

S63

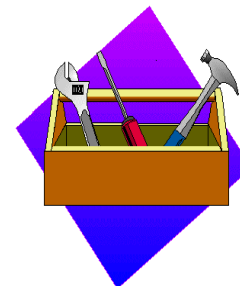
Understanding the IMS Monitor with the Help of IMS Performance Analyzer

David Mierowsky



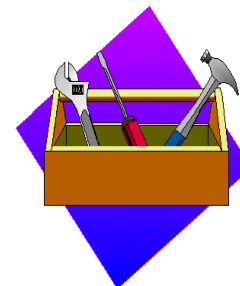
Miami Beach, FL

October 22-25, 2001



Agenda

- **Overview of the IMS monitor**
- **IMSPA overview**
- **Tuning using IMSPA monitor reports**
- **IMSPA futures**



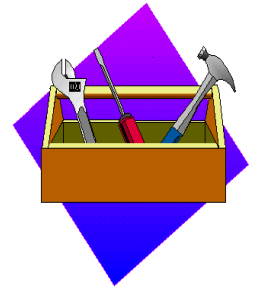
IMS Monitor

- Activate via /TRA SET ON MON command
- Writes records to IMSMON dataset before and after various IMS events
- Make sure at least two checkpoints in monitor interval
- IMS provides monitor analysis program DFSUTR20 (DFSUTR30 for batch)
- **Get the block size and number of buffers right! (ACTL latch)**

Half Track

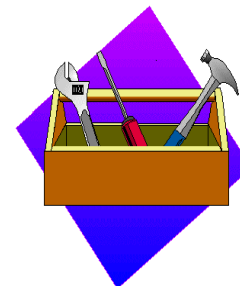
20-40

IMS PA



IMS Monitor

- ◆ DFSUTR20 report program
 - ◆ Very little control over reports produced
 - ◆ Events reported in the order they occur
 - ◆ No filtering or grouping
 - ◆ No support for IMS V7 Fast Path monitor records

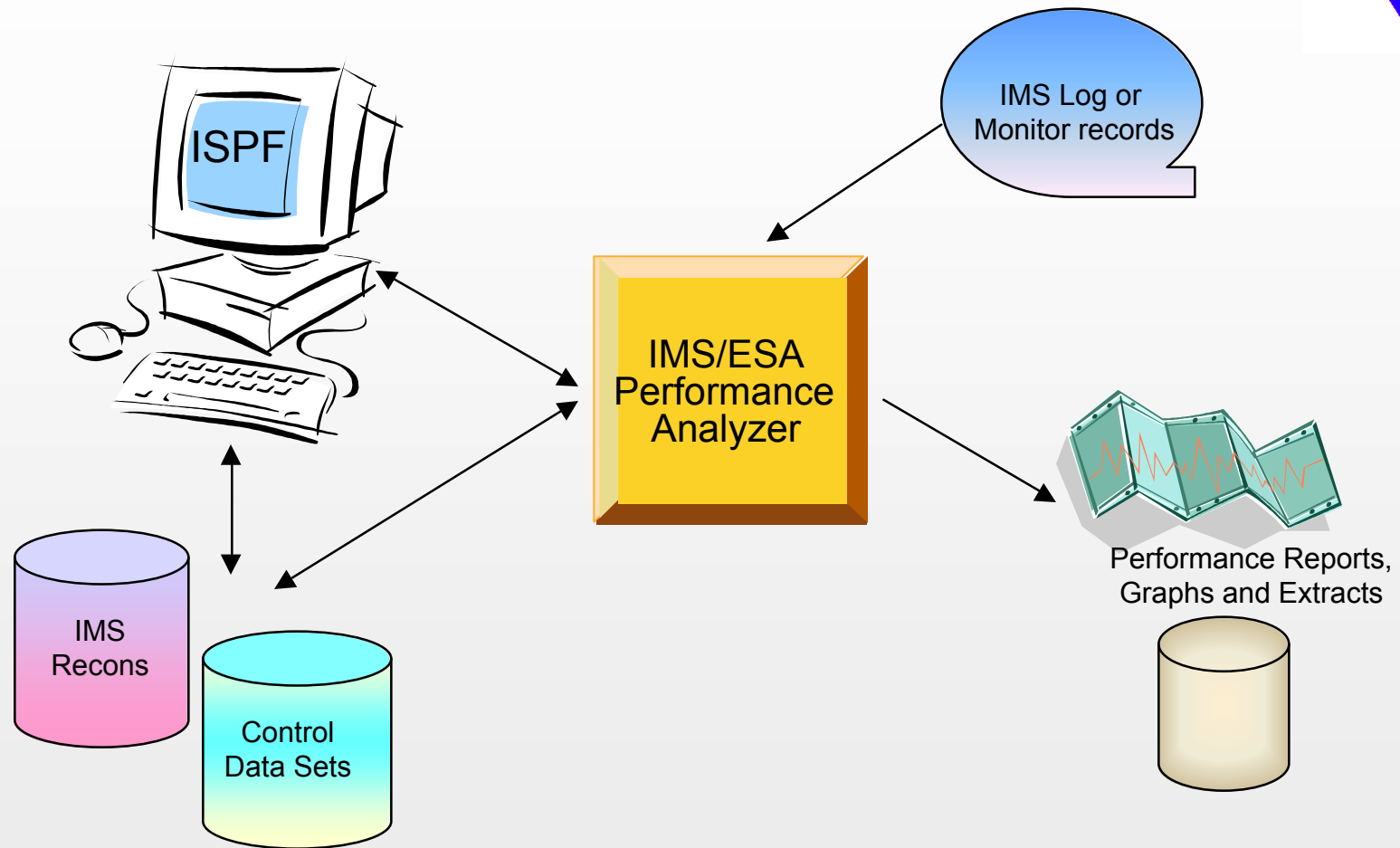
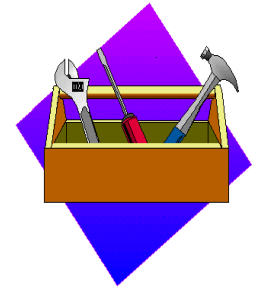


IMS PA

- ◆ Reports from both log and monitor
- ◆ High degree of control on report selection
- ◆ ISPF interface or batch commands
- ◆ Exception reporting
- ◆ IMS V7 Fast Path monitor support
- ◆ IMSASAP (and IMSPARS) replacement

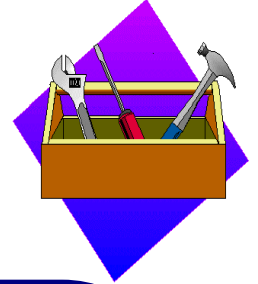
IMS PA

IMS PA Operation



IMS PA

How to generate IMS PA reports



File Options Help

IMS/ESA Performance Analyzer 3.1 - Primary Option Menu

Option ==> 3

0	IMS PA Profile	Change IMS PA user profile
1	Log Input	Specify IMS/ESA log data sets to process
2	Monitor Input	Specify IMS/ESA monitor data sets to process
3	Report Sets	Report Set editing and processing
4	Expectation Sets	Expectation Set editing (Log Exception reporting)
5	Averages	Averages data set editing (Log Exception reporting)
6	Object Lists	Object List editing
7	Distributions	Distribution editing
8	Graphing & Export	Graphing and export of Extract by Interval data
X	Exit	Leave IMS PA online session

F1=Help

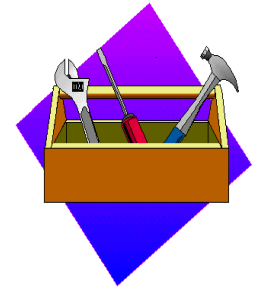
F3=Exit

F10=Actions

F12=Cancel

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Monitor Reports - Part 1



Region Activity Summary

- Schedule/Transaction
- S Region
- S Program (PSB)
- S Database IWAIT

Region Activity Analysis

- Region Analysis
- Application Detail
- Database IWAIT Analysis
- S Performance Exceptions
- S Enqueue/Dequeue Trace
- Region Histogram

