

Optimizing IMS Performance - Identify and resolve problems faster and easier

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Agenda

Using IMS tools, we will navigate around the IMS log and other diagnostic data sources to answer questions associated with common problem scenarios. Time does not allow me to discuss all the topics in the list but they are there for your awareness.

We will use:

- IMS Performance Analyzer
- IMS Problem Investigator
- IBM Transaction Analysis Workbench

The topics in the presentation, listed on the next foil, are varied to reflect the many challenges faced by system programmers and management when supporting our IMS systems.

If we missed your pain-point, then just let us know so we can update the presentation and get back to you.



Topics – not all are discussed

1. The IMS log – what am I collecting?
2. TRANSTAT=YES – start collecting 56FA for more accurate CPU time, as well as DB IO counts and times, OSAM/VSAM read/write counts, ESAF call count
3. What is the transaction index and why should I start building one?
4. Database update activity – what are my busiest databases?
5. Sync callout – what is the impact on overall transaction response time?
6. BMPs – what databases are they using? What is CPU time per checkpoint interval?
7. Program switch – now do I trace their flow in the log?
8. IMS-DB2 – what updates to DB2 did my IMS transaction do?
9. CICS-DBCTL – investigating CICS response time problems in IMS
10. Impact of syncpoint processing – how long are my transactions talking to syncpoint, and what is the cause of the delays?
11. Transaction response time – who's letting the team down?
12. Shared queues analysis – are transactions being effectively scheduled, including the impact of local-first
13. Mobile workload pricing – how do I calculate CPU usage for mobile workloads?
14. SCRUB – make the log available to everyone by removing sensitive data
15. Using the IMS system checkpoint to identify resources (transactions, programs, databases) that are no longer being used



LOGINFO – what am I collecting in my IMS log?

- Provides a quick recap of the type and volume of records in the IMS log
- This report is always produced when you run IMS PA and PI

V4R3M0

IMS Performance Analyzer - Log Information

Log data From 2014-06-29 14:58:00.941667 To 2014-06-29 15:12:39.354269 Duration 14:38.412602

Code	Count	MCNT	Recs/Sec	In		Byte/Sec	MB	%	
				Ave Len	Max Len				
01 IN	21,342		24	1,725	3,240	41,942	36.8	6.3	IMS Message
INPUT	15,072		17	1,727	3,240	29,655	26.0	4.5	Input message
MSC FE	134		0	1,032	1,912	157	0.1	0.0	MSC front end
MSC BE	3,418		3	1,193	3,240	4,644	4.0	0.7	MSC back end
01 OUT	291		0	1,410	3,157	467	0.4	0.1	IMS Message
MSC FE	149		0	1,486	2,325	252	0.2	0.0	MSC front end
MSG SWI	142		0	1,331	3,157	215	0.1	0.0	Message switch
03 IN	97,160		110	2,176	3,240	240,902	211.5	36.2	IMS Message
INPUT	25,643		29	1,218	3,240	35,597	31.2	5.3	Program switch
MSC FE	7,661		8	3,235	3,240	28,234	24.7	4.2	MSC front end
MSC BE	11,236		12	807	3,240	10,337	9.0	1.6	MSC back end
CONT	52,620		59	2,782	3,240	166,731	146.3	25.0	Continuation
03 OUT	15,257		17	2,081	3,240	36,166	31.7	5.4	IMS Message
OUTPUT	14,603		16	2,138	3,240	35,568	31.2	5.3	Output message
MSC BE	137		0	1,749	2,672	272	0.2	0.0	MSC back end
MSG SWI	517		0	551	800	324	0.2	0.0	Message switch
07	41,039	50,985	46	456	456	21,314	18.7	3.2	Program schedule end
MPP	32,753	34,446	37	456	456	17,010	14.9	2.6	MPP
QUICK	8,190	16,463	9	456	456	4,253	3.7	0.6	MPP quick reschedule
FALSE	12	0	0	456	456	6	0.0	0.0	MPP false schedule
BMP	15	0	0	456	456	7	0.0	0.0	BMP
ABEND	69	76	0	456	456	35	0.0	0.0	ABEND
08	41,040		46	148	148	6,917	6.0	1.0	Program schedule
MPP	32,835		37	148	148	5,534	4.8	0.8	MPP
QUICK	8,190		9	148	148	1,380	1.2	0.2	MPP quick reschedule
BMP	15		0	148	148	2	0.0	0.0	BMP



56FA – transaction accounting statistics

- TRANSTAT=YES cuts type x'56FA' transaction accounting statistics records at transaction-end and BMP-checkpoint.
- Overcomes the limitations of type x'07' which is cut at program schedule termination and often accumulates statistics for many transactions.
- Without 56FA you cannot get accurate transaction CPU time or other useful transaction-level details.

```
Code... 56FA Transaction Statistics
STCK... CBFC740BD90293A4 LSN.... 00000001C254F89
Date... 2014-06-23 Monday Time... 14.58.01.912361.227
JOBNAME.... 'IMSPMSG1' PROGRAM.... 'BANKING' TRAN..... 'BANK2'
CPU..... 0.009593
DBIO..... 0.068882 LockWait... 0.000544 IOcalls.... +15
VSAMread... +7 VSAMwrite.. +2
OSAMread... +6 OSAMwrite.. +1
ESAFcalls.. +12
```



IMS transaction index – Full or Exceptions

All the accumulated information from the IMS log about each transaction is condensed into a single transaction index record (created by IMS PA).

