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Problem Analysis with IMS Tools

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Fundi Software

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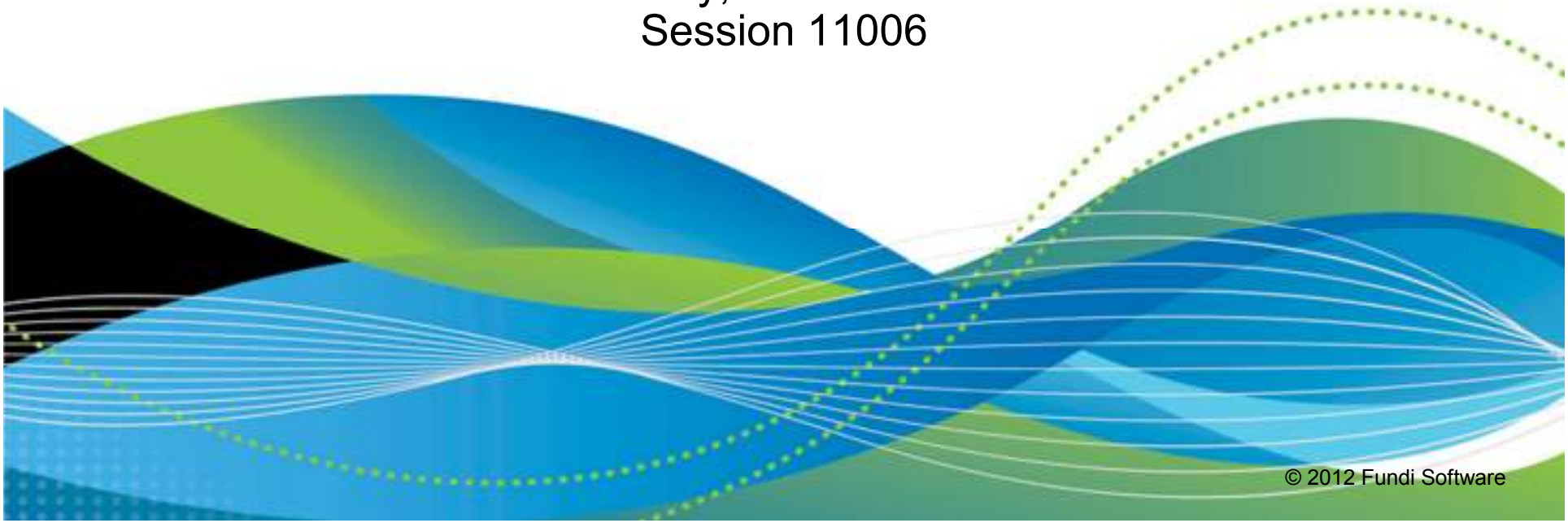
Session 11006



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Agenda

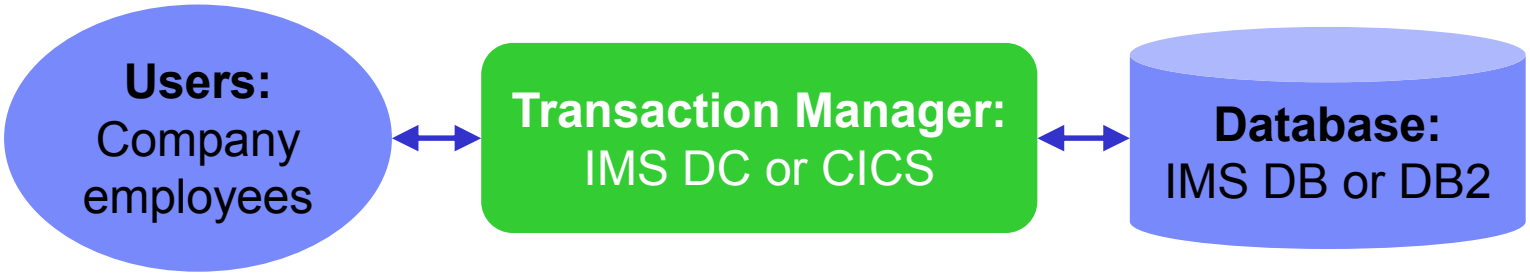
Introducing
Transaction Analysis Workbench

Scenario: IMS DB2 problem

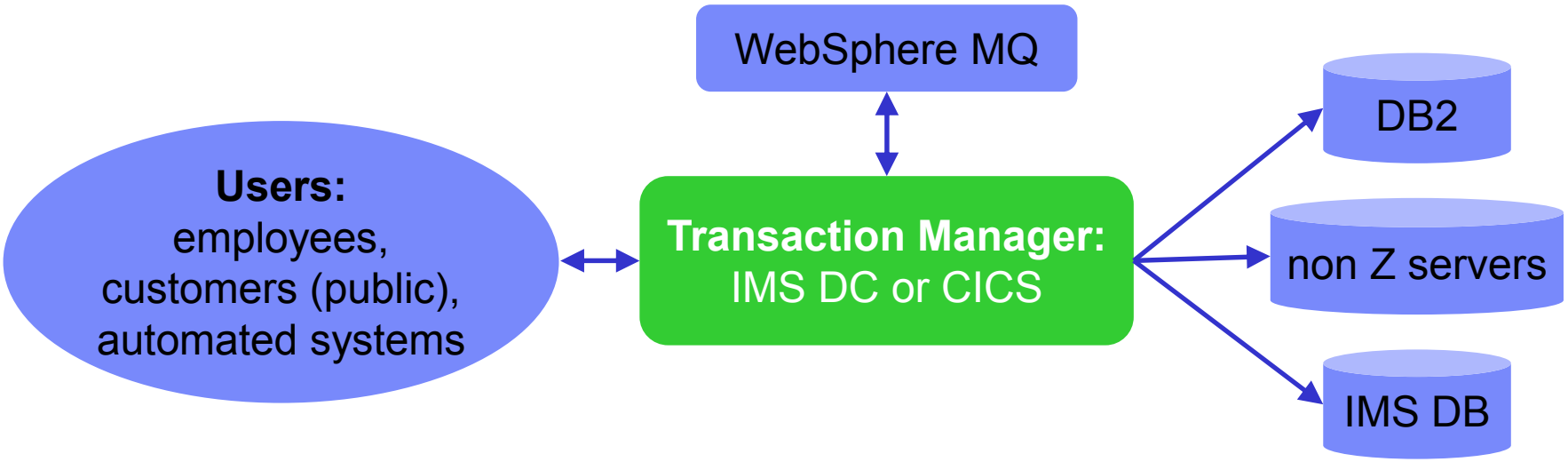
Batch SMF and OPERLOG reports

It's all about evolution

1980: in-house users only; simple data, single data store



2012: users are customers; data is complex, often distributed



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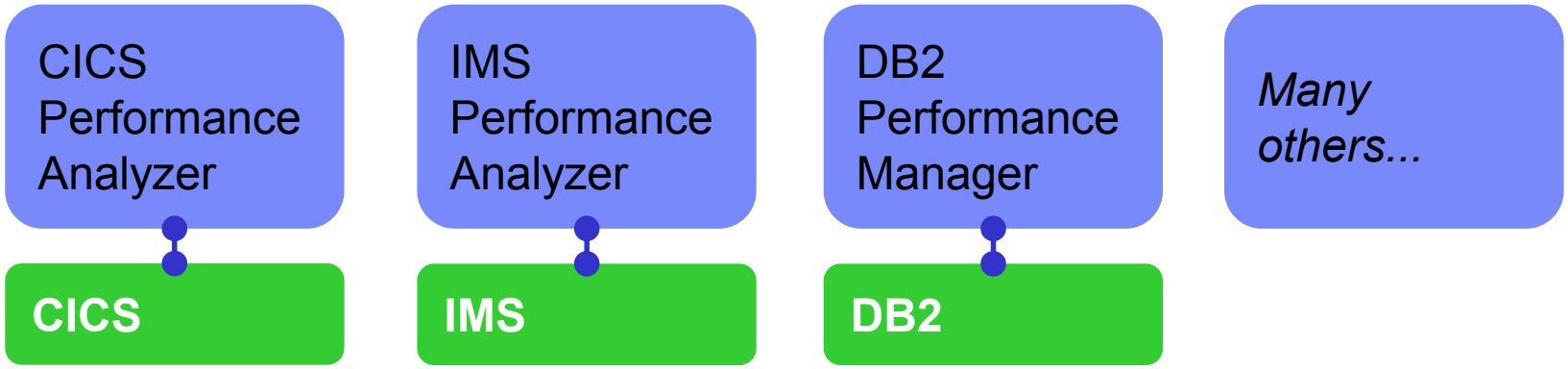
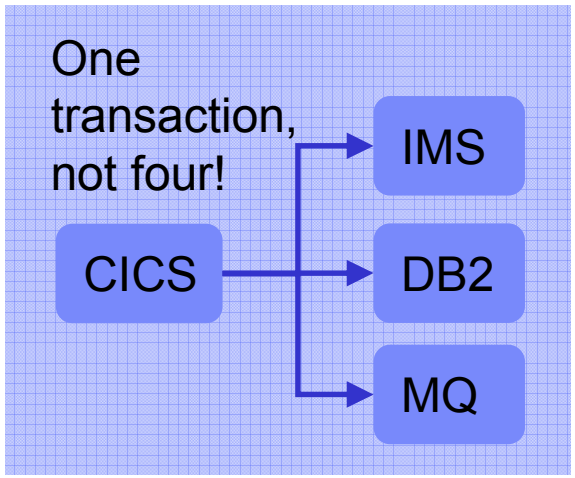
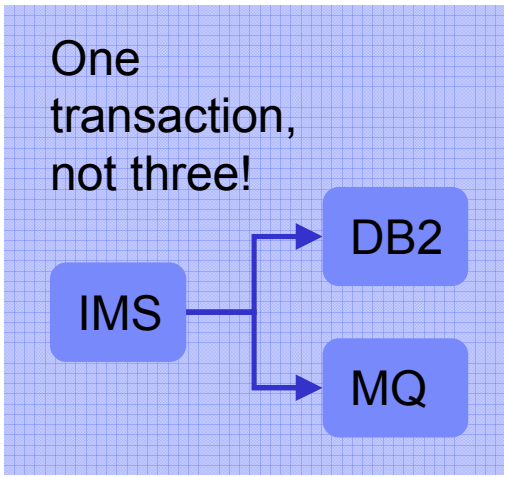
Analysis tools have not kept pace