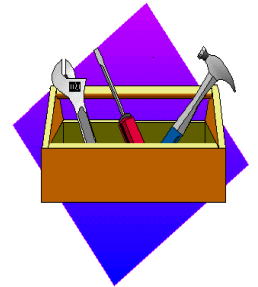
System Analysis

- S Total System IWAIT

Program Analysis

- S Program Activity Detail
- S Program Trace
- Batch VSAM Statistics

Monitor Reports - Part 2



Fast Path Analysis

- DEDB Resource Contention
- FP Buffer Statistics
- BALG/Shared EMHQ
- OTHREAD Analysis
- VSO Summary

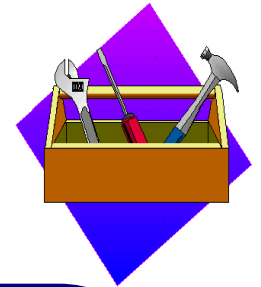
Resource Usage

- Buffer Pool and Latch Statistics
- Communication
- MSC
- ESAF

Monitor Data Analysis

- Monitor Record Trace

Report Request



SAMPMON - Program Activity Detail

Command ==>

Enter the desired values which will be updated within the Report Set on Exit

Report Format

- 1 1. PSB Details
- 2. PSB-TranCode Analysis
- 3. PSB Details with PSB-TranCode data added at the lowest level

Supplementary Reports:

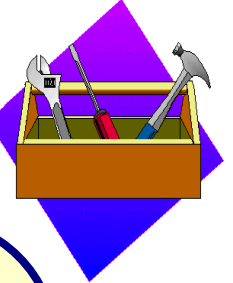
_ DDname by PSB-TranCode

Reports Required (in Report Format):

- / Function Code
- _ Segment Name
- _ DDname
- _ Function-Segment Name
- _ Function-DDname

IMS PA

Report Set JCL and Batch Commands

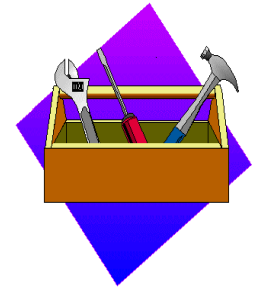


```
//IMSPA JOB CLASS=A
//IPI      EXEC PGM=IPIMAIN,PARM='V610'
//STEPLIB DD DSN=IMSPA.V310.SIPILINK,DISP=SHR
//* Input data set(s)
//LIMSA001 DD DSN=IMS.V710.IMSMON,DISP=SHR
//* IMS PA Messages
//SYSPRINT DD SYSOUT=*
//SYSUDUMP DD SYSOUT=*
//* Report Set Command Input
//IPICMD  DD *
* IMS PA Monitor Report
* Report Set Name - SAMPMON
          IMSPAMON      DDNAME (SUMMRPT) ,
                        DETAILDDNAME (DETLRPT) ,
                        PAGESIZE (60) ,
                        PRINTAT (STOP) ,
                        MINIWAIT (5)
          IMSPAMON      PSBREports (
                        BYREPORT ,
                        FUNCTION)
          IMSPAMON      EXECUTE

/*
```

IMS PA

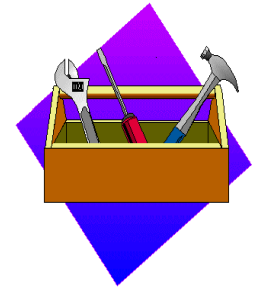
Monitor Reporting



- ◆ Summary and Detail reporting
 - ◆ Region
 - ◆ Program
 - ◆ Transaction
 - ◆ Resource
- ◆ Comprehensive IWAIT Analysis
 - ◆ Database
 - ◆ System
- ◆ Reporting on all new IMS V7 monitor records
- ◆ Similar functionality to DFSUTR20 / 30
- ◆ External Subsystem Call statistics
- ◆ Monitor Record Trace

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IMSPA Monitor Reports



Many reports of varying detail – so where do we start ?

- ◆ Use summary reports to get an overall idea
- ◆ Based on findings, select the appropriate detail reports

Good places to start

Total System IWAIT Summary

Summary of IWAIT activity for the whole IMS system – system datasets, database, block loader, MFS, scheduler etc

Region and Program Summary

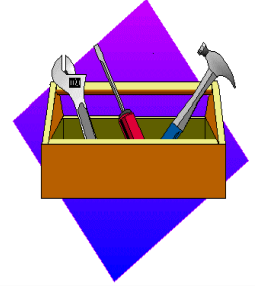
Analysis of schedule, transaction and call activity

Performance Exception

Reports on violations of thresholds for call elapsed, IWAIT elapsed and IWAITS per call as well as intent failures, pool space failures and deadlock events

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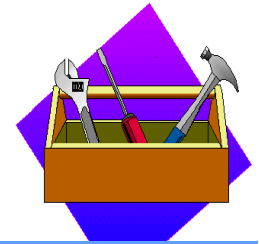
Total System IWAIT Summary



- ◆ IWAIT activity for the entire IMS system, including:
 - ◆ System data sets
 - ◆ Databases (full function and Fast Path)
 - ◆ Block Loading
 - ◆ Message Format Services
 - ◆ Scheduler
 - ◆ Checkpoints
 - ◆ Line/Node IWAITs
 - ◆ Pools
 - ◆ Multiple System Transfers

IMS PA

Total System IWAIT Summary

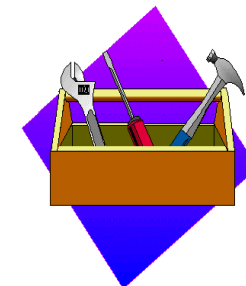


Total System IWAIT Summary

----- I / O I W A I T S -----							----- N O N I / O I W A I T S -----						
Count	Elap/IWAIT	StdDv	Max value	Pct of	Pct of		Count	Elap/IWAIT	StdDv	Max value	Pct of	Pct of	
	Sc.Mil.Mic	X Avg	Sc.Mil.Mic	IWAITs	IWT Elp			Sc.Mil.Mic	X Avg	Sc.Mil.Mic	IWAITs	IWT Elp	
System Datasets													
LGMSG	67	13.368	2.289	190.376	42.95%	70.37%							
SHMSG	3	3.501	.949	6.887	1.92%	.83%							
QBLKS	2	2.187	.967	4.263	1.28%	.34%							
Database IWAITs													
OSAM	6	2.854	1.718	13.782	3.85%	1.35%							
VSAM	8	2.850	2.544	22.035	5.13%	1.79%							
DEDB (Read)	54	4.978	1.384	24.619	34.62%	21.12%							
DEDB (Write)	16	3.343	.394	6.236	18.39%	13.66%							
DEDB (Lock)							13	241.604	.137	353.663	2.59%	30.61%	
Block Loading													
PGM ISOLATN							18	18.178	1.448	87.380	.33%	.01%	
Scheduler IWAITs													
NO MSG/CHKPT							2,742	775.604	2.029	39.260.910	50.28%	84.09%	
MPP INTENT							44	44.074	.618	142.246	.81%	.08%	
WAITNG/INPUT							2,330	171.735	1.059	1.364.031	42.72%	15.82%	
Line/Node IWAITs													
LINE INTERPT							320	0.233	.770	1.306	5.87%	.00%	
Totals	43,267	9.606					5,454	463.731					
	5.13%	1.79%											

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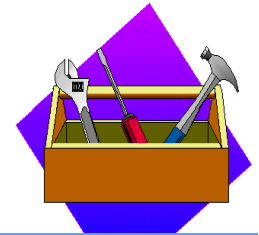
Total System IWAIT Detail



- ◆ Detailed IWAIT activity for :
 - ◆ Databases (full function and Fast Path)
 - ◆ Block Loading
 - ◆ Message Format Services
 - ◆ Line/Node IWAITs



