

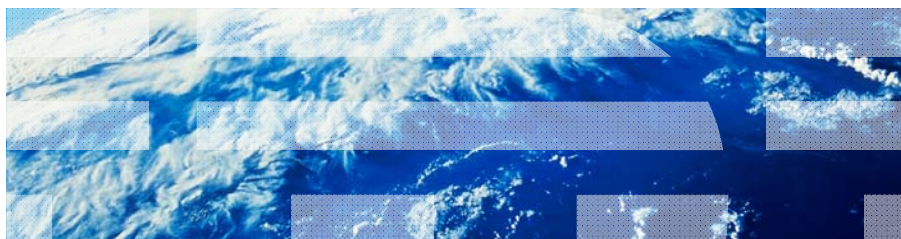
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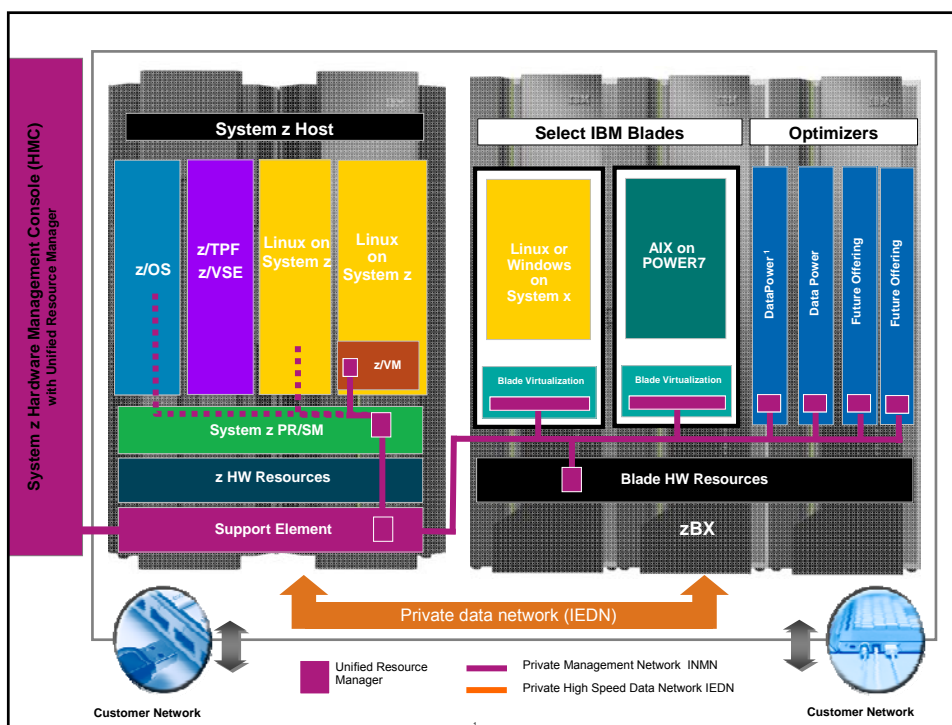
Session 11601


## Introduction to zEnterprise Performance Management

Glenn Anderson, IBM Technical Training



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## Agenda

- zEnterprise Workload Management
  - z/OS Virtual Servers
    - WLM and IRD
  - z/VM Guests and zBX Blade Virtual Servers
    - PPM
- zEnterprise Resource Monitoring
  - z/OS Virtual Servers
    - RMF
  - z/VM Guests and zBX Blade Virtual Servers
    - PPM
    - RMF XP

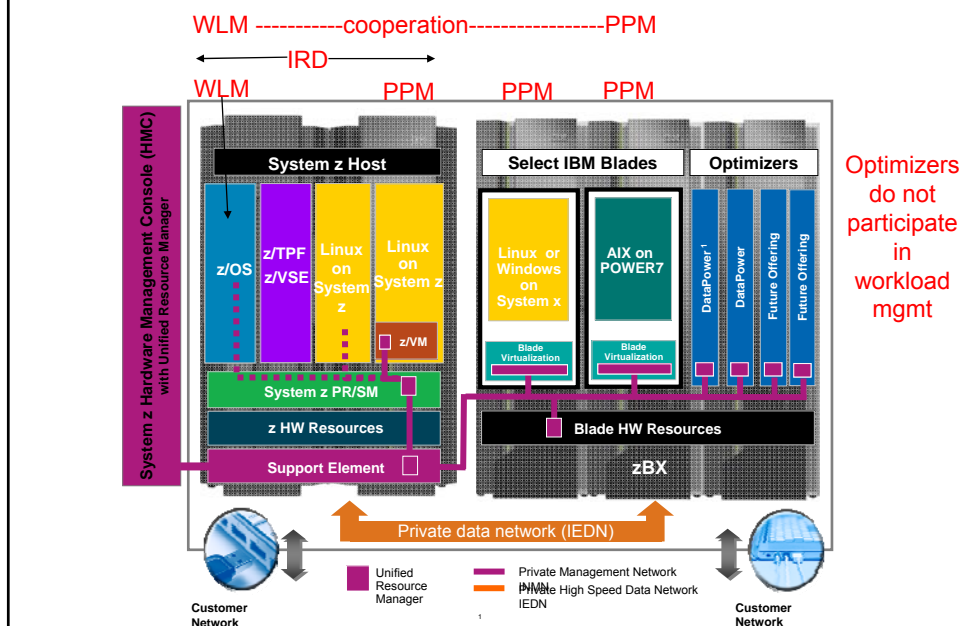
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## zEnterprise Workload Management

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## zEnterprise Workload Management Overview



Platform Performance Manager



## zEnterprise Platform Performance Manager

- **Platform management component responsible for goal-oriented resource monitoring, management, and reporting across the zEnterprise Ensemble**
  - Core component responsible for definition and implementation of goal-oriented management policy
  - Extend goal oriented approach of z/OS WLM to platform managed resources
  - Common approach to monitoring / management of platform resources across zEnterprise
  - Orchestration of autonomic management of resources across virtual servers
    - Provide Intelligent Resource Director like function across the zEnterprise
    - Pushes management directives to the SE, Hypervisors, and OS agents as required across the zEnterprise
- **Integration of HMC console support**
  - Integrated UI for monitoring, display of workload topology relationships, status alerts, etc
  - Definition of Performance Management Goals and Policy Administration
- **Functionality integrated into the Unified Resource Manager**
  - Code structured and packaged as System Z firmware
  - Inter-Component communication over trusted internal platform management network

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## PPM Components

- **HMC**
  - HMC is management server and console
  - Provides ensemble wide aggregation of performance data
  - UI for defining workloads, performance policy and reporting data
  - Pushes management directives to all the nodes of ensemble
- **Support Element (SE)**
  - Provides node (or CPC) level aggregation of performance data
  - Pushes management directives to all the hypervisors in the node.

The diagram illustrates the PPM architecture. On the left, a vertical bar represents the HMC. To its right is a stack of components: PR/SM, Z CPU, Memory and IO, and SE. Further right, there are two main sections: 'Power7' and 'System x'. The 'Power7' section contains z/OS, z/VM, and z/VM Mgmt Guest. The 'System x' section contains AIX, VIOS, Linux, Windows, and xHyp. Below these sections are AMM and z Blade Extension components.

