Session # 15838

Monitoring IMS Performance for Faster Problem Solving

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IBM Corporation

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8:30 a.m. – 9:30 a.m.
David L. Lawrence Convention Center,
Room 303
Agenda

- Understanding the workload
  - IMS as part of a bigger picture
- Real Time IMS monitoring examples
  - Typical steps in problem analysis
  - Examples of key monitoring metrics
- Historical data analysis example
- Examples of alerts
- Summary
IMS works as a central component of many critical applications.
Application connectivity and flow may take many forms.
Understanding the flow helps drive monitoring requirements.
IMS Has Many Potential Bottlenecks

- Threads
- DB2 Subsystem
- IMS Control Region
- IMS Message & BMP Regions
- IMS DLI
- IRLM

Network delays:
- IMS Connect
- OTMA
- APPC
- Telnet

Connection bottlenecks:
- IMS Connect
- OTMA
- APPC
- Telnet

Queues & Scheduling:
- IMS Control Region
- IMS Message & BMP Regions
- IMS DLI

App Init & execution:
- IMS Control Region
- IMS Message & BMP Regions
- IMS DLI

Threads:
- IMS Control Region
- IMS Message & BMP Regions
- IMS DLI

DB, BP I/O delays:
- IMS Control Region
- IMS Message & BMP Regions
- IMS DLI

Lock Conflicts:
- IMS Control Region
- IMS Message & BMP Regions
- IMS DLI

Network delays:
- IMS Connect
- OTMA
- APPC
- Telnet
- IMS Control Region
- IMS Message & BMP Regions
- IMS DLI
- IRLM
Monitoring Information
Real Time versus Historical versus Alerts

- A complete monitoring approach will commonly require elements of each of the following:
  - Real time performance and availability
    - Current resource utilization, availability, and status
  - Historical performance and availability
    - Detailed historical performance and availability information
    - Interval historical information for trending and analysis
  - Alerts and Automation
    - Alert notification of critical performance and availability issues
    - Notification of alerts (visual or via other means)
    - Automated corrective action (where appropriate)
• Managing and analyzing IMS performance depends upon an understanding of the flow of the workload
  – What is the workload?
  – What is the flow of the workload?
  – Where are the potential workload bottlenecks?
  – If the workload is bottlenecked, to what extent?
• Build a monitoring strategy to focus on key metrics
  – Transaction response time – with application grouping
  – Transaction queue/rate information at various levels
    • IMS transaction response time correlated with transaction rate
  – Transaction enqueue/dequeue rate at various levels
    – Enqueue/dequeue rate at the system level, OTMA level, Fast Path level
    – Bottleneck analysis (wait states for the system and by workload group)
    – IMS Connection Bottlenecks (including external subsystem bottlenecks)
    – Transaction queue depth
      • Queuing at the system level and the transaction level
      • Queuing at other levels (FP BALG, MSC link, etc.)
  – Dependent region processing (region occupancy)
Examples Of Typical IMS Performance And Availability Challenges

- Poor IMS response time, trans queuing and/or bottlenecked
  - IMS transactions queued
  - IMS scheduling delays
  - IMS application performance/system bottlenecks
- IMS connection bottlenecks
  - CICS/DBCTL connection bottlenecks
  - Network delays
  - Delays related to IMS Connect, OTMA, APPC, etc.
- IMS database and subsystem delays
  - IMS database delays
    - High I/O, poor BP performance and IMS lock conflicts
- External subsystem (DB2) delays – elongate IMS application time
  - DB2 thread connection issues
  - DB2 SQL delays
  - DB2 database I/O delays and BP performance
  - DB2 lock conflicts
Response Time Analysis provides critical information on workload flow, issues, and outliers.

Response time monitoring should be able to show the following:

- Queuing and service times within IMS
  - Input queue time, Processing time, Output queue time
  - IMS transaction rates
  - Outlier/poorly performing transactions

Grouping related workload for analysis

- If feasible group related transactions/programs together
  - Simplifies management and analysis
  - Focus on loved ones and problem children
Use Response Time Analysis To Understand Transaction Performance And To Identify Potential Issues

Analyze response time analysis should show transaction response time for workload groups, broken down by component, and various time intervals.

