z/OS Tuning Basics: Intro to RMF - Where Do I Find the Important Data?

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IBM Systems Lab Services and Training

RMF Product Overview

- RMF Data Gatherer
- RMF Postprocessor: Historical Reporting, Analysis and Planning
- RMF Monitor I
- RMF Monitor II
- RMF Monitor III
- RMF XP (GPM4CIM)
- RMF Distributed Dataserver (DDS)
- RMF Spreadsheet Reporter
- RMF Data Portal for z/OS
- RMF Performance Data Portal
- Portal for z/OS RMF Resource Monitoring
- AIX, Windows & Linux CIM Client APIs
- CIM Client APIs
- VSAM
What is the IBM z/OS Management Facility?  

**The Application Stack**

- The IBM z/OS Management Facility is now a part of z/OS V2.2 that provides support for a modern, Web-browser based management console for z/OS.
- The z/OS Management Facility applications run on the z/OS enabling you to manage z/OS from z/OS
  - Information is presented on a workstation using a browser
- The z/OS Management Facility requires:
  - z/OS Communications Server
  - Security definitions (SAF)
  - Other components and functions are required for specific z/OSMF plug-ins
  - IBM 64-bit SDK for z/OS Java Technology Edition V7.1 or V8.0  zIIP eligible!
### z/OSMF 2.2 functions

#### IBM z/OS Management
- Welcome
- Notifications
- Functionality
  - Configuration
    - Configuration Assistant
    - Integration Services
      - System Messages
      - Resource Monitoring
      - System Status
    - System Administration
      - System LINKs
      - System Performance
    - Problem Determination
    - Software Management
- z/OS Classic Interfaces
- ISPF Task
- z/OSMF Settings
- FTP Servers
- Systems
- Settings

<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
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</table>
| **Notifications and Workflow** *(R2.1)* | Notifications and Workflow can assist in managing and updating configurations.
| **Configuration** | Configuration Assistant for z/OS Communication Server provides simplified configuration and setup of TCP/IP policy-based networking functions.
| **Links**         | Links to resources - provides common launch point for accessing resources beyond z/OSMF.
| **Performance**   | Capacity Provisioning - manage connections to CPMs, view reports for domain status, active configuration, and active policy. Resource Monitoring, System Status - provide integrated performance monitoring of customer's enterprise. Workload Manager Policy Editor application - facilitate the creation and editing of WLM service definitions, installation of WLM service definitions, and activation of WLM service policies.
| **Problem Determination** | Incident Log - provide a consolidated list of SVC Dump related problems, along with details and diagnostic data captured with each incident, facilitate sending the data for further diagnostics. Software category *(updated)* - Management - deployment of installed software simpler and safer, manage service levels and product levels.
| **Software**      | Management - deployment of installed software simpler and safer, manage service levels and product levels.
| **z/OS Classic Interface** | ISPF Task - integrate existing ISPF into z/OSMF to enable tasks from single interface and ability to launch ISPF functions directly.
| **z/OSMF Administration** | z/OSMF Administration category - z/OSMF authorization services for administrator - dynamically add links to non-z/OSMF resources; application linking manager(R13)
| **z/OSMF Settings** | z/OSMF Settings category *(New!)* - Manage FTP destinations and systems.

### z/OSMF Resource Monitoring

- Browser connects to z/OSMF.
- z/OSMF Resource Monitoring can connect to all systems where the RMF Distributed Data Server (DDS) is running.
- DDS retrieves z/OS performance data from all images of the sysplex where the RMF Monitor III gatherer is active.
Localplex is preconfigured.

One DDS connection per line.