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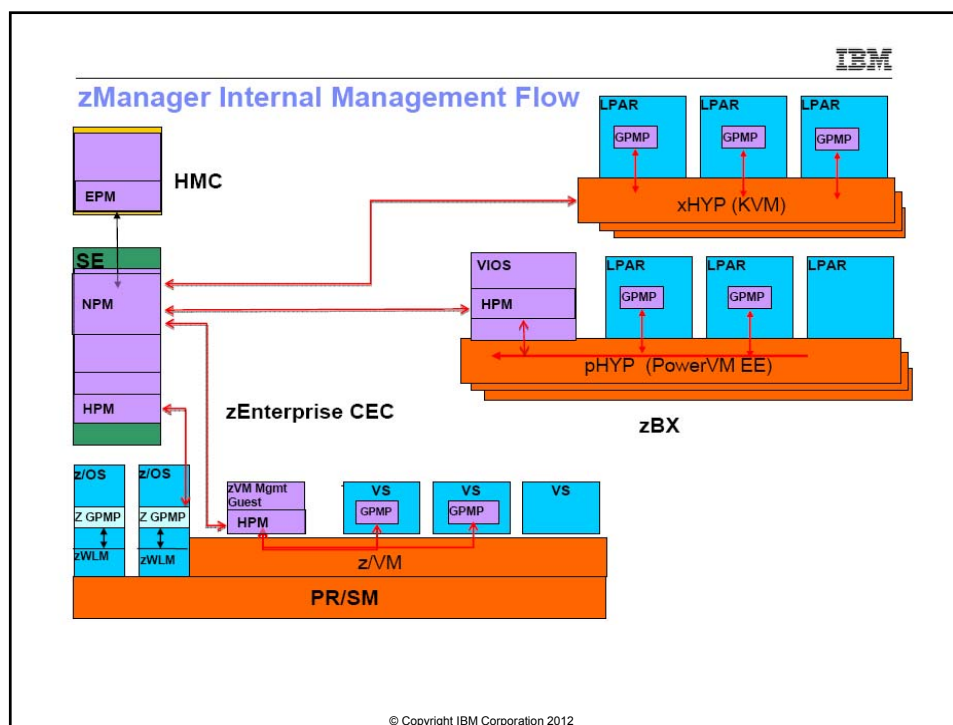
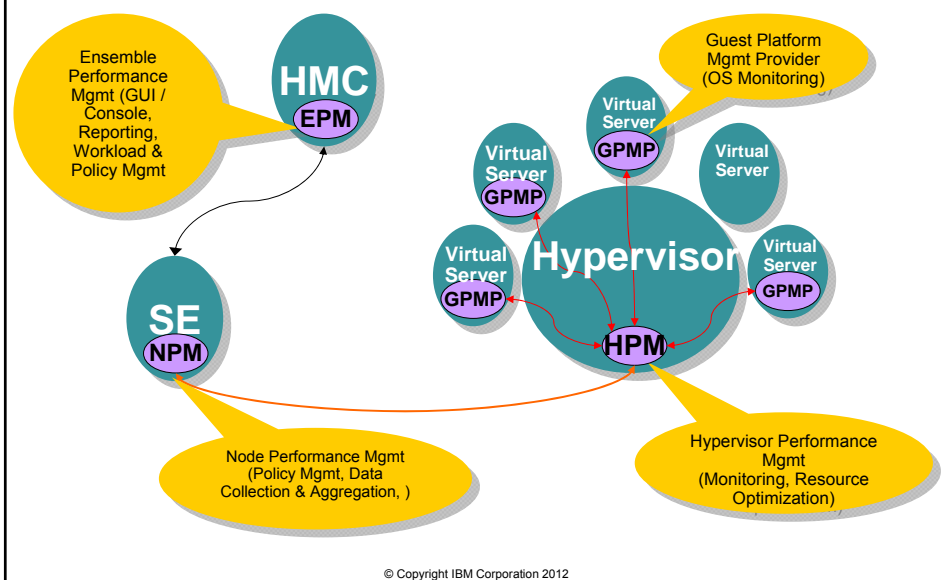
## PPM Components

- **Hypervisors**
  - Monitors goal defined in performance policy and performs dynamic resource mgmt (z/VM and Power VM) to achieve performance goal where applicable
  - Collects virtual server statistics from hypervisor and guest platform management providers. Pushes aggregated metrics to SE
- **Virtual Servers**
  - **Optional** Guest Platform Management Provider software deployed in Virtual Server
  - Collects monitoring data from Operating system and ARM instrumented applications and pushes to hypervisors.

The diagram illustrates the PPM architecture. On the left, a vertical bar represents the HMC. To its right is a stack of components: PR/SM, Z CPU, Memory and IO, and SE. Further right, there are two main sections: 'Power7' and 'System x'. The 'Power7' section contains z/OS, z/VM, and z/VM Mgmt Guest. The 'System x' section contains AIX, VIOS, Linux, Windows, and xHyp. Below these sections are AMM and z Blade Extension components.

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## Platform Performance Management Structure





## zManager CPU Mgmt Functions

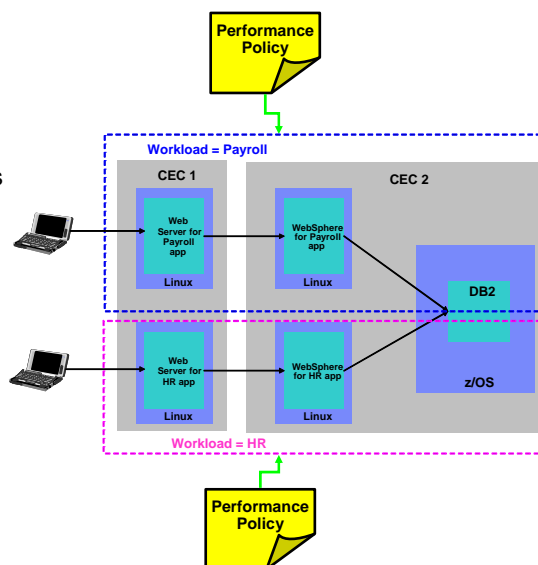
- z/VM and PowerVM Hypervisors
  - Virtual Server CPU Management provides the ability to manage CPU resources across virtual servers based on a goal-oriented performance policy.
- System x xHyp (KVM based) Hypervisor
  - Does not currently participate in CPU Management
- PR/SM Hypervisor
  - Does not make resource management adjustments based on PPM Policy. Only IRD dynamically influences the PR/SM hypervisor

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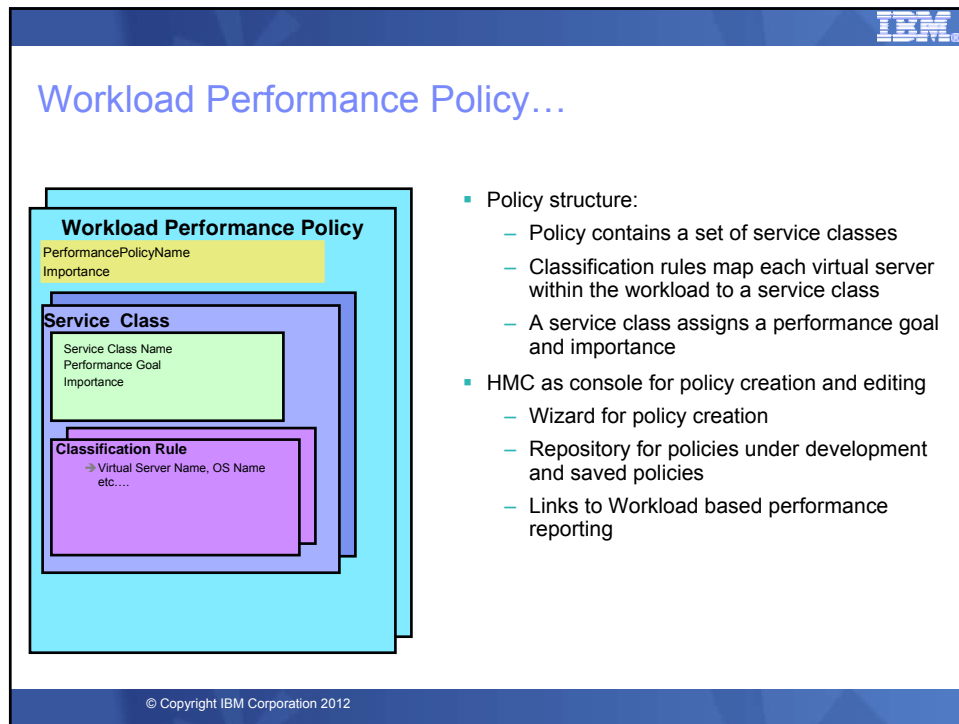