There are many tools to help analyze *individual* transaction environments on System z:







Each tool is well-suited to its environment, but you often need a subject matter expert to use each tool

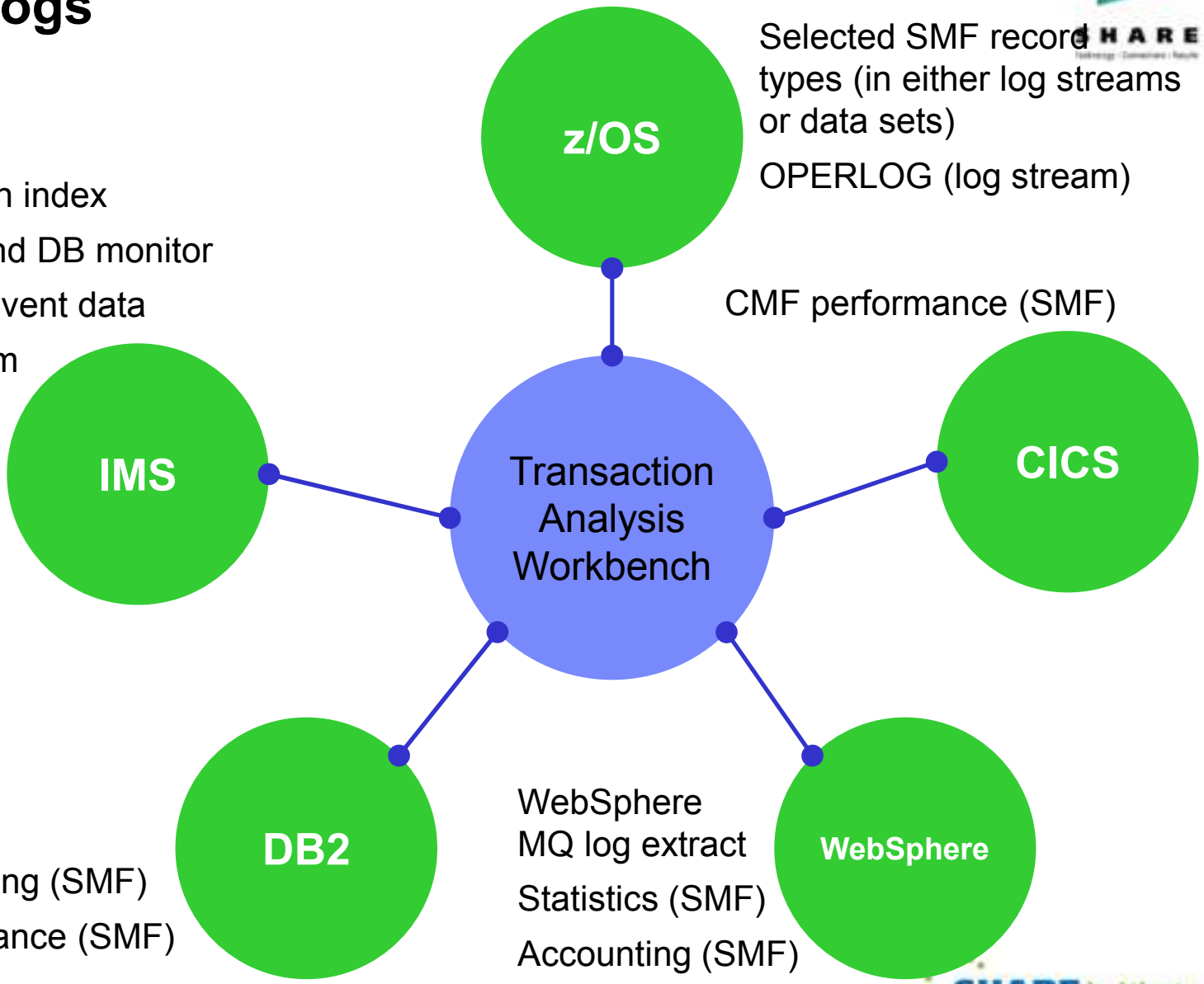
Product overview

- A transaction analysis framework for System z
  - Not transaction manager specific
  - Leverages current IBM tools for transaction analysis
- Not IMS or CICS specific, but first release provides more synergy with the existing tools for those transaction managers
- Automates collection of data needed for problem analysis
- Provides a session manager to manage problem analysis through its lifecycle
- In this presentation, it might look like the Workbench is IMS or CICS centric but that is not the case
  - The tools for IMS and CICS are the first to be engaged

Product goals

- Enable higher productivity by lower skilled staff.
- Automate trivial tasks commonly needed for problem determination.
  - Data acquisition – get the data needed for problem analysis
  - Reporting – basic reporting without tool specific knowledge
  - Autonomics - automated transaction analysis
- Allow the “first responder” to determine the most likely source of the problem.
  - Give the receiving expert confidence in the assignment
- Allow for “deep dive” problem determination via synergy with other IBM tools
  - Create a “common” approach to transaction problem resolution
  - Increase the degree and ease of collaboration in problem resolution

Supported logs



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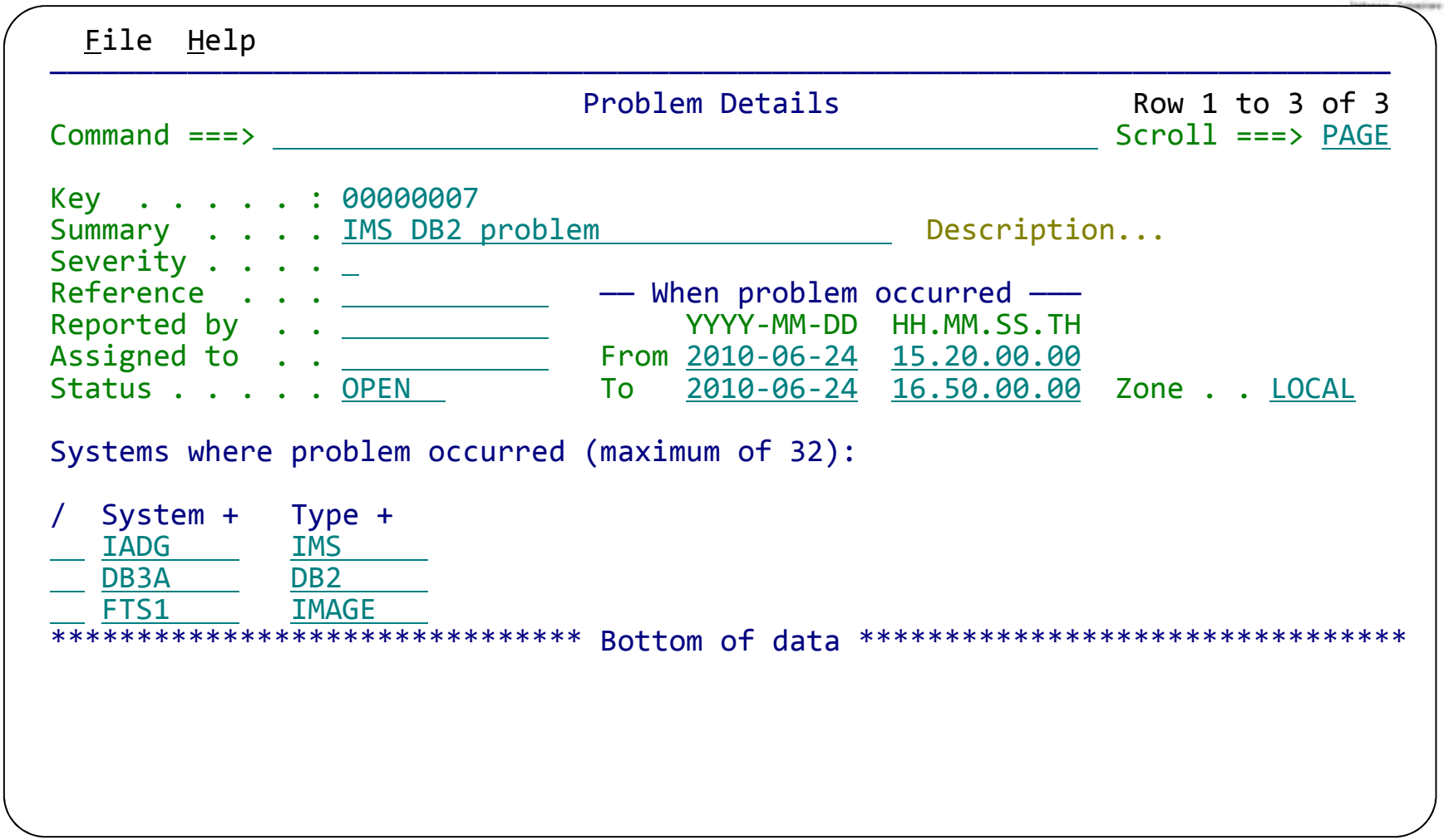
Session manager (ISPF dialog)