Total System IWAIT Detail



Data Base IWAITS

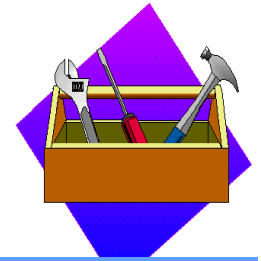
----- I / O I W A I T S -----								----- I / O I W A I T S -----							
Elap/IWAIT StdDv				Max value Pct Tot Pct Tot				Elap/IWAIT StdDv				Max value Pct Tot Pct Tot			
OSAM DDn	IWTs	Sc.Mil.Mic	X Avg	Sc.Mil.Mic	IWAITS	IWT	Elp	VSAM DDn	IWTs	Sc.Mil.Mic	X Avg	Sc.Mil.Mic	IWAITS	IWT	Elp
DHSK0201	5	3.354	1.559	13.782	83.33%	97.94%		DXSK0201	8	2.850	2.544	22.035	100.00%	100.00	
----- R e a d I / O I W A I T S -----								----- W r i t e I / O I W A I T S -----							
Elap/IWAIT StdDv				Max value Pct Tot Pct Tot				Elap/IWAIT StdDv				Max value Pct Tot Pct Tot			
DEDB ADs	IWTs	Sc.Mil.Mic	X Avg	Sc.Mil.Mic	IWAITS	IWT	Elp	DEDB ADs	IWTs	Sc.Mil.Mic	X Avg	Sc.Mil.Mic	IWAITS	IWT	Elp
DB21AR3	28	5.126	1.798	30.719	30.51%	39.30%		DB21AR3	10	7.126	1.798	30.719	30.51%	39.30%	
DB21AR9	26	0.356	.508	0.665	6.78%	.61%		DB21AR9	6	1.356	.508	0.665	6.78%	.61%	

ACBLIB Block Loading IWAITS

----- I / O I W A I T S -----								----- N O N I / O I W A I T S -----							
Elap/IWAIT StdDv				Max value Pct Tot Pct Tot				Elap/IWAIT StdDv				Max value Pct Tot Pct Tot			
IntList	IWAITS	Sc.Mil.Mic	X Avg	Sc.Mil.Mic	IWAITS	IWT	Elp	PSBname	IWAITS	Sc.Mil.Mic	X Avg	Sc.Mil.Mic	IWAITS	IWT	Elp
DDLTFPE4	6	1.941	.070	2.088	85.71%	73.24%		BMP255	5	3.228	.273	4.803	35.71%	40.87%	
DDLTLM20	1	4.256	.000	4.256	14.29%	26.76%		DDLTFPE4	6	3.230	.354	5.396	7.14%	4.29%	
								HSBASK41	2	2.402	.261	3.029	14.29%	12.17%	
** Total	7	2.272	.361	4.256	100.00%	100.00%		PLAPJK24	3	2.459	.140	2.867	21.43%	18.68%	
								PMVAPZ12	2	2.883	.038	2.992	14.29%	14.60%	
								PSVAZZ30	1	3.704	.000	3.704	7.14%	9.38%	
								** Total	19	2.820	.279	5.396	100.00%	100.00	

IMS PA

Total System IWAIT Detail



Data Base IWAITs

----- I / O I W A I T S -----								----- I / O I W A I T S -----							
Elap/IWAIT StdDv				Max value Pct Tot Pct Tot				Elap/IWAIT StdDv				Max value Pct Tot Pct Tot			
OSAM DDn	IWTs	Sc.Mil.Mic	X Avg	Sc.Mil.Mic	IWAITs	IWT Elp		VSAM DDn	IWTs	Sc.Mil.Mic	X Avg	Sc.Mil.Mic	IWAITs	IWT Elp	
DHSK0201	5	3.354	1.559	13.782	83.33%	97.94%		DXSK0201	8	2.850	2.544	22.035	100.00%	100.00	
----- R e a d I / O I W A I T S -----								----- W r i t e I / O I W A I T S -----							
Elap/IWAIT StdDv				Max value Pct Tot Pct Tot				Elap/IWAIT StdDv				Max value Pct Tot Pct Tot			
DEDB ADs	IWTs	Sc.Mil.Mic	X Avg	Sc.Mil.Mic	IWAITs	IWT Elp		DEDB ADs	IWTs	Sc.Mil.Mic	X Avg	Sc.Mil.Mic	IWAITs	IWT Elp	
DB21AR3	28	5.126	1.798	30.719	30.51%	39.30%		DB21AR3	10	7.126	1.798	30.719	30.51%	39.30%	
DB21AR9	26	0.356	.508	0.665	6.78%	.61%		DB21AR9	6	1.356	.508	0.665	6.78%	.61%	

ACBLIB miscellaneous IWAITs

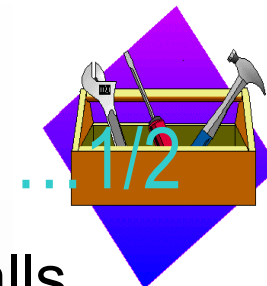
----- I / O I W A I T S -----								----- N O N I / O I W A I T S -----							
Elap/IWAIT StdDv				Max value Pct Tot Pct Tot				Elap/IWAIT StdDv				Max value Pct Tot Pct Tot			
DMBname	IWAITs	Sc.Mil.Mic	X Avg	Sc.Mil.Mic	IWAITs	IWT Elp		PI/Unkn	IWAITs	Sc.Mil.Mic	X Avg	Sc.Mil.Mic	IWAITs	IWT Elp	
								RMZILGDP	18	18.178	1.448	87.380	100.00%	100.00%	
								** Total	18	18.178	1.448	87.380	100.00%	100.00%	

Line Interrupts

----- N O N I / O I W A I T S -----								----- N O N I / O I W A I T S -----							
Elap/IWAIT StdDv				Max value Pct Tot Pct Tot				Elap/IWAIT StdDv				Max value Pct Tot Pct Tot			
Line No	IWAITs	Sc.Mil.Mic	X Avg	Sc.Mil.Mic	IWAITs	IWT Elp		Nodename	IWAITs	Sc.Mil.Mic	X Avg	Sc.Mil.Mic	IWAITs	IWT Elp	
2	320	0.233	.770	1.306	100.00%	100.00%									
** Total	320	0.233	.770	1.306	100.00%	100.00%									

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Region Summary Report



- ◆ An analysis of schedule, transaction, DC and DB calls, and IWAIT activity for each region, including for IMS V7:
 - ◆ IFP regions and transactions
 - ◆ DEBD and MSDB databases

REGION SUMMARY

** Region and Jobname **

<u>Reg No.</u>	<u>Job Name</u>	<u>Type</u>
1	MPPI1X3	MPP
4	IFPI1X2	IFP

** Transaction data **

Rgn No.	Elapsed		Trans	Elap/Schd /Schd	Sc.Mil.Mic	% of Regn elapsed			Sch-DLI Mil.Mic	Elap/Tran Sc.Mil.Mic	CPU/Trn Mil.Mic	% of Tran Elapsed		
	Secs.Mil	Schds				Sc-DLI	Active	Idle				CPU	Call	IWAIT
1	43.424	5	5	1.00	3.601.940	36.96%	4.52%	58.52%	3209.604	490.420	2.503	.51%	38.32%	1.90%
4	24.473	1	2	2.00	410.700	3.22%	1.82%	94.96%	262.329	222.556	0.000	.00%	.00%	.00%

IMS PA

Region Summary Report



** Schedule data **

Rgn No.	Trans /sec	Call /sec	IWTs /sec	Schd On Q	Percents of Regn Idle Time					No Messages		Blk Ldr Busy		Sched NotIWT		Synch DB IWTs	
					NoMsg	Bldr	I/CK	DBAS	NtIW	No.	Avg Elap	No.	Avg Elap	No.	Avg Elap	No.	Avg Elap
1	0.09	0.05	0.25	0.00	92.5%	.0%	.0%	.0%	7.4%	3	5.774.459	2	2.231	5	278.816	0	
4	0.08	0.00	0.00	0.00	99.8%	.0%	.0%	.0%	.2%	2	211.596	0		3	16.410	0	