## Platform Workload

- 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



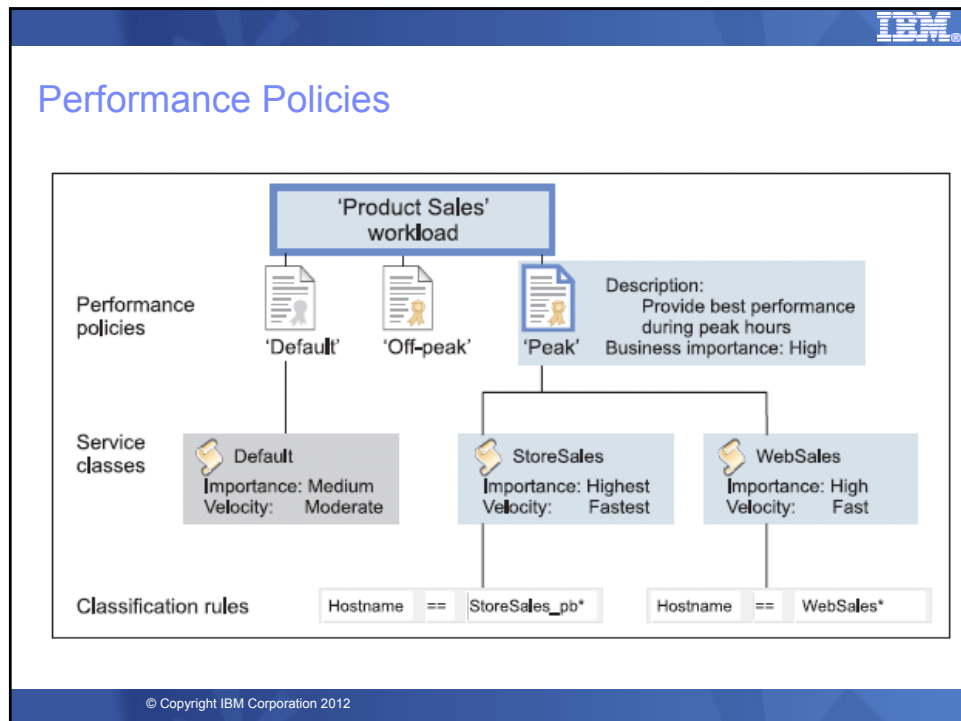
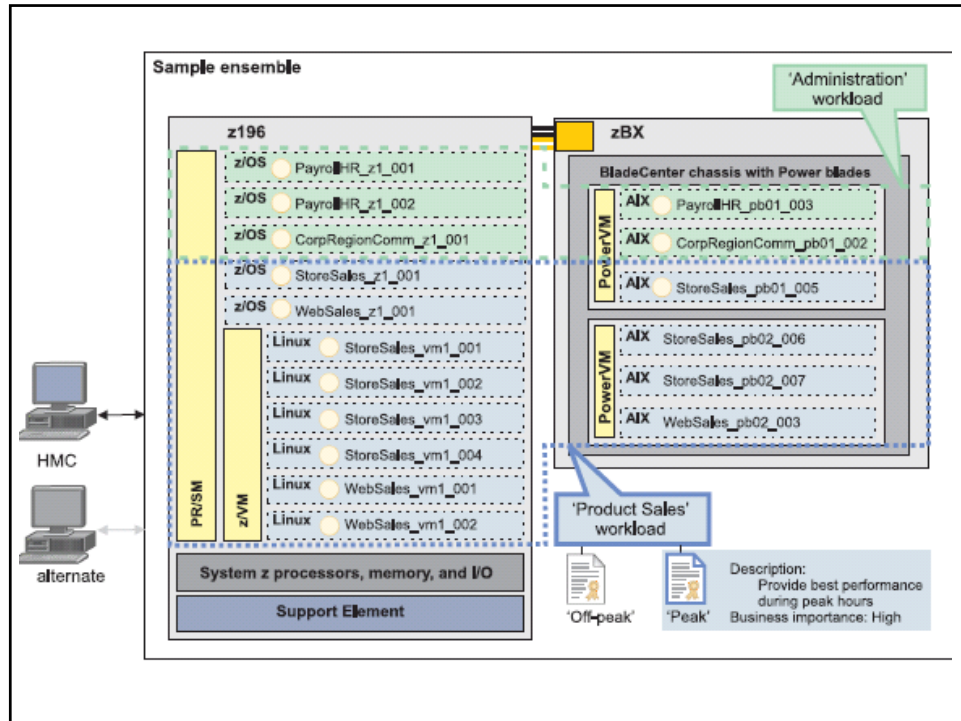
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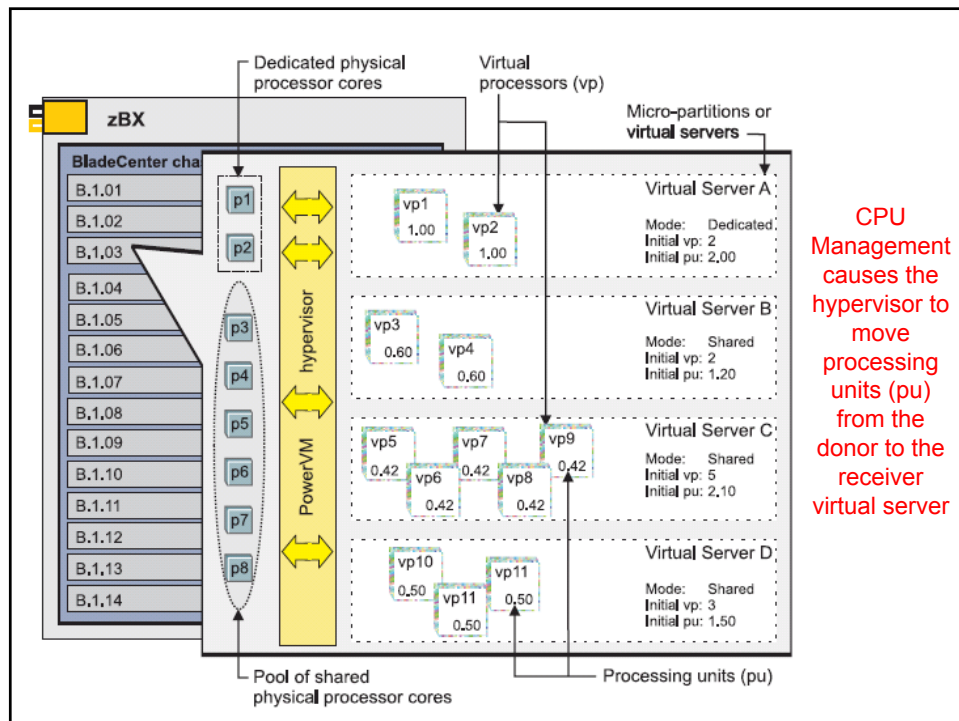
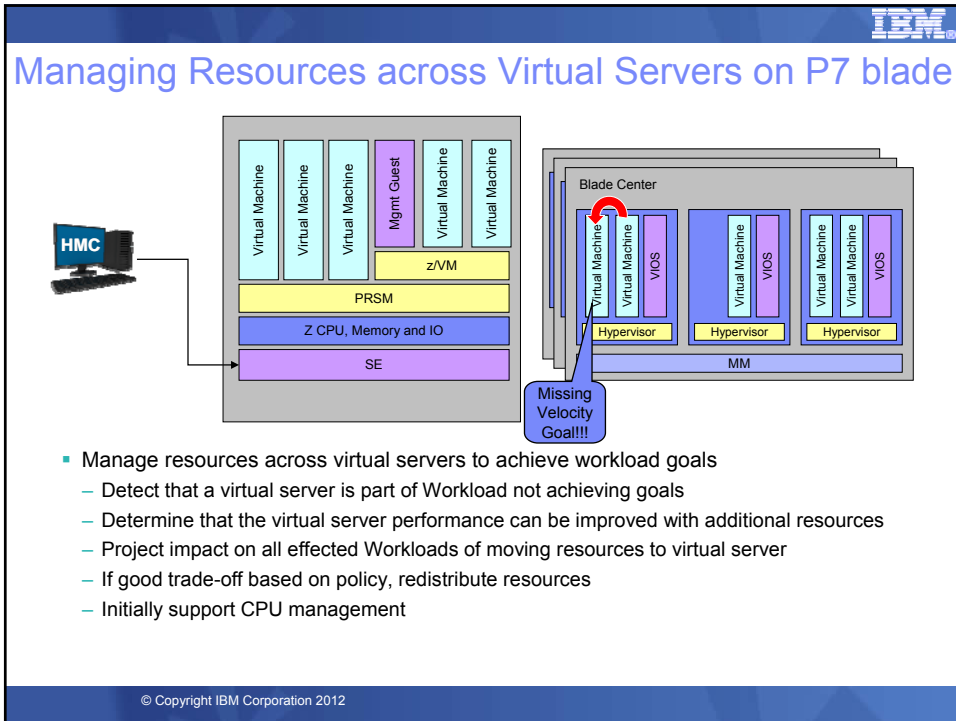
## Elements of a Service Class

- **Performance Goal (managed at the virtual server level)**
  - Velocity: Fastest, Fast, Moderate, Slow, Slowest
  - Discretionary: No performance goal
- **Business Importance:** Highest, High, Medium, Low, Lowest
- **Classification Rule**
  - Use Virtual Server Name as qualifier to assign Service Class
  - Virtual Servers under the PR/SM and System x hypervisors should be classified into a Service Class for resource monitoring purposes

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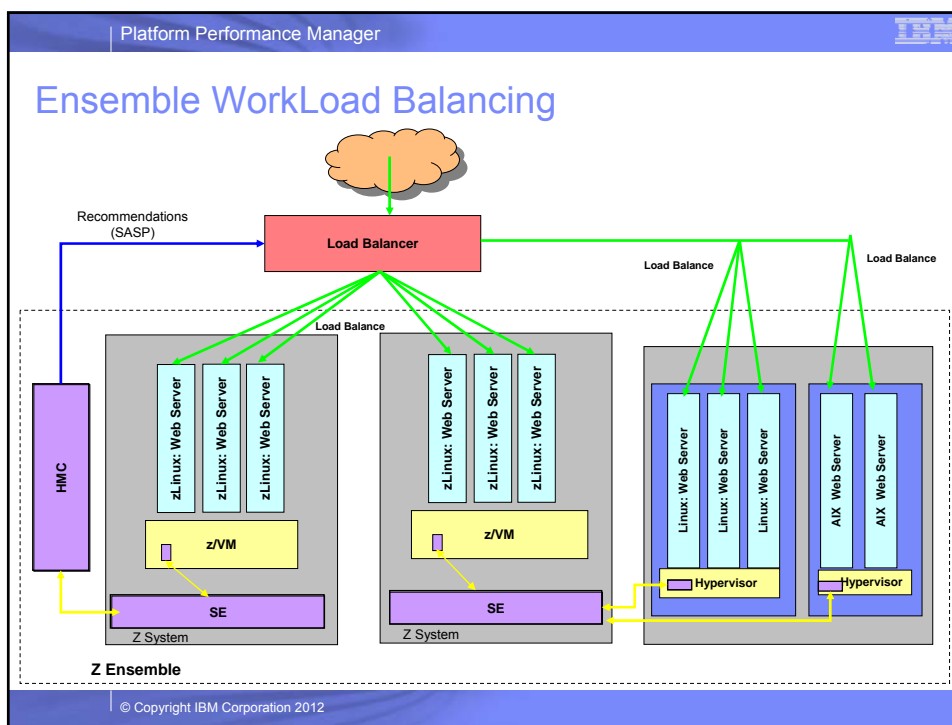





