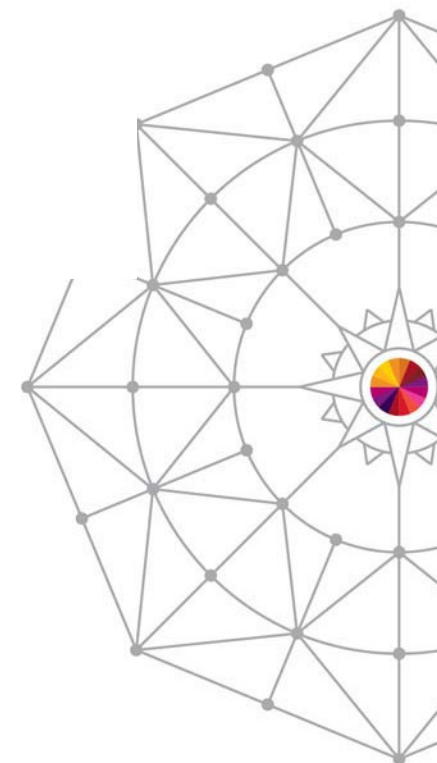


Session # 15838

Monitoring IMS Performance for Faster Problem Solving

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IBM Corporation*

*August 7, 2014
8:30 a.m. – 9:30 a.m.
David L. Lawrence Convention Center,
Room 303*



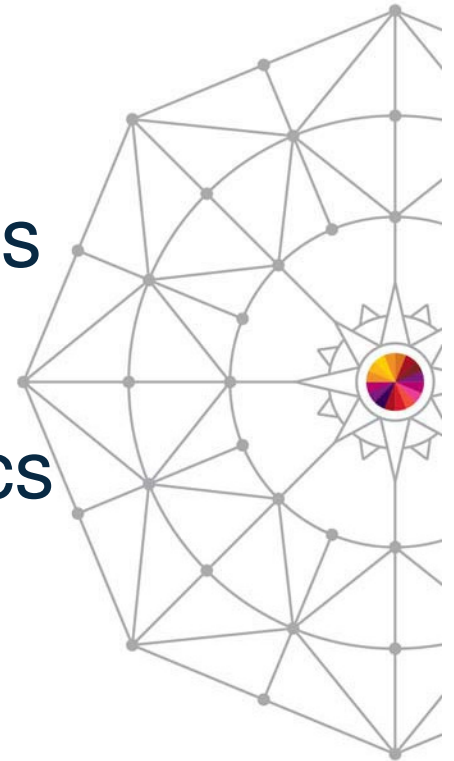
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Agenda



- 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

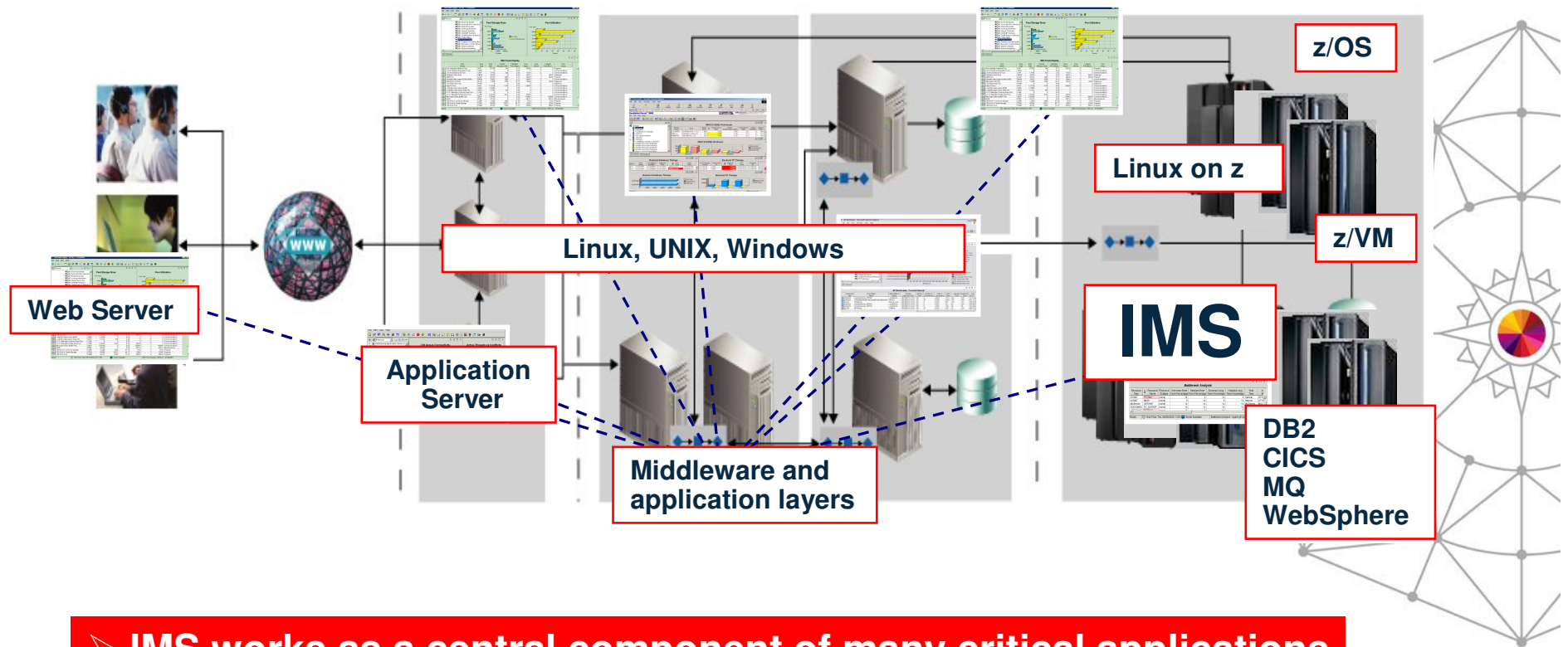


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IMS Is Part Of A Much Bigger Picture



- 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

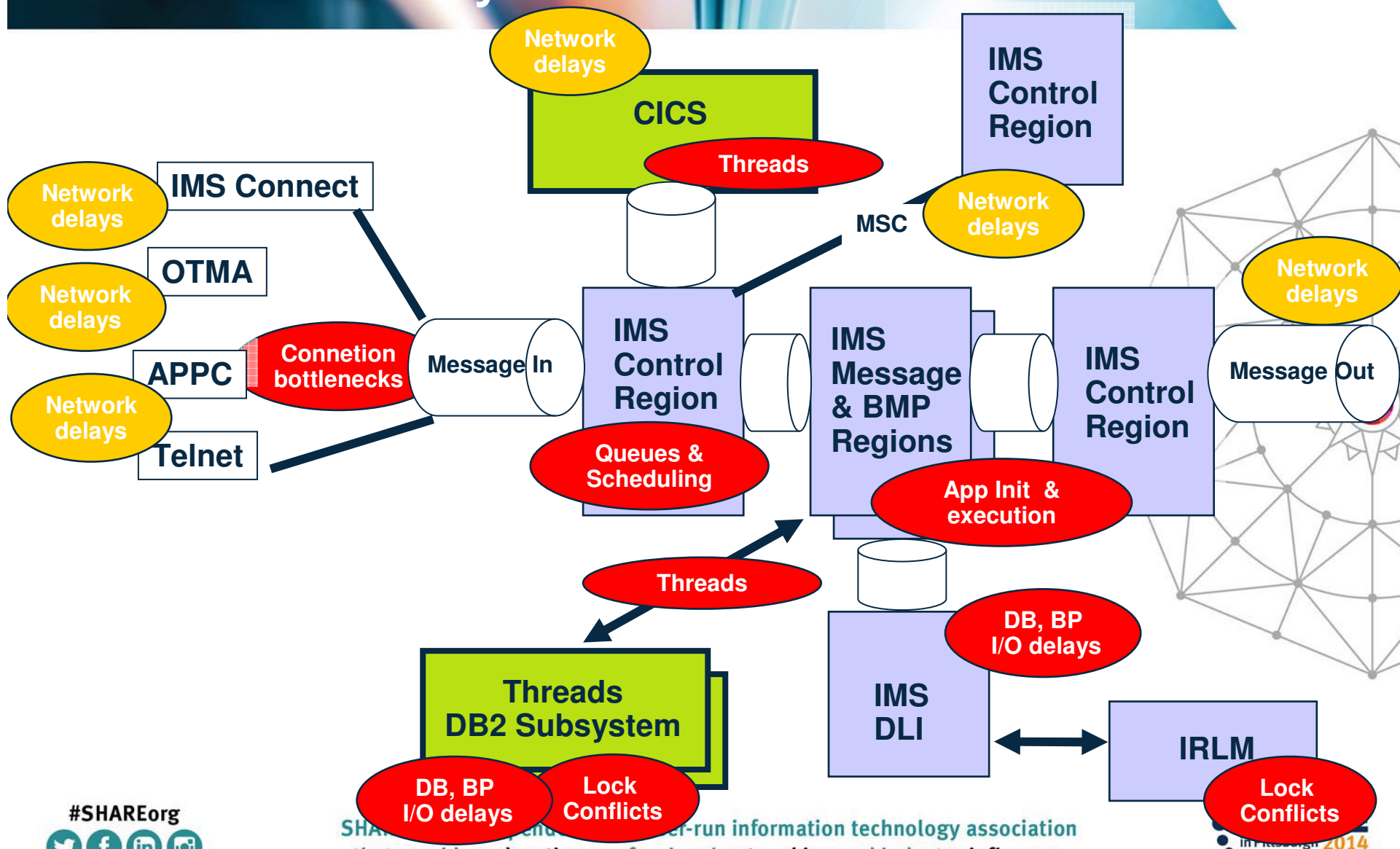


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IMS Has Many Potential Bottlenecks



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)



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Creating A Consolidated Monitoring Strategy To Analyze IMS Processing And Bottlenecks



- 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)



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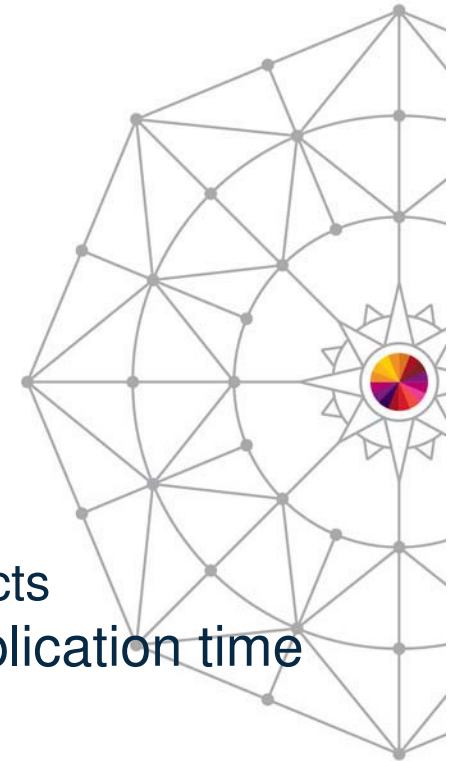
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Examples Of Typical IMS Performance And Availability Challenges



- 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



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Understanding The Workload Response Time Analysis



- 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



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Use Response Time Analysis To Understand Transaction Performance And To Identify Potential Issues



```

KRIINT  VTM  OI-II  V420./C IVP1 10/24/08 12:48:04  B
> Help PF1      Back PF3      Up PF7      Down PF8
=====
>
> Overview
> To display information about a
> directly after IRSP below and press ENTER.
> To display information about a specific response time component, type I, PI,
> P, O, R0, R1, or AL directly after TIM and press ENTER.

IRSP_
time  ID  (00:15) 00:01:06 | (00:30) 00:16:06 | (01:00) 00:16:06 |
+ G=CLASS 1 0.000937 | 0.000909 | 0.000909 |
+ AVERAGES 0.000937 | 0.000909 | 0.000909 |
+ SYSTEM 0.000937 | 0.000909 | 0.000909 |
=====
    
```

Analyze transaction response time over various time intervals

Input queue time
Processing time
Output queue time

Where is the issue?