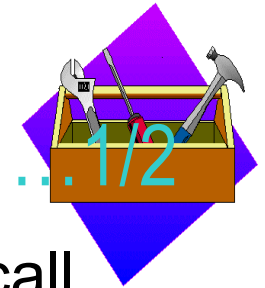
** Call data **

Rgn No.	Calls /Tran	IWTs /Tran	IWTs /Call	--- MESSAGE QUEUE CALLS ---					----- DATABASE CALLS -----								
				Calls /Tran	IWTs /Tran	IWTs /Call	Elap/Call	Pct of Call	Elap	Calls /Tran	IWTs /Tran	IWTs /Call	Elap/Call	Pct of Call	Elap		
1	0.5	2.8	5.50	0.3	0.0	0.00	0.101	5.9%	94.1%	.0%	0.3	2.8	11.00	751.569	.0%	.0%	5.0%

** Call data (FP) **

Rgn No.	Calls /Tran	IWTs /Call	----- E M H C A L L S -----			----- D E D B C A L L S -----			----- M S D B C A L L S -----					
			Calls /Tran	IWTs /Call	Elap/Call	Pct of	Calls /Tran	IWTs /Call	Elap/Call	Pct of	Calls /Tran	IWTs /Call	Elap/Call	Pct of
4	3.5	0.00	1.5	0.00	0.203	.0%	2.0	0.50	3.118	91.4%	0.0	0.00	0.000	.0%

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Program Summary Report

- ◆ An analysis of schedule, transaction, and DC and DB call activity for each PSB-Transaction Code, including for IMS V7:
 - ◆ IFP regions and transactions
 - ◆ DEBD and MSDB databases

P R O G R A M S U M M A R Y

```

Region Totals      From 03Feb2001 13.06.21.86 To 03Feb2001 13.09.52.04   Elapsed= 0 Hrs 4 Mins 26.545.110 Secs
** Program Analysis **
----- Per Schedule ----- |----- P e r   T r a n s a c t i o n -----
      Scheds      Trans  Scd-DLI      DLI-Term  Schd      Elapsed  CPUtime  Pct of Tran Elap
PSBname  TranCode   Trans /Schd  Mil.Mic  Sc.Mil.Mic  on Q  Calls  IWTs  Sc.Mil.Mic  Mil.Mic  CPU  Call  IWT
BMPFPE05 TXCDDL00   1   1   1.00  103.895  5.210.432  .0  18.0   .0  5.210.432  10.010  .2%  .0%  .0%
BMPFPE06 TXCDDL01   3   3   1.00   75.383  9.488.192  .0  21.7   .0  9.488.192  10.010  .1%  9.1%  .0%
BMPFPE07 TXCDDL02   1   4   4.00   20.176  6.660.503  .0   6.5   .0  1.665.126   2.503  .2%  .0%  .0%
BMP255                1   1   1.00  327.885  1.936.357  .0 292.0   .0  1.936.357  10.010  .5%  .2%  .0%
DDLTD01 TXCDDS01   4  12   3.00   10.170  5.747.907  .0   5.8   .0  1.915.969   0.000  .0%  5.0%  .0%
DDLTFPE3 TXCDDS03   1   1   1.00  428.989 10.364.899  .0 182.0   .0 10.364.899  10.010  .1%  .0%  .0%
. . .
**Grand* *TOTALS* 22  41   1.86 9029.407  5.104.575  .1  17.9   .0  2.739.040   3.662  .1%  3.8%  .0%
**Group  BMP        6   9   1.50 3472.329  7.045.311  .0  44.6   .0  4.696.874   6.673  .1%  6.1%  .0%
**Group  DDL       15  31   2.07 ***11,854  4.668.580  .1  10.7   .1  2.258.990   2.583  .1%  2.4%  .0%
  
```

Program Summary Report



```

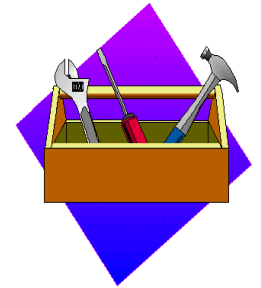
Region Totals          From 03Feb2001 13.06.21.86 To 03Feb2001 13.09.52.04   Elapsed= 0 Hrs 4 Mins 26.545.110 Secs
** Call Analysis **
----- Message Queue Calls ----- Database Calls -----
Calls IWTs  IWTs CPY Elp DLA Elp Elp/IWT  Calls IWTs  IWTs CPY Elp DLA Elp Elp/IWT  Pct DB Call Elap
PSBname TranCode /Trn /Trn /Call Mil.Mic Mil.Mic Mil.Mic  /Trn /Trn /Call Mil.Mic Mil.Mic Mil.Mic  CPY  DLA  IWT
BMPFPE05 TXCDDL00  2.0  .0  .00  0.007  0.140  0.000  13.0  .0  .00  0.014  0.019  0.000  41.7% 58.3% .0%
BMPFPE06 TXCDDL01  2.3  .0  .00  0.007  7.347  0.000  14.0  .0  .00  0.054  60.443  0.000  .1% 99.9% .0%

** Call Analysis (FP) **
----- E M H C a l l s ----- ----- D E D B C a l l s ----- ----- M S D B C a l l s -----
Calls  IWTs  Elap/Call  Pct of  Calls  IWTs  Elap/Call  Pct of  Calls  IWTs  Elap/Call  Pct of
PSBname TranCode /Trn /Call Sc.Mil.Mic IWAIT  /Tran /Call Sc.Mil.Mic IWAIT  /Tran /Call Sc.Mil.Mic IWAIT
BMPFPE05 TXCDDL00  0.0  0.0  0.000  0.00%  3.0  1.00  4.562  10.3%  0.0  0.00  0.000  0.00%
BMPFPE06 TXCDDL01  0.0  0.0  0.000  0.00%  3.0  1.00  3.365  76.4%  2.3  0.00  0.994  24.8%

** PSB Comparison **   *** All values are percents of total ***
----- Data Base Calls ----- ----- Msg Que Calls -----
PSBname TranCode  Schds  Trans  Sc-Dl  Dl-Tm  CPUtm  Calls  CPYEL  DLAEI  IWTs  IWElp  Calls  ClElp  IWTs  IWElp
BMPFPE05 TXCDDL00  4.55%  2.44%  .05%  4.64%  6.67%  9.09%  4.58%  .01%  .00%  .00%  2.27%  .43%  .00%  .00%
BMPFPE06 TXCDDL01 13.64%  7.32%  .11% 25.35% 20.00% 29.37% 58.86% 60.77% .00%  .00%  7.95% 75.25% .00%  .00%

** PSB Comparison (FP) ***** All values are percents of total ***
----- E M H C a l l s ----- ----- D E D B C a l l s ----- ----- M S D B C a l l s -----
PSBname TranCode  Calls  ClElp  IWTs  IWTElp  Calls  ClElp  IWTs  IWTElp  Calls  ClElp  IWTs  IWTElp
BMPFPE05 TXCDDL00  .00%  .00%  .00%  .00%  .65%  .05%  2.33%  .41%  .00%  .00%  .00%  .00%
BMPFPE06 TXCDDL01  .00%  .00%  .00%  .00%  1.96%  .12%  6.98%  6.80%  70.00% 61.47% .00%  .00%
    
```

Database IWAIT Summary Report



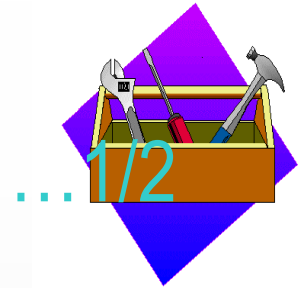
- ◆ A summary of IWAIT activity for each data set