Response time analysis should show transaction response time for workload groups, broken down by component, and various time intervals.

Analyze transaction response time over various time intervals

Input queue time
Processing time
Output queue time

Where is the issue?

Analyze response time components
IMS Has Many Potential Bottlenecks

Network delays
IMS Connect
OTMA
APPC
Telnet
Connection bottlenecks
IMS Connect – types of connections
- Non-Persistent socket
  - Closes after each send to the ICON client
- Transaction socket
  - Close after each transaction or conversation - The default
  - Has connect/disconnect overhead for each message
- Persistent socket
  - Multiple read/writes for multiple transactions
  - Typically more efficient
  - Will keep the socket open – make sure you have enough sockets

Message considerations
- General ROT – use one send for the entire message
- If doing multiple writes then specify NODELAYACK on PORT statement in z/OS
  - If not specified then may wait up to 300ms for each transmission
IMS Network Examples Of Relevant Options And Parameters

- **PROFILE.TCPIP parameters**
  - **PORT**
    - Reserve ports for IMS Connect
      - Include the NODELAYACK parameter for multi-message applications
      - Example benchmark
  - **SOMAXCONN**
    - The number of connection requests that can be queued because IMS Connect has not yet issued the accept call
    - Default setting is 10
  - **IMS Connect parameter MAXSOC**
    - Total number of sockets IMS Connect supports across all ports at the same time
    - Note - USS parameter MAXFILEPROC must be equal to or greater than the value of the IMS Connect parameter MAXSOC
    - IMS Connect issues warning message HWSS0772W when the number of sockets reaches the default warning threshold of 80 percent of MAXSOC
Monitor At The Host/Network Level

- Connection activity, connection counts, connection backlogs
  - Look for applications with connection failures and backlogs

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Monitor Transaction Processing And Queue Depth

- Is the system processing transactions?
- Are transactions queued? Queued at what level?

### IMS System Information

<table>
<thead>
<tr>
<th>IMS ID</th>
<th>IMSA</th>
</tr>
</thead>
<tbody>
<tr>
<td>DSGroup Name</td>
<td>MVSE</td>
</tr>
<tr>
<td>MVS ID</td>
<td></td>
</tr>
<tr>
<td>Dependent Regions</td>
<td>2</td>
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</table>

<table>
<thead>
<tr>
<th>IMSplex Name</th>
<th>DEMOA</th>
</tr>
</thead>
<tbody>
<tr>
<td>SQGroup Name</td>
<td></td>
</tr>
<tr>
<td>Sysplex Identifier</td>
<td>DEMOPLX</td>
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</table>

### IMS Lock Status

<table>
<thead>
<tr>
<th>Lock Waiters</th>
<th>0</th>
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</thead>
<tbody>
<tr>
<td>Locks Held</td>
<td>0</td>
</tr>
</tbody>
</table>

| Longest Lock  | 0.000s     |

### IMS Resource Usage

<table>
<thead>
<tr>
<th>Control CPU Percent</th>
<th>0.03%</th>
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</thead>
<tbody>
<tr>
<td>Total CPU Percent</td>
<td>0.03%</td>
</tr>
<tr>
<td>Dependent I/O Rate</td>
<td>3.20</td>
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<tr>
<td>Control Paging Rate</td>
<td>0.00</td>
</tr>
<tr>
<td>Total Paging Rate</td>
<td>0.00</td>
</tr>
</tbody>
</table>

| Dependent CPU Percent | 0.00%      |
| Control I/O Rate     | 2.00       |
| Total I/O Rate       | 5.20       |
| Dependent Paging Rate| 0.00       |

### IMS Transaction Queue Rates and Depth

| FF ENQ Rate | 0.80       |
| BALG ENQ Rate| 0.00       |
| Total ENQ Rate| 0.80       |
| FF Transaction Queue| 3          |
| Total Transaction Queue| 3          |

| FF DEQ Rate     | 0.80       |
| BALG DEQ Rate   | 0.00       |
| Total DEQ Rate  | 0.80       |
| BALG Message Queue | 0         |
Monitor Queues At The Transaction Level

- Identify transactions that have queued
- Determine Competing versus Non-Competing status
High region occupancy may be an indication of application delays. May result in higher response time, scheduling delays, and transaction queues.