Enterprise-wide Connections to RMF Distributed Data Server (DDS)

Resource Monitoring – Monitoring Desktops

At a Glance
Resource Monitoring – Monitoring Desktops: z/OS and Linux

*z/OS LPAR environment*
Current IBM exploitation of zAAPs and zIIPs

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<tr>
<th>Specialty CP</th>
<th>Eligible</th>
<th>Major Users</th>
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<tbody>
<tr>
<td>zAAP or zIIP on z13</td>
<td>Any Java Execution</td>
<td>Websphere, CICS, Native apps, XMLSS</td>
</tr>
<tr>
<td>zIIP</td>
<td>Enclave SRBs</td>
<td>DRDA over TCPIP, DB2 Parallel Query, DB2 Utilities Load, Reorg, Rebuild, RUNSTATS (V10), DB2 V9 z/OS remote native SQL procedures, DB2 prefetch, deferred write (V10), DBM1, MSTR(V11), TCPIP - IPSEC, XMLSS, zIIP Assisted HiperSockets Multiple Write, Virtual Tape Facility Mainframe (VTFM) Software, z/OS Global Mirror (XRC), System Data Mover (SDM), z/OS CIM Server, RMF Mon Iii, OMEGAMON on z/OS and DB2, IMS Ver 8, SDSF (V2.2)</td>
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CPU Activity Report Part 1 – Detailed CP Data

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<th>NUM</th>
<th>TIME</th>
<th>%</th>
<th>NPS</th>
<th>NPSS</th>
<th>Par</th>
<th>SHARE</th>
<th>%</th>
<th>LOG Proc</th>
<th>I/O</th>
<th>Inter</th>
<th>I/O Rate</th>
<th>% Via TPI</th>
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System Address Space Analysis

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ADDRESS SPACE TYPES
- BAYON: 8 18 31.0
- STC: 510 591 569.6
- TSO: 75 82 78.7
- AXCH: 0 0 0.0
- OMV: 103 193 113.2

WORK UNITS
- CP: 2,399 19.5
- IIP: 435 5.1

 Doesn't differentiate by CP type

z/OS LPAR environment

Diagram showing the relationship between Logical Processors, Physical Processors, Work Units (TCBs and SRBs), and the z/OS Dispatcher.
### Partition Data Report

<table>
<thead>
<tr>
<th>Workload</th>
<th>Service Class</th>
<th>Goal Description</th>
<th>Period</th>
<th>Duration</th>
<th>Importance</th>
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<tr>
<td>TSO</td>
<td>TSOPROD</td>
<td>80% within 1 second</td>
<td>1</td>
<td>500</td>
<td>2</td>
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<tr>
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<td>BATNOR</td>
<td>AVG=1 min</td>
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</table>

### WLM typical Service Policy goals (1 of 3)

<table>
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<th>Workload</th>
<th>Service Class</th>
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<td>80% within 1 second</td>
<td>1</td>
<td>400</td>
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### WLM typical Service Policy goals (2 of 3)

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<th>Importance</th>
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<td>IMS</td>
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### WLM typical Service Policy goals (3 of 3)

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Workload Activity Report: The WLM view

**REPORT BY:** POLICY=WLMPOL  
**WORKLOAD=BAT_WKL**  
**SERVICE CLASS=BATSPEC**  
**RESOURCE GROUP=BATMAXRG**

**TRANSACTIONS**  
**TRANS-TIME**  
**HH:MM:SS.TTT**  
**--QASD I/O--**  
**--SERVICE--**  
**SERVICE TIMES**  
**--APPL %**

**AVG**  0.98  
**ATTACH**  6.520  
**SHRPT**  11.5  
**IDC**  8326  
**CPU**  24.7  
**CP**  0.97

**MPL**  0.98  
**EXECUTION**  6.128  
**RESP**  7.0  
**CPU**  662386  
**SRB**  0.0  
**AAP**  0.01

**ENDED**  10  
**QUEUED**  391  
**CONN**  6.9  
**MSO**  0.0  
**RCT**  0.0  
**IIP**  0.0

**END/S**  0.17  
**R/S AFFIN**  0.0  
**DISC**  0.0  
**IOC**  8326  
**AAP**  40.27

**GOAL:** EXECUTION VELOCITY 35.0%  
**VELOCITY MIGRATION:**  
**I/O MGMT**  99.2%  
**INIT MGMT**  92.2%

---

Workload Activity Report – TSO example

**REPORT BY:** POLICY=WLMPOL  
**WORKLOAD=TSO**  
**SERVICE CLASS=TSO**  
**RESOURCE GROUP=*NONE**  
**PERIOD=1**  
**IMPORTANCE=2**

