IMS Performance Solution Pack Quick Start

Commonly asked questions?

How do I use IMS Performance Analyzer to answer the following questions?

- Overall statistics – How many transactions were processed by IMS in a given period? And what names/types?
- Transaction timeline -- When did any given transaction start and end? How long did it run for in IMS?
- What did transaction "*TRANX*" do in IMS; including DB2 calls, IMS DB calls, etc., with timestamps?

We will use the following tools to answer these questions:

- IMS Performance Analyzer V4.4 : IMS PA Knowledge Center
- IMS Problem Investigator V2.4 : IMS PI Knowledge Center

Have you considered the IMS Performance Solution Pack?

You get three tools in one: IMS Performance Analyzer, IMS Problem Investigator and IMS Connect Extensions

We recommend a trial of IMS Problem Investigator – you will soon see why

Quick start JCL

The JCL that follows will run the IMS PA reports featured in this presentation, as well as provide other useful information.

Please take a copy of the JCL, make the following changes, then submit.

1. Adjust the job card for your site standards
2. Set the IMS version PARM=V131, V141, or V151 for IMS versions 13, 14 and 15 respectively
3. Set the IMS PA SIPILINK data set name as the STEPLIB
4. Specify the log file(s) for a single system, or
5. Specify the log files for shared queue systems
6. Optional: To focus on a single transaction code “X”, change “*” (for all transaction codes) to “X”.

The command input is complicated because it was generated by the ISPF dialog. We will show you later how easy it is to customize reporting to meet your exact requirements.

The JCL extends over the next seven pages.
Please copy all 7 pages into a PDS member for edit and submission.
Cut and paste from this PDF will lose the command indentation – do not worry about this – all commands will be accepted starting in column 1.

```
//IMSPA JOB ,CLASS=A,MSGCLASS=T,NOTIFY=&SYSUID      (1)
//*
//S1       EXEC PGM=IPIMAIN,PARM='V131'             (2)
//STEPLIB  DD  DISP=SHR,DSN=IMSPA.V4R4M0.SIPILINK   (3)
//*  IMS log file: single system
//LOGIN    DD  DISP=SHR,DSN=IMS1.LOG                (4)
//* IMS log files: shared queues
//* LIMSA001 DD  DISP=SHR,DSN=IMSA.LOG              (5)
//* LIMSA001 DD  DISP=SHR,DSN=IMSB.LOG
//SYSPRINT DD  SYSOUT=*
//IPICMD   DD  *
  IMSPALOG INPUTDD(LOGIN),
           OUTPUTDD(RPTOUT),
           PAGESIZE(60),
           PRINTAT(STOP),
           SETIMSID(DDNAME)
  IMSPALOG BMPSYNC(YES)
```

```
IMSPALOG LIST(
         DESC('List of Transactions'),
         DDNAME(LIST0001),
         SECGROUP,
         STARTLVL(2),
         COMPLVL(2),
         PRECISION(6),
         TRANMIX(1),
         INCL(TRANCODE(*)),           (6)
         FIELDS(ORGLTERM,
                TRANCODE,
                USERID,
                STARTIMS(TIME),
                INPUTQ,
                STARTDEP(TIME),
                PROCESS,
                CPUTIME,
                DBCALLS,
                ESAFNAME,
                ESAFCALL,
                SYNCTIME(TIME)))
```

```
IMSPALOG SUMMARY(
         DESC('Transaction performance summary'),
         DDNAME(SUMM0001),
         SECGROUP,
         TOTALS(0),
         INTERVAL(00:01:00),
         STARTLVL(2),
         COMPLVL(3),
         PRECISION(6,2),
         TRANMIX(1),
         FIELDS(TRANCODE(ASCEND),
                REGTYPE(ASCEND),
                TRANCNT,
                INPUTQ(AVE),
                PROCESS(AVE),
                INPUTQ(RNGPERC(>0.5)),
                PROCESS(RNGPERC(>1.0)),
                CPUTIME(AVE),
                DBCALLS(AVE),
                ESAFCALL(AVE),
                RATEMIN))
```

```
IMSPALOG SUMMARY(
         DESC('Transaction processing rate'),
         DDNAME(SUMM0002),
         SECGROUP,
         TOTALS(0),
         INTERVAL(00:01:00),
         STARTLVL(2),
         COMPLVL(3),
         PRECISION(3,2),
         TRANMIX(1),
         FIELDS(STARTDEP(TIME,ASCEND),
         REGTYPE(ASCEND),
         TRANCNT))
```

```
IMSPALOG SUMMARY(
         DESC('Transaction processing summary'),
         DDNAME(SUMM0003),
         SECGROUP,
         TOTALS(0),
         INTERVAL(00:01:00),
         STARTLVL(2),
         COMPLVL(3),
         PRECISION(6,2),
         TRANMIX(1),
         FIELDS(STARTDEP(TIME,ASCEND),
                TRANCODE(ASCEND),
                TRANCNT,
                INPUTQ(AVE),
                PROCESS(AVE),
                INPUTQ(RNGPERC(>0.5)),
                PROCESS(RNGPERC(>1.0)),
                CPUTIME(AVE),
                DBCALLS(AVE),
                ESAFCALL(AVE)))
```

```
IMSPALOG IRUR(
         DDNAME(IRURDD),
         INTERVAL(0),
         INCL(POOLS( Pool Statistics:
         QP,         Message Queue
         FP,         Message Format Buffer
         DB,         OSAM Buffer
         VS,         VSAM Buffer
         SM,         Storage Management (PSB/DMB/CIOP)
         AS,         Application Scheduling
         PI,         Program Isolation
         LT,         Latch
         DLICALLS,   DL/I call
         MISC,       Miscellaneous
         CB,         Storage
         LL,         Logical Logger
         FI,         Fixed Pool Usage
         DS,         Dispatcher/Dynamic SAP
         RU,         User IRLM
         RS,         System IRLM
         RF,         RACF
         ST,         Virtual Storage usage
         IM,         IMODULE
         EW,         EWLM
         C6,         64-bit Storage
         FB,         64-bit FastPath Storage
         UX)))       User Exit
```

```
  IMSPALOG DBUPDATE(
           DDNAME(DBUADD),
           FORMAT2,
           PROGRAM)
  IMSPALOG EXECUTE
/*
```