What transaction, PSB, and how many calls?

How busy is the region?

Tran elapsed Input Queue time
IMS Potential Bottleneck Indicators
External Subsystem Delays

- Network delays
- IMS Connect
- OTMA
- APPC
- Telnet
- IMS Control Region
- CICS
- Threads
- IMS Message & BMP Regions
- IMS Control Region
- Queues & Scheduling
- App Init & execution
- IMS DLI
- DB, BP I/O delays
- IMS Connect
- IRLM
- Lock Conflicts
- IMS Potential Bottleneck Indicators
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- Lock Conflicts
Where Is The Bottleneck?
Analyze Where The Workload May Be Bottleenecked

Bottleneck Analysis methodology breaks workload into components (for example):
- Using CPU/Waiting for CPU Scheduling Waits
- IMS Iwaits
- Database Waits
- z/OS system waits
- Waits for DB2 or MQ

Use Bottleneck Analysis to determine where to look next

External subsystem waits
Perform Workload Bottleneck Analysis To Understand Where Time Is Spent

<table>
<thead>
<tr>
<th>Wait Reason</th>
<th>Short Term %</th>
<th>Long Term %</th>
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<tbody>
<tr>
<td>DC Sys Ckpt Latch</td>
<td>0.20&gt;</td>
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<tr>
<td>Database I/O Waits</td>
<td>15.30:---&gt;</td>
<td>23.8:---&gt;</td>
</tr>
<tr>
<td>Other DL/I IWAIT</td>
<td>5.60:&gt;</td>
<td>32.0:-----&gt;</td>
</tr>
<tr>
<td>Other DL/I IWAIT</td>
<td>10.70:--&gt;</td>
<td>2.70:---&gt;</td>
</tr>
<tr>
<td>TM Schedule Latch</td>
<td>0:</td>
<td></td>
</tr>
<tr>
<td>DM Schedule Latch</td>
<td>0.50:&gt;</td>
<td></td>
</tr>
<tr>
<td>ISWITCHed to CTL</td>
<td>2.40:&gt;</td>
<td></td>
</tr>
<tr>
<td>ESS Wait</td>
<td>26.5:-----&gt;</td>
<td>23.8:-----&gt;</td>
</tr>
<tr>
<td>Commit (Phase 2)</td>
<td>2.80:&gt;</td>
<td>2.30:&gt;</td>
</tr>
<tr>
<td>Prepare to Commit</td>
<td>4.70:&gt;</td>
<td>5.60:&gt;</td>
</tr>
<tr>
<td>User Sign on DB2</td>
<td>10:&gt;</td>
<td>30:--------</td>
</tr>
<tr>
<td>Terminate Thread</td>
<td>0:</td>
<td>0:</td>
</tr>
<tr>
<td>SQL Call</td>
<td>18.70:-----&gt;</td>
<td>15.30:-----</td>
</tr>
<tr>
<td>Other Wait</td>
<td></td>
<td></td>
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Note that an external subsystem (such as DB2) may impact overall workload time line.
DB2 Monitoring Provides Detail On Application Activity

DB2 Accounting Traces – SMF 101

DB2 Wait time

Elapsed time

In-DB2 time

- Elapsed time
- In-DB2 time
- DB2 Wait time
IMS Potential Bottleneck Indicators
Application & Scheduling Delays

- IMS Connect
- OTMA
- APPC
- Telnet
- IMS Control Region
- CICS
- Queues & Scheduling
- IMS Message & BMP Regions
- IMS Control Region
- IMS DLI
- IRLM
- DB, BP I/O delays
- Lock Conflicts
- Network delays
- Thread delays
- Application & Scheduling Delays
- IMS Connect Delays
- OTMA Delays
- APPC Delays
- Telnet Delays
- IMS Control Region Delays
- CICS Delays
- Queues & Scheduling Delays
- IMS Message & BMP Regions Delays
- IMS Control Region Delays
- IMS DLI Delays
- IRLM Delays
- DB, BP I/O delays
- Lock Conflicts
- Network delays
Use Workload Bottleneck Analysis To Identify Scheduling Delays