Database IWAIT Summary

```
Region Totals      From 06Jun2001 14.51.58.40 To 06Jun2001 14.55.01.80  Elapsed= 0 Hrs 3 Mins 24.212.705 Secs
                   Elap/IWAIT StdDev      Max IWAIT      Calls      IWAITs      Pct Tot      Pct Tot      Pct Tot      Pct Tot
DDname  Type  IWAITs  Sc.Mil.Mic  X Avg  Sc.Mil.Mic  Waiting  /Call  Calls  IWAITs  IWTElp  DLAElp
DB21AR3  DEDB    16      5.731  1.676   30.719     15      1.07  1.51%  26.23% 36.112% .066%
DB21AR9  DEDB     2      0.471  .413    0.665      1      2.00  .10%   3.28%  .371%  .001%
DH SK0202 OSAM     1      0.353  .000    0.353      1      1.00  .10%   1.64%  .139%  .000%
DXSK0201 VSAM     8      2.850  2.544   22.035     1      8.00  .10%  13.11% 8.979% .016%
```

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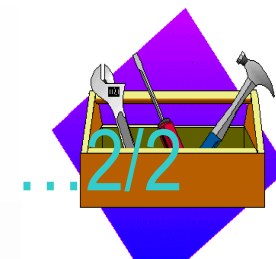
Performance Exception Reports



- ◆ Exception Listing
 - ◆ Violations of performance thresholds for call elapsed time, IWAIT elapsed time, and number of IWAITs per call
 - ◆ BMP schedule failures
 - ◆ Transaction abends
- ◆ Intent Failure Summary
 - ◆ Schedule failures due to PSB/DMB intent conflict
- ◆ Pool Space Failure Summary
 - ◆ Failures of requests to reserve storage for pool space
- ◆ Deadlock Event Summary
 - ◆ Deadlocks occurring in DMB segments

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Performance Exception Reports



Exception Listing

Excd	Call	Elapsed	PSBname	Trancode	Scheduled at	in Rgn	PCBname	Func	Sc	Seg	Fdbk	Call#	Call/IWT	St	Call/IWT	El	IWTs
			PSTOCK	-STOCK	17Jun 09.25.29.05	13	STOCK	GU		ITEM	01	1202+	4.873.007		1.914.730		11
DD=STOCK		VSAM	PSTOCK	-STOCK	17Jun 09.25.36.52	14	STOCK	GU		DESCR	02	5+	8.305.755		3.302.570		10
DD=STOCK		VSAM	PSTOCK	-STOCK	17Jun 09.25.36.52	14	STOCK	GU		DESCR	02	5+	11.629.014		1.535.824		10
Excd	Call	Elapsed	PORDER	-ORDER	17Jun 09.25.29.05	13	ORDER	GU		ORDER#	02	1223+	21.432.949		6.075.017		2
Excd	Call	Elapsed	PMAIL	-MAIL	17Jun 09.25.36.52	14	MAIL	GU		MESSAGE	01	18+	20.556.658		12.092.247		10
DD=MESSAGES		VSAM	PMAIL	-MAIL	17Jun 09.25.36.52	14	MAIL	GU		MESSAGE	01	18+	30.551.609		1.505.862		10

Intent Failure Summary

<u>PSB Name</u>	<u>DMB Name</u>	<u>Count</u>
BMP255	DH41SK01	2
DDLTRN15	DH41ST01	5

Pool Space Failure Summary

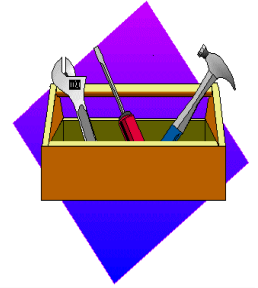
<u>Pool ID</u>	<u>Bytes req.</u>	<u>Count</u>
DLDP	12561	1
DLHP	4325	2

Deadlock Event Summary

<u>Winning PSB</u>	<u>Losing PSB</u>	<u>DMB Name</u>	<u>Area Name</u>	<u>Count</u>
BMPFPE05	BMPFPE06	DEDBJN23	DB23AR5	1
BMPFPE06	DDLTD01	DEDBJN23	DB23AR5	3

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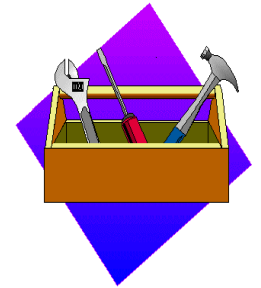
Resource Usage Reports



- ◆ Message Queue Pool
- ◆ Message Format Buffer Pool
- ◆ OSAM Buffer Pools
- ◆ VSAM Buffer Pools
- ◆ Latch Statistics



Resource Usage Reports



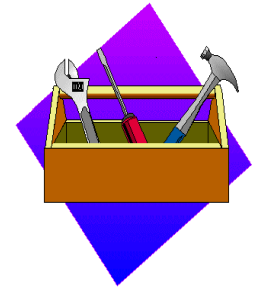
Message Queue Pool

Message Queue Pool

	Start	End	Difference
Number of Locate calls from QMGR	12290247	12328901	38654
Number of Record Release calls from QMGR	4824622	4839910	15288
Number of Locate and Alter calls from QMGR	23214141	23287948	73807
Number of Requests to Purge the Q Pool	253	253	0
Number of Address to DRRN Translation Requests	0	0	0
Number of Read Requests	13811	13814	3
Number of Write Requests (Total)	2985	2985	0
Number of Writes done by Purge	432	432	0
Number of Waits for Purge completion	53	53	0
Number of Waits because no Buffer available	0	0	0
Number of Waits for other DECB to Read this Buffer	272	273	1
Number of Waits for other DECB to Write this Buffer	26	26	0
Number of Waits for conflicting end DEQ Buffer req	0	0	0
Number of PSBs unchained from buffers	0	0	0
Number of calls to QMGR (Total)	18325590	18384148	58558
Number of calls to Reposition a Lost Buffer	0	0	0
Number of calls to ENQ a Message	3566150	3577595	11445
Number of calls to DEQ one or more Messages	1282151	1286073	3922
Number of calls to Cancel Input or Output	422	422	0

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Resource Usage Reports



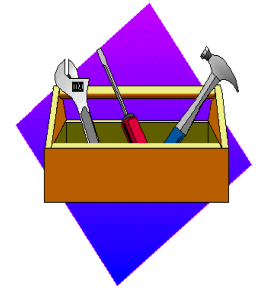
Message Format Buffer Pool

Message Format Buffer Pool

	Start	End	Difference
Number of P/F requests	45	45	0
Number of I/F requests	94	94	0
Number of I/F I/Os	21	21	0
Number of times Pool Compress would be successful	0	0	0
Number of Directory I/O operations	80	80	0
Number of times Block washed for FRE	0	0	0
Number of times P/F request ignored	5	5	0
Number of F/B requests	94	94	0
Number of times F/B request ignored	0	0	0
Number of times I/F on F/B queue	73	73	0
Number of times I/F on I/F queue	0	0	0
Number of times F/B on I/F queue	94	94	0
Number of times P/F on I/F queue	0	0	0
Number of times P/F on F/B queue	40	40	0
Number of times there was no DIR Entry for a Block	12	12	0
Number of times I/O Errors POINT or READ Macro	0	0	0
Number of Immed. I/O Requests waited due to Maximum I/O	0	0	0
Number of requests satisfied by Index/Dynamic Directory	4	4	0

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Resource Usage Reports



OSAM Buffer Pool (Part 1)

Database Buffer Pool

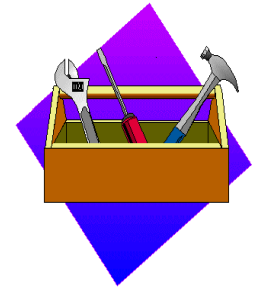
Fix Prefix/Buffers : Y/N
Subpool ID :
Subpool Buffer Size : 6144
Total Buffers in Subpool : 10

	Start	End	Difference
Number of Locate-type calls	2087926	2087966	40
Number of requests to create new Blocks	0	0	0
Number of Buffer Alter calls	1410	1410	0
Number of Purge calls	9	9	0
Number of Locate-type calls, Data already in OSAM pool	1985111	1985149	38
Number of Buffers searched by all Locate-type calls	2183117	2183165	48
Number of Read I/O requests	102816	102818	2
Number of Single Block Writes by Buffer Steal Routine	250	250	0
Number of Blocks written by Purge	40	40	0
Number of Locate calls waited due to Busy Id	0	0	0
Number of Locate calls waited due to Buffer Busy Write	0	0	0
Number of Locate calls waited due to Buffer Busy Read	0	0	0
Number of Buffer Steal/Purge waited for ownership Rlse	24	24	0