## Managing Resources across z/VM Virtual Machines

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

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Platform Performance Manager 

## PPM Load Balancing Function

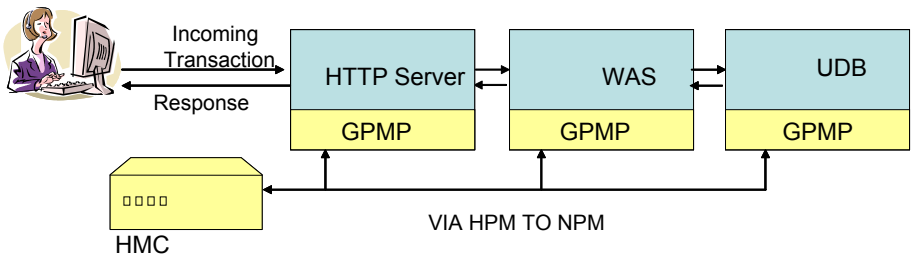
- **Objective: Influence workload balancing decisions across a System z Ensemble**
  - Use SASP protocol to make recommendations for workload balancers (e.g. IP switches / routers that load balance)
  - HMC hosts SASP function
  - Scope of recommendations is non-z/OS virtual servers within the ensemble
    - z/OS Load Balancing Advisor (LBA) provides SASP recommendations for z/OS
    - Same SASP client code can interact with both LBA and HMC SASP implementations to provide complete coverage of z environment
  - HMC recommendations based on the platform performance manager's understanding of the current performance of the members of a load balancing group
    - Recommendation based on overall utilization and delays experienced by virtual servers
    - If IP address and port used to register members of a load balancing group, port is used to determine application availability on each member of load balancing group. Weight of 0 given to members where port is not open

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Platform Performance Manager 

## Unified Resource Manager View

- **GPMP will sample system statistics**
- **GPMP will know whether application is currently running or not**

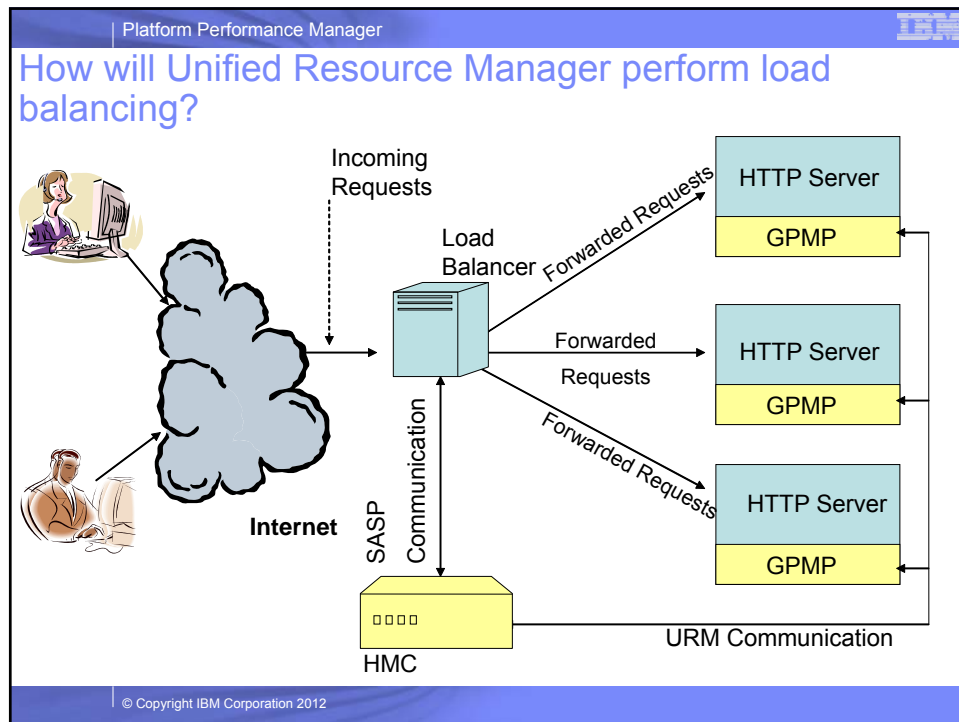


```

graph LR
    Client[Client] -- "Incoming Transaction" --> HTTP[HTTP Server]
    HTTP -- "Response" --> Client
    HTTP <--> WAS[WAS]
    WAS <--> UDB[UDB]
    HMC[HMC] -- "VIA HPM TO NPM" --> GPMPs
    subgraph GPMPs
        GPMP1[GPMP]
        GPMP2[GPMP]
        GPMP3[GPMP]
    end
    GPMP1 --- HTTP
    GPMP2 --- WAS
    GPMP3 --- UDB
  
```

The diagram illustrates the Unified Resource Manager View. It shows a client (represented by a person at a computer) sending an 'Incoming Transaction' to an 'HTTP Server'. The 'HTTP Server' returns a 'Response' to the client. The 'HTTP Server' is connected to 'WAS' (WebSphere Application Server) and 'UDB' (Universal Database), which are also connected to each other. Below these components are three 'GPMP' (Global Performance Monitor) boxes, each associated with one of the main components. These GPMPs are connected to an 'HMC' (Hardware Management Console) box via a path labeled 'VIA HPM TO NPM'.

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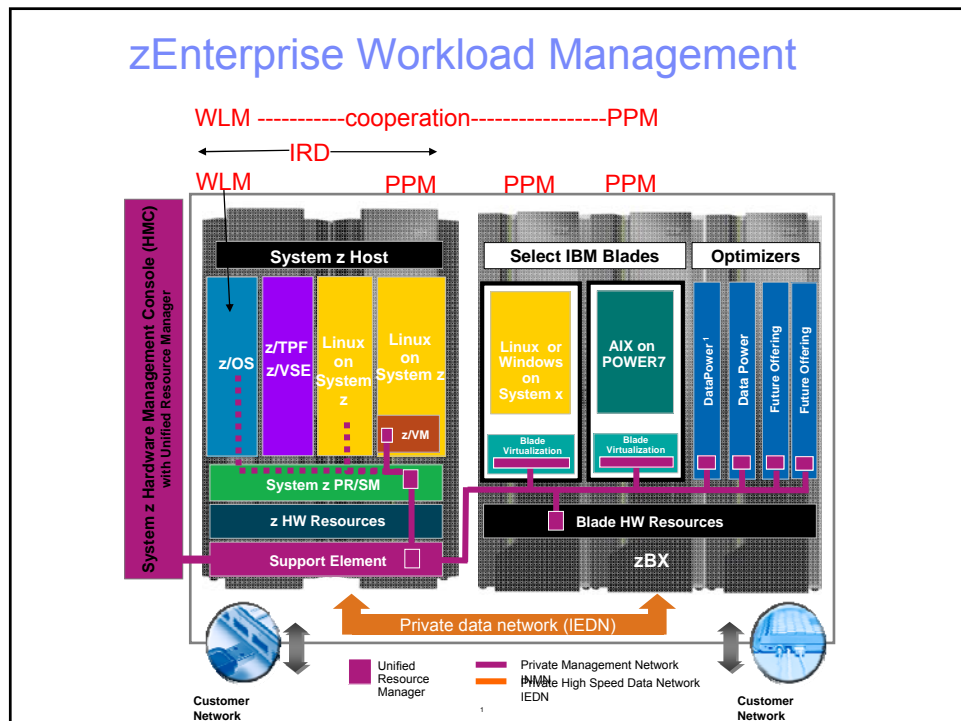
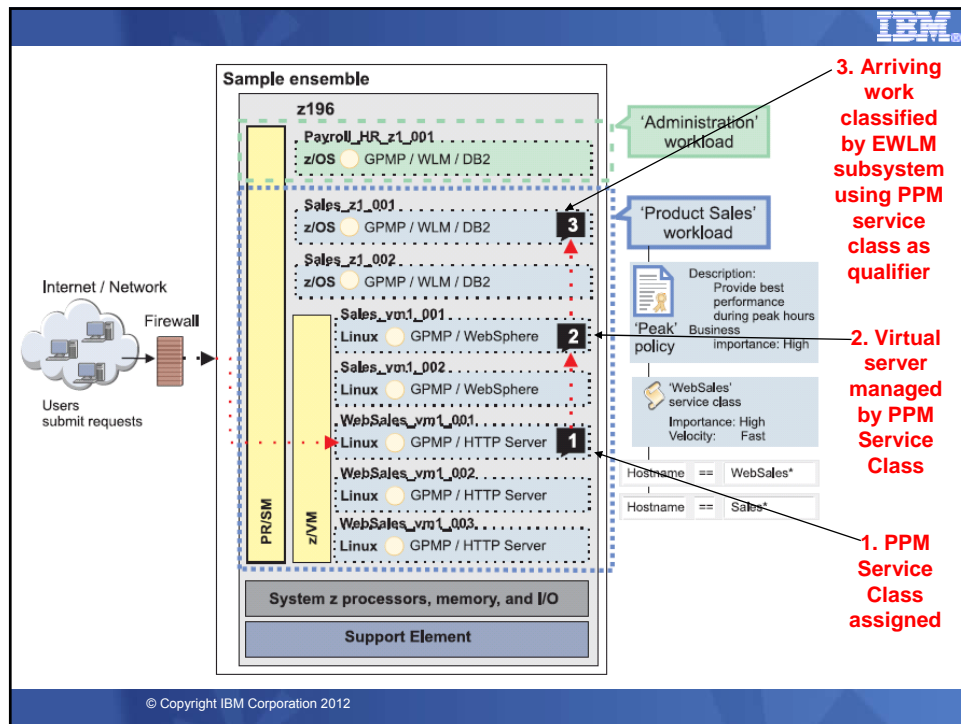