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

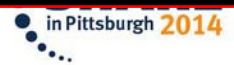
```

420./C IVP1 10/24/08 12:47:11  B
> help PF1      Back PF3      Up PF7      Down PF8
=====
> Transactions and LTERMs with the Longest Response Times
>RMON ON
>
> Transactions
XMON Transactions with longest R0 time (00:15) 00:13:57
+ ID I P R0 ID I P R0
+ IVP1 PART .000147 .000835 .000982
>
> Logical Terminals (LTERMs)
TMON Logical terminals with longest R1
+ ID R1 ID R1
+ IVP1 IBMUSER .000982
=====
    
```

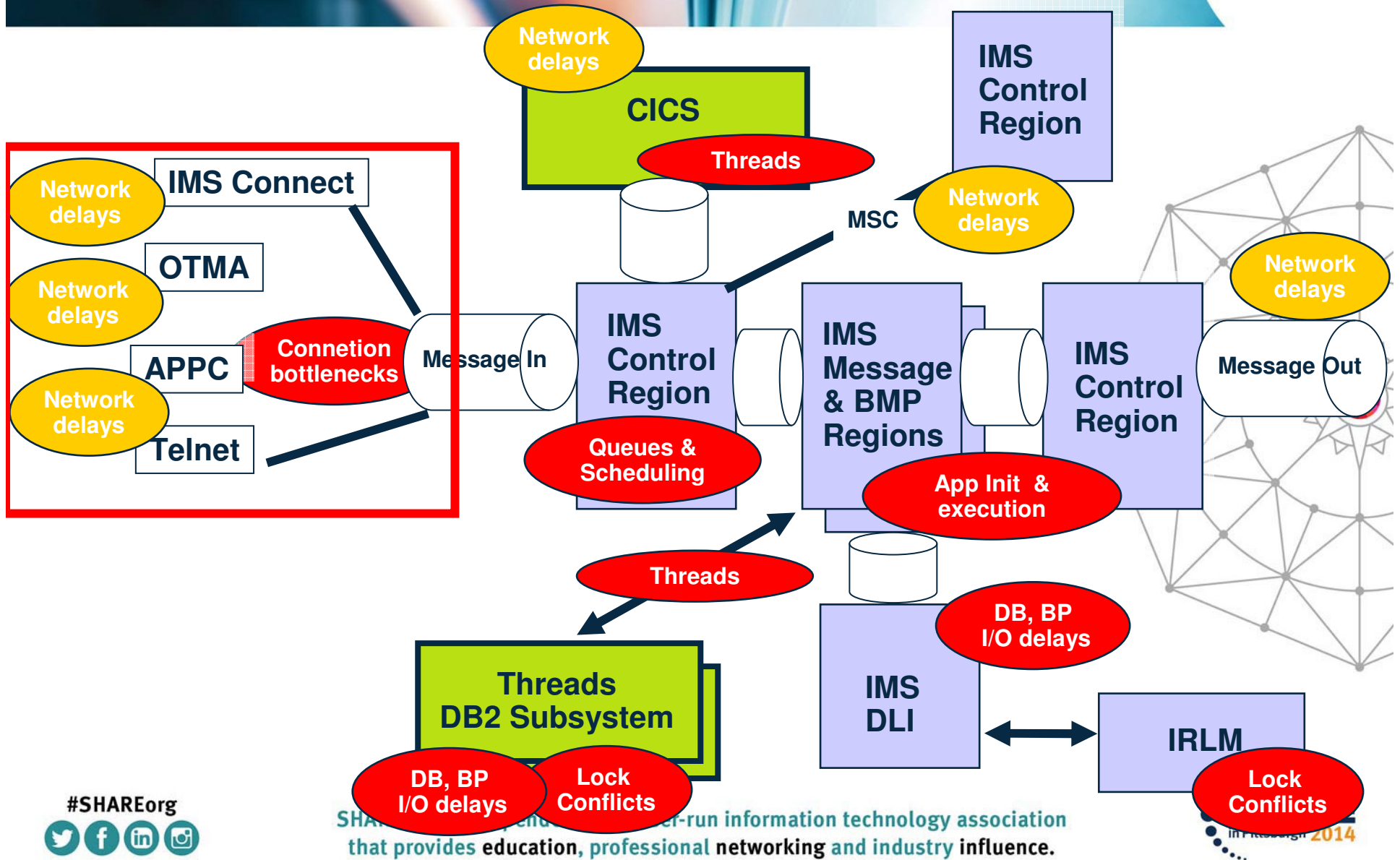
Analyze response time components



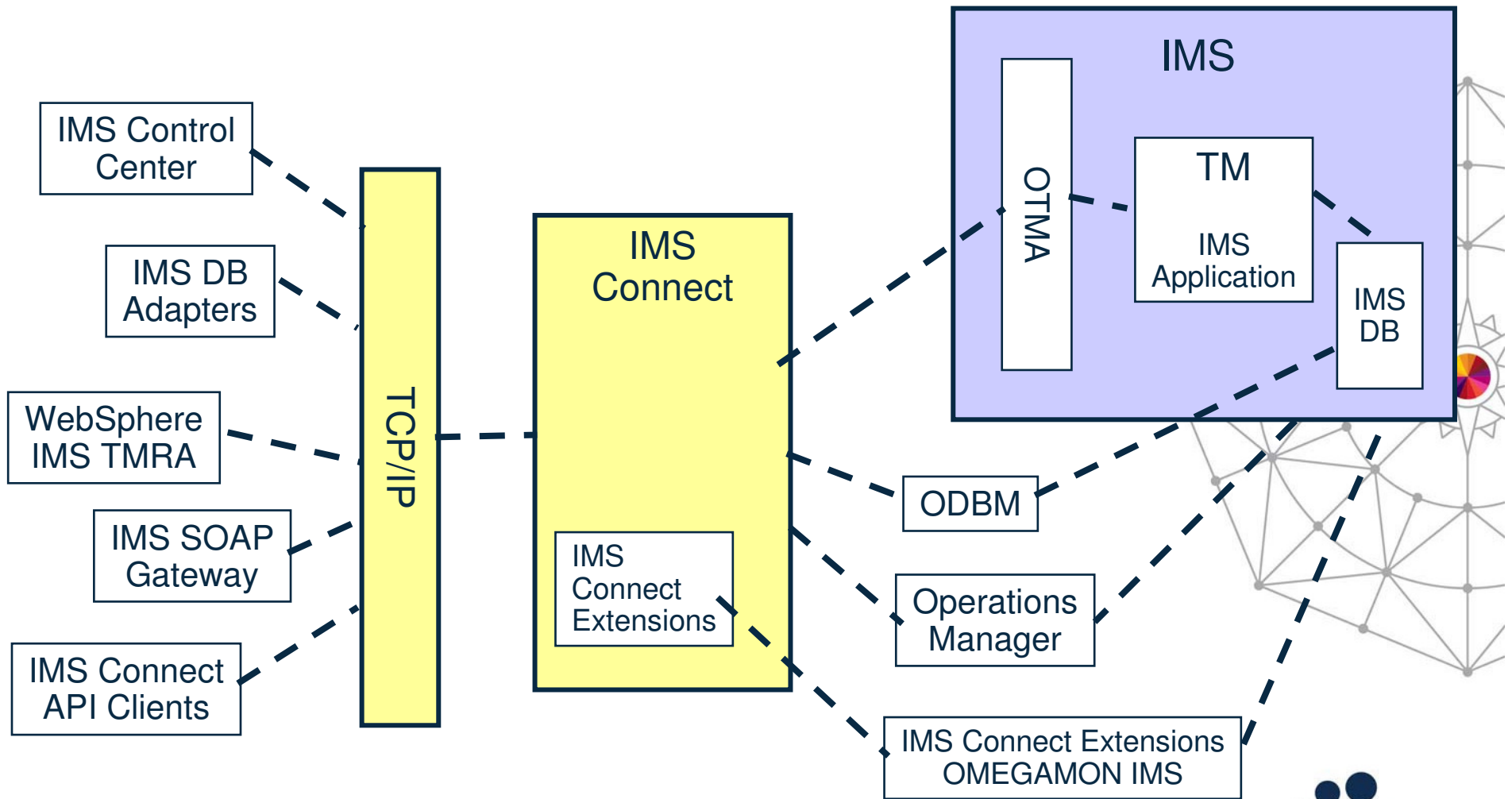
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IMS Has Many Potential Bottlenecks



IMS Connect And The Interaction With TCP/IP



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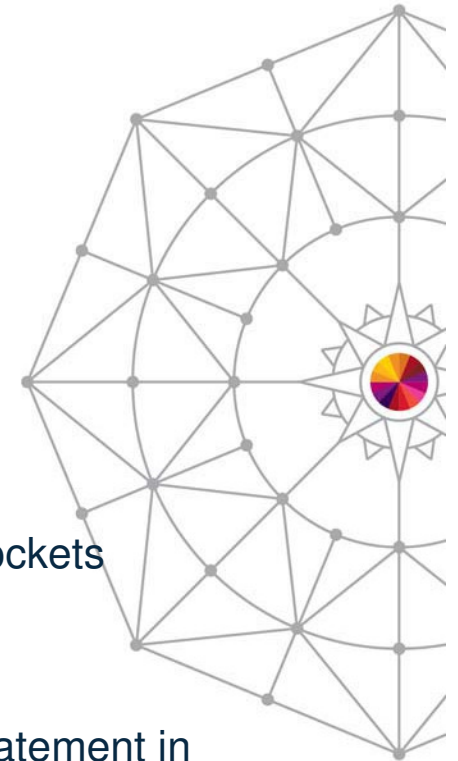


IMS Connect

Types Of Connections & Message Considerations



- 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



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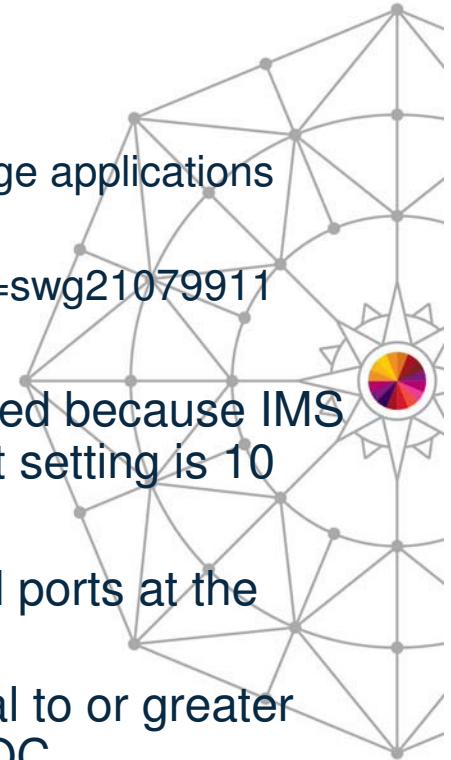
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IMS Network Examples Of Relevant Options And Parameters



- PROFILE.TCPIP parameters
 - PORT
 - Reserve ports for IMS Connect
 - Include the NODELAYACK parameter for multi-message applications
 - Example benchmark
 - » <http://www-01.ibm.com/support/docview.wss?uid=swg21079911>
 - 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



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IMS Connect Monitoring An Example



Response Time Detail for Transaction PART Page: 1 of 144

Tran Code	Target Dastore	Client ID	Port Number	User ID	Collection Level	Message Received Time	Response Time	Input Pre-OTMA Time	Input Read Socket Time	Input Read Exit Time	Input Read Exit Name	Input SAF Time	Process OTMA Time	Output Confirm Time	Output Post-OTMA Time	XMIT Exit Time	X
PART	91Y	ICTDRVR	4713	JMAHE	Maximum	01/14/09 12:08:06	0.000139	0.065653	0.000021	0.026154	HWSIMSO0	0.000000	0.118476	0.000000	0.000629	0.000025	HW
PART	91Y	ICTDRVR	4713	JMAHE	Maximum	01/14/09 12:08:06	0.000062	0.000110	0.000018	0.000039	HWSIMSO0	0.000000	0.007838	0.000000	0.000342	0.000015	HW
PART	91Y	ICTDRVR	4713	JMAHE	Maximum	01/14/09 12:08:06	0.000098	0.000089	0.000028	0.000013	HWSIMSO0	0.000000	0.009208	0.000000	0.000587	0.000020	HW
PART	91Y	ICTDRVR	4713	JMAHE	Maximum	01/14/09 12:08:06	0.000113	0.000124	0.000018	0.000016	HWSIMSO0	0.000000	0.023006	0.000000	0.000614	0.000026	HW
PART	91Y	ICTDRVR	4713	JMAHE	Maximum	01/14/09 12:08:06	0.000244	0.000117	0.000019	0.000016	HWSIMSO0	0.000000	0.007549	0.000000	0.000588	0.000020	HW
PART	91Y	ICTDRVR	4713	JMAHE	Maximum	01/14/09 12:08:06	0.000096	0.000123	0.000030	0.000016	HWSIMSO0	0.000000	0.010288	0.000000	0.000622	0.000020	HW
PART	91Y	ICTDRVR	4713	JMAHE	Maximum	01/14/09 12:08:06	0.000093	0.000124	0.000020	0.000018	HWSIMSO0	0.000000	0.008585	0.000000	0.000601	0.000020	HW
PART	91Y	ICTDRVR	4713	JMAHE	Maximum	01/14/09 12:08:06	0.000080	0.000108	0.000016	0.000016	HWSIMSO0	0.000000	0.010068	0.000000	0.000550	0.000017	HW
PART	91Y	ICTDRVR	4713	JMAHE	Maximum	01/14/09 12:08:06	0.000078	0.000115	0.000018	0.000014	HWSIMSO0	0.000000	0.008033	0.000000	0.000620	0.000018	HW
PART	91Y	ICTDRVR	4713	JMAHE	Maximum	01/14/09 12:08:06	0.000082	0.000105	0.000018	0.000014	HWSIMSO0	0.000000	0.008343	0.000000	0.000542	0.000017	HW
PART	91Y	ICTDRVR	4713	JMAHE	Maximum	01/14/09 12:08:06	0.000123	0.000124	0.000019	0.000018	HWSIMSO0	0.000000	0.009186	0.000000	0.000647	0.000029	HW