**TRANSACTIONS**  
**TRANS-TIME**  
**HH:MM:SS.TTT**  
**--QASD I/O--**  
**--SERVICE--**  
**SERVICE TIMES**  
**--APPL %**

**AVG**  293.25  
**ATTACH**  2.335  
**SHRPT**  187.4  
**IDC**  197358K  
**CPU**  114.26  
**BLK**  0.000  
**MPL**  293.23  
**EXECUTION**  2.335  
**RESP**  0.4  
**CPU**  197358K  
**SRB**  33.108  
**AAPCP**  0.00  
**ENQ**  0.000  
**TOTAL**  767254

**ENDED**  80683  
**QUEUED**  0  
**CONN**  0.3  
**MSO**  106510K  
**RCT**  42.824  
**IIPCP**  0.00  
**CRM**  0.000  
**SHARED**  56

**END/S**  89.66  
**R/S AFFIN**  0  
**DISC**  0.0  
**SRB**  7339K  
**IIT**  1.079  
**LCK**  62.436

**#SWAPS**  46123  
**INELIGIBLE**  0  
**Q+PEND**  0.2  
**TOT**  393027K  
**HST**  0.009  
**AAP**  0.00  

---

**GOAL:** RESPONSE TIME 000.00.02.000 AVG

**RESPONSE TIME EX**  
**PERF**  
**AVG**  

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**SYSTEM**  
**VEL%**  
**INDEX**  
**ADDRSP**  
**CPU**  

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**AAP**  76.4  
**IIP**  1.2  
**I/O**  561.0  
**TOT**  0.2  
**CPU**  0.0

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**AAP**  65.5  
**IIP**  0.8  
**I/O**  117.1  
**TOT**  0.1  
**CPU**  0.0

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**AAP**  79.2  
**IIP**  0.8  
**I/O**  61.3  
**TOT**  0.1  
**CPU**  0.0

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**AAP**  95.0  
**IIP**  1.3  
**I/O**  44.0  
**TOT**  0.8  
**CPU**  0.0

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**AAP**  92.6  
**IIP**  1.5  
**I/O**  13.0  
**TOT**  1.0  
**CPU**  0.0

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**AAP**  66.7  
**IIP**  5.9  
**I/O**  30.0  
**TOT**  0.0  
**CPU**  0.0

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**AAP**  92.9  
**IIP**  1.3  
**I/O**  21.0  
**TOT**  1.0  
**CPU**  0.0

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**AAP**  82.6  
**IIP**  1.3  
**I/O**  21.0  
**TOT**  1.0  
**CPU**  0.0

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**AAP**  92.6  
**IIP**  2.1  
**I/O**  8.1  
**TOT**  0.0  
**CPU**  0.0

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**AAP**  98.0  
**IIP**  0.0  
**I/O**  96.0  
**TOT**  0.0  
**CPU**  0.0

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R/W report is at 1 minute interval
RMF Product Overview

- RMF Monitor I
- RMF Monitor II
- RMF Monitor III
- RMF Distributed Dataserver (DDS)
- RMF XP (GPM4CIM)
- RMF Data Gatherer
- RMF Monitor II and III
- RMF Postprocessor
- Real-Time Reporting, Problem Determination
- Historical Reporting, Analysis and Planning
- RMF Monitor III
- RMF Monitor II
- RMF Monitor I
- RMF Data Gatherer
- RMF Data Portal for z/OS
- RMF Performance Data Portal
- RMF Spreadsheet Reporter
- RMF Data Portal for z/OS
- RMF Data Portal for z/OS
- z/OSMF Resource Monitoring
- AIX, Windows & Linux
- CIM Client APIs
- CIM Provider
- VSAM
- RMF Distributed Dataserver (DDS)
- RMF XP (GPM4CIM)