- Session manager approach to problem management:
  - Register the problem
  - Locate the files required to diagnose the problem: IMS, DB2, CICS, SMF, OPERLOG etc.
  - Resume from where you left off, or from a previous save-point
  - Write reminder notes and information as you go
  - Re-assign the problem to the appropriate subject-matter expert
  - Use PI-style interactive analysis to look at related logs and other subsystem events via SMF, OPERLOG etc.
  - Run reports that are specific to the problem

Scenario: IMS DB2 problem

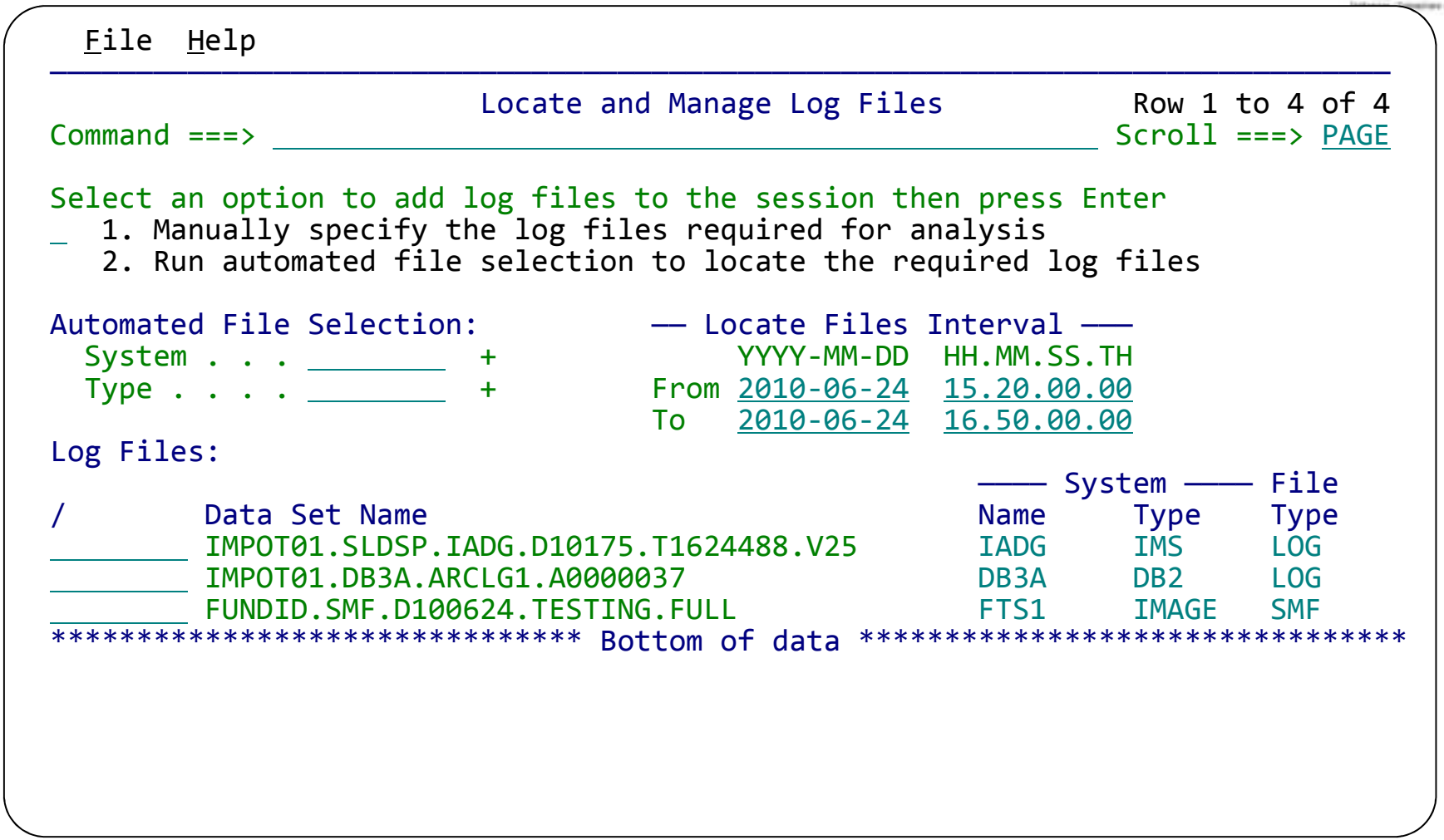
- On the following slides, we present an example scenario: a user has reported a long transaction response time for an IMS transaction performing DB2 updates
- The analysis is divided into two parts:
  1. The **first responder** registers the problem in the Workbench session manager, collects the log files, and then runs some preliminary batch reports to attempt to identify the cause of the problem
  2. The **specialist** performs a “deep dive” on the problem: reviewing the reports, and using interactive analysis to identify the specific log records for the cause of the problem

IMS DB2 problem: creating a session



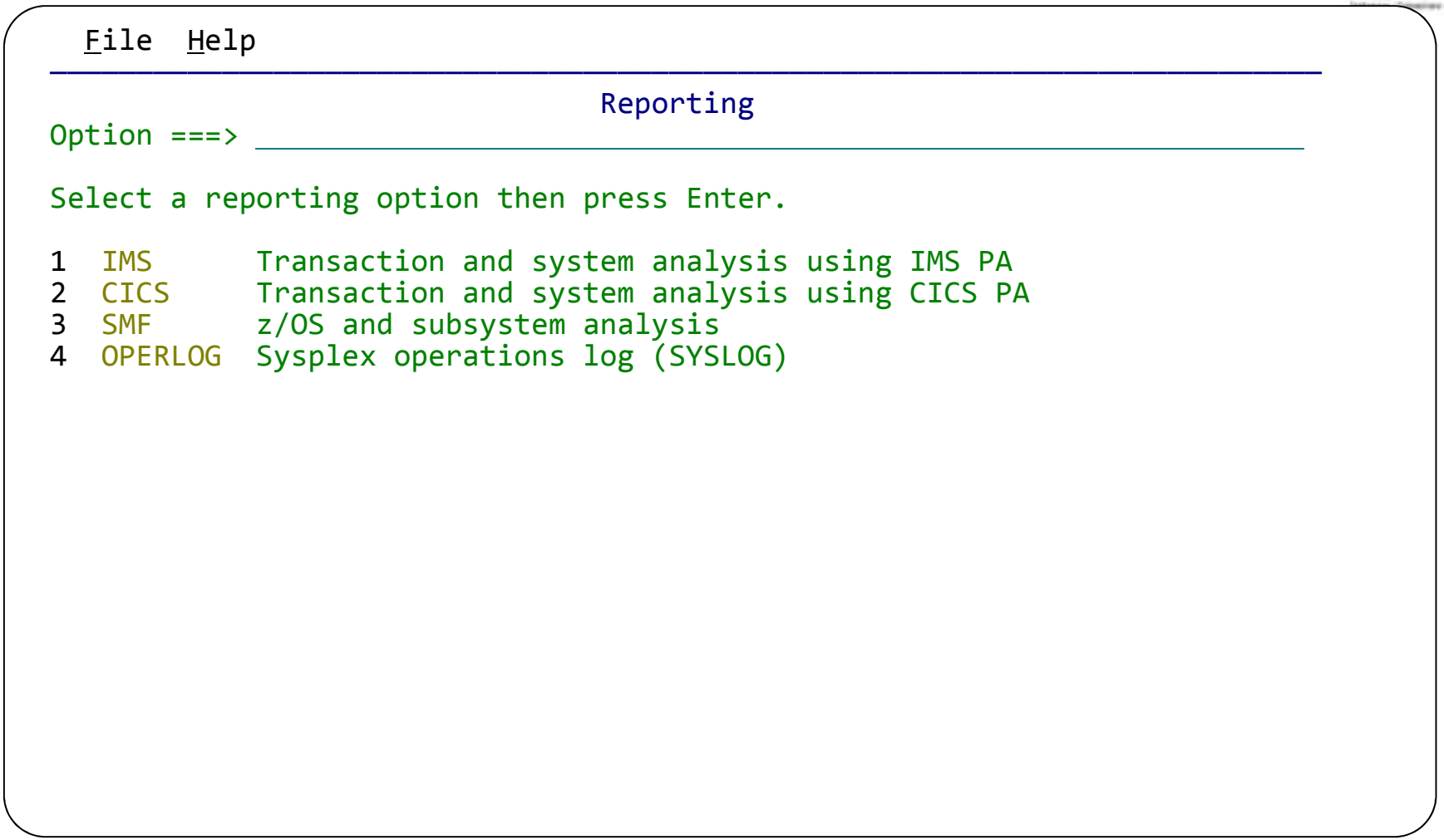
Create a session (main menu ▸ option 1 **Sessions** ▸ **NEW**).
Add the names of the relevant IMS, DB2, and MVS (“IMAGE”) systems.

