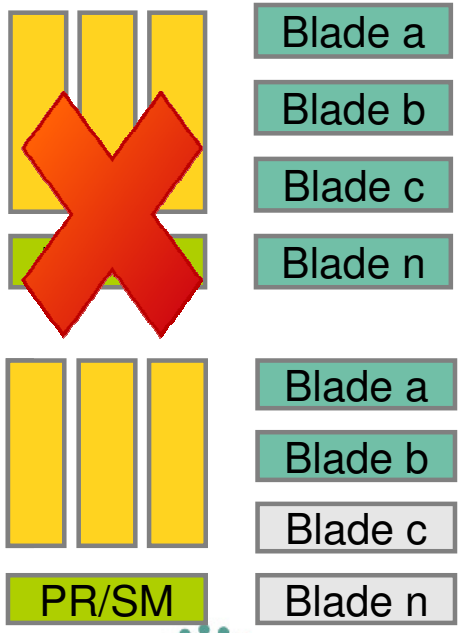
Indicate blade not operating in context of business system

1. Subscribe for changes at zBX blades
2. Blade fails unexpectedly. ProcOps detects this and creates message that runs through NetView Automation Table
3. Automation Table action INGALERT is used to forward EIF-event to OMNIbus from where it can be brought into TBSM
   - ✓ LOB is immediately informed about potential failure



Datacenter power management + Site Failover

- Shutdown of complete node due to maintenance
  - Use SA z/OS ProcOps to
    - deactivate all blades
    - deactivate all LPARs
    - power off CPC and zBX
  - ✓ Fully automated hardware operations enables quick shutdown and startup and reduces overall maintenance window
- Site takeover directed by GDPS
  - GDPS, through SA z/OS ProcOps, activates idle resources on backup server
  - ✓ Customers pays for backup resources only in DR case



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API Usage by System Automation Application Manager

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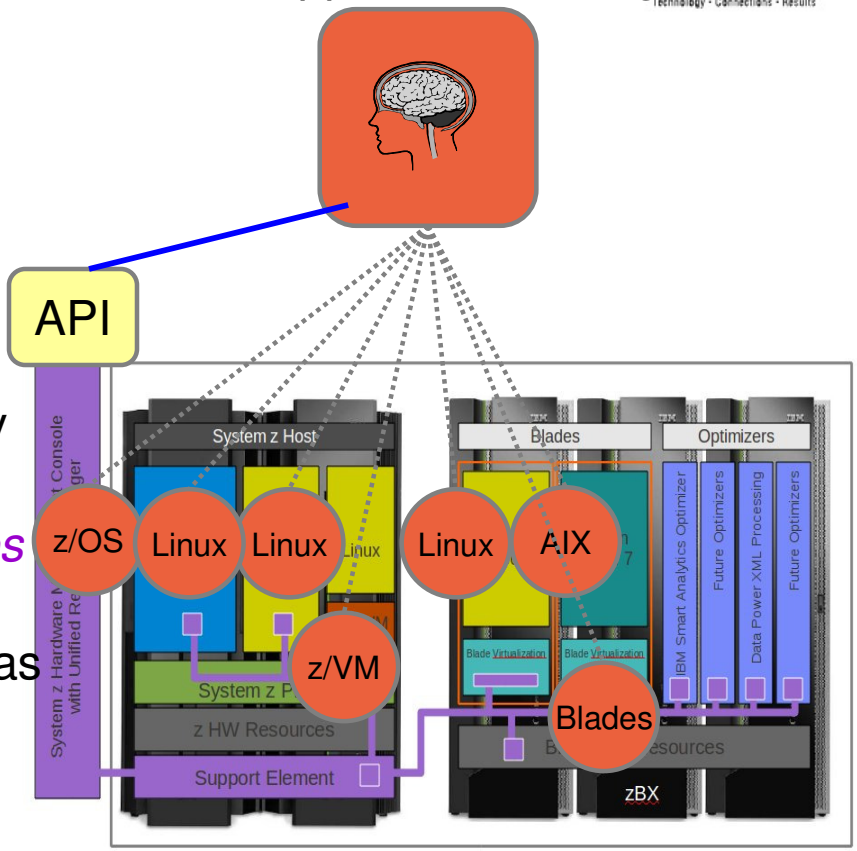
Basic Availability and DR