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Resource Usage Reports



OSAM Buffer Pool (Part 2)

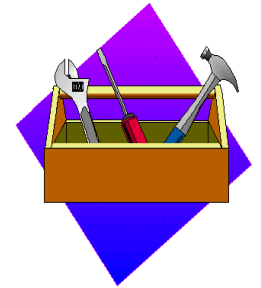
Database Buffer Pool

Fix Prefix/Buffers : Y/N
Subpool ID :
Subpool Buffer Size : 6144
Total Buffers in Subpool : 10

	Start	End	Difference
.			
.			
.			
Number of Buffer Steal requests waited for Buffers	0	0	0
Total number of I/O errors for this Subpool	0	0	0
Number of Buffers locked due to Write errors	0	0	0
Number of CF Reads	0	0	0
Number of CF requests expected, but not Read	0	0	0
Number of Writes to CF (Prime)	0	0	0
Number of Writes to CF (Changed)	0	0	0
Number of CF requests not written, Storage Class full	0	0	0
Number of Blocks invalidated with XI	0	0	0
Number of successful XI calls	0	0	0
Number of Sequential Buffer Reads	0	0	0
Number of Sequential Buffer Anticipated Reads	0	0	0

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Resource Usage Reports



VSAM Buffer Pool (Part 1)

VSAM Buffer Pool

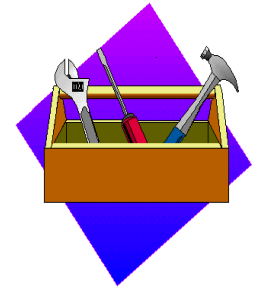
Fix Index/Block/Data : N/Y/N
Shared Resource Pool ID : XXXX
Shared Resource Pool Type: D
Subpool ID : 1
Subpool Buffer Size : 2048
Total Buffers in Subpool : 64
Number Hiperspace Buffers: 0

	Start	End	Difference
Number of Retrieve by RBA calls received by Buf Handler	0	0	0
Number of Retrieve by Key calls	3370922	3370922	0
Number of Logical Records inserted into ESDS	0	0	0
Number of Logical Records inserted into KSDS	88009	88009	0
Number of Logical Records altered in this Subpool	0	0	0
Number of times Background Write function invoked	8133	8133	0
Number of Synchronization calls received	1227142	1231236	4094
Number of Write Error Buffers currently in the Subpool	0	0	0
Number of Write Error Buffers currently in the Subpool	0	0	0
Largest number of Write Errors in the Subpool	0	0	0

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Resource Usage Reports



VSAM Buffer Pool (Part 2)

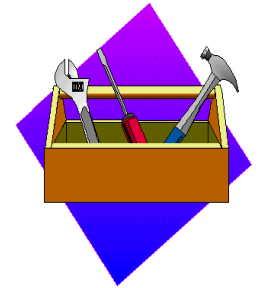
VSAM Buffer Pool

Fix Index/Block/Data : N/Y/N
Shared Resource Pool ID : XXXX
Shared Resource Pool Type: D
Subpool ID : 1
Subpool Buffer Size : 2048
Total Buffers in Subpool : 64
Number Hiperspace Buffers: 0

	Start	End	Difference
	.		
	.		
	.		
Number of VSAM Get calls issued	3458944	3458944	0
Number of VSAM SCHBFR calls issued	0	0	0
Number of times CI requested already in pool	31879386	31910570	31184
Number of CI Read from External Storage	3243288	3249955	6667
Number of VSAM Writes initiated by IMS/ESA	43677	43738	61
Number of VSAM Reads from HIPERSPACE Buffers	15	15	0
Number of VSAM Writes to HIPERSPACE Buffers	0	0	0
Number of failed VSAM Reads from HIPERSPACE Buffers	0	0	0
Number of failed VSAM Writes to HIPERSPACE Buffers	0	0	0
Number of PLH Waits	0	0	0

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Resource Usage Reports



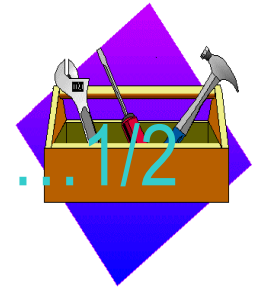
Latch Statistics

Latch Statistics Counters

Latch Name	*** Start ****		**** End *****		* Difference *		
	Call	Wait	Call	Wait	Call	Wait	
			.				
			.				
			.				
ACTL SYS/Statistics	0	0	492928	1873	492928	1873	
LOGL SYS/Logger	0	430	159707	740	159707	310	

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Program Activity Detail Reports



- ◆ PSB Details

- ◆ Program activity by PCB name to varying levels of detail

- ◆ PCB Totals

- ◆ by Function Code

- ◆ by Function Code - Segment Name Feedback

- ◆ by Segment Name Feedback

- ◆ PCB Totals with DD IWAITs

- ◆ by DDname IWAITed On

- ◆ by Function Code with DD IWAITs

- ◆ by Function Code - DDname

- ◆ DDname by PSB-TranCode

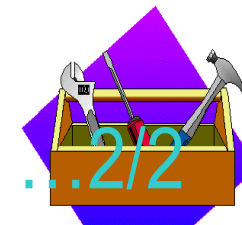
- ◆ Call and IWAIT activity for each combination of DDname, PSB name, Transaction Code, PCB name

Reports show all calls regardless of resulting IWAIT activity

Reports show only the calls that result in IWAITs

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Program Activity Detail Reports



PSB Details by Functn-Segname

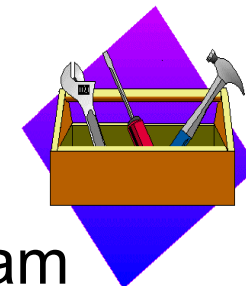
PCBNAME	Func	Lvl	DDname or Segname	Sc	PSBNAME	TranCode	Calls	IWTs /Call	Elap/IWAIT Sc.Mil.Mic	IWTElap/Cl Sc.Mil.Mic	Elap/Call (Max IWT)	---Percent of System---	Calls	IWTs	ClElp	IWTEL
STOCK	DLET	01	PART#		PSTOCK	STOCK	5				1.698		.0%	.0%	.0%	.0%
	GU	00		GE	PORDER	ORDER	10				0.442		.0%	.0%	.0%	.0%
		00		GE	PCLIENT	CLIENT	10	2	.20	15.666	3.133		.0%	.0%	.0%	.0%
		00		GE	PSTOCK	STOCK	15				0.354		.0%	.0%	.0%	.0%
		01	ORDER#		PORDER	ORDER	20	16	.80	271.334	217.067		.0%	.2%	1.5%	2.6%
		01	NAME		PCLIENT	CLIENT	10	4	.40	28.371	11.348		.0%	.1%	.0%	.1%
STOCK	**	Total					115	26	.23	232.465	52.557		.2%	.3%	2.4%	3.6%

DDname by PSB-Tran using

DDname	PSBNAME	TranCode	PCBNAME	Calls	IWAITs /Call	Elap/IWAIT Sc.Mil.Mic	IWTElap/Cl Sc.Mil.Mic	Max IWAIT Sc.Mil.Mic	Percent DDname	Total	IWTs	IWTEL
STOCK	PSTOCK	STOCK	STOCK	2	2	1.00	15.043	15.043	17.949	5.6%	3.6%	2.3%
	PCLIENT	CLIENT	STOCK	3	3	1.00	19.233	19.233	23.308	8.3%	5.5%	4.4%
			I/O PCB	2	4	2.00	9.996	19.992	27.294	5.6%	7.3%	3.0%
	PPART	PART	STOCK	17	20	1.18	24.761	29.131	104.893	47.2%	36.4%	37.4%
			I/O PCB	8	21	2.63	31.239	82.001	272.425	22.2%	38.2%	49.5%
	PMAIL	MAIL	STOCK	3	3	1.00	13.990	13.990	24.057	8.3%	5.5%	3.2%
			I/O PCB	1	2	2.00	2.250	4.500	2.255	2.8%	3.6%	.3%
STOCK	**	Total		36	55	1.53	24.099	36.819	272.425	100%	100%	100%