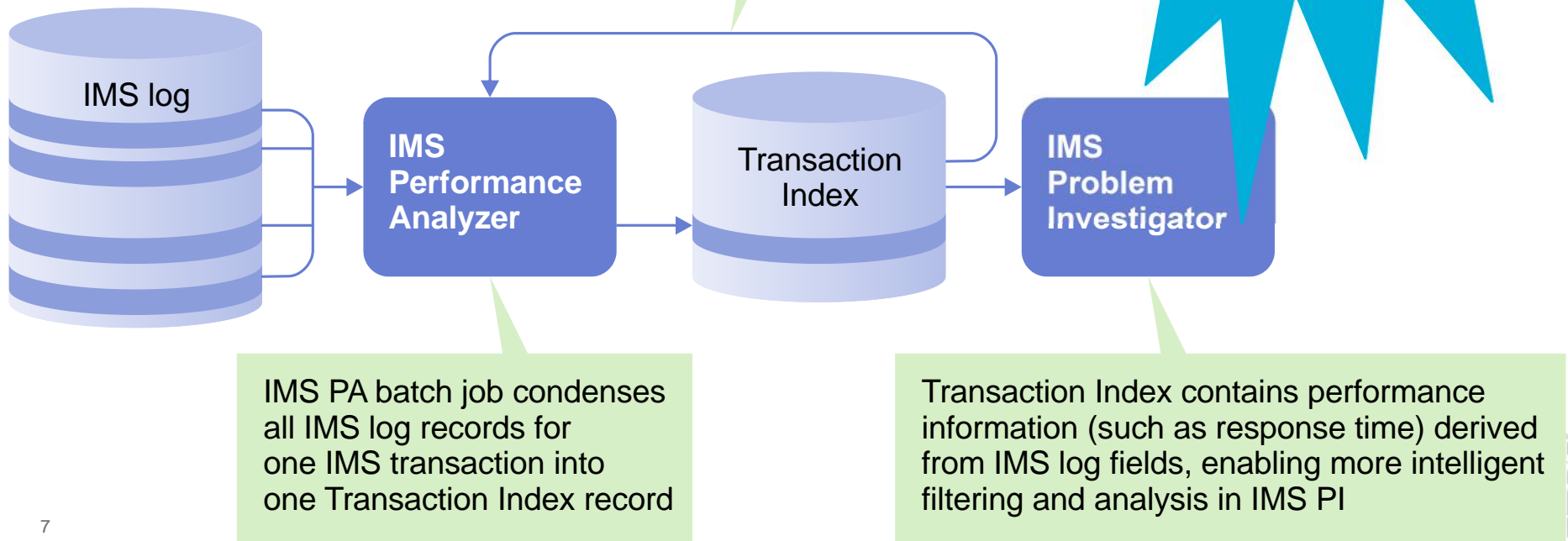
Use the transaction index as input into:

- IMS PA reporting - Instead of re-processing large SLDS log files
- IMS PI analysis - To enable more intelligent problem detection

- Can be for exceptions only

Save processing time by using Transaction Index as input to IMS PA instead of IMS log

“Inflight” is now available for continuous log processing without missing a beat.



Distributions and Service Levels

Once you have an index (or straight from the log) you can start to get answers:

- Ensure transactions are performing according to management-defined service levels
- User-defined thresholds, for example - <0.1, 0.1 to 0.5, >0.5 seconds etc.
- Report as either a percentage (of all transactions) or as a count

Response Time Distribution

Trancode	Tran Count	Min	Avg	Max	<0.01	<0.05	<0.10	<0.20	<0.50	>=0.50	>=0.50
		Total	Total	Total	Total	Total	Total	Total	Total	Total	Total
		IMS Time	IMS Time	IMS Time	IMS Time	IMS Time	IMS Time	IMS Time	IMS Time	IMS Time	IMS Time
BALANCE	89	0.045362	0.119435	1.493757	1.12%	31.46%	85.39%	91.01%	93.26%	6.74%	6
LOGON	92	0.028291	0.158065	1.667653	1.09%	31.52%	72.83%	85.87%	93.48%	6.52%	6
ORDER	95	0.017040	0.117309	0.833115	0.00%	35.79%	80.00%	86.32%	94.74%	5.26%	5
PAY	936	0.004527	0.019000	0.358372	33.76%	94.87%	98.18%	99.47%	100.00%	0.00%	0
STOCK	98	0.025835	0.103145	0.812622	0.00%	29.59%	83.67%	89.80%	95.92%	4.08%	4
TRANSFER	78	0.015636	0.118776	0.765933	0.00%	44.87%	78.21%	80.77%	96.15%	3.85%	3
WITHDRAW	105	0.026213	0.110366	1.556585	0.00%	29.52%	75.24%	89.52%	96.19%	3.81%	4

Service Level dictates that 95% of transactions must have response time less than 0.5 seconds, then...
PAY, STOCK, TRANSFER, WITHDRAW do meet the required level of service – OK
BALANCE, LOGON, ORDER do not meet the required level of service – Fail



Syncpoint – how is it affecting response time?

