zEnterprise eXposed!
Experiences with zManager
Guest Platform Management Provider

Session 10003

Mary Astley
Advanced Technical Skills
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DB2*                  PR/SM                   WebSphere*
Datapower*            RMF                     z/OS*
IBM*                  Rational                z/VM*
Parallel Sysplex       System p*               zEnterprise

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Agenda

Platform Performance Management

♦ Role
♦ Workloads
♦ Application Response Measurement
♦ Guest Platform Management Provider

Reports

♦ Workloads report
♦ Virtual servers report
♦ Hops report
♦ Topology report
IBM zEnterprise Unified Resource Manager (zManager)

IBM zEnterprise System

IBM zEnterprise 196 (z196)

IBM zEnterprise BladeCenter Extension (zBX)

IBM zEnterprise Unified Resource Manager is firmware that executes on the IBM zEnterprise 196 Support Element (SE) and the Hardware Management Console (HMC).
Platform Performance Management

- zManager component responsible for workload based, goal oriented resource management, monitoring, and reporting
- Scope is the ensemble
- User interface is the ensemble HMC
- Workload goals are specified in workload performance policy
- Workload monitoring to determine if performance goals are being met
- Manage processor resources across AIX virtual servers and z/VM virtual servers
- Optional Guest Platform Management Provider to interface with operating systems
PPM Key Pieces

Ensemble

Workload Performance Policies

ARM

GPMP
zManager Workload

A workload is a customer defined collection of virtual servers

♦ Provides a way to group virtual servers to manage and monitor performance for a business application
♦ Has one or more performance policies
♦ Specify workload importance and goals in performance policy

Virtual servers in a workload

♦ Must be in the same ensemble
♦ Can be on different blades or nodes
♦ May reside in more than one workload
♦ Virtual servers not assigned to a custom workload are in default workload
Performance Policy

Active performance policy is used by zManager to manage platform resources used by the virtual servers.
A 'Default' performance policy is provided.
Additional policies may be defined, as needed.
Only one policy can be active.
Change active policy dynamically.
Each performance policy has
  ♦ A unique name
  ♦ Business importance:
    Highest, High, Medium, Low, or Lowest
  ♦ One or more service classes
Service Classes

Performance policy has a ‘default’ service class
Additional service classes may be defined
Each service class has

♦ Unique name
♦ Performance goal type
  Discretionary
  Velocity – Fastest, Fast, Moderate, Slow, Slowest
♦ Business importance for velocity goal
  Highest, High, Medium, Low, or Lowest
♦ Classification rules to assign incoming work to service class

zManager will assign a PI for every service class

♦ PI = 1.0 – Service Class Achieving Goal
♦ PI > 1.0 – Service Class Missing Goal
♦ PI < 1.0 – Service Class Overachieving Goal
Defining a Workload
New Workload

Hardware Management Console

Ensemble Management > ATSENS1 > Workloads

Tasks: Workloads

Configuration
New Workload

New Workload: Create a new ensemble workload. - Click to launch
Welcome
Welcome to the New Workload wizard.

Use this wizard to create a workload. A workload provides you with a resource through which you can manage and monitor the end-to-end work being done by your virtual servers.

This wizard guides you through the following tasks:

- Naming and categorizing the workload
- Defining the virtual servers which perform work
- Creating performance policies to specify performance goals
- Creating service classes to prioritize and classify work within a policy
- Activating a performance policy
### New Workload - ATSENS1

- **Welcome**
- **Workload Name**

Select Virtual Servers
Create Performance Policy
Create Service Class
Service Class Goal
Classification Rule
Manage Service Classes
Manage Performance Policies
Activate Policy
Summary

#### Workload Name

Enter a name, description, and category for the workload.

<table>
<thead>
<tr>
<th>Name:</th>
<th>Trade_wkld</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description</td>
<td>Mary's Trade Workload</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Category:</th>
<th></th>
</tr>
</thead>
</table>

## Select Virtual Servers

Select virtual servers and custom groups to add into the workload. Adding a custom group into the workload adds all virtual servers in the group.