JCL ends here.

Report output

Go to SDSF to view the job output.
User the “?” line action to view the job’s output data sets.

Each requested report has its own DD name:

DDname	Type	Description
SYSPRINT		Run-time messages
LOGINFO	SUMMARY	Log code information
LIST0001	LIST	List of all transactions, including "X"
SUMM0001	SUMMARY	Transaction performance summary
SUMM0002	SUMMARY	Transaction processing rate
SUMM0003	SUMMARY	Transaction processing summary
IRURDD	SUMMARY	IMS statistics reports, buffers etc.
DBUADD	SUMMARY	FF database update activity

LOGINFO

- 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

V4R4M0 IMS Performance Analyzer - Log Information

Log data From 2017-06-27 14:58:00.941667 To 2017-06-27 15:12:39.354269 Duration 14:38.412602

	In								
Code	Count	MCNT	Recs/Sec	Avg len	Max Len	Byte/Sec	MB	%	
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	Input msg (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 record
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	Abended transaction
08	41,040		46	148	148	6,917	6.0	1.0	Program schedule start
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

Form-based transaction analysis

We will use ***form-based transit reporting*** to analyze transaction behavior:

- Provides the most flexible way of analyzing transaction performance
- Use the default forms or the many samples provided, or design your own
- ***LIST*** forms provide detail about individual transactions
- Every piece of detail in the IMS log about a transaction can be selected
- ***SUMMARY*** forms provide a statistical analysis of transaction activity
- Breakdown transaction activity any way you want; for example by time, by transaction code, or any combination of transaction identification attributes
- Statistical functions can be applied to every performance and resource usage metric; **average**, **minimum**, **maximum**, **total**, plus the very useful **range** – to answer questions such as “what percentage of transactions had a processing time greater than one second?”

SUMM0001 – Transaction performance summary

1. Summarizes by transaction code and region type (MPP, IFP, BMP etc.)
2. Average input queue, dependent region processing, and CPU times
3. Percentage of transactions that exceeded site defined elapsed time thresholds

Transaction performance summary

SUMM0001 Printed at 11:09:59 25Jun2017 Data from 14.58.00 24Jun2017 to 15.12.39 24Jun2017

Trancode	Reg Typ	Tran Count	Avg InputQ Time	Avg Process Time	>0.5 InputQ Time	>1.0 Process Time	Avg CPU Time	Avg DB Call Count	Avg ESAFcall Count	Rate /Min
TRANA	MPP	40	0.093190	1.186986	2.50%	57.50%	0.078844	1286.82	43.45	3
TRANB	MPP	336	0.163652	0.438090	2.38%	4.17%	0.014672	177.73	14.99	23
TRANC	MPP	87	0.124831	1.568812	6.90%	44.83%	0.072242	304.40	839.76	6
TRAND	MPP	49	2.575589	0.239190	34.69%	4.08%	0.031598	807.22	70.14	3
TRANE	MPP	8	1.456959	5.935628	12.50%	50.00%	0.160491	38.63	730.63	1
TRANF	MPP	1120	0.341459	0.051020	22.95%	0.27%	0.002731	22.57	94.88	77
TRANX	MPP	123	0.312421	2.390041	11.11%	**94.44%**	0.038543	221.56	99.61	11

4. Average number of FF DLI calls (FP or any other metric can be reported)
5. Average number of ESAF (DB2) calls
6. Transaction rate per minute
7. TRAN**X** performed the worst – exceeding 1 second processing time more than 94% of the time

SUMM0002 – Transaction processing rate

1. Provides transaction processing rate for each minute of the day
2. Time Interval is one minute; but can be from one second to 24 hours
3. Broken down further by region type, although this is optional
4. Reporting option (TRANMIX) can be used to focus on MPP only

Transaction processing rate

SUMM0002 Printed at 11:09:59 25Jun2017 Data from 14.58.00 24Jun2017 to 15.12.39 24Jun2017

Process Start	Reg Typ	Tran Count
14.58.00	BMP	29
14.58.00	MPP	1,684
14.59.00	BMP	19
14.59.00	MPP	1,471
15.00.00	BMP	102
15.00.00	MPP	3,367
15.01.00	BMP	45
15.01.00	MPP	3,994
15.02.00	BMP	29
15.02.00	MPP	2,796
. . .		
Total		61,580