<table>
<thead>
<tr>
<th>PDEX</th>
<th>SHORT TERM %</th>
<th>LONG TERM %</th>
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<tbody>
<tr>
<td></td>
<td>0</td>
<td>50</td>
</tr>
<tr>
<td>+ USING CPU</td>
<td>21.0</td>
<td>--</td>
</tr>
<tr>
<td>+ USING CPU IN APPL</td>
<td>11.2</td>
<td>--</td>
</tr>
<tr>
<td>+ USING CPU IN IMS</td>
<td>9.8</td>
<td>--</td>
</tr>
<tr>
<td>+ SCHEDULING WAITS</td>
<td>2.8</td>
<td>&gt;</td>
</tr>
<tr>
<td>+ WAIT FOR MPP</td>
<td>0.2</td>
<td>&gt;</td>
</tr>
<tr>
<td>+ WAIT FOR GU</td>
<td>2.6</td>
<td>&gt;</td>
</tr>
<tr>
<td>+ IMS ACTIVITY</td>
<td>16.5</td>
<td>--</td>
</tr>
<tr>
<td>+ SPA I/O</td>
<td>1.2</td>
<td>&gt;</td>
</tr>
<tr>
<td>+ SYNC POINT WAIT</td>
<td>5.6</td>
<td>&gt;</td>
</tr>
<tr>
<td>+ ISWITCHED TO CTL</td>
<td>9.7</td>
<td>&gt;</td>
</tr>
<tr>
<td>+ DATABASE I/O WAITS</td>
<td>26.7</td>
<td>&gt;</td>
</tr>
<tr>
<td>+ ADA221</td>
<td>15.4</td>
<td>&gt;</td>
</tr>
<tr>
<td>+ ADA021S</td>
<td>11.3</td>
<td>&gt;</td>
</tr>
<tr>
<td>+ MVS WAITS</td>
<td>35.8</td>
<td>&gt;</td>
</tr>
<tr>
<td>+ CPU WAIT (MPP/BMP)</td>
<td>13.7</td>
<td>&gt;</td>
</tr>
<tr>
<td>+ PROGRAM FETCH I/O</td>
<td>22.1</td>
<td>&gt;</td>
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<tr>
<td>Avg. Trans Executing</td>
<td>5.3</td>
<td>4.0</td>
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</tbody>
</table>
Monitor The Various IMS Pools – Overview part 1

Reference: IMS Performance Guide Redbook, SG24-4637-00

<table>
<thead>
<tr>
<th>EVENT</th>
<th>ACTIVITY</th>
<th>POOLs/LISTs</th>
<th>DATASETss</th>
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<tbody>
<tr>
<td>Message Input</td>
<td>TP</td>
<td>CIOP</td>
<td>LINEs</td>
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<tr>
<td></td>
<td>MFS</td>
<td>RECANY</td>
<td>FORMAT</td>
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<tr>
<td></td>
<td>SPA GET QUEUING</td>
<td>MFP</td>
<td>MSGQs</td>
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<td></td>
<td></td>
<td>SPAP/CWAP</td>
<td>IMSLOG</td>
</tr>
<tr>
<td></td>
<td></td>
<td>QBUF</td>
<td></td>
</tr>
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<td></td>
<td></td>
<td>LOG</td>
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<td>Scheduling</td>
<td>Scheduling</td>
<td>QBUF</td>
<td>MSGQs</td>
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<td></td>
<td>PSB Load</td>
<td>PSBP</td>
<td>ACBLIB</td>
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<td></td>
<td>DMB Load</td>
<td>DMBP</td>
<td>ACBLIB</td>
</tr>
<tr>
<td></td>
<td></td>
<td>LOG</td>
<td>IMSLOG</td>
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<tr>
<td>Schedule End to First DL/I Call</td>
<td>Program Load Initialization</td>
<td>BLDL</td>
<td>STEPLIBs</td>
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<td></td>
<td>VLF/LLA PRELOAD</td>
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<tr>
<td>EVENT</td>
<td>ACTIVITY</td>
<td>POOLs/LISTs</td>
<td>DATASETs</td>
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<tr>
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<td>-------------------</td>
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</tr>
<tr>
<td>Program Elapsed</td>
<td>DC Calls</td>
<td>QBUF</td>
<td>MSGQs</td>
</tr>
<tr>
<td>DL/I Elapsed</td>
<td>DB Calls</td>
<td>OSAM VSAM LOG</td>
<td>Databases</td>
</tr>
<tr>
<td>IWAIT Elapsed</td>
<td>SPA Insert</td>
<td>SPAP/CWAP LOG</td>
<td>IMSLOG</td>
</tr>
<tr>
<td>Termination</td>
<td>Sync Point</td>
<td>OSAM VSAM QBUF LOG</td>
<td>Databases</td>
</tr>
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<td></td>
<td></td>
<td></td>
<td>MSGQs IMSLOG</td>
</tr>
<tr>
<td>Message Output</td>
<td>Dequeuing MFS TP</td>
<td>QBUF MFP CIOP/HIOP</td>
<td>MSGQs FORMAT</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>LINEs IMSLOG</td>
</tr>
</tbody>
</table>
Use Workload Analysis To Understand Resource Delays