**Show:** All virtual servers

### Available Virtual Servers:

<table>
<thead>
<tr>
<th>Select</th>
<th>Name</th>
<th>Hyperviso</th>
<th>Workloads</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>psidwl_c</td>
<td>B.2.03</td>
<td></td>
</tr>
<tr>
<td></td>
<td>rjaihs1</td>
<td>B.2.14</td>
<td>rja_wkld</td>
</tr>
<tr>
<td></td>
<td>rjaihs2</td>
<td>B.2.14</td>
<td></td>
</tr>
<tr>
<td></td>
<td>rjawas1</td>
<td>B.2.14</td>
<td>rja_wkld</td>
</tr>
<tr>
<td></td>
<td>rjawas2</td>
<td>B.2.14</td>
<td>rja_wkld</td>
</tr>
<tr>
<td></td>
<td>robaix1</td>
<td>B.2.13</td>
<td></td>
</tr>
<tr>
<td></td>
<td>TOSP1</td>
<td>TSYS</td>
<td></td>
</tr>
<tr>
<td></td>
<td>TOSP11</td>
<td>TSYS</td>
<td>rja_wkld, ZMGRT</td>
</tr>
<tr>
<td></td>
<td>TOSP12</td>
<td>TSYS</td>
<td></td>
</tr>
<tr>
<td></td>
<td>TOSP13</td>
<td>TSYS</td>
<td></td>
</tr>
<tr>
<td></td>
<td>TOSP14</td>
<td>TSYS</td>
<td></td>
</tr>
</tbody>
</table>

Total: 134  Filtered: 134  Selected: 0

**Selected:**
- TOSP11 (TSYS)
- zmgrt1h (B.2.05)
- zmgrt2h (B.2.06)
- zmgrt2w (B.2.06)
Create Performance Policy

You may create a performance policy for the workload now or use the default performance policy and create a performance policy later.

*Create Option
- Default
- New
- New based on: [Drop-down list]

Policy Details

<table>
<thead>
<tr>
<th>Field</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Workload</td>
<td>Trade_wkld</td>
</tr>
<tr>
<td>Name</td>
<td>Trade_policy</td>
</tr>
<tr>
<td>Description</td>
<td>Performance policy for Trade application</td>
</tr>
<tr>
<td>Business importance</td>
<td>[Drop-down list]</td>
</tr>
</tbody>
</table>
Create Service Class - Trade_policy

You may create a service class for the performance policy now or use the default service and create a service class later.

*Create Option
- Default
- New
- New based on: 

Service Class Details
- Workload: Trade_wkld
- Performance policy: Trade_policy
- Name: *TradeSC
- Description: Service Class for Trade application
Service Class Goal - Trade_policy:TradeSC
Selected the performance goal and business importance for this service class.

Performance Goal
- Velocity: Fast
- Discretionary

Business importance:
- Highest
- High
- Medium
- Low
- Lowest
Workload Classification Rule

Classification Rule - Trade_policy:TradeSC

Define the service class's classification rule using the rule builder.

Classification rule:

- Logical Operators
  - AND
  - OR

- Virtual Server Name == zmgrt.h
- Virtual Server Name == zmgrt2w

- <Select Filter Type> == ?
  - Hostname
  - OS Level
  - OS Name
  - OS Type
  - Virtual Server Name
### Manage Service Classes - Trade_policy

Create, delete, edit, or re-order service classes for this policy.

<table>
<thead>
<tr>
<th>Select</th>
<th>Service Class</th>
<th>Performance Goal</th>
<th>Business Importance</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>○</td>
<td>TradeSC</td>
<td>Velocity - Fast</td>
<td>High</td>
<td>Service Class for Trade application</td>
</tr>
<tr>
<td>○</td>
<td>Default</td>
<td>Velocity - Moderate</td>
<td>Medium</td>
<td>The default workload performance</td>
</tr>
</tbody>
</table>

Total: 2  Selected: 0
### Manage Performance Policies

Use the table below to edit or delete a defined performance policy or create another performance policy.