Response Time Detail for Transaction PART Page: 1 of 144

Tran Code	Target Dastore	Client ID	Port Number	User ID	Collection Level	Message Received Time	XMIT Exit Name	Time Outs	Commit Mode	Synchronization Level	NAK Count	OTMA NAK Sense Code	Client IP Address	Client IP Port	Timestamp	Sysplex Name
PART	91Y	ICTDRVR	4713	JMAHE	Maximum	01/14/09 12:08:06	/SIMSO0	0	CM1	None	0	N/A	9.42.46.28	2999	11/14/09 12:13:04	LPAR400J
PART	91Y	ICTDRVR	4713	JMAHE	Maximum	01/14/09 12:08:06	/SIMSO0	0	CM1	None	0	N/A	9.42.46.28	3000	11/14/09 12:13:04	LPAR400J
PART	91Y	ICTDRVR	4713	JMAHE	Maximum	01/14/09 12:08:06	/SIMSO0	0	CM1	None	0	N/A	9.42.46.28	3001	11/14/09 12:13:04	LPAR400J
PART	91Y	ICTDRVR	4713	JMAHE	Maximum	01/14/09 12:08:06	/SIMSO0	0	CM1	None	0	N/A	9.42.46.28	3002	11/14/09 12:13:04	LPAR400J
PART	91Y	ICTDRVR	4713	JMAHE	Maximum	01/14/09 12:08:06	/SIMSO0	0	CM1	None	0	N/A	9.42.46.28	3003	11/14/09 12:13:04	LPAR400J
PART	91Y	ICTDRVR	4713	JMAHE	Maximum	01/14/09 12:08:06	/SIMSO0	0	CM1	None	0	N/A	9.42.46.28	3004	11/14/09 12:13:04	LPAR400J
PART	91Y	ICTDRVR	4713	JMAHE	Maximum	01/14/09 12:08:06	/SIMSO0	0	CM1	None	0	N/A	9.42.46.28	3005	11/14/09 12:13:04	LPAR400J
PART	91Y	ICTDRVR	4713	JMAHE	Maximum	01/14/09 12:08:06	/SIMSO0	0	CM1	None	0	N/A	9.42.46.28	3006	11/14/09 12:13:04	LPAR400J
PART	91Y	ICTDRVR	4713	JMAHE	Maximum	01/14/09 12:08:06	/SIMSO0	0	CM1	None	0	N/A	9.42.46.28	3007	11/14/09 12:13:04	LPAR400J
PART	91Y	ICTDRVR	4713	JMAHE	Maximum	01/14/09 12:08:06	/SIMSO0	0	CM1	None	0	N/A	9.42.46.28	3008	11/14/09 12:13:04	LPAR400J
PART	91Y	ICTDRVR	4713	JMAHE	Maximum	01/14/09 12:08:06	/SIMSO0	0	CM1	None	0	N/A	9.42.46.28	3009	11/14/09 12:13:04	LPAR400J
PART	91Y	ICTDRVR	4713	JMAHE	Maximum	01/14/09 12:08:06	/SIMSO0	0	CM1	None	0	N/A	9.42.46.28	3010	11/14/09 12:13:04	LPAR400J



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Monitor At The Host/Network Level



Applications Summary Table

Collection Time	Application Name	Connection Count	Active connections	Accepted Connections	Connection Rate	Active Connection High Water Mark	Time stamp for Active Connections High Water Mark	Idle Time Since Last Accept	Time Since Last Activity	Server Up Time	Connections in Backlog	Backlog Connections Rejected	Total Backlog Connections Rejected	Backlog Connections Rejected Time Stamp	Transmit Byte Rate	Receive Byte Rate	Byte Rate
07/29/14 14:17:0	DSNADIST	4	2	0	0	4	07/28/14 15:16:03	19.95	00:00:01.88	88.95	0	0	0		0	0	0
07/29/14 14:17:0	DSNBDIST	3	0	0	0	2	07/25/14 22:59:03	19.97	00:00:13.79	88.95	0	0	0		120	1,152	1,272
07/29/14 14:17:0	DSNCDIST	3	0	0	0	2	07/28/14 15:16:03	19.95	00:00:13.79	88.95	0	0	0		120	1,152	1,272
07/29/14 14:17:0	DSNTDIST	3	0	0	0	4	07/28/14 14:39:03	19.82	00:00:00	88.95	0	0	0		0	0	0
07/29/14 14:17:0	FTPD1	2	0	0	0	3	07/29/14 08:38:05	0.15	00:00:15.5	88.93	0	0	0		0	0	0
07/29/14 14:17:0	HBR1MSTR	6	2	0	0	13	07/28/14 10:28:03	2.59	00:00:01.88	28.20	0	0	0		0	0	0
07/29/14 14:17:0	HBR2MSTR	1	0	0	0	0		0.00	1 Day	0.00	0	0	0		0	0	0
07/29/14 14:17:0	HODSRV3	2	0	0	0	2	07/28/14 15:16:03	19.95	00:00:00	88.92	0	0	0		0	0	0
07/29/14 14:17:0	IBMSMC32	1	0	0	0	1	07/28/14 15:16:03	19.95	00:00:00	88.96	0	0	0		0	0	0
07/29/14 14:17:0	IBMSMV32	2	0	0	0	2	07/28/14 15:16:03	19.95	00:00:00	88.96	0	0	0		0	0	0
07/29/14 14:17:0	IBMSM025	2	0	0	0	0		3.35	00:00:00	3.35	0	0	0		0	0	0
07/29/14 14:17:0	IDISBBGS	3	0	0	0	1	07/28/14 15:16:03	19.95	00:00:00	88.92	0	0	0		0	0	0
07/29/14 14:17:0	IMSACON	2	0	0	0	1	07/28/14 15:16:03	19.97	00:00:00	88.94	0	0	0		0	0	0
07/29/14 14:17:0	IMSBCON	2	0	0	0	1	07/28/14 15:17:03	19.95	00:00:00	88.94	0	0	0		0	0	0
07/29/14 14:17:0	IMSCCON	2	0	0	0	2	07/28/14 16:03:03	19.85	00:00:00	88.94	0	0	0		0	0	0
07/29/14 14:17:0	IMSDCON2	7	6	0	0	6	07/28/14 17:47:03	18.07	00:03:55.36	88.85	0	0	0		0	0	0
07/29/14 14:17:0	IMSREST	2	0	0	0	1	07/28/14 15:16:03	19.95	00:00:00	88.94	0	0	0		0	0	0
07/29/14 14:17:0	IMSREST2	8	0	0	0	10	07/28/14 12:43:03	0.59	00:03:55.36	26.61	0	0	0		0	0	0

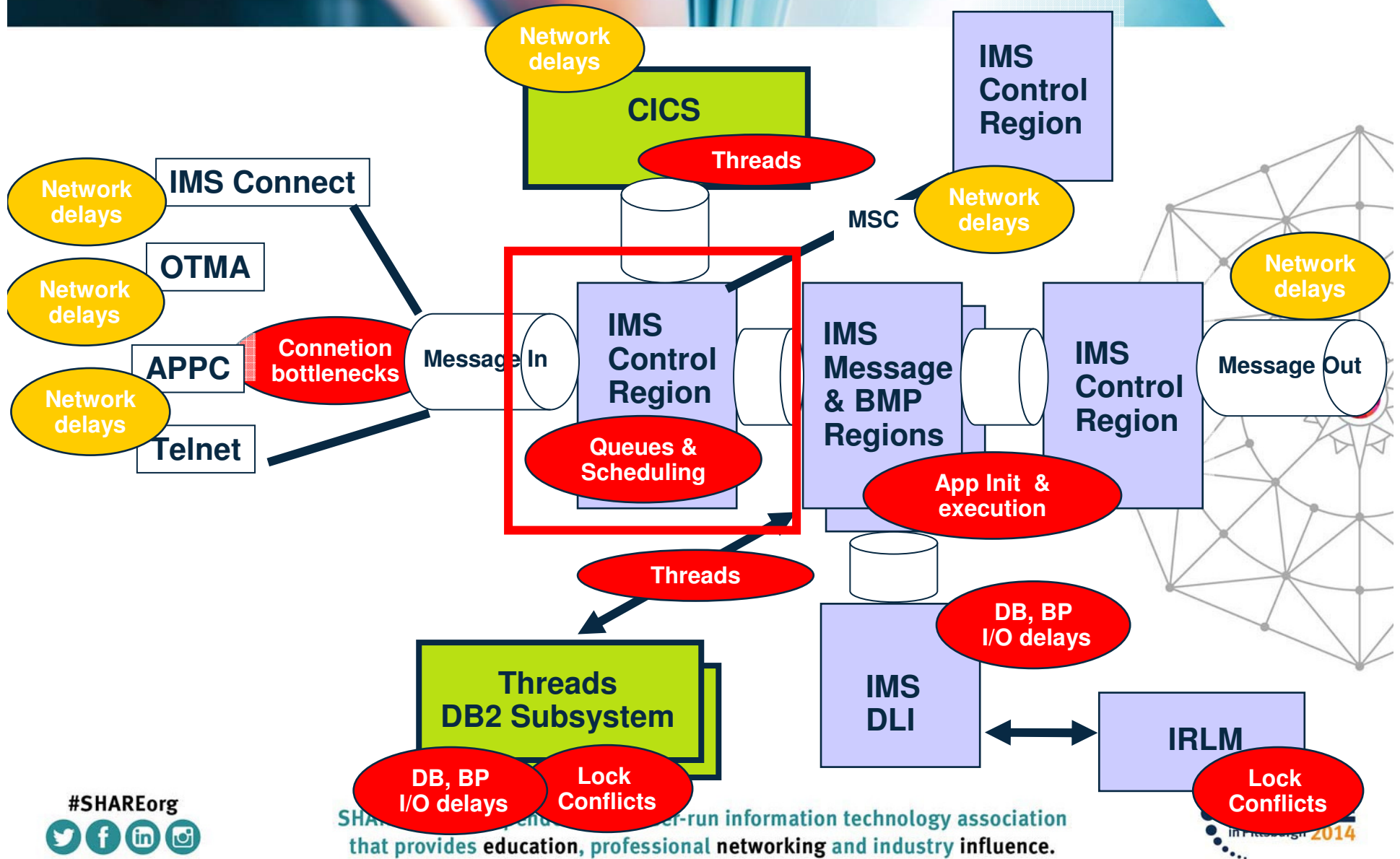
- Connection activity, connection counts, connection backlogs
 - Look for applications with connection failures and backlogs



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IMS Potential Bottleneck Indicators Transaction Queues



Monitor Transaction Processing And Queue Depth



```

File Edit View Tools Options Help 01/02/2013 12:28:51
Auto Update : Off
Command ==> KIPHLTD IMS Health Detail IMSplex : DEMOA
IMSid : IMSA
    
```

IMS System Information			
IMS ID.....	IMSA	IMSplex Name.....	DEMOA
DSGroup Name.....		SQGroup Name.....	
MVS ID.....	MVSE	Sysplex Identifier.....	DEMOPLX
Dependent Regions.....	2		

IMS Lock Status			
Lock Waiters.....	0	Longest Lock.....	0.000s
Locks Held.....	0		

IMS Resource Usage			
Control CPU Percent.....	0.03%	Dependent CPU Percent.....	0.00%
Total CPU Percent.....	0.03%	Control I/O Rate.....	2.00
Dependent I/O Rate.....	3.20	Total I/O Rate.....	5.20
Control Paging Rate.....	0.00	Dependent Paging Rate.....	0.00
Total Paging Rate.....	0.00		

IMS Transaction Queue Rates and Depth			
FF ENQ Rate.....	0.80	FF DEQ Rate.....	0.80
BALG ENQ Rate.....	0.00	BALG DEQ Rate.....	0.00
Total ENQ Rate.....	0.80	Total DEQ Rate.....	0.80
FF Transaction Queue.....	3	BALG Message Queue.....	0
Total Transaction Queue...	3		