5. The report shows that processing peaked at 3pm and just after

SUMM0003 – Transaction processing summary

1. Provides a summary for one (or all) transaction codes, for each minute of the day
2. Transaction count shows when the transaction is most used

Transaction processing summary

SUMM0003 Printed at 11:09:59 25Jun2017 Data from 14.58.00 24Jun2017 to 15.12.39 24Jun2017

Process Start	Trancode	Tran Count	Avg InputQ Time	Avg Process Time	>0.5 InputQ Time	>1.0 Process Time	Avg CPU Time	Avg DB Call Count	Avg ESAFcall Count
14.59.00	TRANX	16	0.000106	0.141083	0.00%	0.00%	0.013241	168.83	141.33
15.00.00	TRANX	31	0.000759	0.091537	0.00%	3.23%	0.009558	165.42	68.87
15.01.00	TRANX	27	0.000124	0.099970	0.00%	0.00%	0.014055	149.33	92.33
15.02.00	TRANX	12	0.000103	0.059830	0.00%	0.00%	0.012627	102.00	90.00
15.03.00	TRANX	18	0.000152	0.082335	0.00%	0.00%	0.015967	183.75	92.88
15.05.00	TRANX	13	0.000125	0.086281	0.00%	0.00%	0.016212	151.67	133.33
15.06.00	TRANX	11	0.000099	0.076710	0.00%	0.00%	0.003964	16.00	0.00
15.07.00	TRANX	16	0.000101	0.157936	0.00%	0.00%	0.022879	196.00	167.17
15.08.00	TRANX	11	0.000173	0.074205	0.00%	0.00%	0.016522	149.00	136.00

3. Statistical analysis can point to performance degradation as throughput increases

LIST0001 – List of all processed transactions

1. Lists all the transactions that were processed
2. Identified by Lterm, Transaction Code and User id
3. When the transaction arrived and how long it stayed on the input queue
4. When the transaction started processing in the dependent region, how long it took to process, and its CPU time

List of Transactions

LIST0001 Printed at 09:55:38 25Jun2017 Data from 14.58.00 24Jun2017 Page 1

Org			IMS Tran	InputQ	Process	Process	CPU	DB	ESAF	ESAF	Syncpoint
LTERM	Trancode	Userid	Start	Time	Start	Time	Time	Calls	Name	Calls	Time
DENMARK1	ORDER	THOMAS	14.58.00.978186	0.000065	14.58.00.978251	0.008691	0.001764	12	DB2A	5	14.58.00.986942
NEWYORK	WEBQUERY	JIM	14.58.01.013102	0.000100	14.58.01.013202	0.004708	0.001399	4	DB2A	1	14.58.01.017910
DENMARK2	QUERY	FRED	14.58.01.042490	0.000081	14.58.01.042571	0.033228	0.006507	79	DB2A	45	14.58.01.075799
DENMARK1	MAILOUT	NARY	14.58.01.217365	0.000033	14.58.01.217398	0.040633	0.014193	27	DB2A	37	14.58.01.251515
PARIS	WEBORDER	ISABEL	14.58.01.248874	0.000048	14.58.01.248922	0.030394	0.004673	91	DB2A	62	14.58.01.279316
PERTH	ORDER	JOHN	14.58.01.127841	0.000518	14.58.01.128359	0.273461	0.034143	612	DB2A	1	14.58.01.401820

5. Full Function DLI data base calls (FP also available)
6. Did the transaction use an external subsystem (ESAF) such as DB2, and if so how many calls did it make?
7. When the transaction processing ended

DBUA – FF database update activity

1. For each full function 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
ORDERDB	ORDERP1	APPL	2,135	DLI	2,135	2,135	0	0	0			0	0	0
				I/O	1,582	540	0	1,042		13	540			0
	ORDERP2	APPL	720	DLI	720	720	0	0	0			0	0	0
				I/O	537	179	0	358		4	179			0
	Total	APPL	3,609	DLI	3,609	3,593	16	0	0			0	0	0
				I/O	2,677	901	0	1,776		27	905			0

3. Refer to the speaker notes for an explanation of the report fields

IRUR – Internal Resource Usage

1. Comprehensive reporting of every IMS statistics (45) record type
2. Needs at least two checkpoint (or statistics) intervals so that deltas can be calculated from the raw and continuously accumulating statistics records
3. Message queues, DB buffers, PSB and DMB pools, Control Blocks etc.

Enhanced VSAM Buffer Pool Statistics — Interval : 1.08.59 (HHHH.MM.SS)