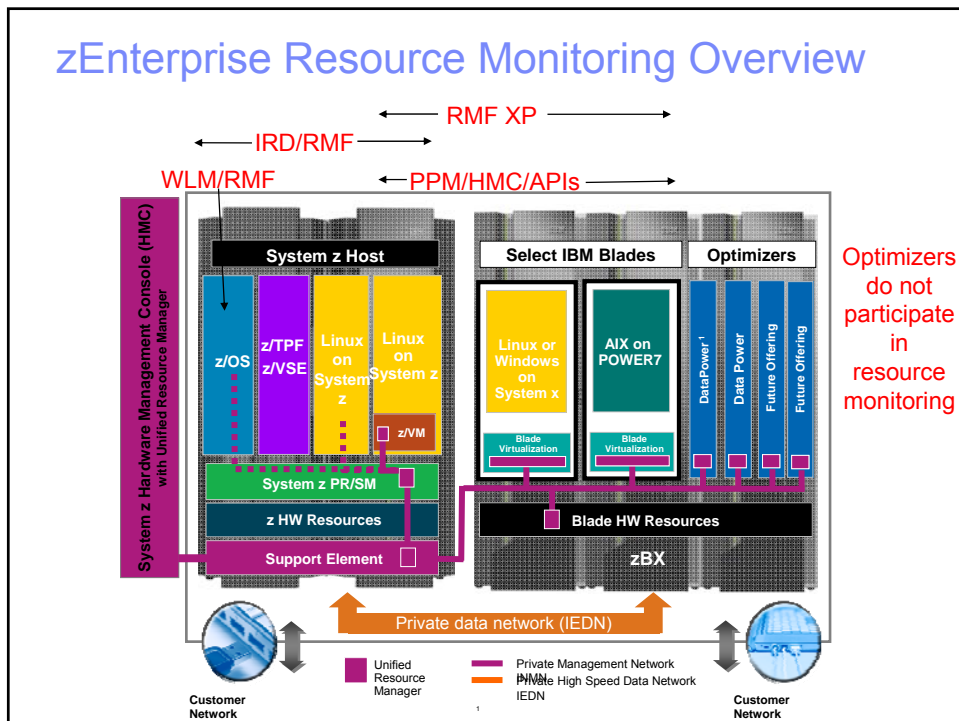
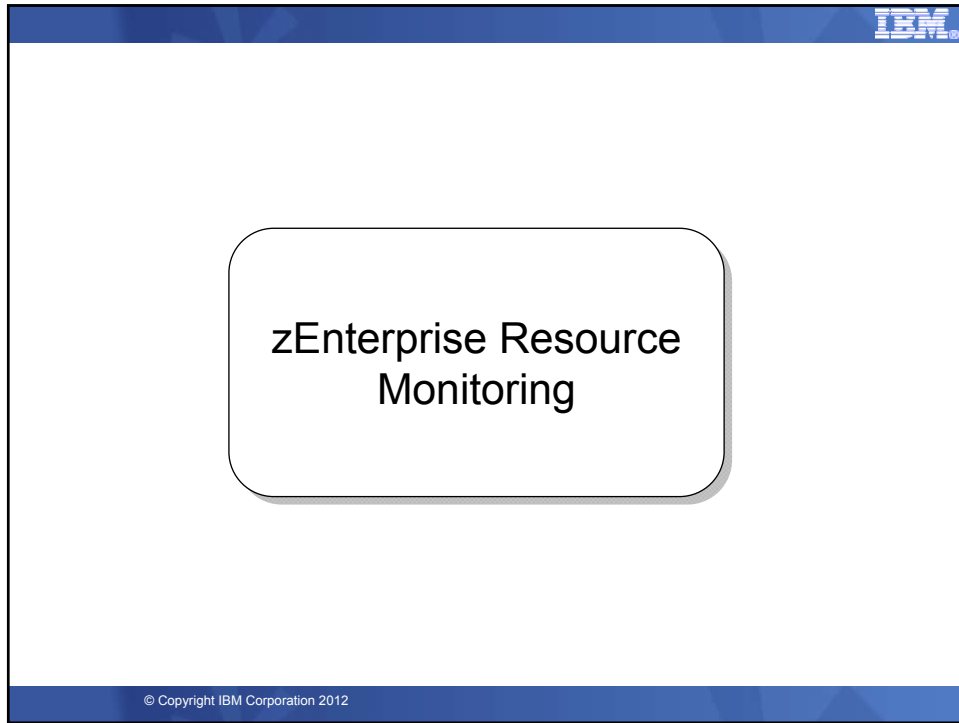
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### Co-operative management with z/OS WLM

- z/OS provides differentiated service to PPM classified work
- Transaction coming to z/OS needs to be ARM instrumented via Guest Platform Management Provider (GPMP) implementation
- WLM service definition needs to map PPM service classes to z/OS WLM service classes via EWLM classification rules
- PPM service class associated with transaction is used by WLM to classify work unit to a different WLM service class.
- WLM manages the resources based on the goal assigned to this specific service class.

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## PPM Workload Based Monitoring and Reporting

- Provide reporting capability that shows usage of platform resources in a Workload context within a zEnterprise Ensemble scope
  - Across virtual servers / partitions supporting the Workload
- Workload goal vs actual reporting
- Drill down from overall Workload “performance health” view to contributions of individual virtual server
- Graphical views
  - Topology, trending graphs, etc
- Links to system activity displays to show hardware utilization views
- Reporting is limited to platform level resources, not trying to replicate tools that report on intra-OS resources and performance

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## Workload Monitoring Overview

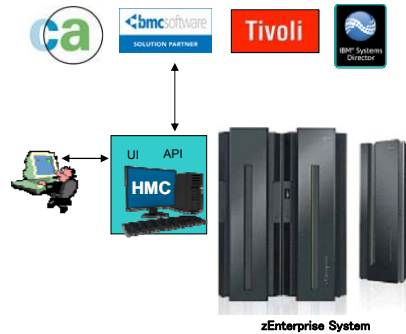
- Provide monitoring on the HMC based on a Workload context
- Display of current data and fairly recent history
  - Current stake in the ground is 36 hours of history
  - Interval of data displayed is user selectable
  - Granularity of data kept in repository changes over time
    - 1 minute granularity kept for most recent hour
    - 15 minute interval data kept after first hour

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## Unified Resource Manager APIs *Enabling External Management Tools*

- New API support allows programmatic access to the same underlying functions exploited by the HMC user interface (UI)
  - ▶ Same resource types, instances and policies
  - ▶ API functions corresponding to views and tasks in the UI
    - Listing resource instances
    - Creating, changing, deleting resource instances
    - Operational control of resource instances
- Access to functions will enable management of Unified Resource Manager from external (to HMC) tools
- Initially the priority scenarios will be the discovery, monitoring, and provisioning use cases

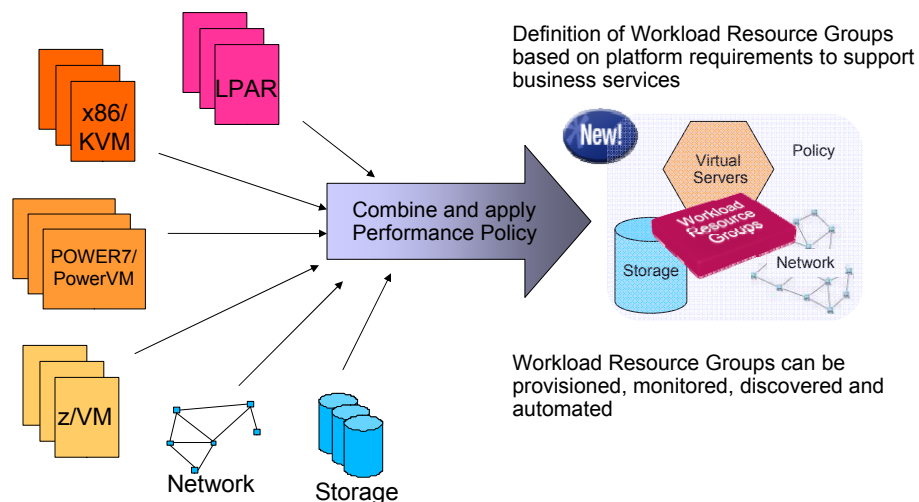


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## Unified Resource Manager APIs intended to enable Tivoli to create and manage Workload Resource Groups