<table>
<thead>
<tr>
<th>--- Select Action ---</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Select</td>
<td>Policy</td>
<td>Importance</td>
<td>Description</td>
</tr>
<tr>
<td>○ Trade_policy</td>
<td>High</td>
<td></td>
<td>Performance policy for Trade application</td>
</tr>
<tr>
<td>○ Default</td>
<td>Medium</td>
<td></td>
<td>The default workload performance policy</td>
</tr>
</tbody>
</table>

Total: 2  Selected: 0
## Workload Activate Performance Policy

### Activate Policy

Select the performance policy to activate when the workload is created.

<table>
<thead>
<tr>
<th>Select</th>
<th>Performance Policy</th>
<th>Business Importance</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>✔️</td>
<td>Trade_policy</td>
<td>High</td>
<td>Performance policy for Trade application</td>
</tr>
<tr>
<td>⬜️</td>
<td>Default</td>
<td>Medium</td>
<td>The default workload performance policy</td>
</tr>
</tbody>
</table>

Total: 2

- Launch Customize Scheduled Operations to schedule future performance policy activations. The task will be launched after the workload has been created.
Workload Summary

New Workload - ATSENS1

Welcome
✓ Workload Name
✓ Select Virtual Servers
✓ Create Performance Policy
✓ Create Service Class
✓ Service Class Goal
✓ Classification Rule
✓ Manage Service Classes
✓ Manage Performance Policies
✓ Activate Policy
→ Summary

Summary
Click Finish to create the workload, its performance policies and their service classes and activate the selected policy.

Workload
Name: Trade_wkld
Active performance policy: Trade_policy
Description: Mary’s Trade Workload
Category:
Virtual servers:
TSYS.B.2.B.2.05.zmgrt1h
TSYS.B.2.B.2.06.zmgrt2h
TSYS.B.2.B.2.06.zmgrt2w
TSYS.TOSP11

Custom groups:
Performance Policies
Workload Summary - Default Policy

New Workload - ATSENS1

Summary
Click Finish to create the workload, its performance policies and their service classes and activate the selected policy.

Performance Policies
Default
Description: The default workload performance policy
Business importance: Medium

Service Classes
Default
Description: The default workload performance policy service class.
Performance goal: Velocity - Moderate
Business importance: Medium
Classification rule: .* == "."
### Summary
Click Finish to create the workload, its performance policies and their service classes and activate the selected policy.

<table>
<thead>
<tr>
<th>Trade_policy</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Description:</strong></td>
</tr>
<tr>
<td><strong>Business importance:</strong></td>
</tr>
</tbody>
</table>

#### Service Classes

<table>
<thead>
<tr>
<th>TradeSC</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Description:</strong></td>
</tr>
<tr>
<td><strong>Performance goal:</strong></td>
</tr>
<tr>
<td><strong>Business importance:</strong></td>
</tr>
<tr>
<td><strong>Classification rule:</strong></td>
</tr>
</tbody>
</table>

#### Default

| **Description:** | The default workload performance policy service class. |
| **Performance goal:** | Velocity - Moderate |
| **Business importance:** | Medium |
| **Classification rule:** | .* == ".*" |
Workload Created

Workload "Trade_wkld" has been created. Launch **Workload Details** to view performance policy activation progress. Launch **Workloads Report** to monitor the workload.

---

### Workloads

<table>
<thead>
<tr>
<th>Select</th>
<th>Name</th>
<th>Virtual Servers</th>
<th>Performance Policy</th>
<th>Performance Policy Status</th>
<th>Performance Policy Business Importance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Default</td>
<td>106</td>
<td>Default</td>
<td>Active</td>
<td>Medium</td>
</tr>
<tr>
<td></td>
<td>rja_wkld</td>
<td>4</td>
<td>rja_wkld1</td>
<td>Active</td>
<td>Highest</td>
</tr>
<tr>
<td></td>
<td>Test zVM Workload</td>
<td>0</td>
<td>Test zVM Policy</td>
<td>Active</td>
<td>Medium</td>
</tr>
<tr>
<td></td>
<td>Trade_wkld</td>
<td>4</td>
<td>Trade_policy</td>
<td>Active</td>
<td>High</td>
</tr>
</tbody>
</table>
Workload contains:

♦ Virtual servers
♦ Performance policies
♦ Each performance policy has service classes and classification rules
ARM and GPMP
Standards Based Application Instrumentation

ARM V4.0 is an approved standard of The Open Group
A method to monitor the performance and availability of applications
- Measure end-to-end transaction response time
- A correlator is passed to secondary applications and other managed servers that process the application

zManager uses information to determine
- Amount of time each application or server used to process trans.
- Name of the application or server that processed the transaction
- Transaction flow as it moves from one application or server to next

Movement of work request from one application or server to another is considered a 'HOP'

For accurate data, all applications and servers processing a work request must be ARM enabled
Workflow Example with ARM Services

Standards Based Application Instrumentation

- Process registration, deregistration
- Work request classification, start, and stop
- Work request correlator

http://www.mysite.com/trade/

<table>
<thead>
<tr>
<th>Web Server</th>
<th>Application Server</th>
</tr>
</thead>
<tbody>
<tr>
<td>arm_register_application</td>
<td>arm_register_application</td>
</tr>
<tr>
<td>arm_start_transaction(...)</td>
<td>arm_start_transaction(...)</td>
</tr>
<tr>
<td>arm_stop_transaction(...)</td>
<td>arm_stop_transaction(...)</td>
</tr>
<tr>
<td>arm_stop_application(...)</td>
<td>arm_stop_application(...)</td>
</tr>
</tbody>
</table>

Transaction results

correlator

TC=WL1
Hop 0

Transaction results
ARM Instrumented Middleware

Web Server support provided by WebSphere plugin
- IHS/Apache
- IIS
- Domino
- iPlanet

WebSphere Application Server V6, V7
DB2 Universal Database – including z/OS DB2
Guest Platform Management Provider

GPMP – Link between operating system and zManager

Lightweight component of PPM that collects performance data for work running on a virtual server and passes it to zManager

With ARM instrumented middleware support, GPMP provides metrics that allows detailed transaction topology as transaction hops through virtual servers

♦ ARM-instrumented middleware applications required
♦ Middleware that calls ARM APIs while servicing work requests
Benefits of GPMP

GPMP provides additional monitoring data

Additional classification rule filters to classify a virtual server

♦ HostName
♦ SystemName
♦ OS Level
♦ OS Type

Option of mapping zManager service classes to z/OS WLM service classes

With ARM instrumented middleware support, GPMP provides

♦ End-to-end transaction response times
♦ Virtual Server Topology report and Hops Report
Enabling GPMP on z/OS
Enable GPMP on z/OS

Sample job in SYS1.SAMPLIB(HVEENV)

Procedure to implement GPMP on z/OS includes

♦ Defining the RACF security environment
  Create user and group ids - group HVEMCA, user HVEMCA1
  Authorize access to INMN
  RDEFINE SERVAUTH EZB.OSM.sysname.tcpname

♦ Specifying parameters for run-time environment
  Provide location of Java 2 1.5 or 1.6 runtime environment
  Create UNIX file system directories
  Specify parameters for GPMP

♦ Verifying HVEMCA procedure is in SYS1.PROCLIB

♦ Starting the GPMP address space
  z/OS R12 – WLM can be setup to automatically start GPMP
  z/OS R11, R10 – GPMP must be started manually
Verify ARM is enabled
   ♦ D WLM,AM  if not  F WLM,AM=ENABLE
Start GPMP
   ♦ F WLM,START,GPMP

```bash
F WLM,GPMP,START
$HASP100 HVEMCA  ON STCINRDR
IEF695I START HVEMCA WITH JOBNAME HVEMCA IS ASSIGNED TO USER
   HVEMCA1 , GROUP HVEMCA
HASP373 HVEMCA    STARTED
$HASP100 BPXAS   ON STCINRDR
$HASP373 BPXAS    STARTED
BPXP024I BPXAS INITIATOR STARTED ON BEHALF OF JOB HVEMCA RUNNING
   IN ASID 0018
$HASP100 BPXAS   ON STCINRDR
$HASP373 BPXAS    STARTED
FEW0600I GPMP started.
IWM070I GPMP POLICY HAS BEEN ACTIVATED
```
Display GPMP Status