Example – z/OS CPU Usage And Delays

Note that z/OS delays may impact the application time line.
IMS and related regions may be prioritized as part of WLM assignment.

Service Classes

SYSTEM
SYSSTC
STCMD
STCLO
ONLPRDHI
ONLPRDLO
DB2 DDF
TSOPRD
PRDBATHI
PRDBATLO
TSTBATHI
TSTBATLO
SYSOTHER

Relative Priority

Workload Manager

JES
NETV
OMVS
CICS/IMS
DB2 DDF
STC
MQ
TSO
CB
TCP
Batch
IWEB

z/OS And WLM Impacts Resources Assigned To IMS
Monitor Critical z/OS Service Classes And WLM Performance Index

### Summary

<table>
<thead>
<tr>
<th>Service Class</th>
<th>Period</th>
<th>Goal Importance</th>
<th>Performance Index</th>
<th>Worst Performance Index</th>
</tr>
</thead>
<tbody>
<tr>
<td>OPSLO</td>
<td>Medium</td>
<td>20.00</td>
<td>20.00</td>
<td></td>
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<tr>
<td>OPSHI</td>
<td>Highest</td>
<td>2.50</td>
<td>70.00</td>
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<tr>
<td>BATMED</td>
<td>Low</td>
<td>0.75</td>
<td>2.72</td>
<td></td>
</tr>
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<td>OPSDEF</td>
<td>High</td>
<td>0.56</td>
<td>0.56</td>
<td></td>
</tr>
<tr>
<td>UNIX</td>
<td>Low</td>
<td>0.50</td>
<td>0.50</td>
<td></td>
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<tr>
<td>CICSDEF</td>
<td>High</td>
<td>0.40</td>
<td>0.40</td>
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<tr>
<td>IMSDEF</td>
<td>High</td>
<td>0.40</td>
<td>0.40</td>
<td></td>
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<tr>
<td>UNIX</td>
<td>Medium</td>
<td>0.21</td>
<td>0.21</td>
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<tr>
<td>CT2R2</td>
<td>High</td>
<td>0.00</td>
<td>0.00</td>
<td></td>
</tr>
<tr>
<td>UNIX</td>
<td>High</td>
<td>0.50</td>
<td>0.50</td>
<td></td>
</tr>
</tbody>
</table>

### Periods Details for Service Class IMSDEF

<table>
<thead>
<tr>
<th>Period</th>
<th>Performance Index</th>
<th>Goal Importance</th>
<th>Transaction Rate</th>
<th>Average Response Time</th>
<th>Vel</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>0.50</td>
<td>High</td>
<td>0.00</td>
<td>4</td>
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</table>
IMS Has Many Potential Bottlenecks
IMS Database Delays