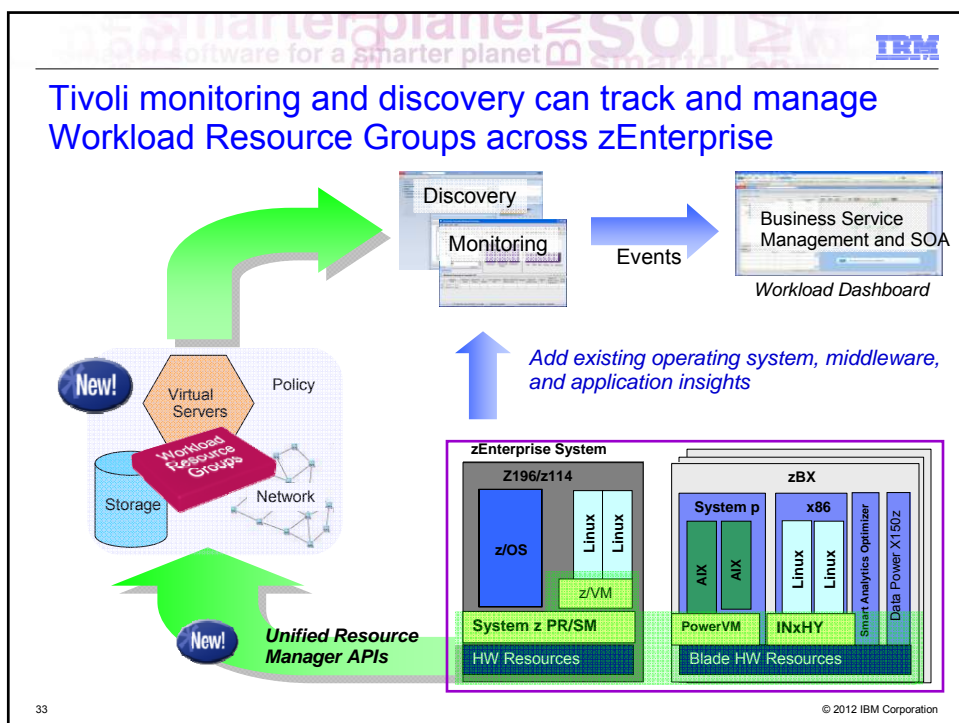


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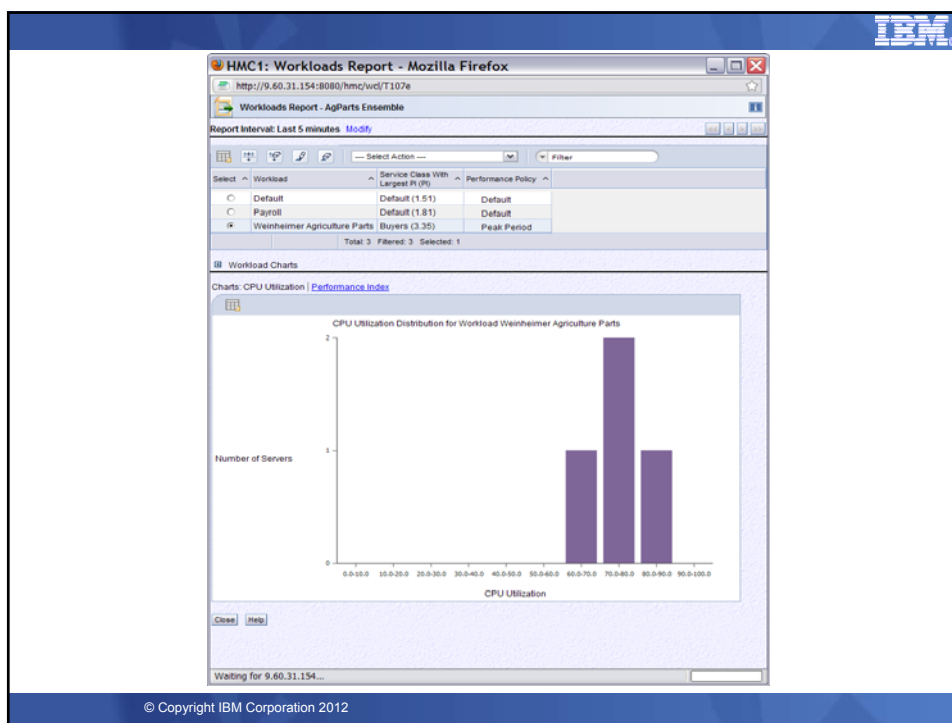
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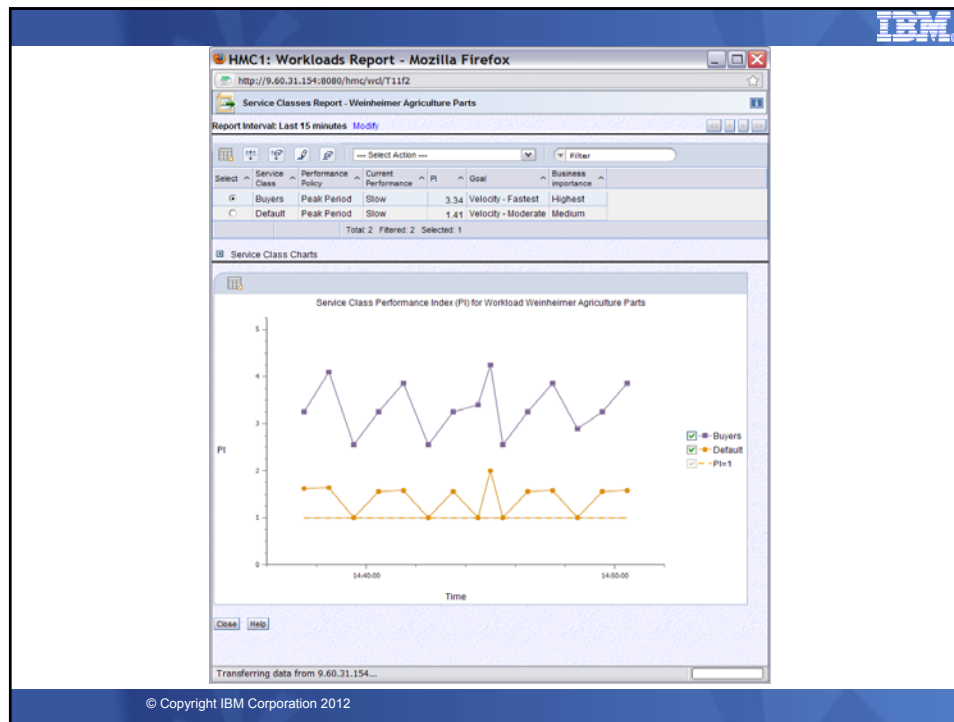
## Workload Monitoring Overview...

- Workload Report
  - Display high level view of “performance health” of each Workload
  - Indication if a Workload contains service class missing goals
  - Worst performing service class / performance index
  - Details of specific Workloads
    - Graph of PI of worst performing service class
      - Option to graph other service classes
    - Bar graph of virtual server utilization distribution
      - Visualize view of workload overall load
  - Drill down to Workload’s service class report



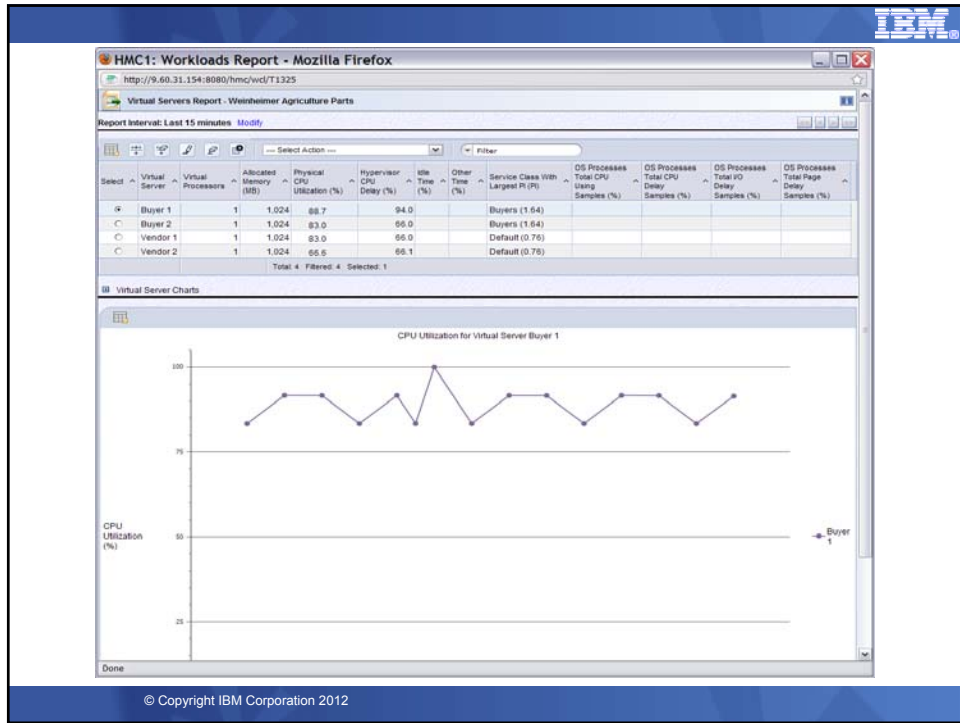
## Workload Monitoring Overview...