		Count	/Transact	/Second	
Shared resource pool ID/type		VS8K/D			
Fix option: index/block/data		N/Y/Y			
Buffer size		8,192			
Buffers in subpool		15			
HS buffers in subpool		75			
Write errors		0			
Largest number of write errors		0	.00	.00	
Retrieve by RBA calls		43,821	4.92	10.59	63.08% of retrieve calls
Retrieve by Key calls		25,653	2.88	6.20	36.92% of retrieve calls
Total retrieve calls		69,474	7.81	16.78	
Logical records inserted into ESDS		1	.00	.00	.07% of update requests
Logical records inserted into KSDS		7	.00	.00	.46% of update requests
Logical records altered in this subpool		1,524	.17	.37	99.48% of update requests
Total number of updates		1,532	.17	.37	
Nbr of background write requests		9	.00	.00	.01% of calls to VSAM
Nbr of Synch calls		624	.07	.15	.94% of calls to VSAM
Nbr of VSAM get calls		65,581	7.37	15.84	99.03% of calls to VSAM
Nbr of VSAM search buffer calls		7	.00	.00	.01% of calls to VSAM
Total Nbr of VSAM calls		66,221	7.44	16.00	
Nbr of times VSAM found CI in pool		54,853	6.16	13.25	83.63% of VSAM buffer requests added
Nbr of times VSAM read CI from DASD		10,738	1.21	2.59	94.19% of VSAM I/O operation
Nbr of writes initiated by IMS		606	.07	.15	5.32% of VSAM I/O operation
Nbr of writes initiated by VSAM		56	.01	.01	.49% of VSAM I/O operation
Total VSAM I/O operations		11,400	1.28	2.75	
Nbr of successful VSAM reads frm HS		4,218	.47	1.02	
Nbr of successful VSAM writes to HS		14,957	1.68	3.61	
Nbr of failed VSAM reads from HS		0	.00	.00	
Nbr of failed VSAM writes to HS		0	.00	.00	
Nbr of PLH waits		0	.00	.00	

Lets take a pause

- At this point we have run a small subset of IMS PA reports to answer some of the questions posed
- Later in this presentation, we will see how the IMS PA ISPF dialog was used to generate these report requests
- But before we do, lets first take a very quick peek at IMS Problem Investigator (IMS PI)
- IMS PI is a most comprehensive log analysis tool – and it is all done interactively

IMSPI: Interactive Log analysis and more

- Allows you to view transaction events across all the subsystems
- ***Merges*** data sources from IMS, DB2, and MQ
- Displays records with ***friendly*** descriptions and ***useful*** information
- Analyze transaction event latencies with ***relative*** and ***elapsed*** times
- Use the ***transaction index*** to identify problem transactions
- Use a ***filter*** to show required records only
- Use ***tracking*** to isolate all the records associated with an individual transaction
- Select a record to see more detail (full mapping)
- No better way to ***learn*** about the IMS log and how transactions are processed by IMS
- It is simple to ***get started*** – select option 1, specify a log file, and select it!

IMSPI: IMS transaction with DB2 log updates

IMS

DB2

SYNC POINT

```
BROWSE    IMSA.LOG1                                    Record 00000426 More: < >
Command ===>                                                  Scroll ===> CSR
        Navigate < 00.00.01.000000 >      Date/Time 2017-07-05 16.39.36.351066
/  ---- Tracking ------------------------ Wednesday 2017-07-05 Time (Elapsed)
__ CA01 IMS Transaction TranCode=FBOICT42 Region=0001          16.39.36.351066
__ 01   Input Message TranCode=FBOICT42                                0.000000
__ 35   Input Message Enqueue TranCode=FBOICT42                        0.000016
__ 08   Application Start TranCode=FBOICT42 Region=0001                0.066014
__ 5607 Start of UOR Program=FBOIAP42 Region=0001                      0.000000
__ 31   DLI GU TranCode=FBOICT42 Region=0001                           0.000018
__ 5616 Start of protected UOW Region=0001                             0.000256
__ 5600 Sign-on to ESAF Region=0001 SSID=DBA6                          0.039950
__ 5600 Thread created for ESAF SSID=DBA6                              0.000015
__ 0020 Begin UR                                                       0.022356
__ 0600 Savepoint                                                      0.000000
__ 0600 Savepoint                                                      0.000016
__ 0600 Delete from a data page                                        0.000000
__ 0600 Update to area map or space map                                0.000016
__ 0600 Insert into a data page                                        0.003264
__ 0600 Savepoint                                                      0.000176
__ 0600 Delete from a data page                                        0.003360
__ 0600 Update to area map or space map                                0.000016
__ 0600 Delete from a data page                                        0.000064
__ 0600 Update to area map or space map                                0.000016
__ 5600 Commit Prepare starting Region=0001 SSID=DBA6                  0.020025
__ 0020 End commit phase 1                                             0.000630
__ 03   Output Message Response LTerm=FUNTRM07                         0.000624
__ 35   Output Message Enqueue LTerm=FUNTRM07 Region=0001              0.000008
__ 3730 Syncpoint End of Phase 1 Region=0001                           0.000012
__ 0020 Begin commit phase 2                                           0.000426
__ 0020 End commit phase 2                                             0.000704
__ 5600 Commit Continue completed Region=0001 SSID=DBA6                0.000914
__ 37   Syncpoint Message Transfer Region=0001                         0.000016
__ 33   Free Message                                                   0.000012
__ 5612 Syncpoint End of Phase 2 Program=FBOIAP42 Region=0001          0.000011
__ 31   Communications GU LTerm=FUNTRM07                               0.000643
__ 07   Application Terminate TranCode=FBOICT42 Region=0001            0.001569
__ 36   Output Message Dequeue LTerm=FUNTRM07                          0.002247
__ 33   Free Message                                                   0.000004
****************************** Bottom of Data ******************************
```