IMS DB2 problem: adding log files



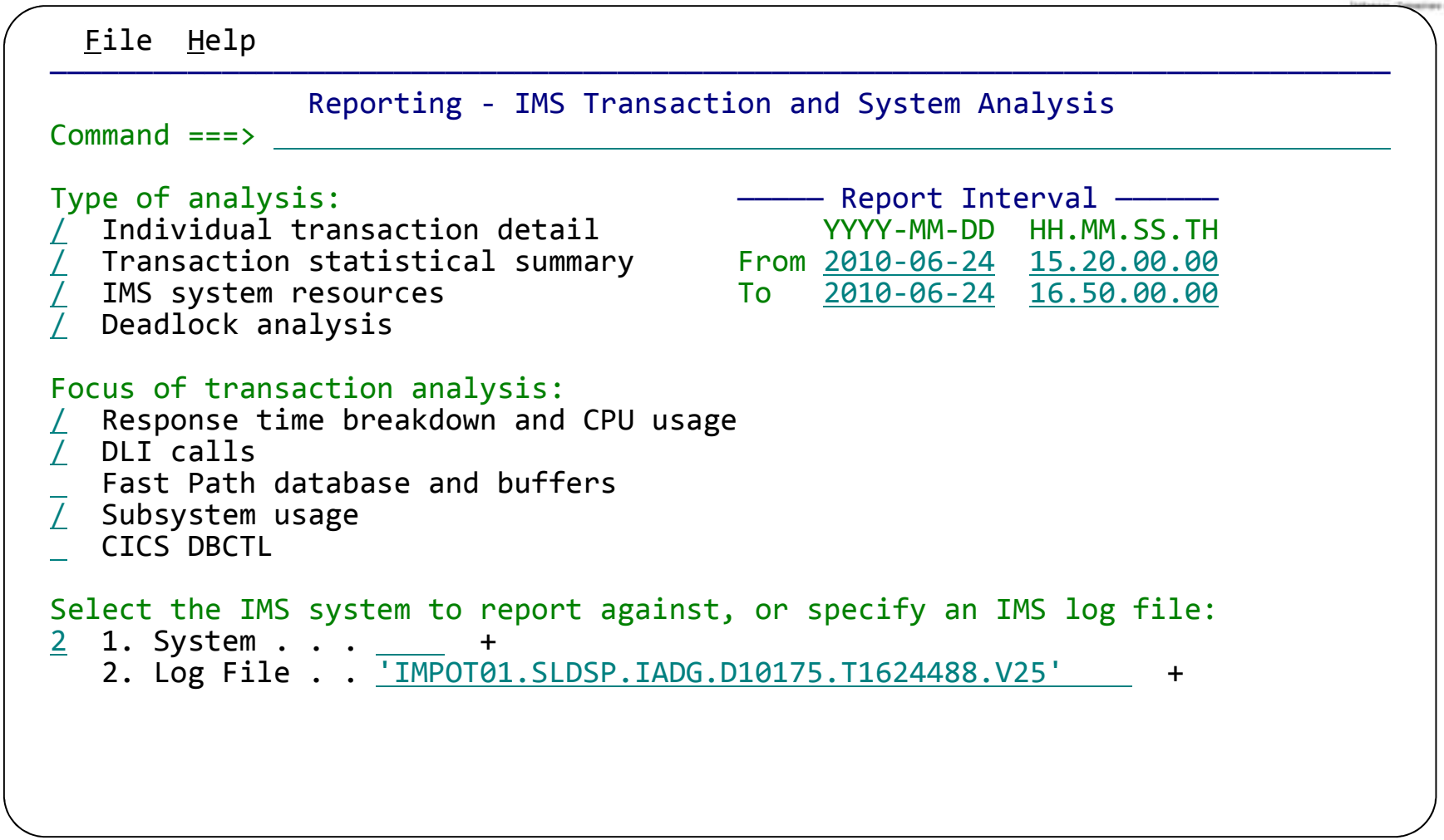
On the session menu, select Files. Either manually add the associated IMS and DB2 logs, or used automated file selection. Manually add the SMF file.

IMS DB2 problem: batch reporting



On the session menu, select option 3 **Reporting**. Then, on the reporting menu, select option 1 **IMS**.

IMS DB2 problem: IMS PA reporting



Select reports, and the IMS log file. Press Enter to view the generated report JCL, and then enter **SUB** to submit the job.

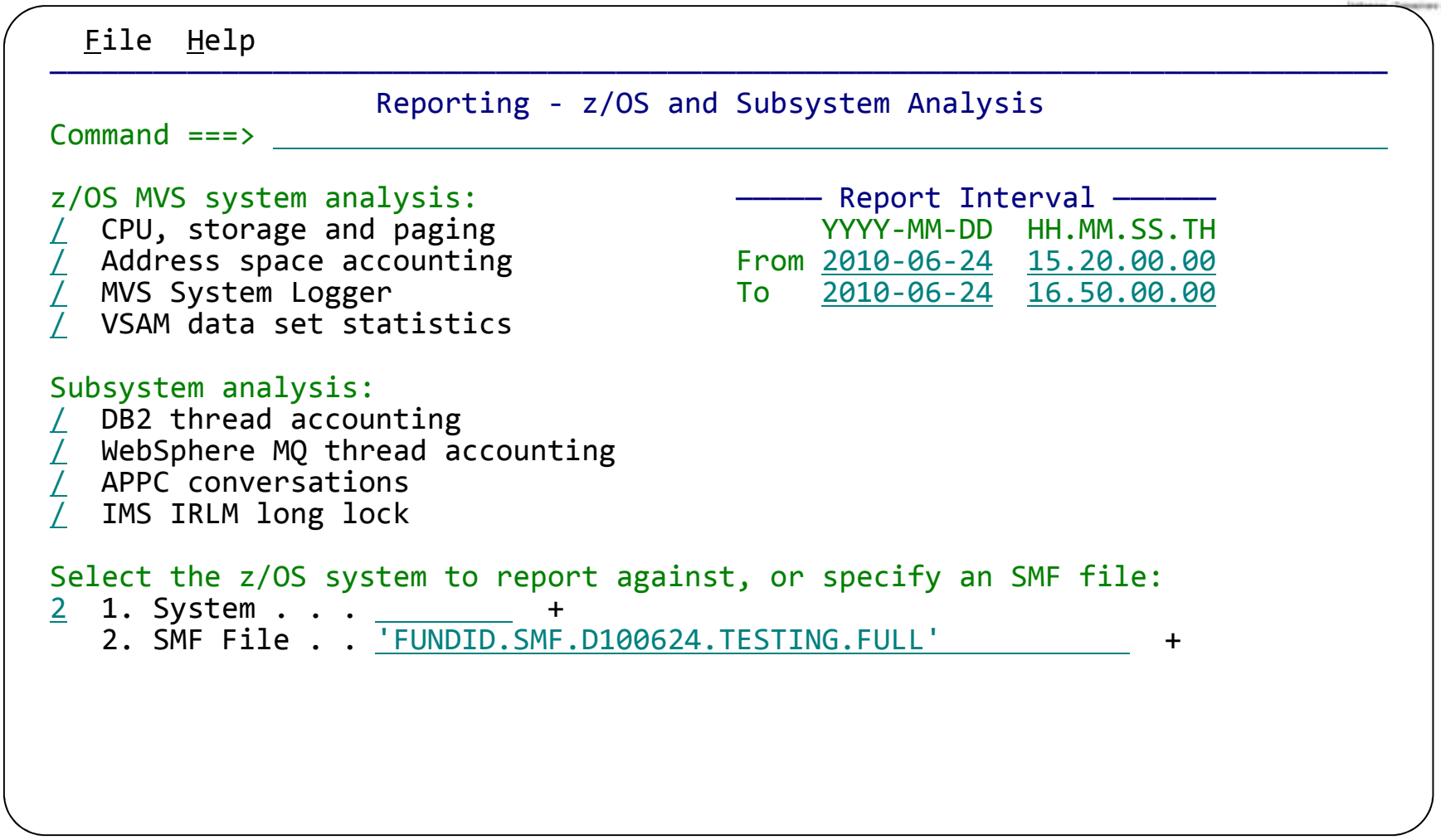
IMS DB2 problem: IMS PA reporting

```
                                                    Tran detail: Response & CPU
LIST0001 Printed at 16:03:44 01Sep2011     Data from 16.31.08 24Jun2010
Org                IMS Tran            DB Call      CPU           Output     InputQ
LTERM    Trancode  Start                 Count     Time Userid    LTERM        Time
FUNTRM15 IVTNV     16.26.06.784315           1 0.002527 FUNTRM15 FUNTRM15 0.000257
FUNTRM15 CEXTNONC  16.31.50.839616           5 0.012386 FUNTRM15 FUNTRM15 0.000170
FUNTRM15 MQATREQ1  16.33.18.743821           5 0.026647 FUNTRM15 FUNTRM15 0.004280
FUNTRM15 MQATREQ1  16.33.26.293602           5 0.032212 FUNTRM15 FUNTRM15 0.000553
FUNTRM15 MQATREQ1  16.33.33.575316           5 0.041999 FUNTRM15 FUNTRM15 0.000562
FUNTRM15 MQATREQ1  16.33.53.109929           5 0.032898 FUNTRM15 FUNTRM15 0.000649
FUNTRM15 MQATREQ1  16.33.59.157802           0 0.013980 FUNTRM15 FUNTRM15 0.000543
```