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Program Trace Report



A detailed trace of the events associated with a program schedule, including information for each call and IWAIT

PROGRAM TRACE

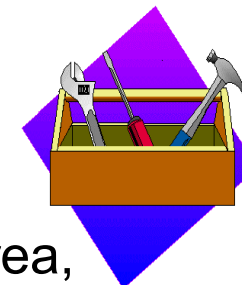
```

17Jun2001  9.32.40.81  PSB=PSTOCK  Tran=STOCK  Scheduled in Region 13
Relative Time Pgm Time Call          ST PCB Feedback Mod IWT DDname IWT Elapsed Breakdown of Call Time  Call Elap
Sec.Mil.Mic Sc.Mil.Mic No. PCBname Func Cd Segname Lvl ULE  (#IWAITs) Sc.Mil.Mic Pct CPY Pct DLA Pct IWT Sc.Mil.Mic
-    0.381          1 I/O PCB BFBM                .00% 100.00%  .00%      0.370

-- 0 --          *** Schedule start ***
+ 326.153    0.000    2 I/O PCB GU                100.00%  .00%  .00%      0.018
+ 373.493    47.322    3 STOCK  GU      NAME      02          1      2.264    7.73%  92.27%  69.13%    3.275
+ 374.225                                DBH OSAM STOCK      2.264
+ 433.498    56.730    4 STOCK  GU      GE          00          61.63%  38.37%  .00%      0.503
+ 436.701    0.178   10 I/O PCB CHNG
+ 437.270    0.078   11 I/O PCB ISRT
+ 437.613    0.071   12 I/O PCB PURG
+ 831.218    82.892   19 PART  GU      PART#     02          30.98%  69.02%  .00%      0.978
+ 1.925.291  176.871  54 ORDERS GU      GE          00          28      2.115.842  .00% 100.00%  18.86%  11.218.609
+ 4.502.729                                VSM VSAM ORDERS      44.146
+ 5.028.549                                VSM VSAM ORDERS      1.478.907
+13.144.156    0.256   55 MAIL  ISRT  DOCUMENT 03          7      92.650    .00% 100.00%  1.86%    4.979.478
+13.145.171                                DBH OSAM MESSAGES    21.661
+13.255.358          Schedule end at 17Jun2001 10.51.07.73
    
```

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DEDB Resource Contention Report



IWAITs on DEDB locks, including CI, UOW, segment level, area, buffer overflow, MSDB, non-DBRC DB, command and dummy locks

Fast Path DEDB Resource Contention Summary

**** CI Lock IWAIT ****

Area Name	Sharing Type	Counts	Elap/Count Sc.Mil.Mic	StDev	Max IWAIT Sc.Mil.Mic	Pct Tot Counts	Pct Tot IW Elp
DB23AR0	A	3	3.313	0.466	5.498	9.09%	0.05%
DB23AR3	A	1	4.871.974	0.000	4.871.974	3.03%	24.50%
DD01AR0	A	13	3.880	0.499	6.863	39.39%	0.25%

Sharing Types:

- A : Area / Non Level Share
- B : 1 IRLM Block Level Share
- C : 2 IRLM Block Level Share

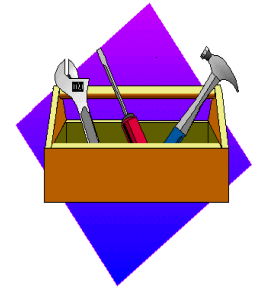
**** Area Lock IWAIT ****

Area Name	Sharing Type	Counts	Elap/Count Sc.Mil.Mic	StDev	Max IWAIT Sc.Mil.Mic	Pct Tot Counts	Pct Tot IW Elp
BANKC00	C	11	18.813	0.129	22.795	39.29%	15.18%
BANKC01	C	17	68.036	2.828	837.022	60.71%	84.82%

Fast Path DEDB Lock Activity

Area Name	Shr Lvl	Loc Typ	Lock Count	Lock Elapsed					IWAIT Elapsed					
				Average Sc.Mil.Mic	StDev	Maximum Sc.Mil.Mic	** Pct Total ** Locks	** Pct Total ** Lock El	IWAIT Count	Average Sc.Mil.Mic	StDev	Maximum Sc.Mil.Mic	** Pct Total ** IWAITs	** Pct Total ** IWT El
DB23AR0	1	CI	8	1.731.126	1.710	7.895.488	6.54%	8.87%	3	2.152	0.078	2.388	7.09%	0.04%
DD01AR0	2	CI	40	417.830	4.100	7.888.613	34.54%	10.71%	13	3.898	0.542	9.214	32.65%	0.28%

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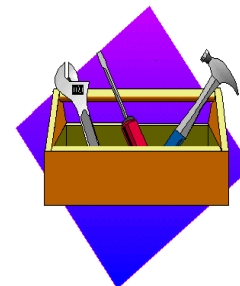
FP Buffer Statistics Report

Activities in the Fast Path buffers, by region and in total

Fast Path Buffer Statistics

Region Totals		From 07Jun2001 11.25.11.80 To 07Jun2001 11.28.25.78										Elapsed= 0 Hrs 3 Mins 13.975.908 Secs					
Trans Code	No. of Sync	No. of Bufs Requested		No. of Bufs Updated		No. of Steal Invoc.		No. of Bufs Stolen		No. of Bufs Used (NBA)		No. of Bufs Used (OBA)		No. of WAITs for OBA		Elapsed Time for OBA	
		Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max
DDLTRN01	38	3	21	3	20	0	0	0	0	3	20	0	0	0	0	0.000	0.000
TXCDDS01	4	4	7	0	1	1	2	1	1	2	3	1	2	0	1	0.004	0.015

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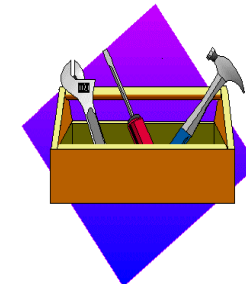
BALG/Shared EMHQ Report

Balancing Group and shared EMHQ activities

Fast Path BALG/Shared EMHQ Analysis

		From 07Jun2001 11.25.51.03 To 07Jun2001 11.27.56.21						Elapsed= 0 Hrs 2 Mins 05.186.320 Secs			
		----- Queue Length / Message -----						----- Queue Time / Message -----			
<u>PSBname</u>	<u>TranCode</u>	<u>Queue</u>	<u>Msg</u> <u>Counts</u>	<u>Length</u> <u>/Msg</u>	<u>StDev</u>	<u>Max Value</u>	<u>Pct Tot</u> <u>Counts</u>	<u>Elap/Msg</u> <u>Sc.Mil.Mic</u>	<u>StDev</u>	<u>Max Value</u> <u>Sc.Mil.Mic</u>	<u>Pct Tot</u> <u>Elaps</u>
DDLTD01	TXCDDS01	BALG	10	1	0.571	2	29.43%	8.048	0.524	13.542	31.32%
DDLTRN14	TXCDRN14	BALG	4	1	0.663	2	10.57%	20.674	0.514	24.436	8.68%
DRPTRS21	TXCDDS21	BALG	15	1	0.465	2	40.43%	8.048	0.689	16.282	38.32%

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OTHREAD Analysis Report

Activities in the OTHREAD queue

Fast Path OTHREAD Analysis

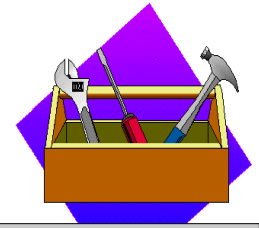
----- Active OTHREADS -----				----- Waiting Areas -----			----- Buffers on Queue -----		
Enq	Counts			Counts			Counts		
Counts	OTHREAD/Enq	StDev	Max value	Area/Enq	StDev	Max value	Buff/Enq	StDev	Max value
731	0.03	6.444	2	0.01	12.025	1	3.20	1.066	16