Event elapsed times

IMSPI: IMS transaction with FF and FP DB updates

```
BROWSE    IMSA.LOG1                                        Record 00166977 More: < >
Command ===> ____________________________________________ Scroll ===> CSR
         Navigate < 00.00.01.000000 >      Date/Time 2017-07-26 00.30.11.995877
/  ____ Tracking ____________________________    Monday 2017-07-26 Time (Relative)
__ 01   Input Message TranCode=ORDER Source=MQ                      00.30.56.562714
__ 35   Input Message Enqueue TranCode=ORDER                              +0.000106
__ 08   Application Start TranCode=ORDER Region=00A6                      +0.000205
__ 5607 Start of UOR Program=ORDERP1 Region=00A6                          +0.000205
__ 31   DLI GU TranCode=ORDER Region=00A6                                 +0.000260
__ 5050 Database ISRT Database=ORDERDB1 Region=00A6                       +0.006692
__ 5050 Database ISRT Database=ORDERDB1 Region=00A6                       +0.006693
__ 5052 Database insert into KSDS Database=ORDERDB2                       +1.084733
__ 5050 Database ISRT Database=ORDERDB2 Region=00A6                       +1.086757
__ 5050 Database ISRT Database=ORDERDB1 Region=00A6                       +1.087384
__ 5610 Syncpoint Start of Phase 1 Region=00A6                            +1.087805
__ 03   Output Message Response LTerm=DENMARK Source=MQ                   +2.310087
__ 35   Output Message Enqueue LTerm=DENMARK Region=00A6                  +2.310090
__ 5950 FP Database Update Database=ORDERF1 Region=00A6                   +2.310114
__ 5950 FP Database Update Database=ORDERF2 Region=00A6                   +2.310116
__ 3730 Syncpoint End of Phase 1 Region=00A6                              +2.310141
__ 5937 FP Syncpoint Program=ORDERP1 Region=00A6                          +2.310141
__ 5600 Commit found no work to do Region=00A6 SSID=MQP1                  +2.310830
__ 37   Syncpoint Message Transfer Region=00A6                            +2.310835
__ 5612 Syncpoint End of Phase 2 Program=ORDERP1 Region=00A6              +2.311716
__ 03   Output Message Response LTerm=DENMARK Source=MQ                   +2.325730
__ 35   Output Message Enqueue LTerm=DENMARK                              +2.325733
__ 31   Communications GU LTerm=DENMARK                                   +2.325739
__ 36   Output Message Dequeue LTerm=DENMARK                              +2.325902
__ 07   Application Terminate TranCode=ORDER Region=00A6                  +2.328605
```

FF

FP

Time relative to start of transaction

IMSPI: formatted database update record

A ***Form*** has been use to “reduce” the display to required information only

```
BROWSE     FUW000.QADATA.DBCTLDLK.IMS.D131101.SL Record 00000104 Line 00000000
Command ===> ____________________________________________________ Scroll ===> CSR
Form    ===> DB50     +    Use Form in Filter                     Format ===> FORM
******************************** Top of data ********************************
+0004  Code... 5050  Database ISRT
+00B1  STCK... CD32A718F96368E0      LSN.... 0000000000000068
       Date... 2017-10-27 Friday     Time... 17.26.21.806134.554

+0004  DLOGCODE... 50          DLOGSCDE... 50          DLOGPSTN... 0001
+0008  DLOGRTKN... Recovery Token
+0008  DLOIMSID... 'FUWTCIC '  DLOOASN.... CC32A718    DLOCOMN.... F7B44686
+002C  DPGMNAME... 'FBOSCHED'  DDBDNAME... 'FBOIAD01'  DLOGRBA.... 00004000
+0044  DLOGBLKO... 0000

+007A  DLOGREDO... REDO Data Section
+007A  DLOGDFLG... C0          DLOGDFUN... 80          DLOGDOFF... 00A4
+007E  DLOGDLEN... 002B        DLOGXPNL... 0056

+0082  DLOGCDAT... Expanded REDO Data (Compressed if Expand fails)
       DLOGCDAT... Variable length REDO Data.
       +0000  01000000 0000E681 A8958540 40404040   *......Wayne     *
       +0010  D1968895 40404040 4040F860 F1F1F160   *John      8-111-*
       +0020  F9F9F9F9 C4F0F461 D9F0F900 00000000   *9999D04/R09.....*
       +0030  00000000 00000000 00000000 00000000   *................*
       +0040  00000000 00000000 00000000 00000000   *................*
       +0050  00000040 4040                         *...             *
****************************** End of data ********************************
```

ISRT data

IMSPA: ISPF dialog

To start quickly from ISPF option 6, use command:

EXEC ‘IMSPA.V4R4M0.SIPIEXEC(IPIOREXX)’ ‘IMSPA.V4R4M0’

```
  File  Options  Help
 ------------------------------------------------------------------------------
                IMS Performance Analyzer 4.4 - Primary Option Menu
 Option ===> __________________________________________________________________

 0  IMS PA Profile      Customize your IMS PA dialog profile
 1  System Definitions  Specify IMS and Connect systems and OMEGAMON files
 2  Groups              Specify Groups of IMS and Connect systems (Sysplexes)
 3  Report Sets         Request and submit reports and extracts
 4  Expectation Sets    Define Expectation Sets (Log exception reporting)
 5  Averages            Edit Averages data sets (Log exception reporting)
 6  Object Lists        Define Object Lists
 7  Distributions       Define Distributions
 8  Graphing & Export   Graph or export Log Extract by Interval data
 9  IMS Connect         Submit IMS Connect report requests
 10 Report Forms        Define Report Forms
 X  Exit                Terminate IMS PA
```