- SA Application Manager manages multi-tier applications across platforms and is IBM's implementation for GDPS Distributed Cluster Management (DCM)
- Enhancements
  - Awareness of zEnterprise platform resources
  - Support for Unified Resource Manager inventory and status notifications
  - Visualization and control (start/stop) of *SA Nodes* at the operations console
  - Toggle support from primary site to backup site as directed by GDPS
    - Metro distance
    - Unlimited distance
- Value
  - **Reduced operations cost** due to SPOC for operating business applications on virtualized infrastructure
  - Avoids or reduces MTTR in case of application or infrastructure outages
  - **Unique zEnterprise DR solution** that completes GDPS Application CA/DR solution for zEnterprise



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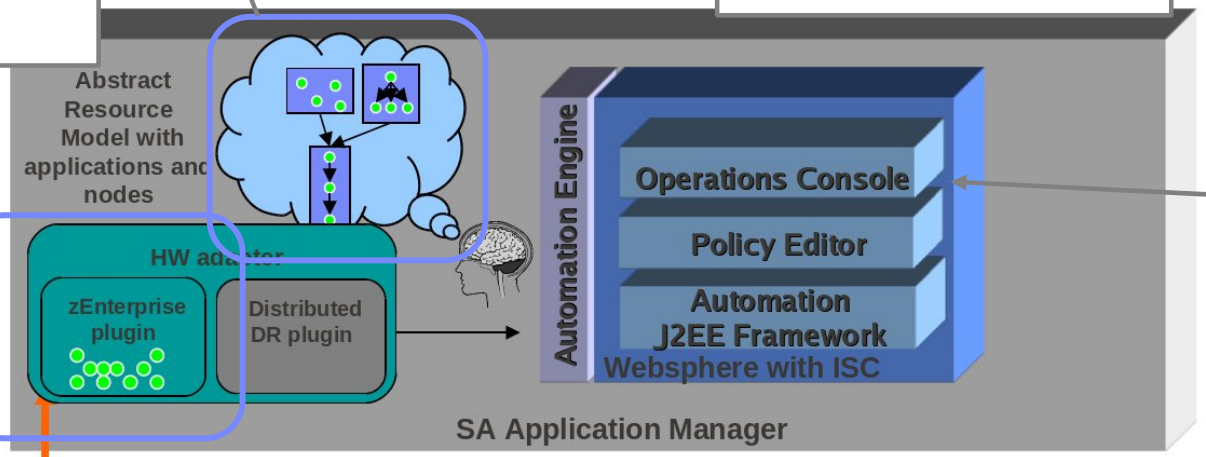
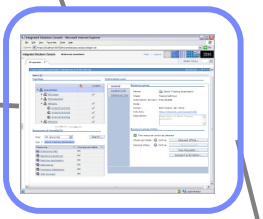
SA AppMan Big Picture