Are you using external subsystems and DASD mirroring? These might affect the time it takes for your transactions to commit:

- Total syncpoint time
- Phase 1
- Phase 2
- Phase 2 attributable to Fast Path database only
- OTHREAD time to complete (asynchronous – not part of SYNCPT)

Syncpoint analysis

Trancode	Count	Process Time	CPU Time	DB Calls	Syncpt Time	Phase 1 Time	Phase 2 Time	Phase 2 FP Time	OThread Time
BANK1	18	0.041045	0.006635	8	0.014769	0.000030	0.014739	0.014739	0.000980
BANK2	26	0.051985	0.005922	8	0.000071	0.000032	0.000039	0.000039	0.001107
BANK3	280	0.048873	0.004889	23	0.000038	0.000018	0.000019	0.000019	0.001203
ORDERS	299	0.044485	0.004687	23	0.000034	0.000017	0.000017	0.000017	0.001200
MOBILE1	316	0.040288	0.004833	23	0.000789	0.000019	0.000771	0.000028	0.000789
MOBILE2	307	0.057567	0.004862	23	0.000037	0.000018	0.000019	0.000019	0.001195
MOBILE3	282	0.033802	0.004694	23	0.000036	0.000019	0.000016	0.000016	0.001191
WEBORDER	19	0.039227	0.007359	9	0.000076	0.000034	0.000043	0.000043	0.001057
STOCK1	21	0.036017	0.006329	9	0.000070	0.000031	0.000039	0.000039	0.001034
STOCK2	15	0.299056	0.020897	21	0.000053	0.000036	0.000016	0.000016	0.000983
STOCK3	16	0.372236	0.020957	21	0.000056	0.000039	0.000017	0.000017	0.001064
Total	18,243	0.089237	0.010805	11	0.000116	0.000027	0.009074	0.000012	0.001106



Interactive Log analysis using the IMSPI and TAW dialogs

- View transaction events across all the subsystems
- Merge data sources from IMS, DB2, CICS and MVS
- Display records with friendly descriptions and useful information
- Analyze transaction event latencies with relative and elapsed times
- Use a filter to show exceptions and required records only
- Use tracking to isolate all the records associated with an individual transaction
- Select a record to see more detail (full mapping)
- Extract data to CSV or DB2 for custom reporting

Shared queues 😊 Local-first and false scheduling ☹️

1. IMS workload broken down by queue type:

- GLOBAL – shared queues where transactions came in on another system
- LOCAL – shared queues where transactions came in on this system
- LOCALF – local-first where shared queue was bypassed

Shared queues transaction performance

IMS ID	Queue Type	Tran Count	Avg InputQ Time	Avg Process Time	Avg OutputQ Time	Avg Total Time	>1.0 InputQ Time	>1.0 Process Time	Avg CPU Time	Max CPU Time	>0.1 CPU Time
IMS1	GLOBAL	493	0.152755	0.353057	0.111123	0.613036	4.26%	11.76%	0.018737	0.199393	5.77%
IMS1	LOCAL	222	0.164432	0.567554	0.000162	0.732051	4.05%	21.62%	0.028475	0.199393	7.37%
IMS1	LOCALF	8701	0.003339	0.056002	0.208816	0.249786	0.10%	0.92%	0.007174	15.15835	0.32%
IMS2	GLOBAL	472	0.157556	0.432707	0.000675	0.590806	4.45%	15.89%	0.023619	0.236885	6.86%
IMS2	LOCAL	224	0.234427	0.457905	0.000130	0.692367	7.14%	16.52%	0.022103	0.208415	5.58%
IMS2	LOCALF	8131	0.002857	0.065651	0.190159	0.242889	0.00%	0.97%	0.012947	31.13607	0.47%
Total		18243	0.015950	0.089237	0.186943	0.276655	0.42%	2.07%	0.010805	31.13607	0.87%

2. False schedule and WFI analysis:

Region overview

MPP Total	CPU	Sched	Trans	***** DB *****	DLI Calls DC	***** Other *****	WFI SUBQ6	Quick	**** Schedule Distribution ****	=0	=1	>1
Total	181858	4636	16842	178088	41165	24530	41556K	6279	Sched	1408	2131	1097
/Sched	39	1.0	3.6	38.4	8.9	5.3	8963	1.4	Tran	0	2365	14477
/Tran	10	0.3	1.0	10.6	2.4	1.5	2467		Tr/Sch	0	1	13
/Minute	30309	772.7	2807.0	29681.3	6860.8	4088.3	6926016	1046.5	Sc/Min	234.7	355.2	182.8
% Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	%Sched	30.37	45.97	23.66