- IMS Connect
- OTMA
- APPC
- Telnet

- Network delays
- Connection bottlenecks

- IMS Control Region
- IMS Message & BMP Regions
- IMS DLI
- IRLM
- CICS
- MSC

- Network delays
- App Init & execution
- Queues & Scheduling
- DB, BP I/O delays

- Lock Conflicts
- Lock Conflicts

- Threads DB2 Subsystem
- Threads
- Message In
- Message Out

- IMS Connect
- IMS Control Region
- IMS Connect
- IMS Control Region
Monitor for IMS lock conflicts. Note lock holders versus lock waiters.
Database I/O Waits Impact Application Processing

<table>
<thead>
<tr>
<th>PDEX</th>
<th>SHORT TERM %</th>
<th>LONG TERM %</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Elapsed Time= 1:41 MN)</td>
<td>35.7</td>
<td>26.7</td>
</tr>
<tr>
<td>USING CPU:</td>
<td>21.0</td>
<td>20.5</td>
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<tr>
<td>USING CPU IN APPL:</td>
<td>11.2</td>
<td>11.0</td>
</tr>
<tr>
<td>USING CPU IN IMS:</td>
<td>9.8</td>
<td>9.5</td>
</tr>
<tr>
<td>SCHEDULING WAITS:</td>
<td>2.8</td>
<td>2.5</td>
</tr>
<tr>
<td>WAIT FOR MPP:</td>
<td>0.0</td>
<td>0.2</td>
</tr>
<tr>
<td>WAIT FOR GU:</td>
<td>2.8</td>
<td>2.3</td>
</tr>
<tr>
<td>IMS ACTIVITY:</td>
<td>16.5</td>
<td>12.5</td>
</tr>
<tr>
<td>SPA I/O:</td>
<td>1.2</td>
<td>1.0</td>
</tr>
<tr>
<td>SYNC POINT WAIT:</td>
<td>5.6</td>
<td>5.2</td>
</tr>
<tr>
<td>ISWITCHED TO CTL:</td>
<td>9.7</td>
<td>6.3</td>
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<tr>
<td>DATABASE I/O WAITS:</td>
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<td>PAY221</td>
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<td>15.4</td>
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<tr>
<td>ADA021S</td>
<td>10.3</td>
<td>11.3</td>
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<tr>
<td>MVS WAITS:</td>
<td></td>
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</tr>
<tr>
<td>CPU WAIT (MPP/BMP)</td>
<td>13.7</td>
<td>12.6</td>
</tr>
<tr>
<td>PROGRAM FETCH I/O:</td>
<td>12.1</td>
<td>10.1</td>
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<tr>
<td>Avg. Trans Executing:</td>
<td>5.3</td>
<td>3.5</td>
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</table>

Use Bottleneck Analysis to understand the impact of IMS database delays.
### OSAM Buffer Pools Status

<table>
<thead>
<tr>
<th>Subpool</th>
<th>Subpool Id</th>
<th>Number of Buffers</th>
<th>Hit Ratio</th>
<th>Size of Buffers</th>
<th>Buffers Page-Fixed?</th>
<th>Prefix Page-Fixed?</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>none</td>
<td>64</td>
<td>62.5%</td>
<td>1024</td>
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<td>NO</td>
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<tr>
<td>2</td>
<td>none</td>
<td>32</td>
<td>62.0%</td>
<td>2048</td>
<td>NO</td>
<td>NO</td>
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<tr>
<td>3</td>
<td>none</td>
<td>16</td>
<td>41.3%</td>
<td>4096</td>
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### Device Statistics

<table>
<thead>
<tr>
<th>Volser</th>
<th>Unit</th>
<th>Response Time</th>
<th>IOSQ Time</th>
<th>Pend Time</th>
<th>Conn Time</th>
<th>Disc Time</th>
<th>I/Os per sec</th>
<th>Queue</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>PPSMPE</td>
<td>14E</td>
<td>7.5</td>
<td>.0</td>
<td>3.2</td>
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<tr>
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<tr>
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<td>2B9</td>
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<td>.0</td>
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<td>.4</td>
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<tr>
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<td>1.5</td>
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<td>30.9</td>
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<td>.00 3.4</td>
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<tr>
<td>PPSMPH</td>
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<td>.0</td>
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<td>.0</td>
<td>.0</td>
<td>.00 0.0</td>
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<tr>
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<td>.6</td>
<td>3.0</td>
<td>4.0</td>
<td>.6</td>
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<td>.00 2.0</td>
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<tr>
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<td>14.5</td>
<td>4.6</td>
<td>7.8</td>
<td>.0</td>
<td>.02 11.5</td>
</tr>
</tbody>
</table>
Categories Of Typical Alerts