The worst-performing transaction. We will take a closer look at this transaction when interactively browsing the logs.

```
                                                    Page      1
 Process  OutputQ    Total IMS Resp ABEND
    Time      Time IMS Time      Time Code
0.003702 0.000068 0.004027 0.004027
0.021937 0.000000 0.022107 0.016131
0.468912 0.000000 0.473192 0.462459
0.407164 0.000000 0.407717 0.395793
0.497229 0.000000 0.497791 0.487811
0.384754 0.000000 0.385403 0.373700
0.424378 0.000000 0.424921 0.419555
```

IMS DB2 problem: SMF reporting



Return to the reporting menu, and select option 3 **SMF**. Select all reports, and the SMF file. Press Enter to view the generated report JCL, and then enter SUB to submit the job.

IMS DB2 problem: SMF reporting DB2 accounting

V1R1M0 Transaction Analysis Workbench

SMF Type=101 DB2 Accounting Summary

DB2 SSID	Plan Name	Connection Name	Connection Type	Thread Count								
DB3A	CEXTPGM	IADG	IMS MPP	68	Start: 2010-06-24 07:27:39							
					End: 2010-06-24 08:44:00							
Class1: Thread Time			Avg: Elapsed=70.43305	CPU= .011006	Interval: 01:16:20							
			Max: Elapsed=2045.732	CPU= .013724	Rate/sec: < 1							
Class2: In-DB2 Time			Avg: Elapsed= .015108	CPU= .006035								
			Max: Elapsed= .033537	CPU= .008234								
Class3: Suspend Time			Avg: Total = .008709	I/O= .000000	Lock/Latch= .002404	Other= .006305						
			Max: Total = .017377	I/O= .000000	Lock/Latch= .007199	Other= .010178						
Buffer Manager Summary			Avg: GtPgRq= 7.0	SyPgUp= 3.0								
			Max: GtPgRq= 7	SyPgUp= 3								
Locking Summary			Avg: Suspnd= .0	DeadLk= .0	TmeOut= .0	MxPgLk= 1.0						
			Max: Suspnd= 0	DeadLk= 0	TmeOut= 0	MxPgLk= 1						
SQL DML Query/Update			Avg: Sel= .0	Ins= 1.0	Upd= 1.0	Del= 1.0						
			Max: Sel= 0	Ins= 1	Upd= 1	Del= 1						
SQL DML 'Other'			Avg: Des= .0	Pre= .0	Ope= 1.0	Fet= 9.0	Clo= 1.0					
			Max: Des= 0	Pre= 0	Ope= 1	Fet= 9	Clo= 1					

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IMS DB2 problem: SMF reporting WebSphere MQ

V1R1M0 Transaction Analysis Workbench

SMF Type=116-0 WebSphere MQ Accounting Class 1 Summary

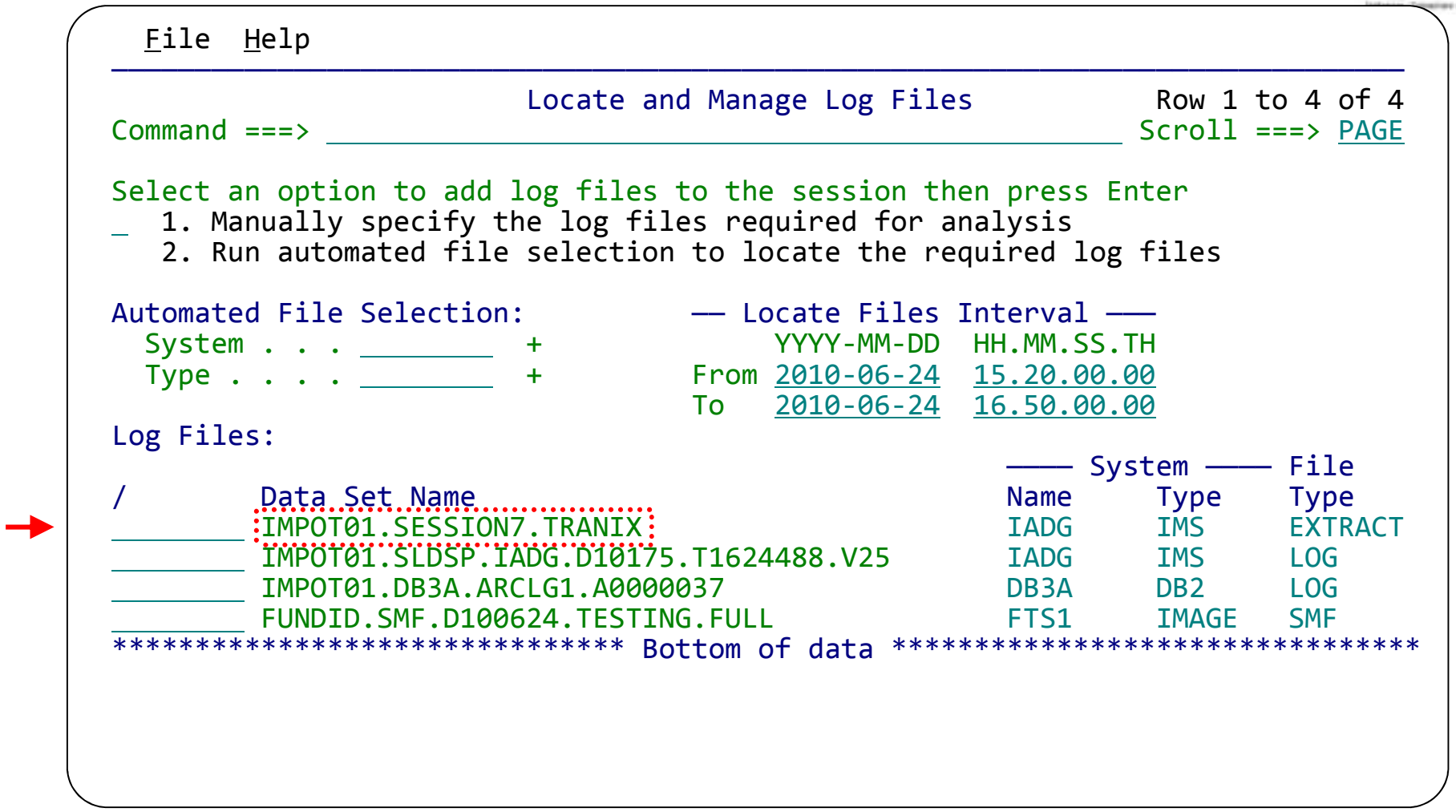
MQ SSID	-- Connection -- Type	Name	---- QMGR CPU ---- Average	Maximum	-- Elapsed Time -- Average	Maximum
CSQ6	IMSDEP	IADG	0.000058	0.000085	0.000272	0.000442

Thread Count	--------- Average GET Counts ---------- <=99	<=999	<=9999	>=10000	--------- Average PUT Counts ---------- <=99	<=999	<=9999	>=10000
5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

MQ SSID	-- Connection -- Type	Name	PSB	---- QMGR CPU ---- Average	Maximum	-- Elapsed Time -- Average	Maximum
CSQ6	IMSDEP	IADG	MQATPGM	0.001819	0.008076	0.167525	0.425349