BMPs – checkpoints, database and ESAF

1. Syncpoint – are checkpoints being taken frequently enough?
2. Database – what is being updated and checkpointed?

Database XREF

Program	BMP CHKP ID	Start Time	CPU Time	Process Time	DB Gets	DB Upds	Database Name	Access Method
NITERUN	NITECP1	21.30.23.310271	0.232909	1.315058	1332	157	CUSTOMER PAYMENTS ORDERS STOCK WIDGETS	ESDS DEDB CHKP CHKP CHKP
NITERUN	NITECP2	21.30.24.657028	0.314702	1.403829	1465	264	CUSTOMER PAYMENTS ORDERS STOCK WIDGETS	ESDS DEDB CHKP CHKP CHKP

3. Subsystem – what is being accessed?

ESAF XREF

Program	BMP CHKP ID	Start Time	CPU Time	Process Time	ESAF Calls	ESAF Name	SYNCPOINT Time
NITERUN	NITECP1	21.30.23.310271	0.232909	1.315058	57	DB2P MQP1	0.026114 0.003612
NITERUN	NITECP2	21.30.24.657028	0.314702	1.403829	65	DB2P MQP1	0.010984 0.004757

Database update activity

1. For each database, shows the programs that updated it, and how often
2. Shows DLI call and physical I/O statistics

Database Update Activity-IMSA

Database	Program	Proc	5050 Total		Updates	ISRT	DLET	REPL	ROLX	New Block	Free Space	5052 Insert	5051 Problem	20 open/ 24 Error
ORDERS	ONLINE	APPL	2,135	DLI I/O	2,135 1,582	2,135 540	0 0	0 1,042	0	13	540	0	0	0 0
	MOBILE	APPL	720	DLI I/O	720 537	720 179	0 0	0 358	0	4	179	0	0	0 0
	Total	APPL	2,855	DLI I/O	3,609 2,677	3,593 901	16 0	0 1,776	0	27	905	0	0	0 0



Does not show DB performance, you need to run the monitor for that.

Although this information may be enough to tell you where to focus your DB analysis and maintenance efforts.

Other reports will show transaction database I/O latencies, but not per database.

Program Switch – following the trail of transactions

IMS Performance Analyzer								
Program Switch List								
Org	IMS Tran	Parent	Prog	InputQ	PgmSwch	Process	OutputQ	
LTERM	Start	Trancode	Trancode	Time	Time	Time	Time	
NEWYORK	14.58.02.023922	BANK0001	0	0.004688	-	0.009277	-	
	14.58.02.037859	BANK0001	BANK0010	1	0.000150	0.000137	1.065917	-
	14.58.03.102187	BANK0010	BANK0011	2	0.001114	0.001093	0.762127	-
	14.58.03.861171	BANK0011	BANK0012	3	0.004557	0.004535	0.586579	-
	14.58.04.449915	BANK0012	BANK0013	4	0.003350	0.003330	0.458266	-
	14.58.04.909175	BANK0013	BANK0014	5	0.101360	0.101341	0.428108	-
	14.58.05.435875	BANK0014	BANK0015	6	0.312120	0.312099	0.754851	0.000000

Transaction BANK0001 originated from lterm NEWYORK at 14.58.02.023922
 It switched to trancode BANK0010
 Trancode BANK0010 then switched to BANK0011
 Four (4) further switches to Trancode BANK0015 completed the sequence
 The overall transaction response time is always reported against the originating transaction – 4.467306 seconds – from when the originating transaction arrived on the message queue to when a response was sent back to the terminal
 The last transaction in the sequence responded back to the terminal – you can tell because it has an output queue time
 Notice the long switch times for the last 2 transactions – this contributed to almost 0.5 seconds of the response time

Total	IMS	Resp	CPU
IMS	Time	Time	Time
0.013965	4.467306	0.000737	
1.066054	-	0.014046	
0.763220	-	0.015807	
0.591114	-	0.015897	
0.461596	-	0.014347	
0.529449	-	0.013495	
1.066950	-	0.028735	