Types Of Alerts

- **Availability**
  - Application availability
  - Essential infrastructure availability
  - Subsystem availability

- **Performance**
  - Subsystem performance
  - Application performance
  - Identification of performance issues

- **Resource**
  - Subsystem resource utilization
  - Application resource utilization
Benefits Of An Effective Alert Management Methodology

- Improved ability to manage increasingly complex composite applications
  - Enables an integrated approach to the management of subsystems, platforms, and application components
- Reduce time to problem resolution
  - Identify potential issues more rapidly
- Improved event management and problem isolation
  - More meaningful and useful problem alerts
- Improved event correlation and management
  - Eliminate the “noise” and focus on key issues
- Superior performance analysis capabilities
  - Monitor and manage based upon actual information, not anecdotal data
Using boolean logic allows the alert to be application sensitive.

Monitor response time on an ongoing basis to identify potential issues.

Consider using options to filter out outliers.
This situation will alert on transaction queue depth for the subsystem.

Note – this is a subsystem level number. For more granular queue alerts you may want to alert on specific transactions.
Monitor the queuing and status of the PART transaction. If PART is queued or the Queue depth is beyond a certain level, generate an alert.
Region occupancy measures how busy the message region is.
IMS Historical Performance Analysis
Trend IMS Bottleneck And Workload Processing Over Time

Plot chart analysis of key IMS performance metrics

Plot charts of history by time interval. Use for trend analysis.

Transactions by status

IMS Bottlenecks

Response time and processing rate

Enqueue/dequeue rates
## Summary – Key Monitoring Metrics

<table>
<thead>
<tr>
<th>Metric</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monitor IMS transaction response time</td>
<td>IMS Monitor</td>
</tr>
<tr>
<td>Monitor z/OS resources</td>
<td>IMS Monitor</td>
</tr>
<tr>
<td>Monitor scheduling bottlenecks</td>
<td>IMS Monitor</td>
</tr>
<tr>
<td>Monitor application workload bottlenecks</td>
<td>IMS Commands</td>
</tr>
<tr>
<td>Monitor performance and issues</td>
<td>IMS Monitor</td>
</tr>
<tr>
<td>Monitor IMS processing and queues</td>
<td>IMS Monitor</td>
</tr>
<tr>
<td></td>
<td>IMS Commands</td>
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</table>
### Summary - Key Monitoring Metrics

<table>
<thead>
<tr>
<th>Metric</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monitor IMS lock conflicts</td>
<td>IMS Monitor</td>
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<tr>
<td>Monitor database I/O activity</td>
<td>IMS Monitor</td>
</tr>
<tr>
<td>Alerts on critical resources</td>
<td>z/OS Monitor</td>
</tr>
<tr>
<td>Monitor IMS performance history</td>
<td>Storage Monitor</td>
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<tr>
<td></td>
<td>IMS Monitor</td>
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<td>IMS Monitor</td>
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<tr>
<td></td>
<td>DB2 Monitor</td>
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<td></td>
<td>z/OS Monitor</td>
</tr>
<tr>
<td></td>
<td>Network Monitor</td>
</tr>
</tbody>
</table>
Thank You!!
References

- IMS product documentation
- IMS Webcasts by Deepak Kohli
    - Replay URL: http://ibm.co/16WNtBE
- IMS Performance Monitoring and Tuning Update Redbook, SG24-6404-00
- IMS Performance Guide Redbook, SG24-4637-00
- IMS Slideshare and SHARE conference presentations
- IBM OMEGAMON XE for IMS User’s Guide
- www.ibm.com/ims