For this exercise we will use, in order:

10. Report Forms to design our (form-based transit) reports
1. System definitions to identify our IMS subsystems and their logs
3. Report Sets to request our reports

ISPF dialog option 10: Forms

- Here is the list of ***Forms*** we created for this exercise
- They are ***designs*** for the form-based transit reports we want to run
- These forms are referenced later in the Report Set

```
  File  View  Samples  Options  Help
──────────────────────────────────────────────────────────────────────────────
                              Report Forms                    Row 1 to 4 of 4
Command ===> ____________________________________________ Scroll ===> PAGE

Report Forms Data Set  . . : JCH.IMSPA.FORM9

/   Name    Type              Description              Changed        ID
_  TALIST1  LIST    List of Transactions            2017/05/15 21:19 JCH
_  TASUMM1  SUMMARY Transaction performance summary 2017/05/15 21:26 JCH
_  TASUMM2  SUMMARY Transaction processing rate     2017/05/15 21:24 JCH
_  TASUMM3  SUMMARY Transaction processing summary  2017/05/15 21:14 JCH
****************************** Bottom of data ********************************
```

Form TALIST1: List of Transactions

- ***LIST*** report forms are used to provide individual transaction detail
- The fields listed here will form the columns in the report

```
  File  Edit  Options  Help
--------------------------------------------------------------------------------
EDIT                    List Report Form - TALIST1            Row 1 to 13 of 13
Command ===> ____________________________________________________ Scroll ===> PAGE

Description . . . List of Transactions              Page Width . . . 256
                                                    Precision  . . . 6
                                                    Digit Grouping   YES

   Field
/  Name +    Func  Len  Description
__ ORGLTERM  _____   8  Originating LTERM
__ TRANCODE  _____   8  Transaction Code
__ USERID    _____   8  User ID
__ STARTIMS  TIME   15  IMS transaction arrival time
__ INPUTQ    _____  10  Input queue time
__ STARTDEP  TIME   15  IMS transaction processing start
__ PROCESS   _____  10  Processing time
__ CPUTIME   _____  10  CPU time
__ DBCALLS   _____  10  DB call count
__ ESAFNAME  _____   8  ESAF (external subsystem) name
__ ESAFCALL  _____  10  Total ESAF call count
__ SYNCTIME  TIME   15  IMS transaction syncpoint time
__ EOR       _____      ----------------- End of Report -----------------
****************************** Bottom of data ********************************
```

Form TASUMM1: Transaction summary

- ***SUMMARY*** report forms are used to provide a statistical analysis of transaction processing
- The fields listed here will form the columns in the report; summarized by key fields TRANCODE and REGTYPE
- Statistical functions have been requested; average and range

```
EDIT                    Summary Report Form - TASUMM1     Row 1 of 13 More: < >
Command ===> _____________________________________________ Scroll ===> PAGE

Description . . . Transaction performance summary   Page Width . . . 132
                                                    Precision  . . . 6
                                                    Digit Grouping   SEC

   Field     Sort
/  Name +    K  O Func  Len Description
__ TRANCODE  K  A _____   8 Transaction Code
__ REGTYPE   K  A _____   3 Region type
__ TRANCNT      _ _____  10 Transaction count
__ INPUTQ       _ AVE     8 Input queue time
__ PROCESS      _ AVE     8 Processing time
__ INPUTQ       _ RANGE   8 Input queue time
__ PROCESS      _ RANGE   8 Processing time
__ CPUTIME      _ AVE     8 CPU time
__ DBCALLS      _ AVE    10 DB call count
__ ESAFCALL     _ AVE    10 Total ESAF call count
__ RATESEC      _ _____  10 Transaction rate / Second
__ EOR          _ _____     ----------------- End of Report -----------------
******************************* Bottom of data ********************************
```

Form TASUMM2: Transaction processing rate

- ***SUMMARY*** report forms are used to provide a statistical analysis of transaction processing
- The STARTDEP key field is a time field – when the transaction started processing
- When a time field is a key field, time interval reporting occurs
- The time interval is specified later in the Report Set (report request)

```
  File  Edit  Options  Help
--------------------------------------------------------------------------------
EDIT                    Summary Report Form - TASUMM2       Row 1 of 4 More: < >
Command ===> ____________________________________________________ Scroll ===> PAGE

Description . . . Transaction processing rate      Page Width . . . 132
                                                   Precision  . . . 6
                                                   Digit Grouping   SEC
   Field     Sort
/  Name +    K  O Func  Len Description
__ STARTDEP  K  A TIME    8 IMS transaction processing start
__ REGTYPE   K  A _____   3 Region type
__ TRANCNT      _ _____  10 Transaction count
__ EOR          _ _____     ---------------- End of Report -----------------
****************************** Bottom of data ********************************
```