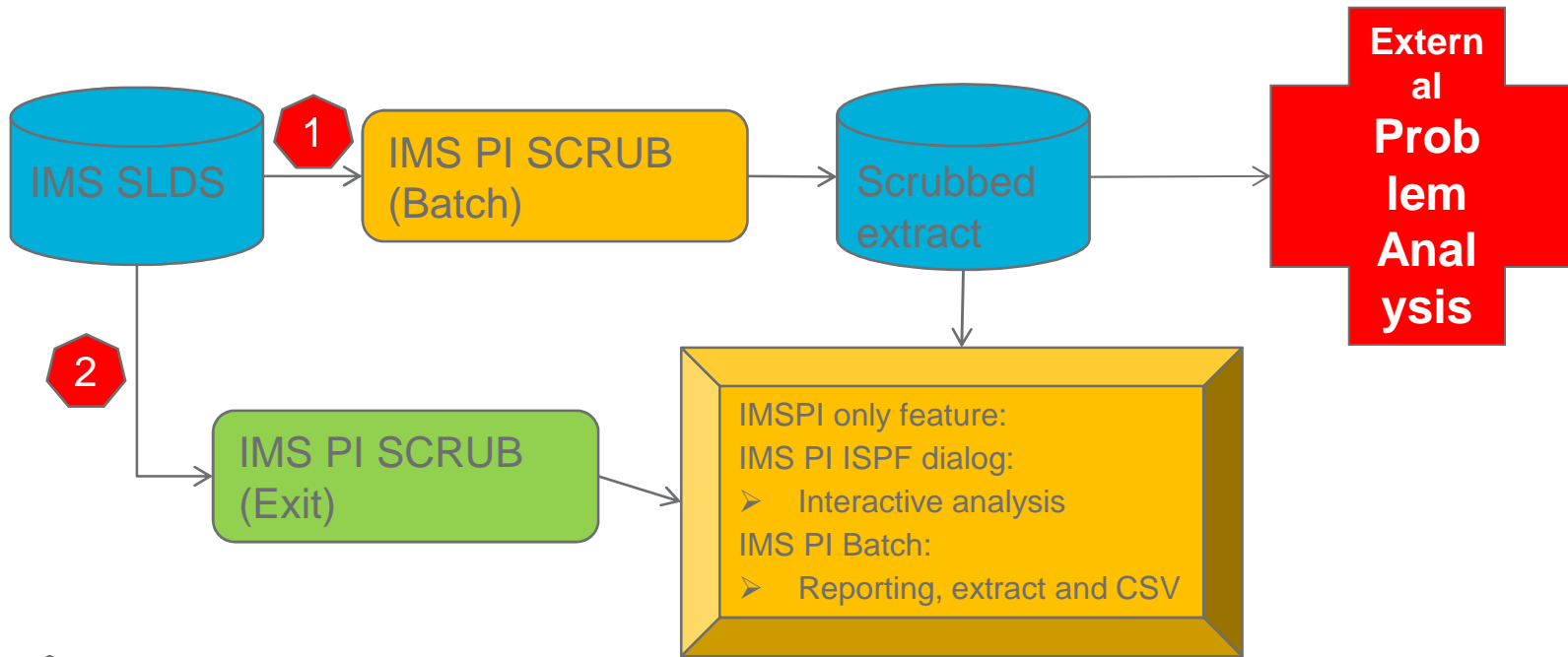
IMS synchronous call-out

From the perspective of IMS connect and the IMS log:

```
003C Prepare READ Socket 13.59.04.796236
0041 Message sent to OTMA Type=Transaction +0.000678
01 Input Message TranCode=JLMTRAN1 Source=Connect +0.002344
35 Input Message Enqueue TranCode=JLMTRAN1 +0.002373
08 Application Start TranCode=JLMTRAN1 Region=0001 +0.097370
5607 Start of UOR Program=JLMPGM01 Region=0001 +0.097371
31 DLI GU TranCode=JLMTRAN1 Region=0001 +0.097420
003C Prepare READ Socket +7.834564
0041 Message sent to OTMA Type=Command +7.834898
6701 YOUT Sync callout message sent +7.835620
0042 Message received from OTMA Type=Data +7.835867
0058 IMS Hold Queue Compensation +7.835888
004A WRITE Socket +7.836168
0041 Message sent to OTMA Type=Response, Resp=ACK +7.838083
6701 YACK Received ACK +7.838202
0045 OTMA Time-out +7.848143
004A WRITE Socket +7.848307
0048 Trigger Event for SYNCHPT +7.848323
0041 Message sent to OTMA Type=Command +7.848379
003C Prepare READ Socket +8.851081
0047 Session Error +8.851341
0048 Trigger Event for CLOSE +8.851501
6701 YRSP Sync callout response received +8.852048
03 Output Message Response LTerm=7901 Source=Connect +8.852911
31 Message GU for APPC LTerm=7901 +8.852933
5610 Syncpoint Start of Phase 1 Region=0001 +8.853035
```

Also, you can measure synch callout time as part of response time analysis using IMSPA.

SCRUB – How to address privacy issues



1 SCRUB utility

1. Systems Programmer creates a copy of the original SLDS with confidential data scrubbed
2. The scrubbed extract data set is made available to all IMS PI users – data set to <<CLEARED>>
3. 100% secure – user has no access to confidential data

2 SCRUB exit (ALZUAUTH) – IMSPI only

1. All IMS PI users have access to the original (un-scrubbed) SLDS
2. All IMS PI ISPF dialog and batch services scrub the log records prior to display or reporting
3. Not secure – other utilities such as ISPF browse or DFSERA10 will display the confidential data

SYSGEN clean-up – removing unused definitions

Uses checkpoint records:

4004=Transactions, 4006=Databases, 4007=Programs

start of checkpoint interval Date=2014-06-26 Thursday Time=17.51.31

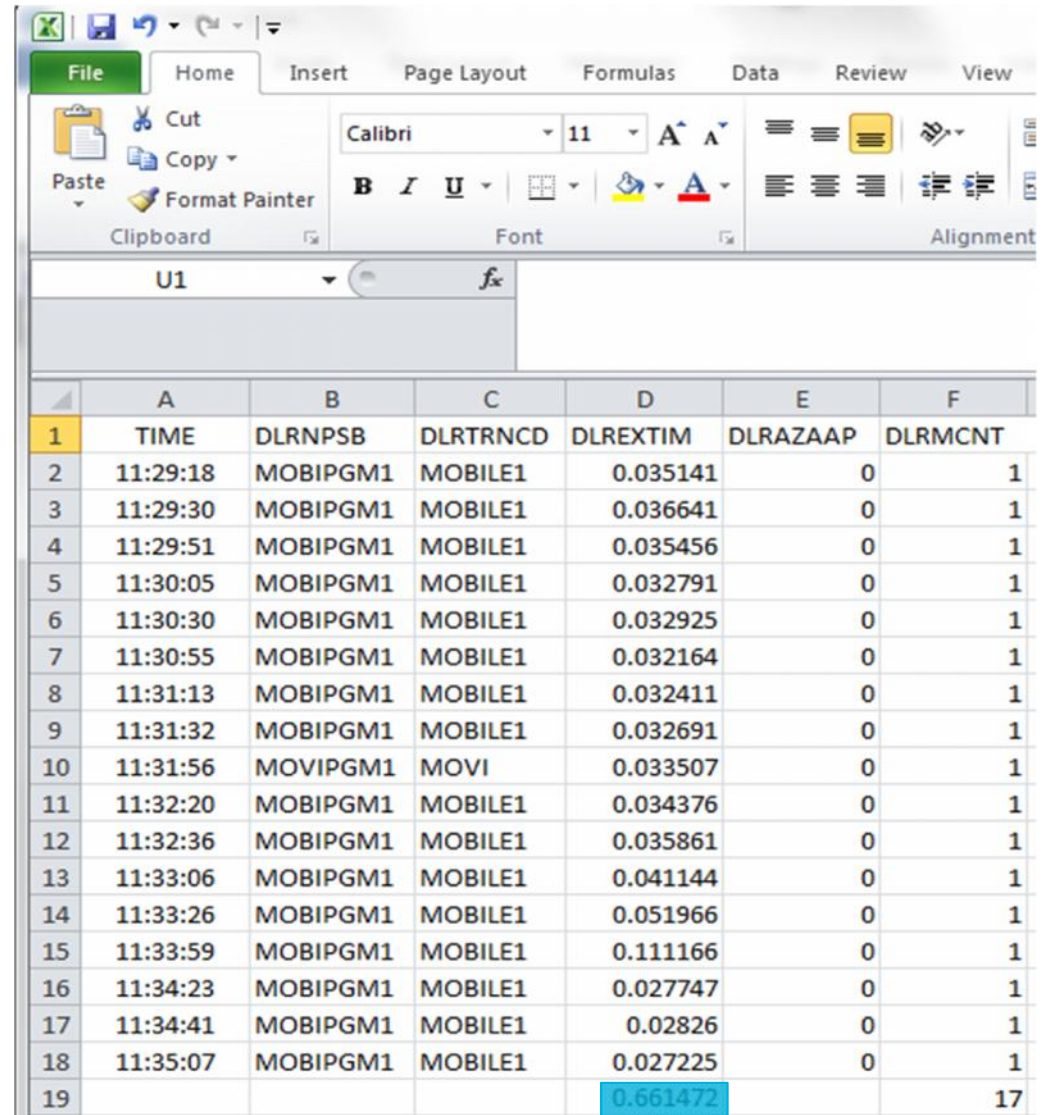
DDIR	DDIROPEN	DDIRDA	CHKWOPN	DDIRGOPN	Used?
ACCOUNTS	40	20	00	00	YES
BANKING	00	00	00	00	NO
ORDERS	00	00	00	00	NO
STOCK	40	20	00	00	YES

DDIR	Database name
DDIROPEN	At least one DCB is opened
DDIRDA	DMB has been dynamically allocated
CHKWOPN	DB was open
DDIRGOPN	GBLSTATUS = OPEN
Used?	YES – at least one of the above is set, DB is in use or has been used
	NO – none of the above are set, DB has not been used

Mobile Workload Pricing using TAW

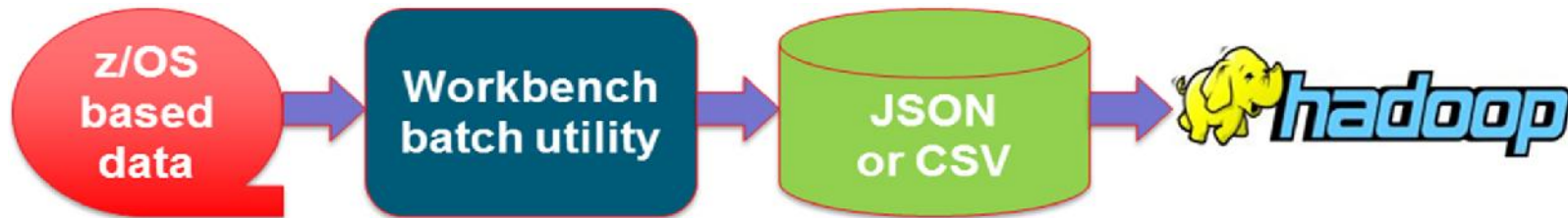
TAW provides a CSV file containing selected (mobile, for example) transaction CPU usage information. The CSV can then assist you to measure your mobile workload for [IBM Mobile Workload Pricing for z/OS](#).