**** DEDB Write IWAIT ****

ADSname	Share	VSO	IWAITs	Elap/IWAIT	Max value	Pct Tot	Pct Tot	---- CI Write Count ----	
	Level			Sc.Mil.Mic	Sc.Mil.Mic	IWAITs	IWT Elp	CI/IWAIT	Max value
DB23AR0	1	NO	5	5.387	17.631	0.63%	1.89%	1	1
DB23AR1	1	NO	5	4.196	5.392	0.63%	0.38%	2	4
BANKC00	3	YES	426	4.404	140.204	47.53%	21.28%	2	8

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VSO Summary Report



Fast Path DEDB VSO Summary

**** Preload ****

Area Name	Share Level	Start Time HH.MM.SS.TH	End Time HH.MM.SS.TH	Elapse Time Sc.Mil.Mic	No. of CI Read
BANKC00	1	15.03.09.85	15.03.09.90	52.019	150

**** I/O Activities **** (SHARELVL 0/1)

Area Name	Share Level	VSO Reads	VSO Writes	DASD Reads	DASD Writes	Castouts Scheduled
BANKC00	1	393	457	64	393	163

**** I/O Activities **** (SHARELVL 2/3)

Area Name	Share Level	Look-aside	CF Reads	CF Writes	Read Hits	Valid Reads	DASD Reads	DASD Writes	Castouts Scheduled
BANKC00	2	NO	393	457	-	-	64	393	163

**** DEDB Write IWAIT ****

ADSname	Share Level	VSO	IWAITs	Elap/IWAIT Sc.Mil.Mic	Max value Sc.Mil.Mic	Pct Tot IWAITs	Pct Tot IWT Elp	---- CI Write Count ---- CI/IWAIT	Max value
BANKC00	1	YES	426	4.404	140.204	49.53%	23.28%	2	8

**** Castout ****

Area Name	Shr Lvl	Start Time HH.MM.SS.TH	End Time HH.MM.SS.TH	Elapse Time Sc.Mil.Mic	CI Writes	Structure name 1	Elapse Time Sc.Mil.Mic	Structure name 2	Elapse Time Sc.Mil.Mic
BANKC00	2	15.03.09.85	15.03.09.90	52.019	150	BANKC00STR1	1.011	BANKC00STR2	1.045

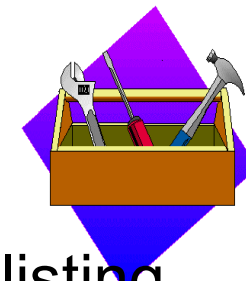
**** CF I/O Wait ****

CF Structure Name	Read				Write			Castout		
	Found Count	Elap/IWAIT Sc.Mil.Mic	Max value Sc.Mil.Mic	Not Found	CI Count	Elap/IWAIT Sc.Mil.Mic	Max value Sc.Mil.Mic	CI Writes	Elapsed/CI Sc.Mil.Mic	Max value Sc.Mil.Mic
BANKC00STR1	393	1.011	10.035	12	457	2.479	12.250	457	2.479	12.250

VSO activity, including preload, I/O for database share levels, write IWAITs, castout operations, coupling facility I/O wait

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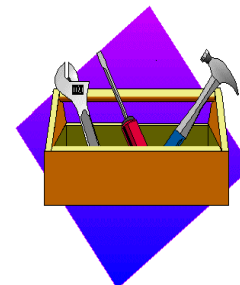
Monitor Record Trace Report



De-blocks and formats monitor records in a chronological listing

Monitor Record Trace

Phys/Logical	Time	F1 Li St Rs					ITASK	Extension Data	Page
Rec No.	Code	Description	HHMMSS	THMIJU	ag ne at Cd	Regn			
11/1	01	System Config	145145961409	00 00 00 00	0000	0000016C	TYP=00 RSF="OCA" SQF=00 EF1=00	1	
98/180	06	IFP Sch Start	145220592476	00 00 81 00	0001	000001A6			
181	18	DMB Blk Ld IW St	145220613808	00 00 81 00	0001	000001A6	NAME="DH41SK02" BLKZ= 0 FUNC=01		
182	19	DMB Blk Ld IW Ed	145220637616	00 00 81 00	0001	000001A6			
197	07	IFP Sch End	145221966353	00 00 81 00	0001	000001A6	PSBN="DDLTRN14" TRAN=" " QCNT= 0		
							DQCT= 1 JOBN="IFPI1X3 "		
176/358	58	IRC10 Start	145222538063	00 00 81 00	0001	000001F0	DBN="I/O PCB " FUN="GU " SLG=01		
359	38	IFP Msg IWAIT St	145222538233	00 00 81 00	0001	000001F0			
360	39	IFP Msg IWAIT Ed	145238685472	00 00 81 00	0001	000001F0			
361	47	BALG Dequeued	145238685491	00 00 81 00	0001	000001F0	PSB="DDLTRN14" TRAN="TXCDRN14" MQT= 5		
							QLN= 0 QFL=40		
362	59	IRC10 End	145238685706	00 00 81 00	0001	000001F0	LEV="		
177/363	58	IRC10 Start	145238688102	00 00 81 00	0001	000001F0	DBN="DEDBDD01" FUN="GHU " SLG=04		
. . .									
	<u>Code</u>	<u>Description</u>	<u>Count</u>						
	06	IFP Sch Start	2						
	07	IFP Sch End	2						
	. . .								
	Total		4074						

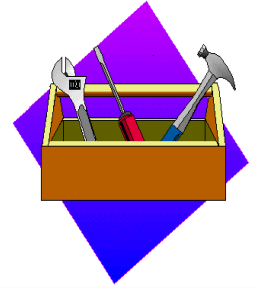


IMSPA futures

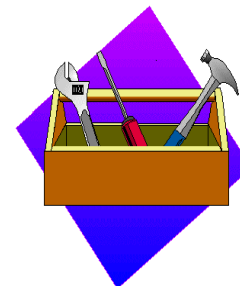
Still to be finalised.....

- ◆ Documentation improvements
- ◆ New Monitor reports
- ◆ New Log reports
- ◆ Customisable reports
- ◆ Online Interface changes

Documentation improvements Manuals

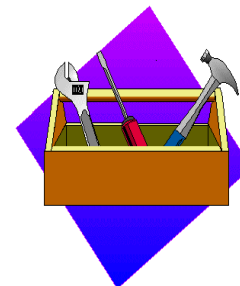


- ◆ More information on reports
 - ◆ What they're useful for
 - ◆ Explanations of what they mean
- ◆ Sections on
 - ◆ Capacity Planning
 - ◆ Performance Analysis
 - ◆ Management Reporting



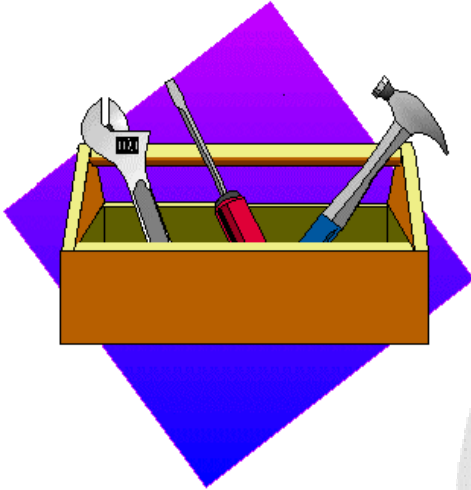
New Monitor reports

- ◆ Add ESAF statistics to existing Region and Program reports
- ◆ Overall System Report
- ◆ Extend Exception reporting
 - ◆ Order reports by resource usage (eg top 10% PSBs by IWAIT)
 - ◆ Limit reports by resource usage (eg database read IWAITs > 3 ms)
- ◆ Other miscellaneous improvements



Customisable reports

- ◆ Customise report content
 - ◆ Which fields appear on reports
 - ◆ Precision of numeric fields
 - ◆ Order
 - ◆ Grouping



IMS PA 3.1

Program Number 5655-E15