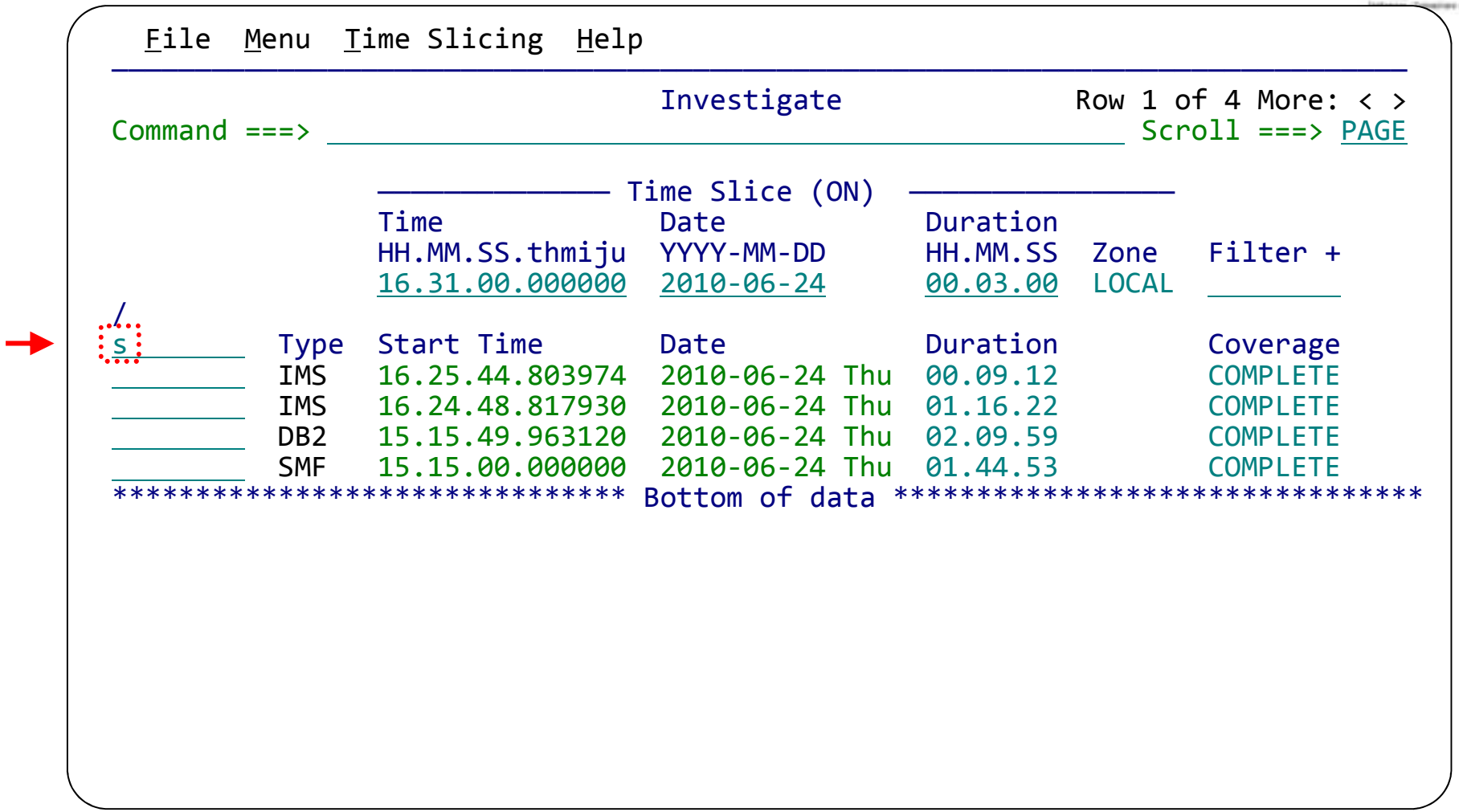
Thread Count	--------- Average GET Counts ---------- <=99	<=999	<=9999	>=10000	--------- Average PUT Counts ---------- <=99	<=999	<=9999	>=10000
44	2.0	0.0	0.0	0.0	2.0	0.0	0.0	0.0

IMS DB2 problem: creating an IMS transaction index



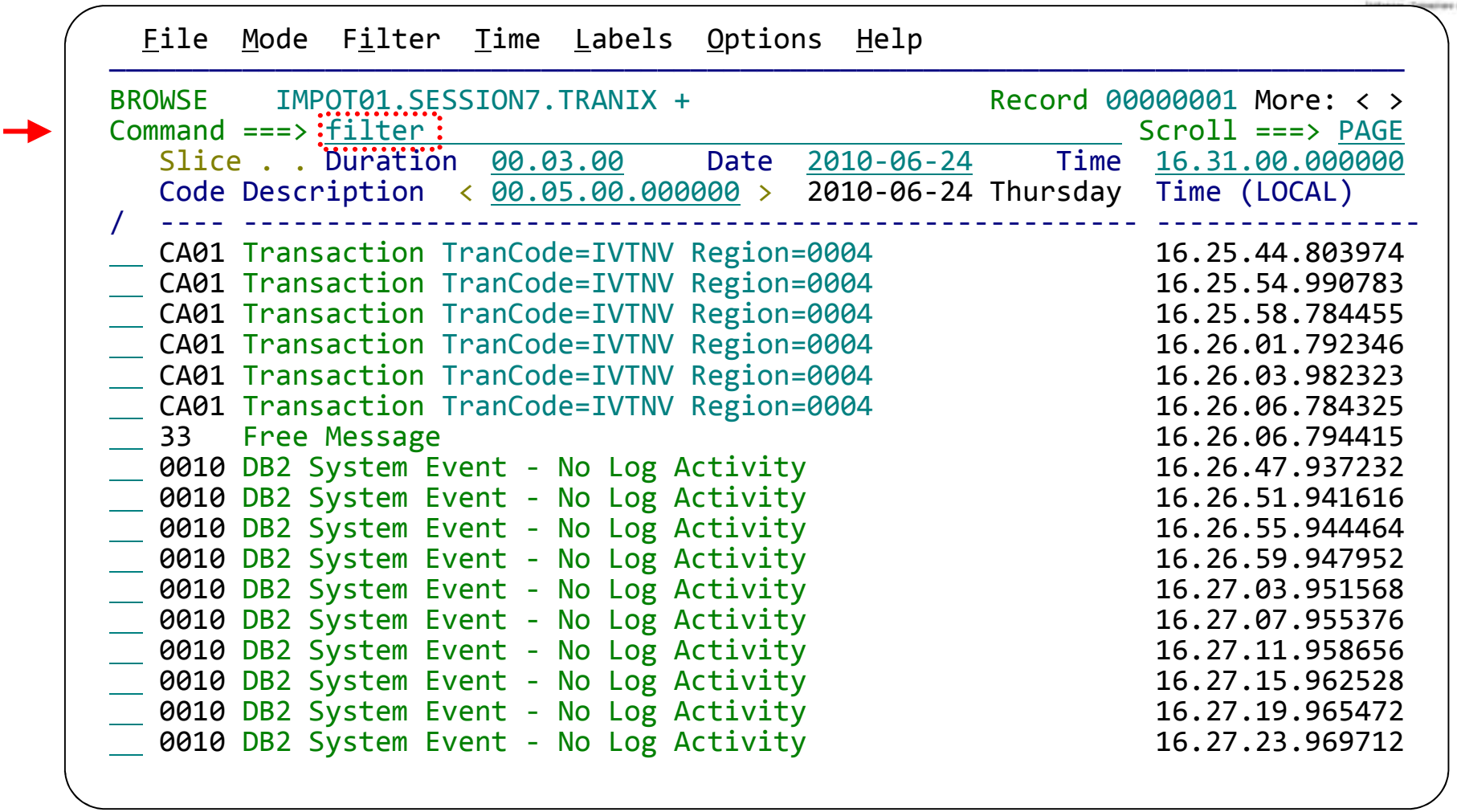
We entered **X** next to the IMS log file: this generated JCL to create an IMS transaction index, which we have added to our list of log files.