A simple one-step command **CSV FORM(MWP)** produces:



	A	B	C	D	E	F
1	TIME	DLRNPSB	DLRTRNCD	DLREXTIM	DLRAZAAP	DLRMCNT
2	11:29:18	MOBIPGM1	MOBILE1	0.035141	0	1
3	11:29:30	MOBIPGM1	MOBILE1	0.036641	0	1
4	11:29:51	MOBIPGM1	MOBILE1	0.035456	0	1
5	11:30:05	MOBIPGM1	MOBILE1	0.032791	0	1
6	11:30:30	MOBIPGM1	MOBILE1	0.032925	0	1
7	11:30:55	MOBIPGM1	MOBILE1	0.032164	0	1
8	11:31:13	MOBIPGM1	MOBILE1	0.032411	0	1
9	11:31:32	MOBIPGM1	MOBILE1	0.032691	0	1
10	11:31:56	MOVIPGM1	MOVI	0.033507	0	1
11	11:32:20	MOBIPGM1	MOBILE1	0.034376	0	1
12	11:32:36	MOBIPGM1	MOBILE1	0.035861	0	1
13	11:33:06	MOBIPGM1	MOBILE1	0.041144	0	1
14	11:33:26	MOBIPGM1	MOBILE1	0.051966	0	1
15	11:33:59	MOBIPGM1	MOBILE1	0.111166	0	1
16	11:34:23	MOBIPGM1	MOBILE1	0.027747	0	1
17	11:34:41	MOBIPGM1	MOBILE1	0.02826	0	1
18	11:35:07	MOBIPGM1	MOBILE1	0.027225	0	1
19				0.661472		17

BigData and IT analytics using Transaction Analysis Workbench



- Most z/OS based performance instrumentation can be loaded quickly and easily into HADOOP; including SMF, CICS, DB2, IMS, WebSphere MQ, WebSphere Application Server
- Supports InfoSphere BigInsights and Cloudera
- CSV can be written directly into zFS file system
 - ASCII format; compatible with the requirements of the HADOOP UPLOAD
 - Use NFS or FTP to facilitate scheduled and automated upload into HDFS
- ISPF dialog provides the “BigData” option to assist you in the setup of jobs to collect the required data and generate the necessary CSVs
- The CSV process generates additional output to assist in the take-up:
 - HCatalog - table abstraction and a storage abstraction system that makes it easy for multiple tools to interact with the same underlying data
 - Schema – DDL to create a DB2 table
 - JSON metadata – describes all the fields in the table by name, with their attributes, as well as a detailed description

Why an IMSPI user might consider the Transaction Analysis Workbench over IMS Problem Investigator

IMS DB2 transaction – what did it do using TAW?

1. IMS transaction starts with an Index record (CA01)
2. IMS log (green), DB2 trace (BLUE) and DB2 log (RED) events are shown
3. Transaction calls a DB2 stored procedure which issues SQL calls, call results are shown

IMS

DB2
Trace
and
SMF

DB2
Log
only

```

Navigate < 00.00.01.000000 >      Date/Time 2013-10-08 17.10.09.284086
/ Tracking _____ Tuesday 2013-10-08 Time (Elapsed)
E CA01 IMS Transaction TranCode=FB0IAT41 Region=0002 17.10.09.284086
  01 Input Message TranCode=FB0IAT41 0.000000
  35 Input Message Enqueue TranCode=FB0IAT41 0.000023
  08 Application Start TranCode=FB0IAT41 Region=0002 0.000256
 5607 Start of UOR Program=FB0IAP41 Region=0002 0.000000
  31 DLI GU TranCode=FB0IAT41 Region=0002 0.000022
 5616 Start of protected UOW Region=0002 0.000189
 5600 Sign-on to ESAF Region=0002 SSID=DBA6 0.005896
 5600 Thread created for ESAF SSID=DBA6 0.000012
  112 Thread allocate FB0IAP41 DBA6 0.000572
  073 Create thread end DBA6 0.000068
  177 Package allocation FB0IAP41 DBA6 0.000227
  233 SP entry FBOSP007 STMT=001031 DBA6 0.000234
  380 SP entry FBOSP007 STMT=001031 DBA6 0.000023
  177 Package allocation FBOSP007 DBA6 0.000184
  061 SQL UPDATE STMT=000001 DBA6 0.000141
 0020 Begin UR 0.001034
 0600 Savepoint 0.000000
 0600 Update in-place in a data page 0.000000
  058 SQL UPDATE SQLCODE=0 STMT=000001 DBA6 0.000338
  065 SQL OPEN C1 STMT=000001 DBA6 0.000090
  058 SQL OPEN SQLCODE=0 STMT=000001 DBA6 0.000021
  499 SP statement execution detail DBA6 0.000039
  233 SP exit FBOSP007 SQLCODE=0 STMT=001031 DBA6 0.000016
  380 SP exit FBOSP007 SQLCODE=0 STMT=001031 DBA6 0.000012
  053 SQL request SQLCODE=466 STMT=001031 DBA6 0.000083
  053 SQL request SQLCODE=0 STMT=001082 DBA6 0.000824
    
```