Form TASUMM3: Transaction processing summary

- ***SUMMARY*** report forms are used to provide a statistical analysis of transaction processing
- This form is a “hybrid” of TASUMM1 and TASUMM2 by breaking down transaction performance by time interval

```
EDIT                      Summary Report Form - TASUMM3      Row 1 of 12 More: < >
Command ===> ____________________________________________________ Scroll ===> PAGE

Description . . . Transaction processing summary   Page Width . . . 132
                                                   Precision  . . . 6
                                                   Digit Grouping   SEC
   Field     Sort
/  Name +    K  O Func   Len Description
__ STARTDEP  K  A TIME     8 IMS transaction processing start
__ TRANCODE  K  A _____    8 Transaction Code
__ TRANCNT      _ _____   10 Transaction count
__ INPUTQ       _ AVE      8 Input queue time
__ PROCESS      _ AVE      8 Processing time
__ INPUTQ       _ RANGE    8 Input queue time
__ PROCESS      _ RANGE    8 Processing time
__ CPUTIME      _ AVE      8 CPU time
__ DBCALLS      _ AVE     10 DB call count
__ ESAFCALL     _ AVE     10 Total ESAF call count
__ EOR          _ _____      ----------------- End of Report ------------------
******************************* Bottom of data ********************************
```

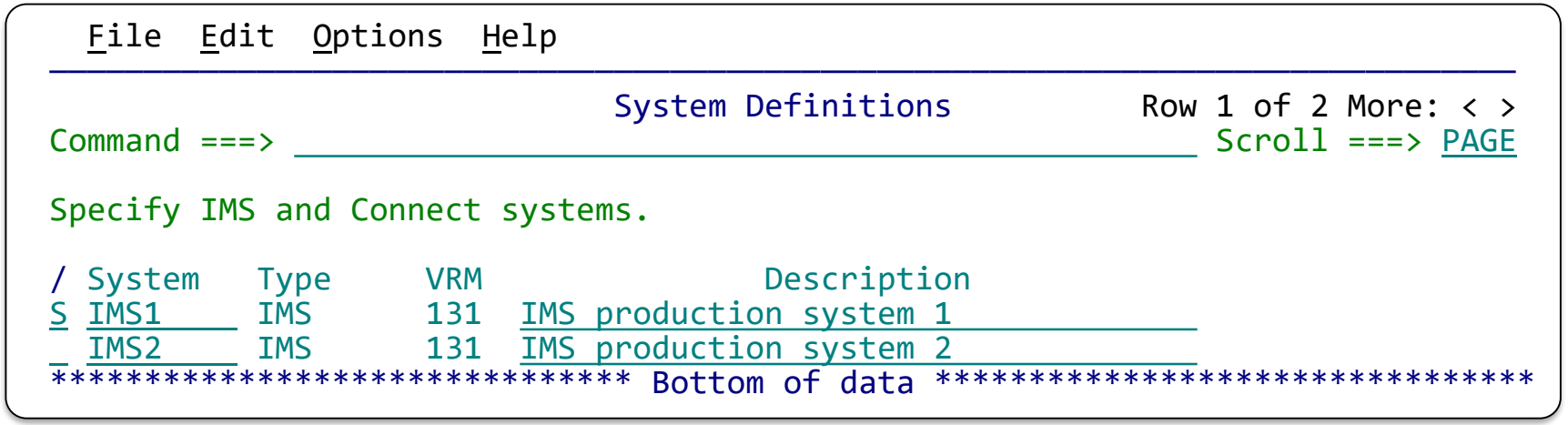
- There is no end to the flexibility that Report Forms provides

ISPF dialog option 1: System definitions

You need to register the IMS subsystems that you want to report against
– IMS PA needs to know where to get the log files for reporting

You can:

1. Explicitly specify the IMS log data sets
2. Specify the RECON data sets so that IMS PA can use automated file selection to locate the log files for you



Explicitly specify the IMS log data sets

- Specify the IMS log files to be used for subsystem IMS1

```
  File  Edit  Options  Help
--------------------------------------------------------------------------------
                                IMS Subsystem                 Row 1 of 1 More: < >
Command ===> ____________________________________________________ Scroll ===> PAGE

IMS Subsystem definition:
 IMS Subsystem ID  . . . . IMS1  IMS Version (VRM) . . . 131  +
 Description . . . . . . . IMS production system 1
 RESLIB Data Set . . . . . ____________________________________________
--------------------------------------------------------------------------------
Specify required view . . 2  1. DBRC Settings    4. Groups
                             2. Log Files        5. OMEGAMON TRF Files
                             3. Monitor Files    6. OMEGAMON ATF Journals
--------------------------------------------------------------------------------
Specify the Log Files (in time sequence) for this subsystem:

/  Exc              Data Set Name (DSN)                UNIT +  SEQ VOLSER +
_      'IMS1.LOG'
****************************** Bottom of data ********************************
```

Automated file selection using the RECONs

- Specify the IMS RECON data sets that contain SLDS and OLDS

```
  File  Options  Help
--------------------------------------------------------------------------------
                                IMS Subsystem                          More: < >
Command ===> ____________________________________________________________________

IMS Subsystem definition:
 IMS Subsystem ID  . . . . IMS7  IMS Version (VRM) . . . 131  +
 Description . . . . . . . IMS production system 1
 RESLIB Data Set . . . . . ____________________________________________________
--------------------------------------------------------------------------------
Specify required view . . 1  1. DBRC Settings    4. Groups
                             2. Log Files        5. OMEGAMON TRF Files
                             3. Monitor Files    6. OMEGAMON ATF Journals
--------------------------------------------------------------------------------
Specify DBRC Settings for automated log file selection:

DBRC Subsystem ID . . . ________  (Specify RSENAME for XRF)
DBRC IMSplex name . . . _____     (RECON Loss Notification)
DBRC Sharing Group ID . ___       (Parallel RECON Access)
RECON Data Set 1  . . . 'IMS1.RECON1'_____________________________________
               2  . . . 'IMS1.RECON2'_____________________________________
               3  . . . 'IMS1.RECON3'_____________________________________
MDA Data Set  . . . . . ____________________________________________________

Enter "/" to select option          JES2 options:
/  Log Data Sets are Cataloged       (DBRC) Node . . ________  SYSAFF . . ____
/  Use OLDS that are not Archived    (SLDS) Node . . ________  SYSAFF . . ____
_  Use Secondary Log Data Sets
```