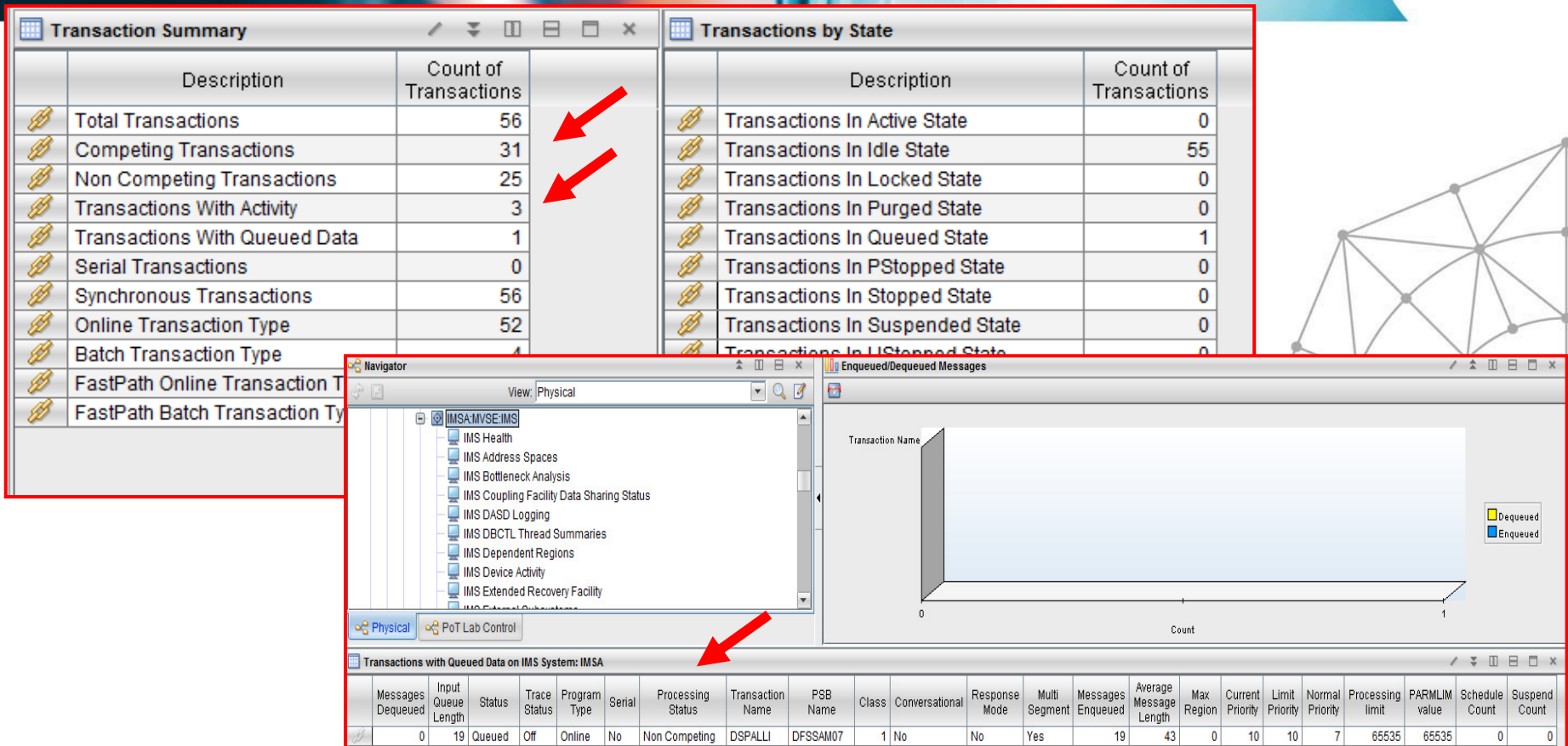
- Is the system processing transactions?
- Are transactions queued? Queued at what level?



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Monitor Queues At The Transaction Level



The screenshot displays several windows from the IMS monitoring interface:

- Transaction Summary:** A table showing overall transaction counts. Red arrows point to 'Competing Transactions' (31) and 'Transactions With Queued Data' (1).
- Transactions by State:** A table showing the distribution of transactions across various states. 'Transactions In Queued State' has a count of 1.
- Navigator:** A tree view showing the system hierarchy, with 'IMSAMVSE:IMS' selected.
- Enqueued/Dequeued Messages:** A graph showing the count of messages in different states. A legend indicates 'Dequeued' (yellow) and 'Enqueued' (blue).
- Transactions with Queued Data on IMS System: IMSA:** A detailed table for a specific transaction.

Description	Count of Transactions
Total Transactions	56
Competing Transactions	31
Non Competing Transactions	25
Transactions With Activity	3
Transactions With Queued Data	1
Serial Transactions	0
Synchronous Transactions	56
Online Transaction Type	52
Batch Transaction Type	4
FastPath Online Transaction Type	0
FastPath Batch Transaction Type	0

Description	Count of Transactions
Transactions In Active State	0
Transactions In Idle State	55
Transactions In Locked State	0
Transactions In Purged State	0
Transactions In Queued State	1
Transactions In PStopped State	0
Transactions In Stopped State	0
Transactions In Suspended State	0
Transactions In UStopped State	0

Messages Dequeued	Input Queue Length	Status	Trace Status	Program Type	Serial	Processing Status	Transaction Name	PSE Name	Class	Conversational	Response Mode	Multi Segment	Messages Enqueued	Average Message Length	Max Region	Current Priority	Limit Priority	Normal Priority	Processing limit	PARMLIM value	Schedule Count	Suspend Count
0	19	Queued	Off	Online	No	Non Competing	DSPALLI	DFSSAM07	1	No	No	Yes	19	43	0	10	10	7	65535	65535	0	0

- Identify transactions that have queued
- Determine Competing versus Non-Competing status

Monitor IMS Region Processing Understand Scheduling And Processing Delays



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

Region Name	Region Identifier	Type	Transaction Name	PSB Name	Database Calls	Message Inserts	Region Occupancy Percentage	Locks Held Count	BMP Checkpoint Count	Wait Time	Transaction Elapsed Time	Transaction Input Q Time	Syncpoint Interval	Logic Termination
IMS9FFP1	1	FastPath	--None--	DFSIVP4	0	0	0.00	0	0	02:18:40	00:00:00	00:00:00	00:00:00	--None
IMS9FFP3	2	FastPath	--None--	DBFSAMP3	0	0	0.00	0	0	02:18:40	00:00:00	00:00:00	00:00:00	--None
IMS9FFP2	3	FastPath	--None--	DFSIVP5	0	0	0.00	0	0	02:18:40	00:00:00	00:00:00	00:00:00	--None
IMSLK9F	4	BMP	--None--	CAND019	571	0	100.00	91	0	00:34:25	00:00:00	00:00:00	00:36:23	--None
IMS9FMS1	5	Message	PART	DFSSAM02	1	0	23.47	1	0	00:08:15	00:00:00	00:00:00	00:00:00	RSTIL
IMSLK9F2	7	BMP	--None--	CAND019	1	0	100.00	1	0	00:34:13	00:00:00	00:00:00	00:00:00	--None

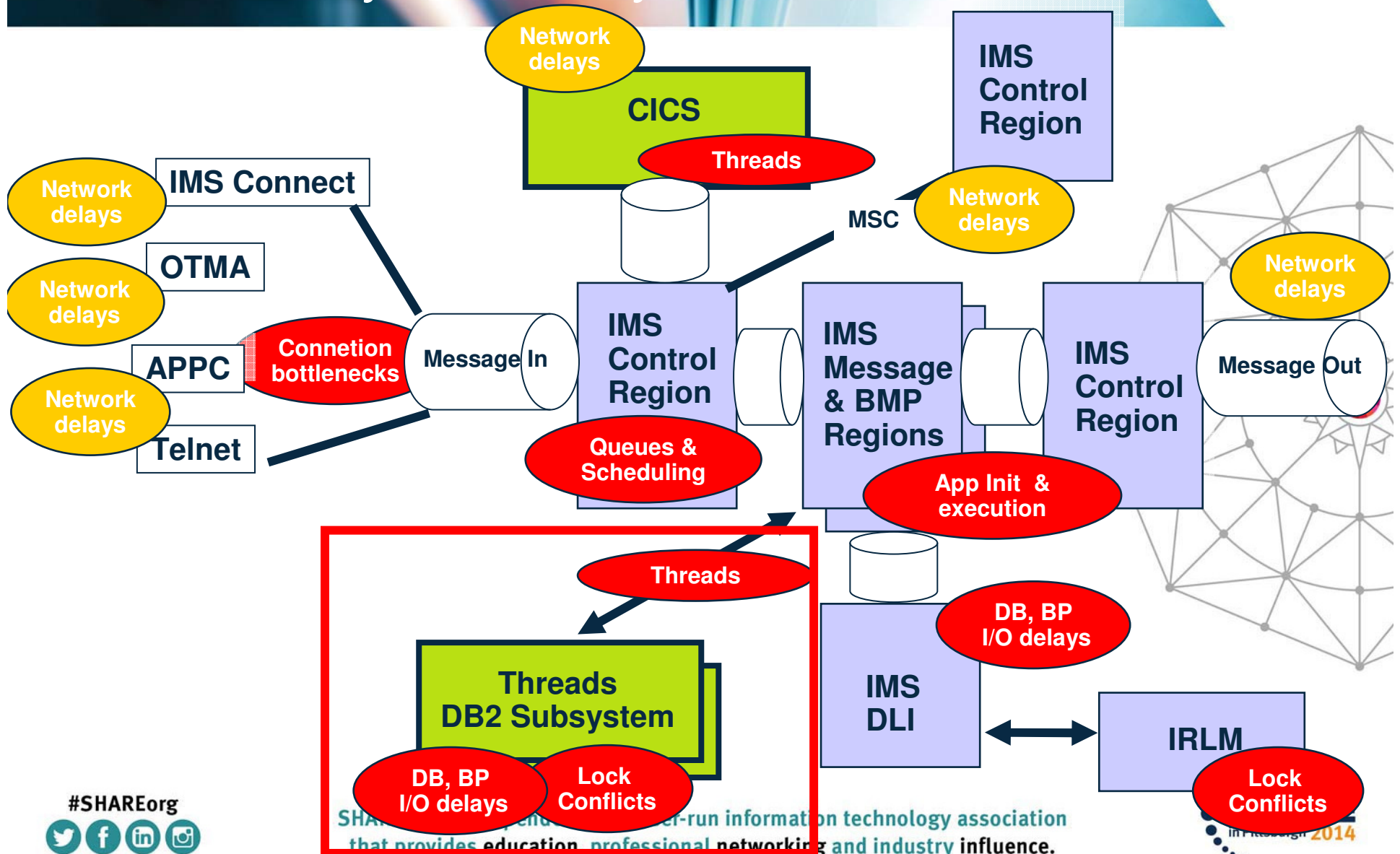


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IMS Potential Bottleneck Indicators

External Subsystem Delays



Where Is The Bottleneck?

Analyze Where The Workload May Be Bottlenecked



```
GoTo Options Help
-----
KI2PSDX2          Bottlenecks Analysis for Group ATM
-----
: Elapsed time . . . : 17:24 MN      Samp
: Suppress states . . < 0 %        Samp
: Display COMPETING TRANSACTIONS + Samp
-----
:          Wait Reason          :          Short Term
:          :                    :          % 0----- 50-----
-----
: Using CPU:                    : 15.0:--> .
: Using CPU in Appl             : 10.70:--> .
: Using CPU in IMS              : 4.20:> .
: Scheduling Waits:             : 7.9:> .
: Wait for MPP                  : 7.70:> .
: Intent Conflict               : .10:> .
: TM Schedule Latch            : 0: .
: IMS Activity:                 : 10.0:--> .
: Other DL/I IWAIT             : 5.60:> .
: IWAIT in IMS Disp            : 1.20:> .
: IWAIT in Term                 : 0: .
: LOGL Latch                    : .50:> .
: DBBP Latch                    : .10:> .
: ISWITCHed to CTL             : 2.40:> .
-----
<Response Time> <Response Time Components>

GoTo Options Hel
KI2PSDX2
-----
: Elapsed time . . .
: Suppress states .
: Display COMPETING
-----
:          Wait Reason
:          :
-----
: DC Sys Ckpt Latch : 0: . . . . . : .20:> . . . . .
: Database I/O Waits : .3:> . . . . . : .2:> . . . . .
: DISS0005           : 0: . . . . . : 0: . . . . .
: DIB80002           : .30:> . . . . . : .20:> . . . . .
: MVS Waits:         : 33.2:-----> . . . . . : 32.0:-----> . . . . .
: CPU Wait (DEP)    : 33.20:-----> . . . . . : 32.00:-----> . . . . .
-----
ESS Waits:           : 26.5:-----> . . . . . : 23.8:----> . . . . .
Commit (Phase 2)    : 2.80:> . . . . . : 2.30:> . . . . .
Prepare to Commit   : 4.70:> . . . . . : 5.60:> . . . . .
User Sign on DB2    : .10:> . . . . . : .30:> . . . . .
Terminate Thread    : 0: . . . . . : 0: . . . . .
SQL Call            : 18.70:--> . . . . . : 15.30:--> . . . . .
Other Waits:        : : . . . . . : : . . . . .
-----
<Response Time> <Response Time Components> (Bottlenecks)
```

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

External subsystem waits

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Perform Workload Bottleneck Analysis To Understand Where Time Is Spent



```

GoTo Options Help
----- 10/09/05 13:31:20
KI2PSDX2      Bottlenecks Analysis for Group ATM      IMSA

-----
: Elapsed time . . . : 17:24 MN      Sampl
: Suppress states . . < 0 %      Sampl
: Display COMPETING TRANSACTIONS + Sampl

-----
:          Wait Reason          :          Short Term
:          :          % 0----- 50-----

-----
: Using CPU:                   : 15.0:--> .
: Using CPU in Appl            : 10.70:--> .
: Using CPU in IMS             : 4.20:> .
: Scheduling Waits:           : 7.9:> .
: Wait for MPP                 : 7.70:> .
: Intent Conflict              : .10:> .
: TM Schedule Latch           : 0: .
: IMS Activity:                : 10.0:--> .
: Other DL/I IWAIT            : 5.60:> .
: IWAIT in IMS Disp           : 1.20:> .
: IWAIT in Term                : 0: .
: LOGL Latch                   : .50:> .
: DBBP Latch                   : .10:> .
: ISWITCHed to CTL            : 2.40:> .

-----
<Response Time> <Response Time Components>
    
```

```

GoTo Options Help
----- 10/09/05 13:31:28
KI2PSDX2      Bottlenecks Analysis for Group ATM      IMSA

-----
: Elapsed time
: Suppress state
: Display COMPET

-----
:          Wait Reason          :          Short Term %          :          Long Term %
:          :          % 0----- 50-----100 :          % 0----- 50-----100 :

-----
: DC Sys Ckpt Latch           : 0: . . . . : .20:> . . . .
: Database I/O Waits          : .3:> . . . . : .2:> . . . .
: DISS0005                    : 0: . . . . : 0: . . . .
: DIB80002                    : .30:> . . . . : .20:> . . . .
: MVS Waits:                   : 32.2:-----> : 32.0:----->
: CPU Wait (DEP)              : 33.20:-----> : 32.00:----->

-----
: ESS Waits:                   : 26.5:-----> : 23.8:-----> .
: Commit (Phase 2)            : 2.80:> . . . . : 2.30:> . . . .
: Prepare to Commit           : 4.70:> . . . . : 5.60:> . . . .
: User Sign on DB2            : .10:> . . . . : .30:> . . . .
: Terminate Thread            : 0: . . . . : 0: . . . .
: SQL Call                     : 18.70:--> . . . : 15.30:--> . . .
: Other Waits:                 : : : : :

-----
<Response Time> <Response Time Components> (Bottlenecks)
    
```

Note that an external subsystem (such as DB2) may impact overall workload time line.