DB2
Log
only

DB2
Trace
and
SMF

IMS

```
...Continuation from previous foil
--- 053 SQL request          SQLCODE=0 STMT=001085 DBA6      0.000119
--- 059 SQL FETCH C1        SQLCODE=0 STMT=001090 DBA6      0.000107
--- 0600 Savepoint          1.437546
--- 0600 Savepoint          0.257680
--- 0600 Savepoint          1.059456
--- 0600 Savepoint          0.000032
--- 0600 Savepoint          0.000016
--- 0600 Savepoint          0.000016
--- 058 SQL FETCH           SQLCODE=0 STMT=001090 DBA6      1.09.840951
--- 053 SQL request          SQLCODE=0 STMT=001090 DBA6      0.000112
--- 059 SQL FETCH C1        SQLCODE=0 STMT=001090 DBA6      0.000295
--- 058 SQL FETCH           SQLCODE=100 STMT=001090 DBA6     0.000036
--- 053 SQL request          SQLCODE=100 STMT=001090 DBA6     0.000022
--- 5600 Commit Prepare starting Region=0002 SSID=DBA6 0.001033
--- 084 Prepare start          DBA6      0.000604
--- 0020 End commit phase 1    0.000223
--- 085 Prepare end          DBA6      0.000519
--- 03 Output Message Response LTerm=FUNTRM10 0.000082
--- 35 Output Message Enqueue LTerm=FUNTRM10 Region=0002 0.000012
--- 3730 Syncpoint End of Phase 1 Region=0002 0.000016
--- 074 Terminate thread start DBA6      0.000403
--- 0020 Begin commit phase 2 0.000052
--- 0020 End commit phase 2 0.001024
--- 239 Package accounting-Native SP DBA6      0.000456
--- 003 Thread accounting     DBA6      0.000060
--- 075 Terminate thread end  DBA6      0.000932
--- 5600 Commit Continue completed Region=0002 SSID=DBA6 0.000400
--- 37 Syncpoint Message Transfer Region=0002 0.000023
--- 33 Free Message           0.000015
--- 5612 Syncpoint End of Phase 2 Program=FB0IAP41 Region=0002 0.000011
--- 07 Application Terminate TranCode=FB0IAT41 Region=0002 0.000288
--- 31 Communications GU LTerm=FUNTRM10 0.000067
--- 36 Output Message Dequeue LTerm=FUNTRM10 0.004397
--- 33 Free Message           0.000005
***** Bottom of Data *****
```

Delay

SYNCPPOINT

1.09.840951

IMS DB2 transaction – what did it do?

IMS PI

1. IMS transaction starts with an Index record (CA01)
2. IMS log (green), and DB2 log (RED) events are shown
3. Transaction calls a DB2 stored procedure which issues SQL calls, but no call results are shown because IFCID trace and SMF records are not known to IMSPI

```
Tracking _____ Tuesday 2013-10-08 Time (Elapsed)
/ E CA01 IMS Transaction TranCode=FB0IAT41 Region=0002 17.10.09.284086
  01 Input Message TranCode=FB0IAT41 0.000000
  35 Input Message Enqueue TranCode=FB0IAT41 0.000023
  08 Application Start TranCode=FB0IAT41 Region=0002 0.000256
 5607 Start of UOR Program=FB0IAP41 Region=0002 0.000000
  31 DLI GU TranCode=FB0IAT41 Region=0002 0.000022
 5616 Start of protected UOW Region=0002 0.000189
 5600 Sign-on to ESAF Region=0002 SSID=DBA6 0.005896
 5600 Thread created for ESAF SSID=DBA6 0.000012
 0020 Begin UR 0.002487
 0600 Savepoint 0.000000
 0600 Update in-place in a data page 0.000000
 0600 Savepoint 1.439200
 0600 Savepoint 0.257680
 0600 Savepoint 1.059456
 0600 Savepoint 0.000032
 0600 Savepoint 0.000016
 0600 Savepoint 0.000016
 5600 Commit Prepare starting Region=0002 SSID=DBA6 1.09.842452
 0020 End commit phase 1 0.000827
  03 Output Message Response LTerm=FUNTRM10 0.000602
  35 Output Message Enqueue LTerm=FUNTRM10 Region=0002 0.000012
 3730 Syncpoint End of Phase 1 Region=0002 0.000016
 0020 Begin commit phase 2 0.000455
 0020 End commit phase 2 0.001024
 5600 Commit Continue completed Region=0002 SSID=DBA6 0.001849
  37 Syncpoint Message Transfer Region=0002 0.000023
  33 Free Message 0.000015
```

IMS

DB2
Log
only

Delay

SYNCPPOINT

- Continued from previous foil.



```
5612 Syncpoint End of Phase 2 Program=FB0IAP41 Region=0002      0.000011
07  Application Terminate TranCode=FB0IAT41 Region=0002      0.000288
31  Communications GU LTerm=FUNTRM10                          0.000067
36  Output Message Dequeue LTerm=FUNTRM10                    0.004397
33  Free Message                                              0.000005
***** Bottom of Data *****
```





More information

- IBM DB2 and IMS Tools website:
www.ibm.com/software/data/db2imstools/
- James Martin, US Representative, Fundi Software:
james_martin@fundi.com.au
- Jim Martin, US Representative, Fundi Software:
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Thank You