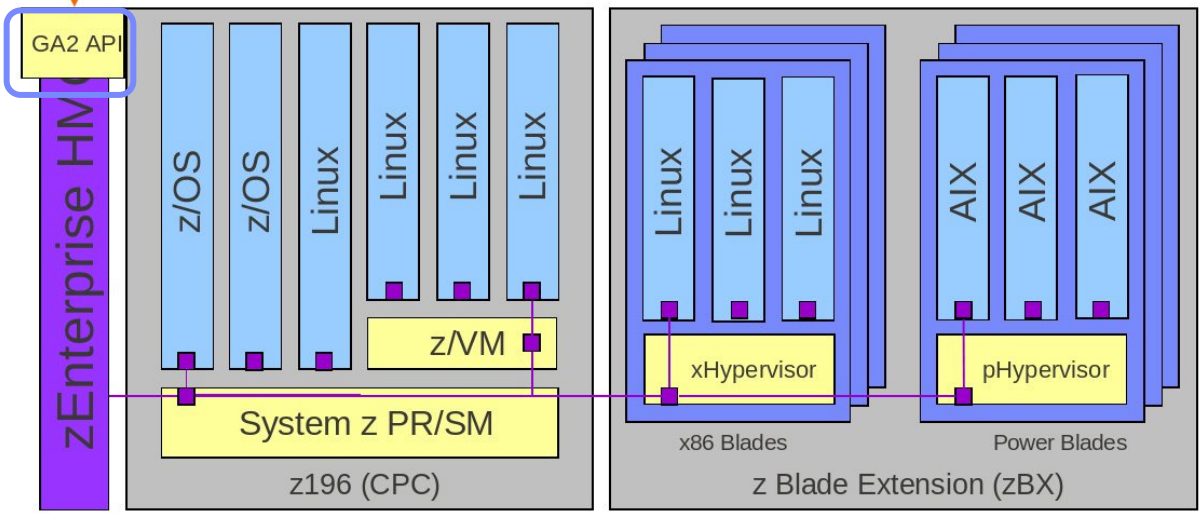
New resources in data model:
- Ensemble
- Workload Resource Group
- Bladecenter, Blade
- Virtual server
- ...

Visualization:
- End-to-end application w/ nodes
- Status
- Context

Interaction with zManager API







Operations:
- Shutdown / startup of node
- View node context
- View domain context

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SA AppMan Setup and Prerequisites

Administrator

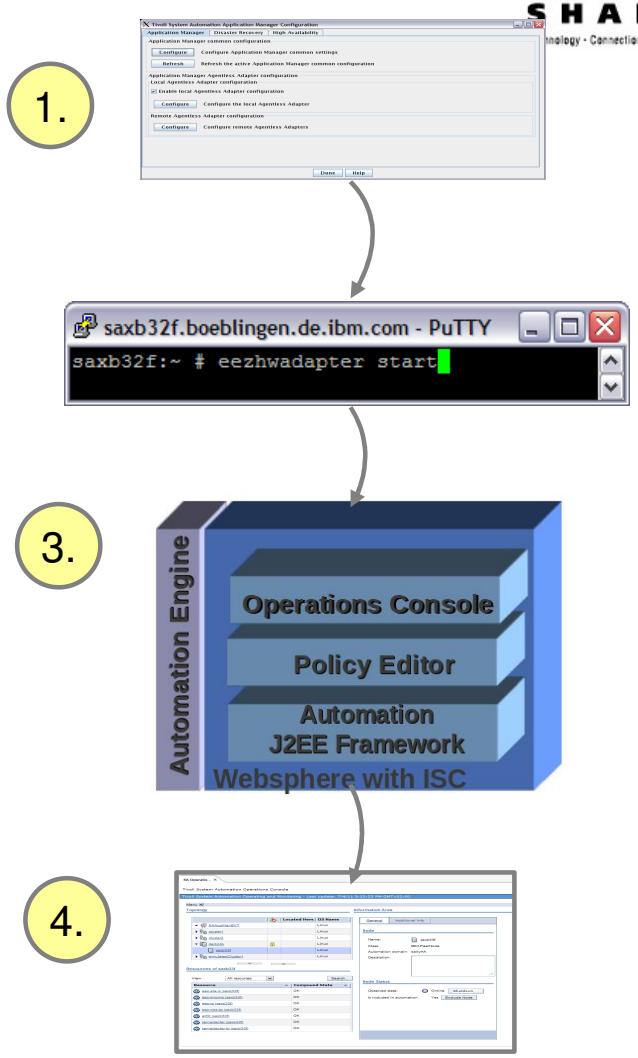
1. Configure access to zEnterprise HMC
2. Start HW adapter

System Automation Application Manager

3. Existing First Level Automation nodes are mapped automatically to virtual servers, where applicable
   - Mapping is based on hostname provided by Unified Resource Manager Web Services API via GPMP