- Service Class Report
  - High-level view of each service class in Workload's performance policy
    - Goal and importance
    - Actual performance
    - Indication if monitoring event is established for service class and event is triggered
    - Service class details
      - Graph of service class performance index
    - Drill down to virtual server report for Workload
- Event Monitoring
  - Initial support:
    - Leverage HMC event monitoring
      - Send e-mail when selected metrics reach threshold
    - Service Class PI threshold
    - Virtual Server CPU Utilization threshold



## Workload Monitoring Overview...

- **Workload virtual server report**
  - List of virtual servers in a service class
    - Virtual server velocity
    - Resource usage
      - Physical CPU utilization
      - OS view of CPU utilization
      - Physical memory used
    - Hypervisor delay percentage
- **Resource adjustment report**
  - Resource adjustment actions taken over report interval



**HMC1: Workloads Report - Mozilla Firefox**  
 http://9.60.31.154:8080/hmc/vcd/T1400

**Virtual Server Resource Adjustments Report - Buyer 1**  
 Report Interval: Last 15 minutes [Modify](#)

**Successful Adjustments**

| Receiver Virtual Servers | Receiver Workload            | Receiver Service Class | Receiver Processing Units After (Before) | Donor Virtual Servers | Donor Workload               | Donor Processing Units After (Before) | Time                    |
|--------------------------|------------------------------|------------------------|--|-----------------------|------------------------------|---------------------------------------|-------------------------|
| Buyer 1                  | Weinheimer Agriculture Parts | Buyers                 | 0.52 (0.50)                              | Payroll App           | Payroll                      | 0.49 (0.50)                           | Jul 11, 2010 4:13:18 PM |
| Buyer 1                  | Weinheimer Agriculture Parts | Buyers                 | 0.52 (0.50)                              | Vendor 1              | Weinheimer Agriculture Parts | 0.49 (0.50)                           | Jul 11, 2010 4:13:18 PM |
| Total: 2 Filtered: 2     |                              |                        |  |                       |                              |                                       |                         |

**Failed Adjustments**

| Receiver Virtual Servers | Receiver Workload | Receiver Service Class | Failure Reason | Time |
|--------------------------|-------------------|------------------------|----------------|------|
| Total: 0 Filtered: 0     |                   |                        |                |      |

[Close](#) [Help](#)

Done

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### PPM Hypervisor Report

**System Statistics:**

- Processor count: 8
- Total CPU consumption: 4.6%
- Total memory allocated for LPARs: 32,768 MB
- Total memory: 65,536 MB
- Total processor entitlement: 6.84

**Virtual Servers**

| Virtual Server       | Processor Management Status | Processor Management Reason | Virtual Processor Count | Consumed Processors | Hypervisor Processing Unit Delay (%) | Allocated Memory (MB) | LPAR Capped | Uncapped Weight | Current Entitled Capacity | Defined Entitled Capacity | Min Entitled Capacity |
|----------------------|-----------------------------|-----------------------------|-------------------------|---------------------|--------------------------------------|-----------------------|-------------|-----------------|---------------------------|---------------------------|-----------------------|
| r90f1b207v2          | Active                      | None                        | 2                       | 0.01                | 0.0                                  | 4,096                 | —           | 128             | 180                       | 180                       | 10                    |
| r90f1b207v3          | Active                      | None                        | 2                       | 0.02                | 0.0                                  | 4,096                 | —           | 128             | 20                        | 20                        | 20                    |
| r90f1b207v4          | Active                      | None                        | 2                       | 0.01                | 0.0                                  | 4,096                 | —           | 128             | 139                       | 139                       | 10                    |
| r90f1b207v5          | Active                      | None                        | 2                       | 0.01                | 0.0                                  | 4,096                 | —           | 128             | 140                       | 140                       | 10                    |
| Total: 8 Filtered: 8 |                             |                             |                         |                     |                                      |                       |             |                 |                           |                           |                       |

**Successful Adjustments**

| Receiver Virtual Servers | Receiver Workload     | Receiver Service Class | Receiver Processing Units After (Before) | Donor Virtual Servers | Donor Workload | Donor Processing Units After (Before) | Time                     |
|--------------------------|-----------------------|------------------------|--|-----------------------|----------------|---------------------------------------|--------------------------|
| r90f1b207v7              | WkldForModerateMedium | SnCIsForModerateMedium | 0.45 (0.25)                              | r90f1b207v2           | Default        | 1.72 (1.80)                           | Sep 29, 2010 11:33:19 AM |
| r90f1b207v7              | WkldForModerateMedium | SnCIsForModerateMedium | 0.45 (0.25)                              | r90f1b207v4           | Default        | 1.35 (1.39)                           | Sep 29, 2010 11:33:19 AM |
| r90f1b207v7              | WkldForModerateMedium | SnCIsForModerateMedium | 0.45 (0.25)                              | r90f1b207v5           | Default        | 1.36 (1.40)                           | Sep 29, 2010 11:33:19 AM |
| r90f1b207v7              | WkldForModerateMedium | SnCIsForModerateMedium | 0.45 (0.25)                              | r90f1b207v6           | Default        | 1.36 (1.40)                           | Sep 29, 2010 11:33:19 AM |
| Total: 4 Filtered: 4     |                       |                        |  |                       |                |                                       |                          |

**Failed Adjustments**

Done

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### Benefits of GPMP

- Guest Platform Management Provider (GPMP) is a lightweight component of PPM that provides additional monitoring data
- Allows cooperative management with z/OS WLM
- Allows virtual server to be classified using additional attributes such as HostName, SystemName, OS Level etc.
- GPMP provides data for recommendation for load balancing function
- With instrumented middleware support, GPMP provides metrics that allows detailed transaction topology as transaction hops through heterogeneous platforms in zEnterprise

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## Benefits of Middleware instrumentation

- Transaction response time reporting
- Multi-tiered work request flow across environments
- Relationship to server resources being consumed
- Same reasoning lead to instrumentation of z/OS subsystems (CICS, IMS, DB2, etc) for z/OS WLM
- OpenGroup Application Response Measurement (ARM) standards based instrumentation.

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## Topology report with GPMP active

**Hops Report - SrcClsForFastestHighest in Workload WldForFastestHighest**  
Report Interval: Starting 9/28/10 8:55:01 AM for 15 minutes (9/28/10 9:10:01 AM) Modify

| Name                         | Hop Number | Group Name      | Successful Transactions | Failed Transactions | Skipped Transactions | Inflight Transactions | Queue Time (s) | Execution Time (s) | Successful Average Response Time (s) |
|------------------------------|------------|-----------------|-------------------------|---------------------|----------------------|-----------------------|----------------|--------------------|--------------------------------------|
| WebSphere APPLICATION_SERVER | 0          | g1sr011         | 0                       | 0                   | 0                    | 0                     | 0.000          | 0.000              | 0.000                                |
| IBM DB2 Universal Database   | 0          | db0mr01         | 0                       | 0                   | 0                    | 0                     | 0.000          | 0.000              | 0.000                                |
| WebSphere APPLICATION_SERVER | 0          | server1         | 0                       | 0                   | 0                    | 0                     | 0.000          | 0.000              | 0.000                                |
| IBM WebSphere Plugin         | 0          | IBM_HTTP_Server | 31,195                  | 0                   | 0                    | 11                    | 0.010          | 0.000              | 0.157                                |
| r90f1b207v3                  | 0          |                 | 31,195                  | 0                   | 0                    | 11                    | 0.010          | 0.000              | 0.157                                |
| Hop 1                        | 1          | g1sr012         | 33,307                  | 0                   | 0                    | 7                     | 0.000          | 0.019              | 0.053                                |
| WebSphere APPLICATION_SERVER | 1          | server1         | 33,307                  | 0                   | 0                    | 7                     | 0.000          | 0.019              | 0.053                                |
| r90f1b207v3                  | 1          |                 | 33,307                  | 0                   | 0                    | 7                     | 0.000          | 0.019              | 0.053                                |
| Hop 2                        | 2          |                 | 2,454,512               | 0                   | 0                    | 2                     | 0.000          | 0.000              | 0.000                                |
| DB2                          | 2          | DBQ2LOC1        | 2,454,512               | 0                   | 0                    | 2                     | 0.000          | 0.000              | 0.000                                |
| ZG1                          | 2          |                 | 2,454,512               | 0                   | 0                    | 2                     | 0.000          | 0.000              | 0.000                                |
| Total: 13 Filtered: 13       |            |                 |                         |                     |                      |                       |                |                    |                                      |

**Virtual Server Topology Report - SrcClsForFastestHighest in Workload WldForFastestHighest**  
Report Interval: Starting 9/28/10 1:49:38 PM for 15 minutes (9/28/10 2:04:38 PM) Modify

```

graph LR
    r90f1b207v3 -- 33302 --> r90f1b207v3
    r90f1b207v3 -- 2396183 --> ZG1
  