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DB2 Monitoring Provides Detail On Application Activity

DB2 Accounting Traces –SMF 101



Elapsed time
In-DB2 time
DB2 Wait time

```

> Help PF1          ZTDTL  VTM  02      V520./C DSN 07/30/14 14:12:40  2
                    Back PF3

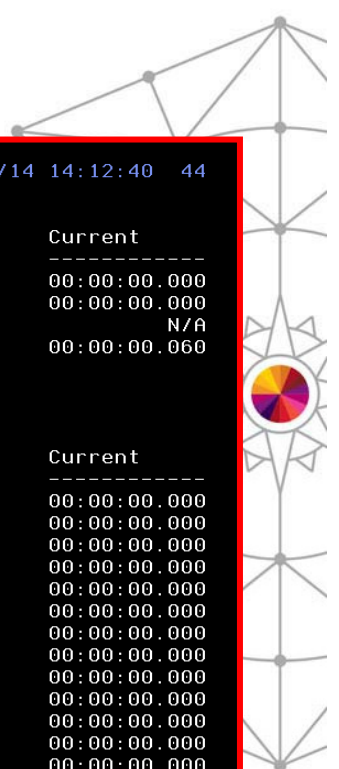
>          THREAD INFORMATION:  Enter a selection letter on the top line.

> *--THREAD DETAIL B--LOCK COUNTS C--LOCK WAITS      D--LOCKS OWNED  E--GLOBAL LOCKS
> F--CURRENT SQL   G--SQL COUNTS  H--DISTRIBUTED   I--BUFFER POOL  J--GROUP BP
> K--PACKAGES      L--RES LIMIT   M--PARALLEL TASKS N--UTILITY      O--OBJECTS
> P--CANCEL THREAD Q--DB2 CONSOLE R--DSN ACTIVITY  S--APPL TRACE  T--ENCLAVE
> U--LONG NAMES    W--ACCEL ACTIVITY

-----
>          THREAD DETAIL
PLAN
+ Thread: Plan=DISTSERV Connid=SERVER Corrid=db2jcc
+ Dist : Type=DATABASE ACCESS, Luwid=C0542F3C.M615.CD8
+ Location : :FFFF:192.84.47.60
+ Host Name:ZSERVER0S
act
+ Thread Activity
-----
+ DB2 Status          = WAIT-REMREQ  TCB Time (SQL)
+ MVS Status          =
+ Total Elapsed Time  = 02-04:07    Wait for TCB T
+ CP CPU Utilization  = 00.0%      Elapsed Time (
+ Total CP CPU Time   = 00:00:00.161 SQL Events
+ IIP CPU Time        = 00:00:00.000
+ Total Parallel Tasks = 0
+ Current Parallel Tasks= 0
+ Thread Status       = RA
+ Stored Procedures
-----
+ Total CPU           = 00:00:00.060  Triggers
+ Elapsed time        = 00:00:01.480  TCB not in Enc
+ Elapsed Time (SQL)  = 00:00:00.438  Elapsed not in
+ Wait for TCB Time   = 00:00:00.390  TCB prior to E
+ Wait Event Count    = 60
+ Curr Wait TCB Time  = 00:00:00.000
+ SavePoints
-----
+ Savepoint Requests  = 0
+ Release Savepoints  = 0
    
```

```

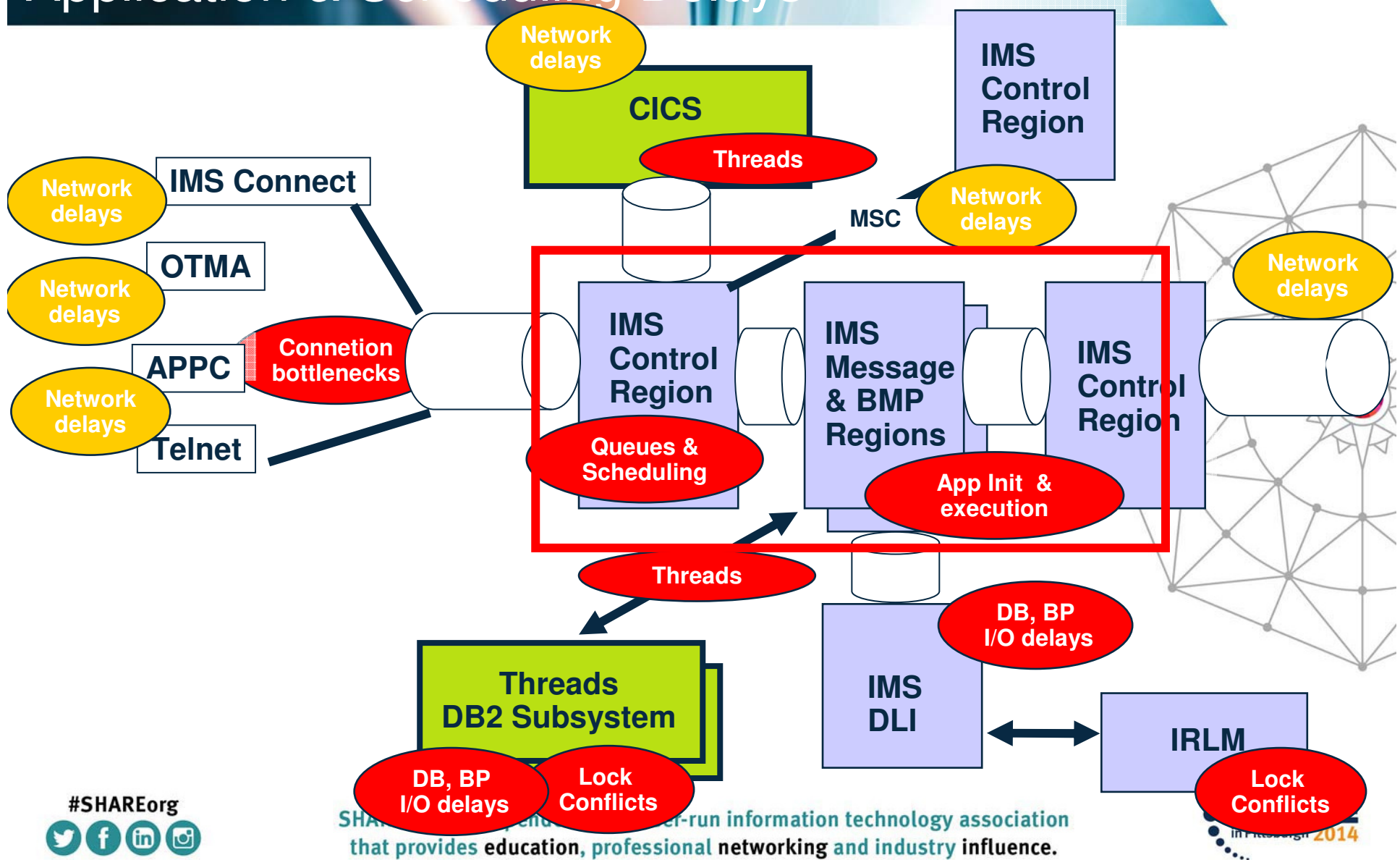
-----
+ Rollback Savepoints = 0
+ In-DB2 Times
-----
+ Elapsed Time          00:00:01.998  Total          Current
+ CP CPU Time           00:00:00.036  00:00:00.000
+ IIP CPU Time          00:00:00.029  N/A
+ Stored Procedure CPU Time 00:00:00.060  00:00:00.060
+ UDF CP CPU Time        00:00:00.000
+ UDF IIP CPU Time       00:00:00.000
+ UDF Elapsed Time Main  00:00:00.000
-----
+ Waits                  Count      Total          Current
-----
+ Synchronous I/O Wait   170      00:00:00.626  00:00:00.000
+ Asynchronous Read I/O Wait 31      00:00:00.133  00:00:00.000
+ Asynchronous Write I/O Wait 0       00:00:00.000  00:00:00.000
+ Local Lock/Latch Wait  1       00:00:00.000  00:00:00.000
+ Page Latch Wait        0       00:00:00.000  00:00:00.000
+ Drain Lock Wait        0       00:00:00.000  00:00:00.000
+ Drain of Claims Wait   0       00:00:00.000  00:00:00.000
+ Archive Log Mode(Quiesce) Wait 0      00:00:00.000  00:00:00.000
+ Archive Read from Tape Wait 0      00:00:00.000  00:00:00.000
+ Switch to Open/Close Wait 26     00:00:00.468  00:00:00.000
+ Switch to SYSLGRNG Service Wait 29    00:00:00.158  00:00:00.000
+ Switch to DMS Waits    24     00:00:00.247  00:00:00.000
+ Other Service Waits    24     00:00:00.023  00:00:00.000
+ Force at Commit Waits  12     00:00:00.018  00:00:00.000
+ Log Write I/O Wait     48     00:00:00.029  00:00:00.000
+ Sync EX Unit Sw-com/abort/dealloc 1     00:00:00.008  00:00:00.000
+ LOB Materialization    5      00:00:00.000  00:00:00.000
+ Latch Contention Wait  0      00:00:00.000  00:00:00.000
-----
+ Total Class 3 Wait Time 00:00:01.715
-----
    
```



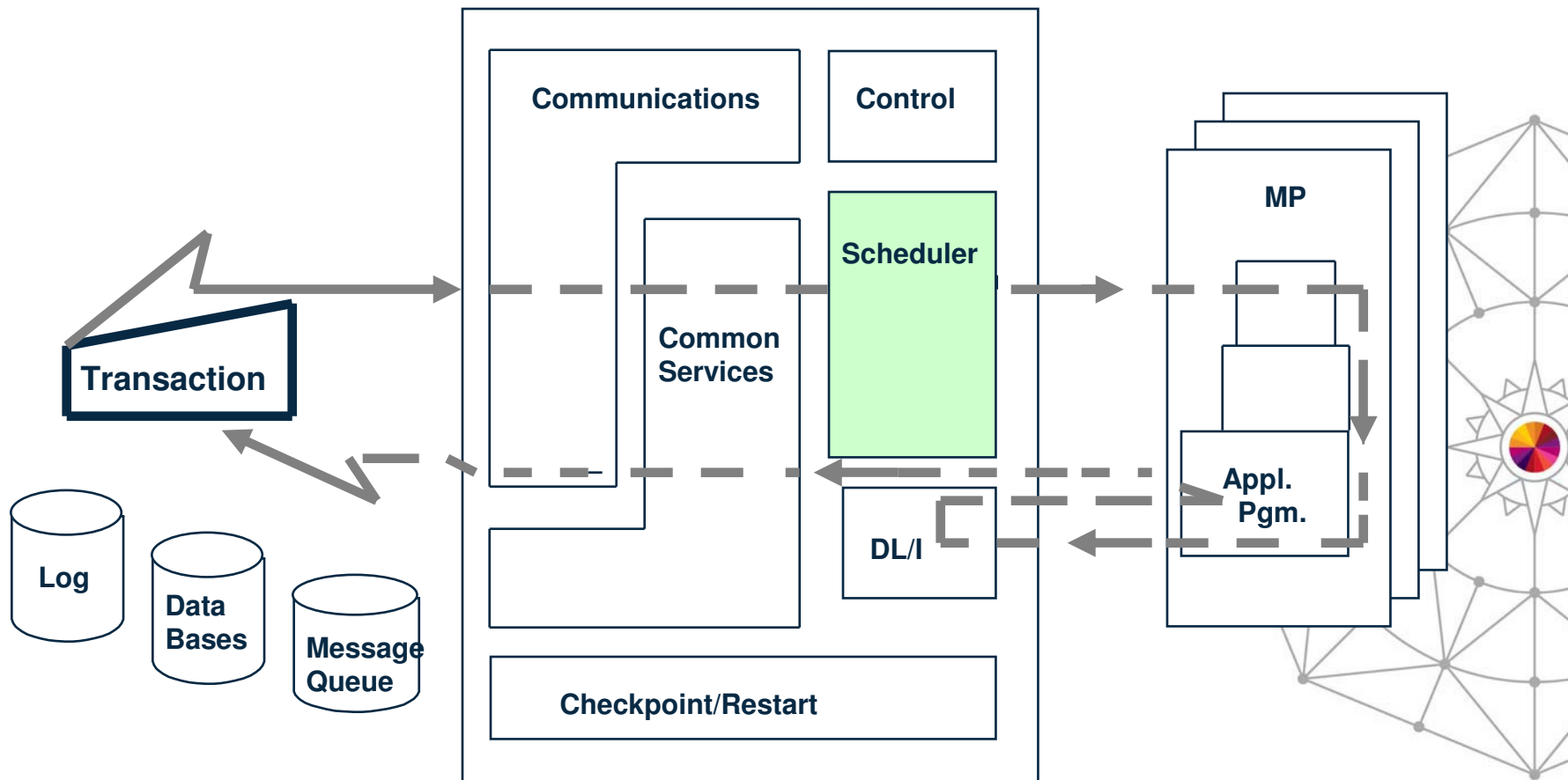
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IMS Potential Bottleneck Indicators Application & Scheduling Delays