IMS DB2 problem: interactive investigation



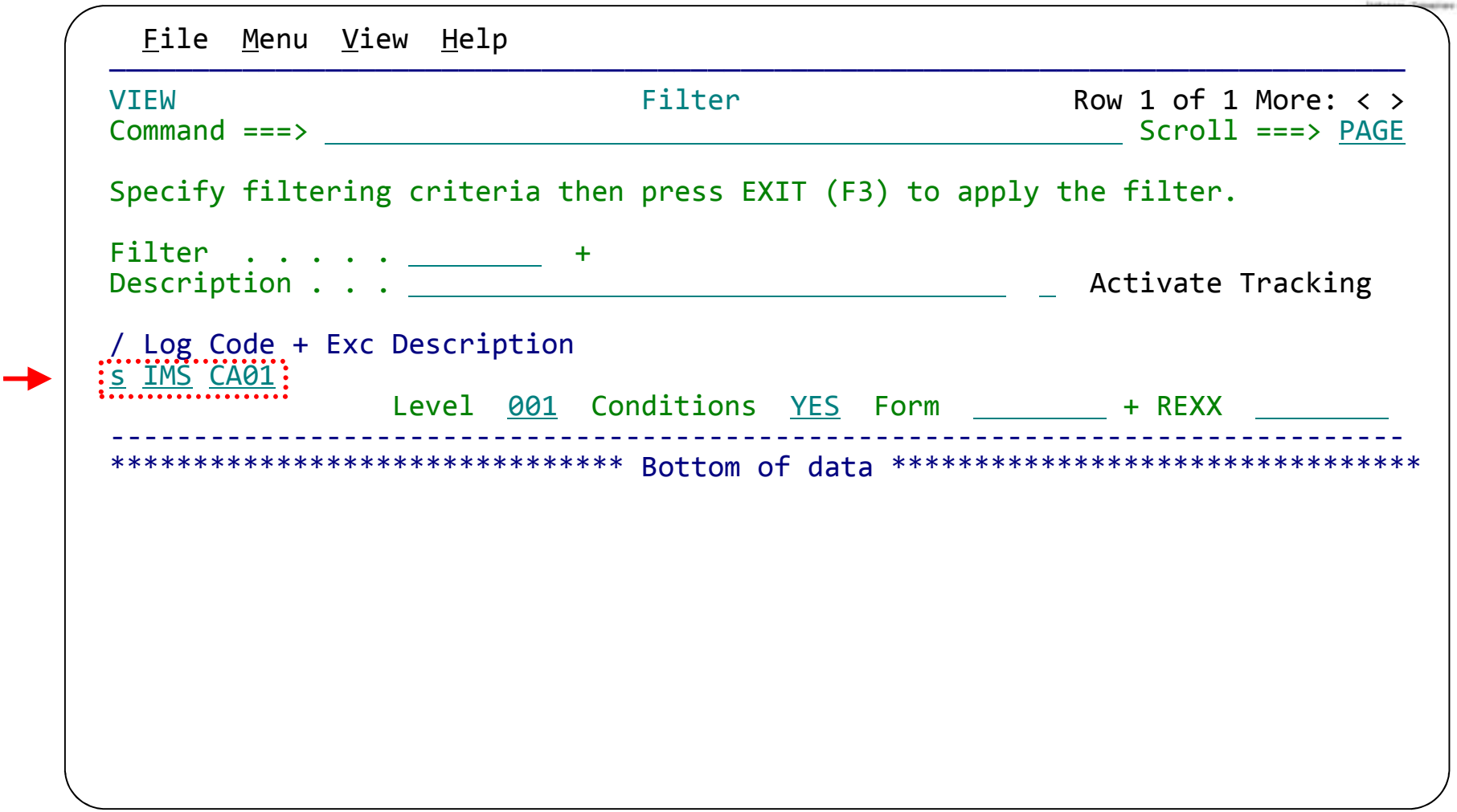
Now return to the session menu, and then select option 4 Investigate.
Enter **S** in the top line action field to browse a merged view of all log files.

IMS DB2 problem: interactive investigation



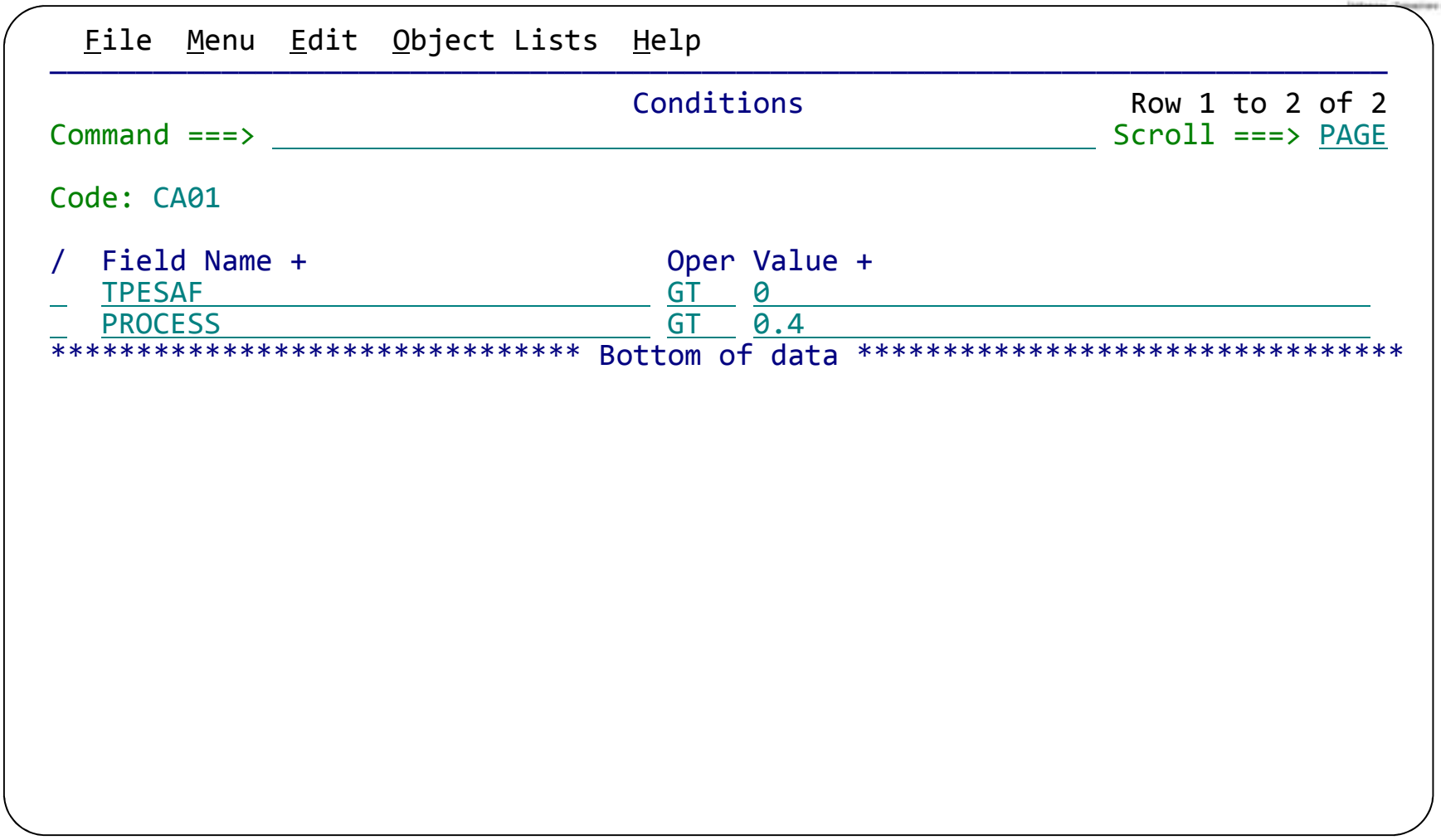
Enter FILTER on the command line.

IMS DB2 problem: defining a filter



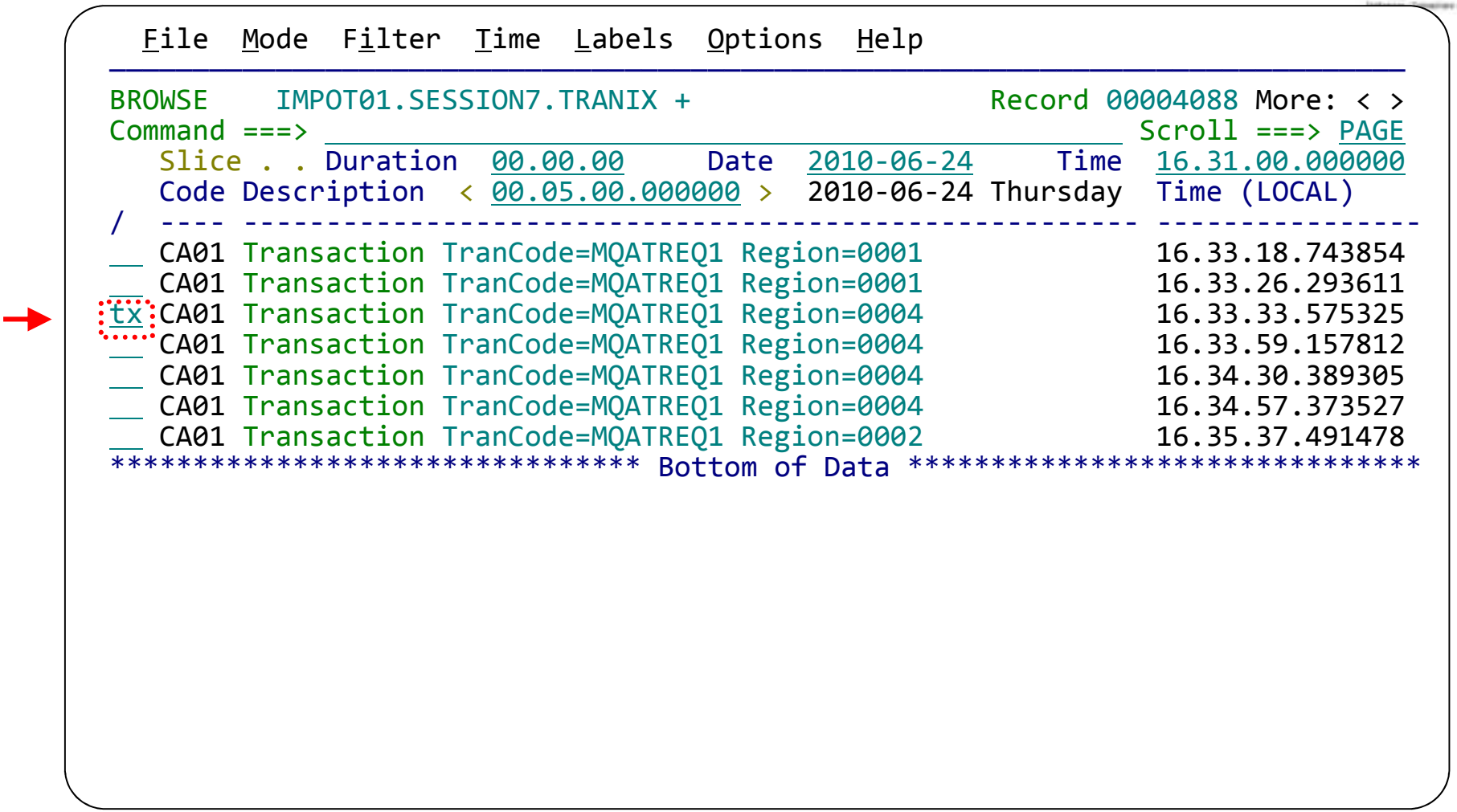
Specify a filter to display only transaction index (IMS CA01) records, and then enter **S** next to the filter to specify more detailed conditions.