Web-based operations console

4. Platform information is available, startup and shutdown possible, if



Sample scenarios:

- Manually shutdown a guest that is part of a HA cluster or standalone systems connected via Agentless Adapter to
  - give resources to other nodes on the same virtualization host
  - drain all nodes because of doing hardware maintenance

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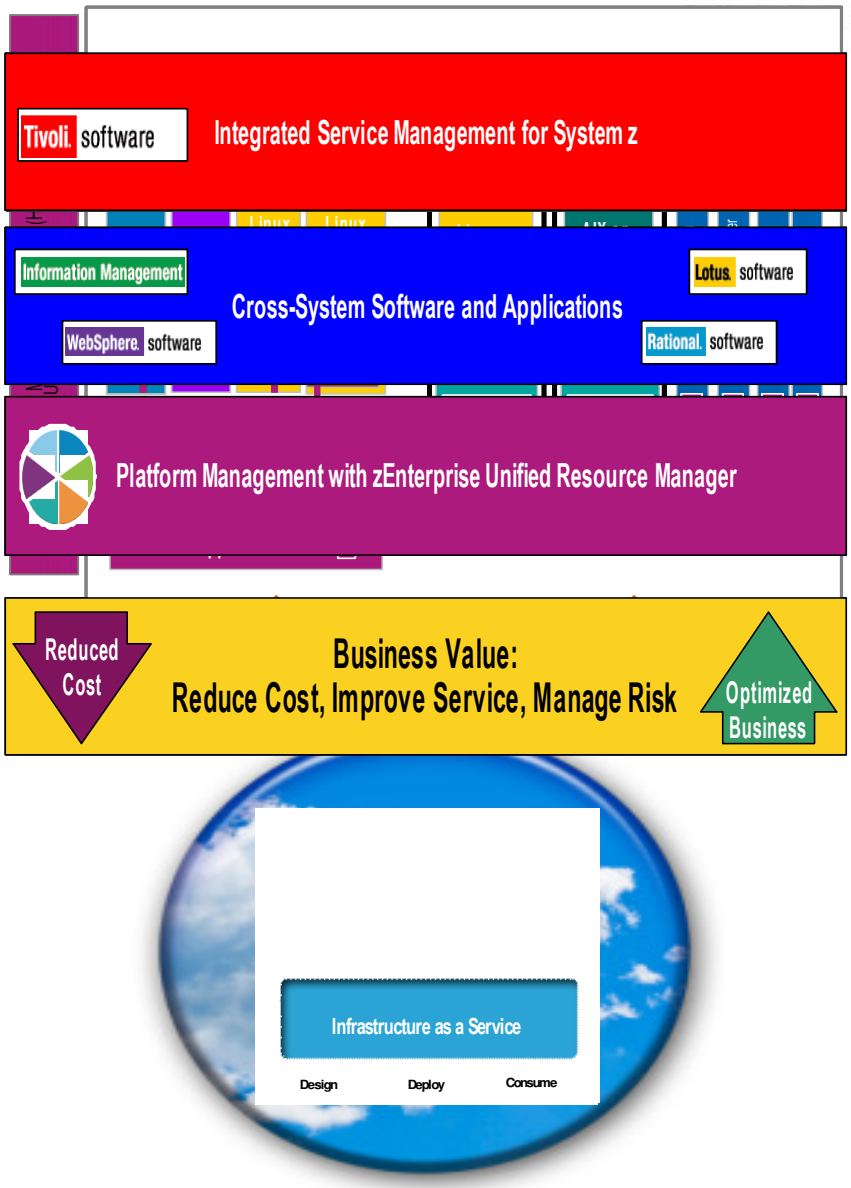
Summary