IMS Scheduler Overview



Use Workload Bottleneck Analysis To Identify Scheduling Delays



PDEX	-----SHORT TERM %-----			-----LONG TERM %-----		
+ (ELAPSED TIME= 1:41 MN)	% 0	50	100	% 0	50	100
+ USING CPU:	21.0	--->	.	20.5	--->	.
+ USING CPU IN APPL	(11.2)	-->	.	(11.0)	-->	.
+ USING CPU IN IMS	(9.8)	-->	.	(9.5)	-->	.
+ SCHEDULING WAITS:	2.8	>	.	2.0	>	.
+ WAIT FOR MPP	(0.2)	>	.	(0)	>	.
+ WAIT FOR GU	(2.6)	>	.	(2.0)	>	.
+ IMS ACTIVITY:	16.5	-->	.	15.5	-->	.
+ SPA I/O	(1.2)	>	.	(1.2)	>	.
+ SYNC POINT WAIT	(5.6)	>	.	(5.6)	>	.
+ ISWITCHED TO CTL	(9.7)	->	.	(8.7)	->	.
+ DATABASE I/O WAITS	26.7	----->	.	21.7	----->	.
+ ADA221	(15.4)	-->	.	(11.4)	-->	.
+ ADA021S	(11.3)	->	.	(10.3)	->	.
+ MVS WAITS:	35.8	----->	.	30.8	----->	.
+ CPU WAIT (MPP/BMP)	(13.7)	-->	.	(10.7)	-->	.
+ PROGRAM FETCH I/O	(22.1)	--->	.	(20.1)	--->	.
+ -----						
+ Avg. Trans Executing:		5.3			4.0	

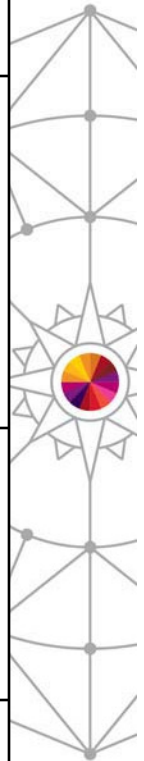


Monitor The Various IMS Pools – Overview part 1



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

EVENT	ACTIVITY	POOLS/LISTS	DATASETs
Message Input	TP MFS SPA GET QUEUING	CIOP RECANY MFP SPAP/CWAP QBUF LOG	LINEs FORMAT MSGQs IMSLOG
Scheduling	Scheduling PSB Load DMB Load	QBUF PSBP DMBP LOG	MSGQs ACBLIB ACBLIB IMSLOG
Schedule End to First DL/I Call	Program Load Initialization	BLDL VLF/LLA PRELOAD	STEPLIBs



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Monitor The Various IMS Pools – Overview part 2



EVENT	ACTIVITY	POOLS/LISTS	DATASET ^s
Program Elapsed	DC Calls	QBUF	MSGQs
DL/I Elapsed	DB Calls	OSAM VSAM LOG	Databases Databases IMSLOG
IWAIT Elapsed	SPA Insert	SPAP/CWAP LOG	IMSLOG
Termination	Sync Point	OSAM VSAM QBUF LOG	Databases Databases MSGQs IMSLOG
Message Output	Dequeuing MFS TP	QBUF MFP CIOP/HIOP LOG	MSGQs FORMAT LINEs IMSLOG



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Use Workload Analysis To Understand Resource Delays

Example – z/OS CPU Usage And Delays

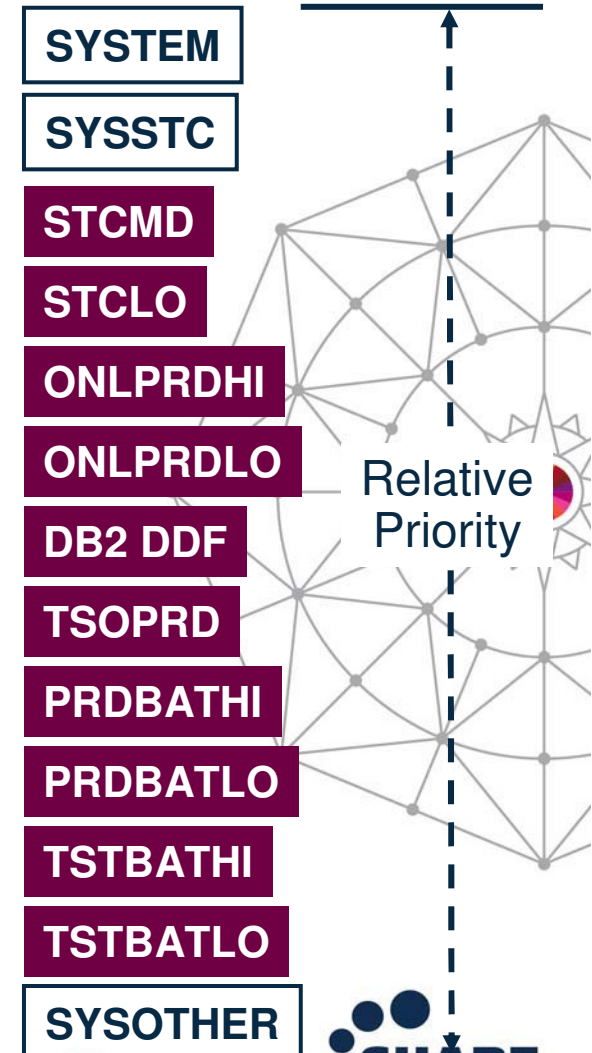
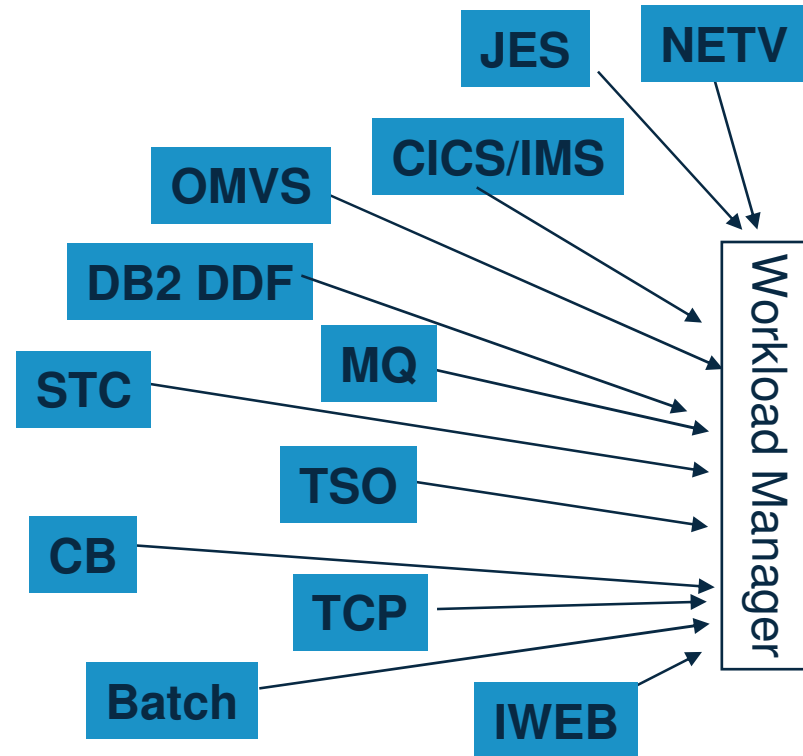


PDEX	-----SHORT TERM %-----			-----LONG TERM %-----		
+ (ELAPSED TIME= 1:41 MN)	% 0	50	100	% 0	50	100
+ USING CPU:	21.0	--->.	.	20.5	--->.	.
+ USING CPU IN APPL	(11.2)	--> .	.	(11.0)	--> .	.
+ USING CPU IN IMS	(9.8)	--> .	.	(9.5)	--> .	.
+ SCHEDULING WAITS:	2.8	> .	.	2.0	> .	.
+ WAIT FOR MPP	(0.2)	> .	.	(0)	> .	.
+ WAIT FOR GU	(2.6)	> .	.	(2.0)	> .	.
+ IMS ACTIVITY:	16.5	--> .	.	15.5	--> .	.
+ SPA I/O	(1.2)	> .	.	(1.2)	> .	.
+ SYNC POINT WAIT	(5.6)	> .	.	(5.6)	> .	.
+ ISWITCHED TO CTL	(9.7)	--> .	.	(8.7)	--> .	.
+ DATABASE I/O WAITS	26.7	----->	.	21.7	----->	.
+ ADA221	(15.4)	--> .	.	(11.4)	--> .	.
+ ADA021S	(11.3)	--> .	.	(10.3)	--> .	.
+ MVS WAITS:	35.8	----->	.	30.8	----->	.
+ CPU WAIT (MPP/BMP)	(13.7)	--> .	.	(10.7)	--> .	.
+ PROGRAM FETCH I/O	(22.1)	--> .	.	(20.1)	--> .	.
+ -----						
+ Avg. Trans Executing:		5.3			4.0	

Note that z/OS delays may impact the application time line.

z/OS And WLM Impacts Resources Assigned To IMS

Service
Classes



- IMS and related regions may be prioritized as part of WLM assignment



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Monitor Critical z/OS Service Classes And WLM Performance Index

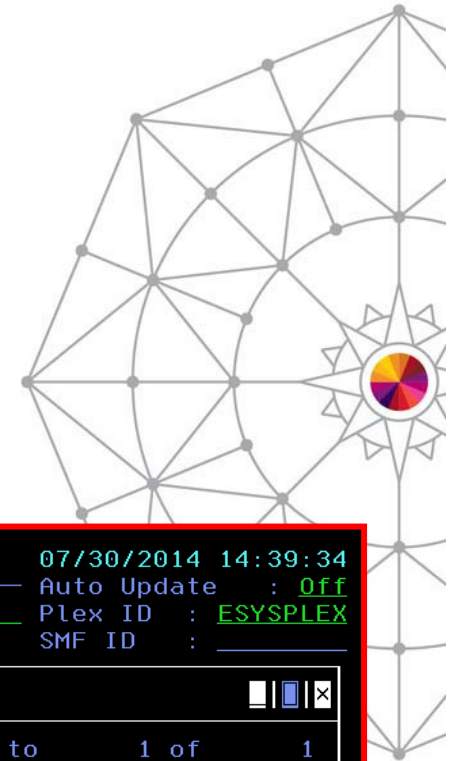


File Edit View Tools Navigate Help 07/30/2014 14:39:18
 Command ==> KM5WSC0 Service Classes for Sysplex Auto Update : Off
 Plex ID : ESYSPLEX
 SMF ID :

Summary

Columns 3 to 5 of 12 Rows 1 to 15 of 15

ΔService Class	ΔPeriod	ΔGoal Importance	ΔPerformance Index	ΔWorst Performance Index
— OPSLO	1	Medium	20.00	20.00
— OPSHI	1	Highest	2.80	70.00
— BATMED	1	Low	2.50	2.50
— OPSDEF	1	High	0.75	2.72
— UNIX	3	Low	0.56	0.56
— CICSDEF	1	High	0.50	0.50
— IMSDEF	1	High	0.50	0.50
— UNIX	2	Medium	0.40	0.40
— CSTRD2	1	High	0.21	0.21
— UNIX	1	High	0.00	0.59
— TSO	1	H		
— SYSSTC	1	U		
— CBHI	1	H		
— BATMED	2	U		
— SYSTEM	1	U		



File Edit View Tools Navigate Help 07/30/2014 14:39:34
 Command ==> KM5WSC02 Periods for Service Class Auto Update : Off
 Plex ID : ESYSPLEX
 SMF ID :

Periods Details for Service Class IMSDEF

Columns 2 to 6 of 10 Rows 1 to 1 of 1

ΔPeriod	ΔPerformance Index	ΔGoal Importance	ΔTransaction Rate	ΔAverage Response Time	ΔVel
— 1	0.50	High	0.0	4	