Display Status of GPMP with D WLM, AM, ALL

```
IWM075I  17.49.20  WLM DISPLAY 433
  ARM SERVICES ARE ENABLED
  GUEST PLATFORM MANAGEMENT PROVIDER JOBNAME=HVEMCA ASID=0018
  GPMP POLICY IS ACTIVE
  NUMBER OF REGISTERED PROCESSES=1, APPLICATIONS=1
  ADDRESS SPACES CURRENTLY REGISTERED WITH ARM:
    JOBNAME=DSNADIST ASID=004D
      APPLICATION=DDF
        IDENTITY PROPERTIES=0  CONTEXT NAMES=0
      STARTED APPLICATION INSTANCES:
        DSN9
          TRAN=0  GROUP=DSN9WSC
      REGISTERED TRANSACTIONS:
        SYS_DefaultZWLMTransactionName
```
Enabling GPMP on AIX
Enable GPMP on AIX Virtual Server

Enable GPMP on the virtual server
  ♦ Virtual Server Details -> Options -> Enable GPMP support

Delivered as rpm package
  ♦ Upload through Mount Virtual Media task in the HMC
  ♦ Select GPMP package to make available to virtual server

Enable EWLM services on AIX virtual server
  ♦ With smitty ewlm or command ewlmcfg –c
  ♦ Confirm EWLM services enabled with command: ewlmcfg –q

Install GPMP rpm package
  ♦ Mount GPMP package on a directory mount point
  ♦ Change to directory and install - rpm -ivh <gpmp package>
  ♦ Default group is ibmgpmp
  ♦ Default user is ibmgpmp  user may not be uid 0
Start GPMP on AIX Virtual Server

GPMP command
♦ Used to start and stop GPMP
♦ Turn autostart option on or off
♦ Query status of GPMP
♦ Cannot issue GPMP command from ROOT

Start GPMP
♦ gpmp start
♦ From ROOT: su ibmgpmp -c "/opt/ibm/gpmp/gpmp start"

```
su ibmgpmp -c "/opt/ibm/gpmp/gpmp start"
FEW6101I The guest platform management provider is starting.
```
### GPMP Status

<table>
<thead>
<tr>
<th>Command</th>
<th>Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>su ibmgpmp -c &quot;/opt/ibm/gpmp/gpmp&quot;</td>
<td>Persistent storage settings for the guest platform management provider:</td>
</tr>
<tr>
<td></td>
<td>FEW6030I Persistence flag is on</td>
</tr>
<tr>
<td></td>
<td>FEW6031I Shared memory ID is 4</td>
</tr>
<tr>
<td></td>
<td>FEW6037I The guest platform management provider is not running</td>
</tr>
</tbody>
</table>
Performance Monitoring and Reporting
Workload Monitoring and Reporting

Report virtual server resource usage in a Workload
User interface for reports is the ensemble HMC
Reports current data and fairly recent history

♦ Interval of data displayed is user selectable
♦ Granularity of data kept changes over time
  1 minute granularity kept for most recent hour
  15 minute interval data kept after first hour
♦ History of 36 hours

Report data can be downloaded to local workstation
♦ Uses CSV format
♦ Can only download data currently represented on screen
Navigating the Reports

Workloads report lists all workloads

These reports are for a specific workload

♦ Service Classes Report
♦ Virtual Servers Report
♦ Resource Adjustment Report
♦ Virtual Server Topology Report
♦ Hops Report
Workloads Report

List of workloads

High level view of “performance health” of each workload

♦ Indication if workload service class is missing goals
♦ Locate worst performing service class / performance index (PI)
♦ Details for a specific workload
  Bar graph of virtual server utilization distribution
  Graph of service class PI
### Workloads Report Example