ISPF dialog option 3: Report Set request

- We are now prepared to start requesting reports
- Go to ISPF dialog option 3 and create a **NEW COMMON LOG** Report Set

```
EDIT                          Report Set - COMMON                    Line 1 of 28
Command ===> SUB (later when the report requests are complete) Scroll ===> CSR

Description . . . My common reports

___              ** Reports **                                  Active
     +   ___     Options                                          Yes
     +   ___     Transaction Transit Reports                      No
     -   ___     Transaction Transit Reports (Form-based)         Yes
               ___   Transit Options                              Yes
               S__   List                                         Yes
               S__   Summary                                      Yes
               ___   Transaction Index                           No
     -   ___     Resource Usage & Availability Reports            Yes
                     . . .
               ___   CPU Usage                                    No
               ___   Internal Resource Usage                     Yes
               ___   MSC Link Statistics                         No
               ___   Message Queue Utilization                   No
               S__   Database Update Activity                    Yes
                     . . .
     +   ___     Fast Path Transit Reports                        No
     +   ___     Fast Path Resource Usage Reports                 No
     +   ___     Trace Reports                                    No
         ___     User-Written Reports                             No
                 ** End of Reports **
```

Request form-based list report

- There is a single report request that uses our prepared list report form TALIST1
- Use Prompt (F4) to select from the list of defined forms

```
                         COMMON - Transit List                             More: < >
Command ===> ________________________________________________________________

Specify required view:                          ----- Report Interval -----
1   1. Report                                        YYYY/MM/DD  HH:MM:SS:TH
    2. Extract                                  From __________  ___________
    3. Transit options                          To   __________  ___________

Reports Required:
                               Output                  Digit     Tran Report
    Type      Form +           Messages Precision      Grouping  Mix  Width
 1. REPORT    TALIST1          NO               6      SEC <     1     143 <
 2. _______   ________         NO               3      NO        1
 3. _______   ________         NO               3      NO        1
 4. _______   ________         NO               3      NO        1
 5. _______   ________         NO               3      NO        1

Selection Criteria:
    Object Type               Inc/Exc  Object +   List     Validation Warning
 Transaction Code              INC     *________  _
 Program                       ___     _________  _
 LTERM                         ___     _________  _
 VTAM Node                     ___     _________  _
 Class                         ___     _________  _
 User ID                       ___     _________  _
```

Request form-based summary reports

- There are three report requests that use our prepared summary report forms
- Be sure to specify the required time interval – we have specified 1 minute
- Use field-sensitive Help (F1) to find out about the many other options available
- Scroll right to see more options
- By the way – instead of a ***REPORT***, you can request an ***EXTRACT*** to write results to a CSV for importing into a spreadsheet

```
                          COMMON - Transit Summary                More: < >
Command ===> ____________________________________________________________________

Specify required view:                          ------ Report Interval ------
1  1. Report                                         YYYY/MM/DD  HH:MM:SS:TH
   2. Extract                                 From ____________  ____________
   3. Transit options                         To   ____________  ____________

Reports Required:
                        Time      Totals Precision    Digit     Tran Report
    Type      Form +    Interval  Level  Time Count   Grouping  Mix  Width
 1. REPORT    TASUMM1   00:01:00    0     6     0     SEC        1    101 <
 2. REPORT    TASUMM2   00:01:00    0     3 <   0     SEC        1     23 <
 3. REPORT    TASUMM3   00:01:00    0     6     0     SEC        1     95 <

Selection Criteria:
    Object Type       Inc/Exc  Object +  List    Validation Warning
 Transaction Code       ___    ________   _
```

Request the database update activity report

- Ensure that you request **Format 2** – it is much improved over format 1
- Note that we have selected a breakdown of database usage by program
- The report request is automatically enabled when you exit, or set the "***Active***" indicator to "Yes" in the Report Set "tree"

```
   File  Options  Help
 ------------------------------------------------------------------------------
                      COMMON- Database Update Activity
 Command ===> _________________________________________________________________

 Specify report options.

 Report Options:                                ----- Report Interval -----
  Format . . . 2  (1 or 2)                           YYYY/MM/DD  HH:MM:SS:TH
  Uncommitted Block Updates Limit 10000         From __________  ___________
                                                To   __________  ___________
  /  Order by Database and Program Name
                                                Report Output DDname  DBUADD__
 Extract Data Set:
  Data Set Name . . . ______________________________________________

 Selection Criteria:
    Object Type           Inc/Exc  Object +  List    Validation Warning
  Database                  ___    ________   _
  IMS Subsystem ID          ___    ________   _
```

Submitting the report request

- We are now ready to submit the report request
- Select the options shown below to generate your JCL with the command input we used way back in the beginning – we're done!