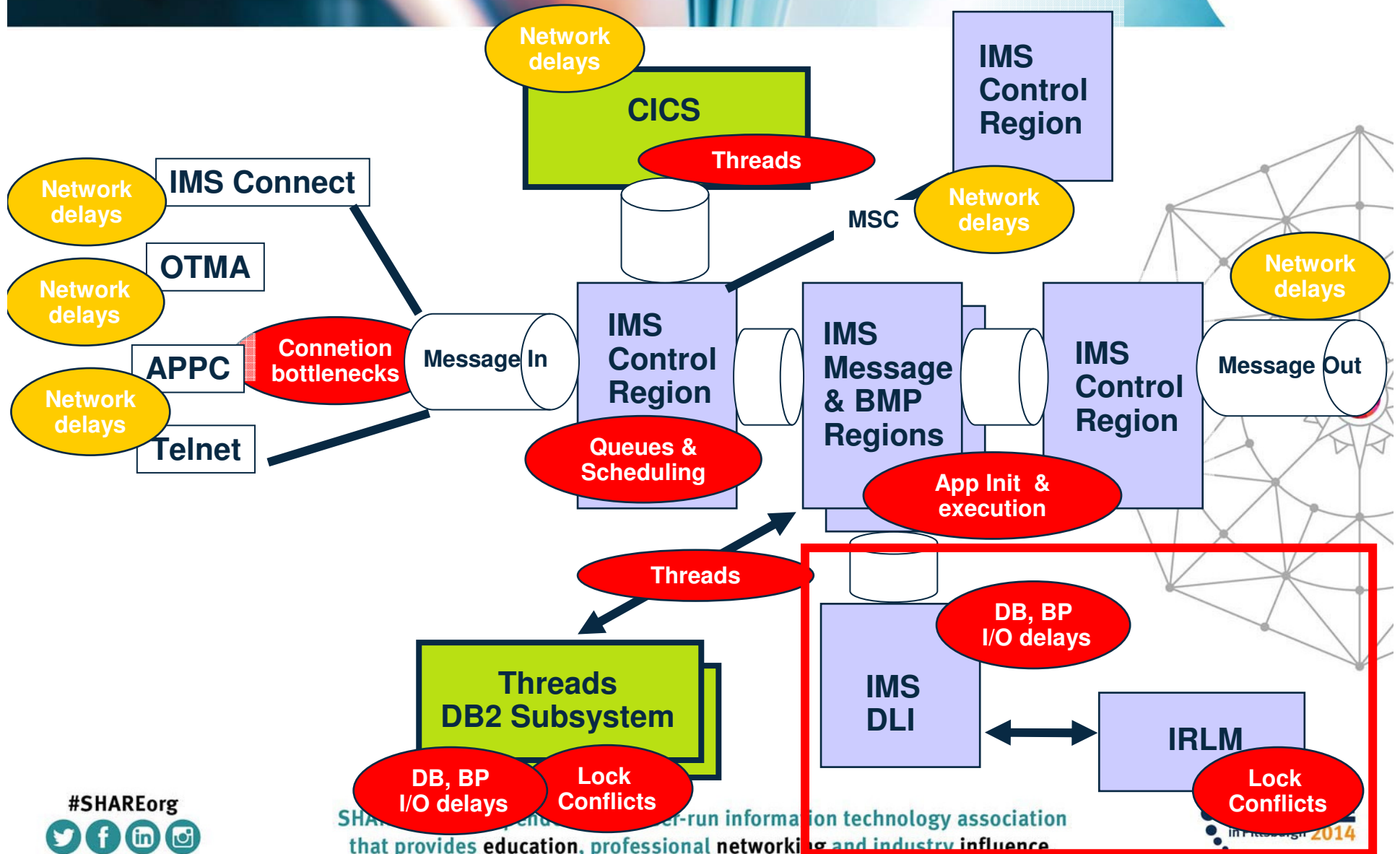


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IMS Has Many Potential Bottlenecks

IMS Database Delays



IMS Lock Conflicts May Bottleneck Workload Processing



Global Lock Conflicts Table View - PFWLERNEW - SYSADMIN *ADMIN MODE*

File Edit View Help

Navigator

Enterprise

- z/OS Systems
 - IMSplex
 - IMS
 - DFSI81G:LPAR400:SQGROUP
 - DFSI8YG:LPAR400:SQGROUP
 - DFSI91G:LPAR400:SQGROUP
 - DFSI9YG:LPAR400:SQGROUP
 - IMS8:LPAR400:DSGROUP
 - IMS9:LPAR400:DSGROUP
 - Coupling Facility Structures
 - Global Lock Conflicts
 - IMS93A:LPAR400:DSGROUP
 - IRLM8Y:LPAR400:DSGROUP
 - IRLM91:LPAR400:DSGROUP
 - IRLM9Y:LPAR400:DSGROUP
 - SP22
 - SYS
 - IMS
 - I81C:SYS:IMS
 - I91A:SYS:IMS
 - I91C:SYS:IMS
 - IMS Address Spaces
 - IMS Bottleneck Analysis

Global Lock Conflicts

Token

Top Blockers - Owns a lock in conflict but not waiting on any locks

Jobname	PSBNAME	Transaction Name	Lock Elapsed Time	Waiter Count	Waiting Count	Token	IMS ID	MVS ID	Region Type	Region Status	Lock Status	DB/Area Name	Timestamp
LOCK9CJ1	CAND019		07:56:33	2	0	9E5A7979	I91C	SYS	BMP	EX DRGN	LockOwner	DI21PART	04/29/08 21:26:13

Global Lock Conflicts Detail View

Lock Status	Token	DB/Area Name	IMS ID	MVS ID	Jobname	PSBNAME	Transaction Name	Region Type	Region Status	Lock Elapsed Time	DCB Number	HALDB Partition ID	HALDB Partition Name	Lock Intent	Elapsed Time Synpoint	Locks Held	Database Updates	Region ID	Owner IMS ID	Owner MVS ID	Owner Jobname	Owner PSBNAME	Owner Transaction Name	Owner Region ID	LT	
LockWaiter	9E567979	DI21PART	I91C	SYS	LOCK9CJ3	CAND019		BMP	WTIRLM	07:56:09	01	0	--N/A--	Update	07:34:06	1	0	10	I91C	SYS	LOCK9...	CAND019		8	DI21PAR	
LockWaiter	AF2392E7	DI21PART	I91C	SYS	IMSLK9C2	CAND019		BMP	WTIRLM	07:53:23	01	0	--N/A--	Update	07:31:27	1	0	11	I91C	SYS	IMSLK9C	CAND019		2	DI21PAR	
LockWaiter	9E567979	DI21PART	I91C	SYS	LOCK9CJ5	CAND019		BMP	WTIRLM	07:54:14	01	0	--N/A--	Update	07:32:16	1	0	9	I91C	SYS	LOCK9...	CAND019		8	DI21PAR	
LockWaiter	9E5A7979	DI21PART	I91C	SYS	IMSLK9C	CAND019		BMP	WTIRLM	07:53:29	01	0	--N/A--	Update	07:31:33	121	309	2	I91C	SYS	LOCK9...	CAND019		6	DI21PAR	
LockWaiter	9E567979	DI21PART	I91C	SYS	LOCK9CJ4	CAND019		BMP	WTIRLM	07:54:23	01	0	--N/A--	Update	07:32:25	1	0	7	I91C	SYS	LOCK9...	CAND019		8	DI21PAR	
LockWaiter	9E5A7979	DI21PART	I91C	SYS	LOCK9CJ2	CAND019		BMP	WTIRLM	07:56:20	01	0	--N/A--	Update	07:34:16	3	1	8	I91C	SYS	LOCK9...	CAND019		6	DI21PAR	
LockWaiter	A322241D	DI21PART	I91C	SYS	IMS9CMS1	DFSSAM...	PART	MPP	WTIRLM	07:50:23	01	0	--N/A--	Share	07:28:36	1	0	5	I91C	SYS	IMSLK9C	CAND019		2	DI21PAR	
LockOwner	AF2392E7	DI21PART	I91C	SYS	IMSLK9C	CAND019		BMP	WTIRLM	07:53:29	01	0	--N/A--	Update	07:31:33	121	309	2	N/A	N/A	N/A	N/A	N/A	N/A	0	DI21PAR
LockOwner	A322241D	DI21PART	I91C	SYS	IMSLK9C	CAND019		BMP	WTIRLM	07:53:29	01	0	--N/A--	Update	07:31:33	121	309	2	N/A	N/A	N/A	N/A	N/A	N/A	0	DI21PAR
LockOwner	9E567979	DI21PART	I91C	SYS	LOCK9CJ2	CAND019		BMP	WTIRLM	07:56:20	01	0	--N/A--	Update	07:34:16	3	1	8	N/A	N/A	N/A	N/A	N/A	N/A	0	DI21PAR
LockOwner	9E5A7979	DI21PART	I91C	SYS	LOCK9CJ1	CAND019		BMP	EX DRGN	07:56:33	01	0	--N/A--	Update	07:34:29	2	1	6	N/A	N/A	N/A	N/A	N/A	N/A	0	DI21PAR

Lock owner/waiters

Monitor for IMS lock conflicts. Note lock holders versus lock waiters.

Lock owner/waiters



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Database I/O Waits Impact Application Processing



```

PDEX
+ (ELAPSED TIME= 1:41 MN) % 0-----SHORT TERM %-----LONG TERM %-----
+ USING CPU:                21.0|--->. . . . | 20.5|--->. . . .
+ USING CPU IN APPL (11.2)|-->. . . . | (11.0)|-->. . . .
+ USING CPU IN IMS (9.8)|-->. . . . | (9.5)|-->. . . .
+ SCHEDULING WAITS:         2.8|>. . . . | 2.5|>. . . .
+ WAIT FOR MPP (0)|>. . . . | (0.2)|>. . . .
+ WAIT FOR GU (2.8)|>. . . . | (2.3)|>. . . .
+ IMS ACTIVITY:            16.5|-->. . . . | 12.5|-->. . . .
+ SPA I/O (1.2)|>. . . . | (1.0)|>. . . .
+ SYNC POINT WAIT (5.6)|>. . . . | (5.2)|>. . . .
+ ISWITCHED TO CTL (9.7)|->. . . . | (6.3)|->. . . .
+ DATABASE I/O WAITS 35.7|----->. . . . | 26.7|----->. . . .
+ PAY221 (25.4)|----->. . . . | (15.4)|-->. . . .
+ ADA021S (10.3)|->. . . . | (11.3)|->. . . .
+ MVS WAITS:                25.8|----->. . . . | 22.7|---->. . . .
+ CPU WAIT (MPP/BMP) (13.7)|-->. . . . | (12.6)|-->. . . .
+ PROGRAM FETCH I/O (12.1)|->. . . . | (10.1)|->. . . .
+ ----
+ - - - - -
+ Avg. Trans Executing:          5.3          3.5
    
```

Use Bottleneck Analysis to understand the impact of IMS database delays

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Monitor IMS Database Buffer Pools And I/O Statistics

08/28/12 14:47:27

OSAM Buffer Pools Status

Lines 1 to 3 of 3						
Subpool	Subpool Id	Number of Buffers	Hit Ratio	Size of Buffers	Buffers Page-Fixed?	Prefix Page-Fixed?
1	none	64	62.5%	1024	NO	NO
2	none	32	62.0%	2048	NO	NO
3	none	16	41.3%	4096	NO	NO

08/28/12 14:47:32

Device Statistics

Lines 1 to 7 of 7

Volser	Unit	Response Time	IOSQ Time	Pend Time	Conn Time	Disc Time	I/Os per sec		Queue Length	% Busy
							Total	IMS		
PPSMPE	14E	7.5	.0	3.2	2.6	1.6	.7	.0	.00	.7
CAN001	2A4	7.2	.0	1.5	2.1	3.5	.5	.0	.00	2.5
CAN009	2B9	6.8	.0	1.0	2.7	2.9	.4	.0	.00	.4
PPSMPI	4E1	4.8	.0	2.6	1.5	.6	30.9	.0	.00	3.4
PPSMPI	4E5	15.0	.0	3.5	1.1	10.2	.0	.0	.00	.0
PPSMPI	4E7	7.6	.0	.6	3.0	4.0	.6	.0	.00	.2
PPSMPI	4E8	54.7	34.3	1.3	14.5	4.6	7.8	.0	.02	11.5

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Categories Of Typical Alerts



Availability

Application availability
Essential infrastructure availability
Subsystem availability

Types Of Alerts

Performance

Subsystem performance
Application performance
Identification of performance issues

Resource

Subsystem resource utilization
Application resource utilization



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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



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Application Performance Example Alert To Monitor Response Time



	R1 Time (Secs.)	RTA Group Name
1	> 0.0200	== 'PART'
2	> 0.0300	== 'SYSTEM'
3		

Using boolean logic allows the alert to be application sensitive.

Condition Type: Attribute Comparison, Situation Comparison

Attribute Group: Local RTA GNT, Local Time, Universal Messages, Universal Time

Attribute Item: IMSID, Input Queue Time (Secs.), MVS System, Originating System Identifier, Output Queue Time (Secs.), Processing Time (Secs.), Program Input Queue Time (Secs.), R0 Time (Secs.), **R1 Time (Secs.)**, **RTA Group Name**, RTA Group Number, SYSPlex Identifier

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

Consider using options to filter out outliers

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Subsystem Performance Example Monitoring Queuing At The Subsystem Level



Description
This situation tracks queue depth for the system

Formula
Transactions Queued \geq 100

	Transactions Queued	
1	\geq	100
2		
3		

intended for logging and reporting data collection times rather than for creating situations. To specify a time of day for monitoring, use attributes from the Universal Time or Local Time groups. See the Tivoli Enterprise Portal help for instructions on specifying timestamp attributes in situations and queries.