- **The zManager APIs and exploiting products integrate the zEnterprise platform into end-to-end Integrated Service Management:**
  - **Visibility**
    - Discover zEnterprise platform resources and place them in infrastructure, application, and business service contexts
    - Efficient monitoring of resources and integration of monitoring to various service management applications
  - **Control**
    - Productively adjust state of resources for planned and unplanned activities across platforms and networks
  - **Automation**
    - Quickly detect anomalies or accept requests and take programmatic action for notification, bypass/resolution, and planned operations



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For Further Information

- IBM System z Hardware Management Console Web Services API (SC27-2616)
  - http://www-01.ibm.com/support/docview.wss?uid=pub1sc27261600
- HMC Unified Resource Manager Web Services API and User Interface Hints and Tips
  - https://share.confex.com/share/118/webprogram/Session10847.html
- Exploiting the zManager Web Services APIs with Python and the zBXStorTool
  - http://www.ibm.com/support/techdocs/atsmastr.nsf/WebIndex/PRS4856
- IBM Tivoli Monitoring and OMEGAMON XE Information Center (contains zEnterprise Monitoring Agent Installation/Configuration and User Guides)
  - http://publib.boulder.ibm.com/infocenter/tivihelp/v15r1/index.jsp
- System Automation for z/OS 3.4 Information Center
  - http://publib.boulder.ibm.com/infocenter/tivihelp/v3r1/index.jsp?topic=/com.ibm.sazos.doc_3.4/welcome.html
- System Automation Application Manager Information Center
  - http://publib.boulder.ibm.com/infocenter/tivihelp/v3r1/index.jsp?topic=/com.ibm.saam.doc_3.2.2/welcome.html
- zEnterprise Monitoring Agent Announcement Letter (US)
  - http://www.ibm.com/common/ssi/ShowDoc.wss?docURL=/common/ssi/rep_ca/1/897/ENUS212-191/index.html
- Planning for the IBM Tivoli zEnterprise Monitoring Agent
  - http://www.ibm.com/support/techdocs/atsmastr.nsf/WebIndex/TD105969

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System z Social Media

- System z official Twitter handle:
  - @ibm_system_z
- Top Facebook pages related to System z:
  - Systemz Mainframe
  - IBM System z on Campus
  - IBM Mainframe Professionals
  - Millennial Mainframer
- Top LinkedIn Groups related to System z:
  - Mainframe Experts Network
  - Mainframe
  - IBM Mainframe
  - System z Advocates
  - Cloud Mainframe Computing
- YouTube
  - IBM System z
- Leading Blogs related to System z:
  - Evangelizing Mainframe (Destination z blog)
  - Mainframe Performance Topics
  - Common Sense
  - Enterprise Class Innovation: System z perspectives
  - Mainframe
  - MainframeZone
  - Smarter Computing Blog
  - Millennial Mainframer

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Tivoli System z Sessions at SHARE

Monday

•11:00	11207: Automating your IMSplex with System Automation for z/OS	Platinum 7
•1:30	11832: What's New with Tivoli System Automation for z/OS	Elite 1
•3:00	11886: Improve Service Levels with Enhanced Data Analysis	Elite 1

Tuesday

•9:30	11792: What's New with System z Monitoring with OMEGAMON	Elite 1
•11:00	11791: Tuning Tips To Lower Costs with OMEGAMON Monitoring	Platinum 8
•1:30	11900: Understanding Impact of Network on z/OS Performance	Grand Salon A

Wednesday

•9:30	11835: Automated Shutdowns using either SA for z/OS or GDPS	Elite 1
•1:30	11479: Predictive Analytics and IT Service Management	Grand Salon E/F
•1:30	11899: Top 10 Tips for Network Perf. Monitoring w/ OMEGAMON	Platinum 9
•4:30	11836: Save z/OS Software License Costs with TADz	Elite 1

Thursday

•9:30	11905: Using NetView for z/OS for Enterprise-Wide Mgmt and Auto	Grand Salon A
•11:00	11909: Get up and running with NetView IP Management	Grand Salon A
•11:00	11887: Learn How To Implement Cloud on System z	Grand Salon E/F

Friday

•9:30	11630: Getting Started with URM APIs for Monitoring & Discovery	Elite 1

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