```

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## Cross Platform Performance Monitoring with RMF XP

- The Common Information Model (aka CIM) instrumentation is available for almost all operating systems on this planet
- RMF has the infrastructure already in place to
  - combine performance data from multiple systems to a Sysplex wide view
  - display performance data by means of state-of-the-art graphical frontends
- RMF XP brings these two well-proven things together
- RMF XP supports the following operating systems:
  - AIX on System p
  - Linux on System x
  - Linux on System z

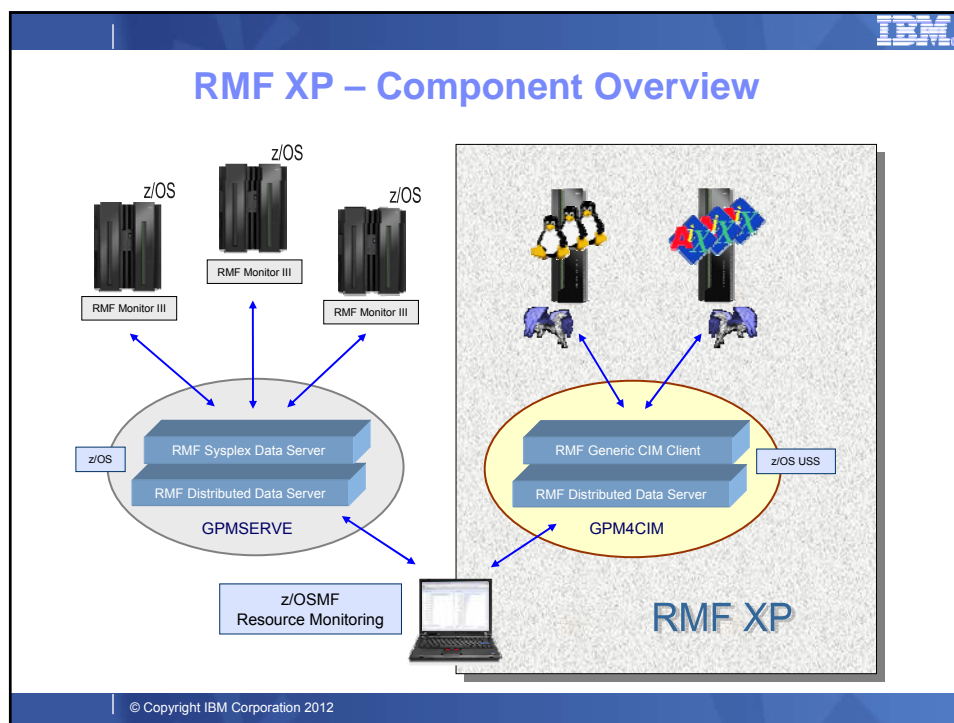
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## RMF XP

- Seamless performance monitoring solution for z/OS and distributed platforms
- z/OS as management platform for distributed environments
- Easy to setup, almost no customization needed
- Two graphical frontends
  - ▶ Instant access via web browser
  - ▶ z/OSMF with advanced capabilities
- zIIP exploitation helps to reduce costs
- Available with z/OS V1R13 RMF and z/OS V1R12 RMF (APAR OA36030)

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## Invocation

- Started Task: SYS1.PROCLIB(GPM4CIM)
- Runs in USS Environment via BPXBATCH
- Multiple instances can run in parallel: one STC per platform
  - ▶ S GPM4CIM.GPM4A,OS=A
  - ▶ S GPM4CIM.GPM4X,OS=X
  - ▶ S GPM4CIM.GPM4Z,OS=Z

```

//GPM4CI M  PROC  OS=X
//STEP1    EXEC  PGM=BPXBATCH, TIME=NOLIMIT, REGION=OM,
//          PARM='PGM /usr/lpp/gpm/bin/gpm4cim cfg=/etc/gpm/gpm4&OS..cfg'
//STDENV   DD   PATH=/etc/gpm/gpm4cim.env'
//STDOUT   DD   PATH=/var/gpm/logs/gpm4cim&OS..out' ,
//          PATHOPTS=(OWRONLY, OCREAT, OTRUNC),
//          PATHMODE=(SI RUSR, SI WUSR, SI RGRP)
//STDERR   DD   PATH=/var/gpm/logs/gpm4cim&OS..trc' ,
//          PATHOPTS=(OWRONLY, OCREAT, OTRUNC),
//          PATHMODE=(SI RUSR, SI WUSR, SI RGRP)
//SYSPRI NT DD   SYSOUT=*
//SYSOUT   DD   SYSOUT=*
//          PEND
  
```

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## Resource Models

**AIX\_SYSTEM\_COMPLEX**

- AIX\_IMAGE
- ACTIVE\_MEMORY\_EXPANSION
- ACTIVE\_MEMORY\_SHARING
- ALL\_DISKS
- DISK
- ALL\_LOGICAL\_PROCESSORS
- LOGICAL\_PROCESSOR
- ALL\_NETWORK\_PORTS
- NETWORK\_PORT
- ALL\_LOCAL\_FILE\_SYSTEMS
- LOCAL\_FILE\_SYSTEM
- ALL\_PROCESSES
- PROCESS
- ALL\_SHARED\_ETHERNET\_ADAPTERS
- SHARED\_ETHERNET\_ADAPTER
- ALL\_VIRTUAL\_TARGET\_DEVICES
- VIRTUAL\_TARGET\_DEVICE
- PARTITION
- MEMORY

**XLINUX\_SYSTEM\_COMPLEX**

- XLINUX\_IMAGE
- ALL\_LOCAL\_FILE\_SYSTEMS
- LOCAL\_FILE\_SYSTEM
- ALL\_IP\_PROTOCOL\_ENDPOINTS
- IP\_PROTOCOL\_ENDPOINT
- ALL\_LOGICAL\_PROCESSORS
- LOGICAL\_PROCESSOR
- ALL\_NETWORK\_PORTS
- NETWORK\_PORT
- ALL\_PROCESSES
- PROCESS
- ALL\_KVM\_GUESTS
- KVM\_GUEST
- ALL\_XEN\_GUESTS
- XEN\_GUEST

**ZLINUX\_SYSTEM\_COMPLEX**

- CEC
- LPAR
- ZLINUX\_IMAGE
- ALL\_LOCAL\_FILE\_SYSTEMS
- LOCAL\_FILE\_SYSTEM
- ALL\_IP\_PROTOCOL\_ENDPOINTS
- IP\_PROTOCOL\_ENDPOINT
- ALL\_LOGICAL\_PROCESSORS
- LOGICAL\_PROCESSOR
- ALL\_NETWORK\_PORTS
- NETWORK\_PORT
- ALL\_PROCESSES
- PROCESS
- ALL\_CHANNELS
- CHANNEL
- ALL\_VOLUMES
- VOLUME

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## RMF XP – Resource Tree

The screenshots show the RMF Performance Data Portal interface. The first screenshot shows the 'Children of: .WEBPlex.AIX\_SYSTEM\_COMPLEX' tree. The second screenshot shows the 'Children of: .tmcc-123-141,ALL\_NETWORK\_PORTS' tree. The third screenshot shows the 'Children of: .tmcc-123-141,AIX\_IMAGE' tree.

**Children of: .WEBPlex.AIX\_SYSTEM\_COMPLEX**

| Icon | Resource               | Metrics | Attributes | Res Type  |
|------|------------------------|---------|------------|-----------|
| 📁    | tmcc-123-141.AIX_IMAGE | Metrics | N/A        | AIX_IMAGE |
| 📁    | tmcc-123-141.AIX_IMAGE | Metrics | N/A        | AIX_IMAGE |
| 📁    | tmcc-123-141.AIX_IMAGE | Metrics | N/A        | AIX_IMAGE |
| 📁    | tmcc-123-141.AIX_IMAGE | Metrics | N/A        | AIX_IMAGE |

**Children of: .tmcc-123-141,ALL\_NETWORK\_PORTS**

| Icon | Resource               | Metrics | Attributes | Res Type  |
|------|------------------------|---------|------------|-----------|
| 📁    | tmcc-123-141.AIX_IMAGE | Metrics | N/A        | AIX_IMAGE |
| 📁    | tmcc-123-141.AIX_IMAGE | Metrics | N/A        | AIX_IMAGE |
| 📁    | tmcc-123-141.AIX_IMAGE | Metrics | N/A        | AIX_IMAGE |
| 📁    | tmcc-123-141.AIX_IMAGE | Metrics | N/A        | AIX_IMAGE |

**Children of: .tmcc-123-141,AIX\_IMAGE**

| Icon | Resource               | Metrics | Attributes | Res Type  |
|------|------------------------|---------|------------|-----------|
| 📁    | tmcc-123-141.AIX_IMAGE | Metrics | N/A        | AIX_IMAGE |
| 📁    | tmcc-123-141.AIX_IMAGE | Metrics | N/A        | AIX_IMAGE |
| 📁    | tmcc-123-141.AIX_IMAGE | Metrics | N/A        | AIX_IMAGE |
| 📁    | tmcc-123-141.AIX_IMAGE | Metrics | N/A        | AIX_IMAGE |

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