Transactions Queued Current number of transactions queued. Valid format is an integer.

Situation Formula Capacity: 0%

Sampling interval: 0 : 04 : 00 (ddd hh mm ss)

Sound: Enable critical.wav

State: **Critical**

Run at startup

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.



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Application Performance Example Monitoring Transaction Level Queuing



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

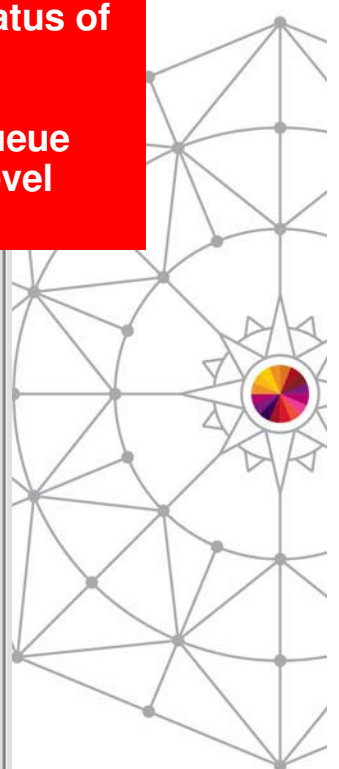
	Status	Messages Enqueued	Transaction Name
1	== 'Queued'		== PART
2	== 'Queueing'		== PART
3	> 0		== 'PART'
4			

Situation Formula Capacity: 30%

Sound: Enable critical.wav

State: **Critical**

Run at startup:



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Subsystem Performance Example Monitor Dependent Region Processing



Situation Editor

Formula Distribution Expert Advice Action Until

Description
Region occupancy for Dependent Region is High

Formula

	Region Occupancy Percentage	Region Name	Type
1	> 50.00	== DEMORGN	== Message
2	> 40.00	== DEMORGN2	== Message
3			

Region Name The job name of the subject IMS address space. Valid format is a text string of up to eight alphanumeric characters.

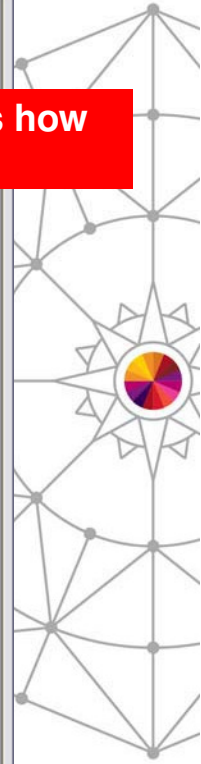
Region Occupancy Percentage The dependent region occupancy percentage. Valid values include an integer, Init, and N/A.

Region Status Indicates the current status of the region. Valid values include Idle, Wait-FPCR Wait-IntCnf Wait-PSR Wait-DMR Wait-HotRtn Wait-Init Wait-IRI M

Situation Formula Capacity 33% Add conditions... Advanced...

Sampling interval
0 / 0 : 2 : 0
ddd hh mm ss Run at startup

Region occupancy measures how busy the message region is.

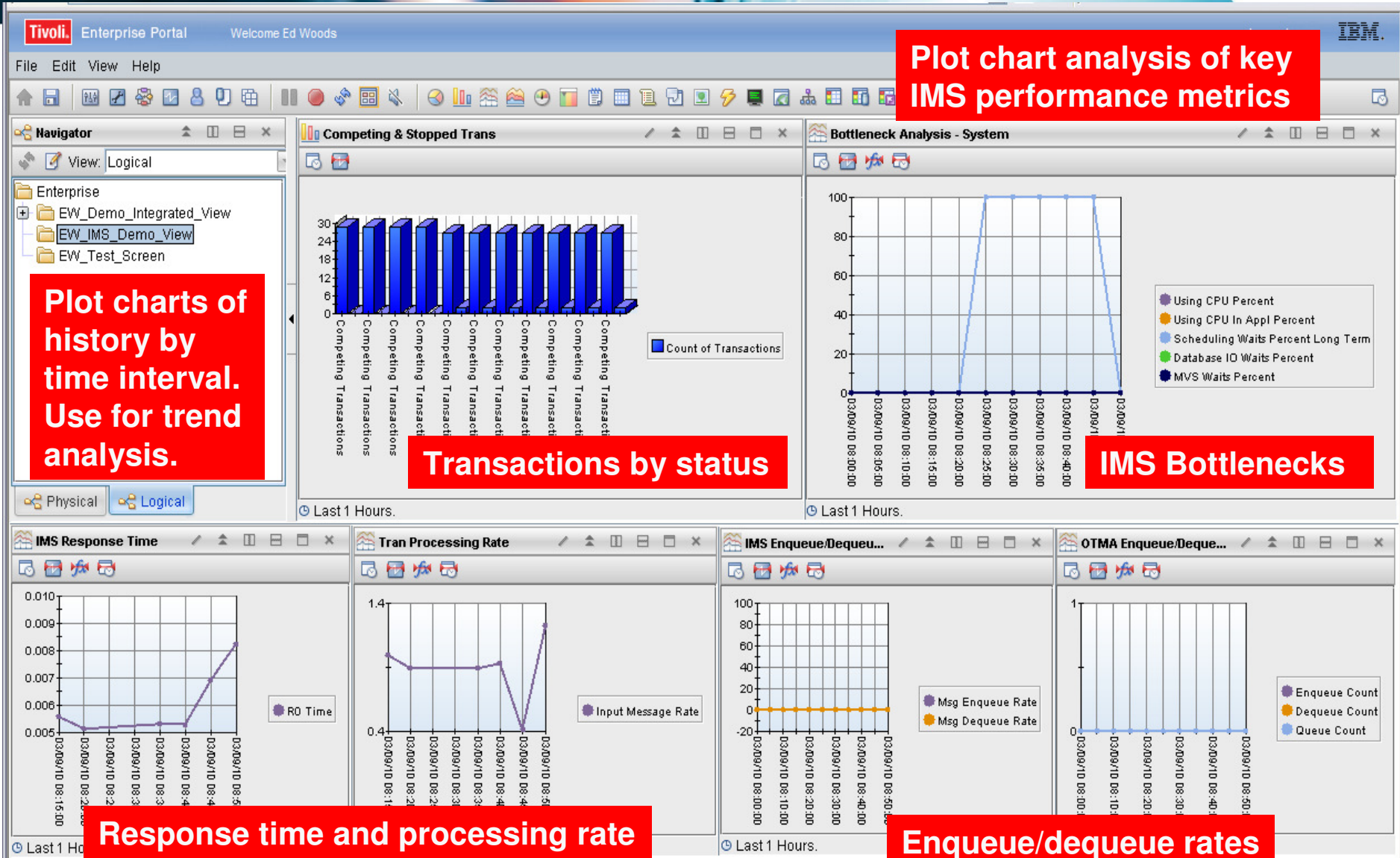


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IMS Historical Performance Analysis

Trend IMS Bottleneck And Workload Processing Over Time



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Summary – Key Monitoring Metrics

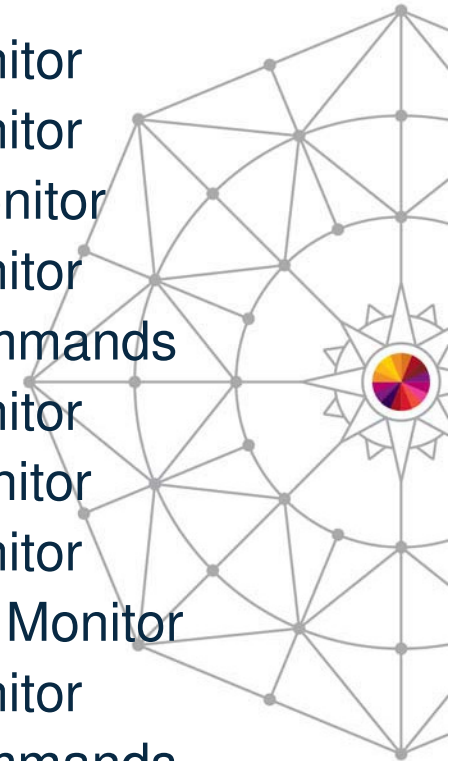


Metric

Source

- Monitor IMS transaction response time
- Monitor z/OS resources
- Monitor scheduling bottlenecks
- Monitor application workload bottlenecks
- Monitor performance and issues
- Monitor IMS processing and queues

IMS Monitor
IMS Monitor
z/OS Monitor
IMS Monitor
IMS Commands
IMS Monitor
DB2 Monitor
IMS Monitor
Network Monitor
IMS Monitor
IMS Commands



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Summary - Key Monitoring Metrics



Metric

Source

- Monitor IMS lock conflicts
- Monitor database I/O activity

- Alerts on critical resources
- Monitor IMS performance history

IMS Monitor
IMS Monitor
z/OS Monitor
Storage Monitor
IMS Monitor
IMS Monitor
DB2 Monitor
z/OS Monitor
Network Monitor



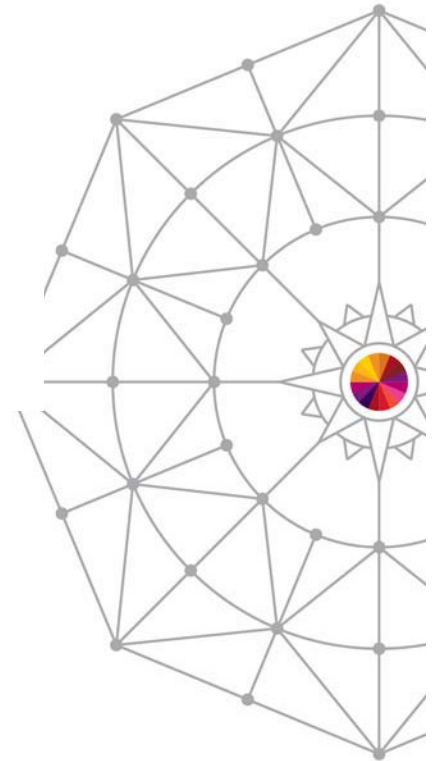
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 - IMS regions simplified, clarified and demystified: PART 1 & PART 2 (Aug 27 & Oct 15, 2013)
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- IMS Performance Monitoring and Tuning Update Redbook, SG24-6404-00
- IMS Performance Guide Redbook, SG24-4637-00
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- IBM OMEGAMON XE for IMS User's Guide
- www.ibm.com/ims

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Tivoli With A z

This is a blog to discuss what is happening in the area of IBM z/Series, Tivoli, OMEGAMON monitoring, System Automation, and other relevant IBM Tivoli technology for z/OS performance and availability management.

Ed Woods
IBM Corporation

Friday, February 5, 2010
OMEGAMON DB2 Near Term History

Record Type	Count	Timestamp of First Record	Timestamp of Last Record
Accounting	1945	2010-02-05-22:28:42	2010-02-05-14:08:18
DB2 Section	8	2010-02-05-22:28:42	2010-02-05-07:53:33
DB2 Section	832	2010-02-05-22:28:42	2010-02-05-14:08:18
DB2 Section	2271	2010-02-05-22:28:42	2010-02-05-14:08:18
DB2 Section	14	2010-02-05-22:44:36	2010-02-05-14:08:18
DB2 Section	14	2010-02-05-22:44:36	2010-02-05-07:44:36
DB2 Section	631	2010-02-05-22:44:36	2010-02-05-14:08:18
Perf-Dyn SQL	21083	2010-02-05-22:50:18	2010-02-05-14:08:25

OMEGAMON DB2 has a very useful Near Term History (NTH) function. NTH provides an easy way to be able to retrieve and review DB2 Accounting and Statistics records from the past few hours of DB2 processing. The data is stored in a set of VSAM files allocated to the OMEGAMON collection task. How far back the history goes depends upon the size of the files and the amount of data being written to these files. Now some of the data volume is driven by the DB2 workload activity. Accounting records are typically written when a DB2 thread terminates processing, and it is the Accounting data that is often looked at by the analyst when studying what DB2 applications have been doing. Statistics records are created on a time interval basis. Usually, you will have much more accounting data than statistics data. Also, OMEGAMON has the ability to pull in additional trace IFCIDs to get information on things such as dynamic SQL activity.

To understand the amount of data being gathered by NTH, there are displays that show the number of records written to the NTH files, by type. In the example I show, you see an example of common NTH settings/options, and then you see a record count in the NTH record information display. If you look carefully you see that 'Perf-Dyn SQL' has a lot of records written relative to the other record types. This is a good way to understand the impact of enabling certain collection options, such as dynamic SQL collection, and see how many trace records are being gathered, as a result.

Posted by Ed Woods at 3:13 PM 0 comments

Internet

ED WOODS

I'm an IT Specialist with IBM Corporation supporting Tivoli Performance solutions on z/OS. Please note that comments made on this blog are my own, and do not necessarily reflect the position of IBM Corporation.

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