#### Workloads Report - ATSENS1

Modify

<table>
<thead>
<tr>
<th>Select</th>
<th>Workload</th>
<th>Service Class With Largest PI (PI)</th>
<th>Performance Policy</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Arbitrage</td>
<td>GROUP1 (1.00)</td>
<td>Standard</td>
</tr>
<tr>
<td></td>
<td>CLAIMS</td>
<td>Default (0.46)</td>
<td>STANDARD</td>
</tr>
<tr>
<td></td>
<td>Default</td>
<td>Default (0.46)</td>
<td>Default</td>
</tr>
<tr>
<td><img src="on" alt="Circle" /></td>
<td>rja_wkld</td>
<td>SrvClsForFastest-Highest (1.61)</td>
<td>rja_wkld1</td>
</tr>
<tr>
<td></td>
<td>Test zVM Workload</td>
<td></td>
<td>Test zVM Policy</td>
</tr>
<tr>
<td></td>
<td>Trade_wkld</td>
<td>TradeSC (0.60)</td>
<td>Trade_policy</td>
</tr>
<tr>
<td></td>
<td>zBX_Sizing</td>
<td>Default (0.40)</td>
<td>zBX_Sizing_Policy</td>
</tr>
<tr>
<td></td>
<td>ZMGRT1</td>
<td>ZMGRT1SC (1.00)</td>
<td>ZMGRT1A</td>
</tr>
</tbody>
</table>

Total: 11  Filtered: 11  Selected: 1

---

**Service class with largest PI is rja_wkld with 1.61**  
**View workload information for rja_wkld**
Workloads Report – CPU Utilization

Charts: CPU Utilization | Performance Index

CPU utilization for virtual servers in rja_wkld
X-axis CPU utilization ranges
Y-axis number of servers
Service Class Performance Index (PI) for Workload rja_wkld

Service class PI for rja_wkld
Virtual Servers

Virtual Servers report

♦ List of virtual servers

♦ Resource information for each virtual server
  Virtual processors
  Service class and PI
  Allocated memory
  Physical CPU utilization
  OS view of CPU utilization

Resource adjustment report

♦ Resource adjustment actions taken over report interval

♦ Donor and receiver virtual servers
### Virtual Servers Report - rja_wkld


<table>
<thead>
<tr>
<th>Select</th>
<th>Virtual Server</th>
<th>Virtual Processes</th>
<th>Allocated Memory (MB)</th>
<th>Physical CPU Utilization (%)</th>
<th>Hypervisor CPU Delay (%)</th>
<th>Idle Time (%)</th>
<th>Other Time (%)</th>
<th>Service Class (PI)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>rjaihs1</td>
<td></td>
<td>2</td>
<td>8,192</td>
<td>23.4</td>
<td>10.8</td>
<td></td>
<td>SrvClsForFastestHighest (1.00)</td>
</tr>
<tr>
<td></td>
<td>rjawas1</td>
<td></td>
<td>4</td>
<td>8,192</td>
<td>71.1</td>
<td>3.1</td>
<td></td>
<td>SrvClsForFastestHighest (1.00)</td>
</tr>
<tr>
<td></td>
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<td>46.4</td>
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</tr>
<tr>
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<td>6.0</td>
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<td></td>
<td>SrvClsForFastestHighest (1.00)</td>
</tr>
</tbody>
</table>

Page 1 of 1  Total: 4  Filtered: 4  Displayed: 4  Selected: 1

Four virtual servers in rja_wkld  
rjawas2 server in default service class
**Resource Adjustment Report**

**Workload Resource Adjustments Report - rja_wkld**

Modify

---

### Successful Adjustments:

<table>
<thead>
<tr>
<th>Receiver Virtual Servers</th>
<th>Receiver Workload</th>
<th>Receiver Service Class</th>
<th>Receiver Processing Units After (Before)</th>
<th>Donor Virtual Servers</th>
<th>Donor Workload</th>
<th>Donor Processing Units After (Before)</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>rjawas1</td>
<td>rja_wkld</td>
<td>SrvClsForFastestHighest</td>
<td>3.04 (2.92)</td>
<td>rjawas2</td>
<td>Default</td>
<td>0.53 (0.65)</td>
<td>Aug 4, 2011 3:34:22 PM EDT</td>
</tr>
</tbody>
</table>

Page 1 of 1  
Total: 1  
Listed: 1  
Displayed: 1

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### Failed Adjustments:

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<tr>
<th>Receiver Virtual Servers</th>
<th>Receiver Workload</th>
<th>Receiver Service Class</th>
<th>Failure Reason</th>
<th>Time</th>
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</thead>
</table>

Total: 0  
Listed: 0  
Displayed: 0

---

Receiver rjawas1 before 2.92 after 3.04 processing units  
Donor was rjawas2 before 0.65 after 0.53 processing units
Information from ARM and GPMP used to create reports

Hops report
- Shows each hop for application in a specific service class
- For each hop provides
  - Name, hop number
  - Transaction information
  - Average response times

Virtual Server Topology Report
- Relationship of virtual servers running a workload
- Graphical representation of virtual servers
### Hops Report - SrvClisForFastestHighest in Workload rja_wkdd

**Report Interval:** Last 5 minutes (8/4/11 3:08:36 PM - 8/4/11 3:13:36 PM)  
**Details for SrvClisForFastestHighest:**
- **Workload:** rja_wkdd
- **Performance goal:** Velocity - Fastest
- **Performance policy:** rja_wkdd1
- **Business importance:** Highest
- **Performance:** Fastest

<table>
<thead>
<tr>
<th>Name</th>
<th>Hop Num</th>
<th>Group Name</th>
<th>Successful Transactions</th>
<th>Failed Transactions</th>
<th>Stopped Transactions</th>
<th>Inflight Transactions</th>
<th>Queue Time (s)</th>
<th>Execution Time (s)</th>
<th>Successful Average Response Time (s)</th>
<th>Inflight Average Response Time (s)</th>
</tr>
</thead>
<tbody>
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<td>202</td>
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<td>0.0000273</td>
<td>0.185120</td>
<td>0.094535</td>
</tr>
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<td>IBM_HTTP_Server</td>
<td>22,231</td>
<td>0</td>
<td>0</td>
<td>202</td>
<td>0.000000</td>
<td>0.0000273</td>
<td>0.165120</td>
<td>0.094535</td>
</tr>
<tr>
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<td>22,231</td>
<td>0</td>
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<td>202</td>
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</tbody>
</table>
Test with GPMP stopped on AIX virtual servers and z/OS

Reports affected

♦ Hops report
♦ Virtual server topology report
♦ Virtual server report
Hops Report - GPMP Stopped

Hops Report - SrvClsForFastestHighest In Workload tja_wkld


Details for SrvClsForFastestHighest:
- Workload: tja_wkld
- Performance goal: Velocity - Fastest
- FI: 1.00
- Performance policy: tja_wkld1
- Business importance: Highest
- Performance: Fastest

<table>
<thead>
<tr>
<th>Name</th>
<th>Hop Number</th>
<th>Group Name</th>
<th>Total Transactions</th>
<th>Failed Transactions</th>
<th>Stopped Transactions</th>
<th>Inflight Transactions</th>
<th>Queue Time (s)</th>
<th>Execution Time (s)</th>
<th>Successful Average Response Time (s)</th>
<th>Inflight Average Response Time (s)</th>
</tr>
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<tbody>
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</table>
Virtual server report for rja_wkld
OS Processes columns contain data provided by GPMP
### Virtual Server Report - GPMP Stopped


<table>
<thead>
<tr>
<th>Select</th>
<th>Virtual Server</th>
<th>Virtual Processors</th>
<th>Allocated Memory (MB)</th>
<th>Physical CPU Utilization (%)</th>
<th>Hypervisor CPU Delay (%)</th>
<th>Service Class (%)</th>
<th>OS Processes Total CPU Using Samples (%)</th>
<th>OS Processes Total CPU Delay Samples (%)</th>
<th>OS Processes Total I/O Delay Samples (%)</th>
<th>OS Processes Total Page Delay Samples (%)</th>
</tr>
</thead>
<tbody>
<tr>
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<td>23.7</td>
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</table>

**OS Processes columns are blank**
Summary

Platform Performance Manager function of zManager provides tools to manage workloads running in the ensemble. Resources are directed to virtual servers based on the goals and importance levels of the workload. HMC is user interface to create workloads and view reports. ARM enabled middleware and GPMP allow for end-to-end monitoring of application performance. Manage workloads in multi-tier application environment.