IMS DB2 problem: defining a filter



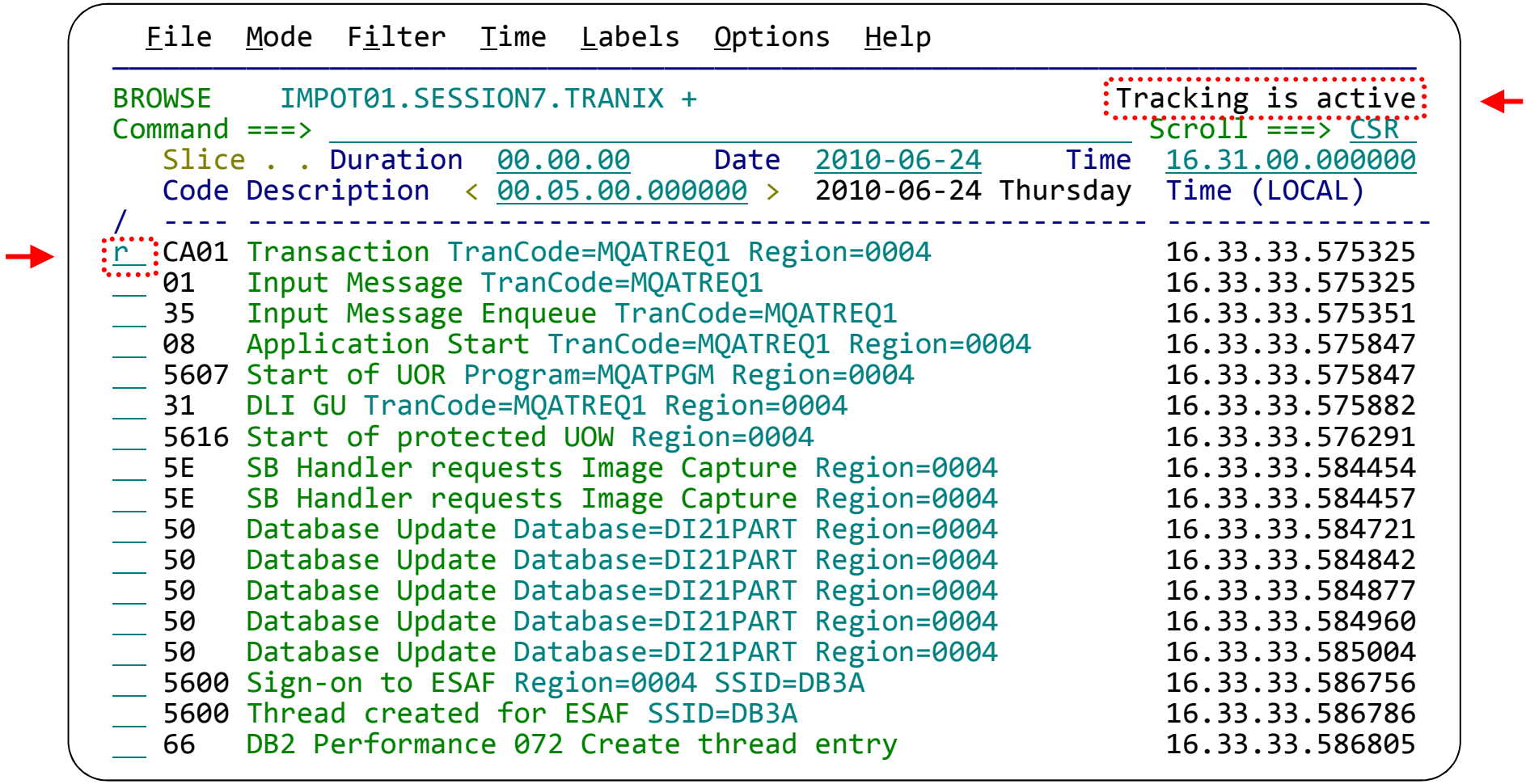
Specify a filter conditions to display only those CA01 records with TPESAF > 0 and PROCESS > 0.4. Press F3 to apply the filter.

IMS DB2 problem: interactive investigation



There are a number of transactions with long response times to choose from, but let's investigate the transaction that we identified in the batch reports. Enter **TX** next to it.

IMS DB2 problem: transaction tracking



```
  File  Mode  Filter  Time  Labels  Options  Help
------------------------------------------------------------------------------
BROWSE    IMPOT01.SESSION7.TRANIX +                      Tracking is active
Command ===>                                               Scroll ===> CSR
   Slice . . Duration  00.00.00     Date  2010-06-24     Time  16.31.00.000000
   Code Description  < 00.05.00.000000 >  2010-06-24 Thursday  Time (LOCAL)
/  ---- ------------------------------------------------- ----------------
r  CA01 Transaction TranCode=MQATREQ1 Region=0004           16.33.33.575325
__ 01   Input Message TranCode=MQATREQ1                     16.33.33.575325
__ 35   Input Message Enqueue TranCode=MQATREQ1             16.33.33.575351
__ 08   Application Start TranCode=MQATREQ1 Region=0004     16.33.33.575847
__ 5607 Start of UOR Program=MQATPGM Region=0004            16.33.33.575847
__ 31   DLI GU TranCode=MQATREQ1 Region=0004                16.33.33.575882
__ 5616 Start of protected UOW Region=0004                  16.33.33.576291
__ 5E   SB Handler requests Image Capture Region=0004       16.33.33.584454
__ 5E   SB Handler requests Image Capture Region=0004       16.33.33.584457
__ 50   Database Update Database=DI21PART Region=0004       16.33.33.584721
__ 50   Database Update Database=DI21PART Region=0004       16.33.33.584842
__ 50   Database Update Database=DI21PART Region=0004       16.33.33.584877
__ 50   Database Update Database=DI21PART Region=0004       16.33.33.584960
__ 50   Database Update Database=DI21PART Region=0004       16.33.33.585004
__ 5600 Sign-on to ESAF Region=0004 SSID=DB3A               16.33.33.586756
__ 5600 Thread created for ESAF SSID=DB3A                   16.33.33.586786
__ 66   DB2 Performance 072 Create thread entry             16.33.33.586805
```

Tracking shows records that are related to the same transaction. Enter **R** next to the CA01 to show elapsed times (relative to the CA01 time, which is the IMS transaction start time).

IMS DB2 problem: tracking (with relative elapsed time)

```
  File  Mode  Filter  Time  Labels  Options  Help
-------------------------------------------------------------------------------
BROWSE    IMPOT01.SESSION7.TRANIX +                  Record 00004609 More: < >
Command ===> _____________________________________________ Scroll ===> CSR
   Slice . . Duration  00.00.00     Date  2010-06-24     Time  16.31.00.000000
   Code Description  < 00.05.00.000000 >  2010-06-24 Thursday  Time (Relative)
/  ---- ------------------------------------------------------ ---------------
__ CA01 Transaction TranCode=MQATREQ1 Region=0004                16.33.33.575325
__ 01   Input Message TranCode=MQATREQ1                                 +0.000000
__ 35   Input Message Enqueue TranCode=MQATREQ1                         +0.000025
__ 08   Application Start TranCode=MQATREQ1 Region=0004                 +0.000521
__ 5607 Start of UOR Program=MQATPGM Region=0004                        +0.000522
__ 31   DLI GU TranCode=MQATREQ1 Region=0004                            +0.000557
__ 5616 Start of protected UOW Region=0004                              +0.000965
__ 5E   SB Handler requests Image Capture Region=0004                   +0.009128
__ 5E   SB Handler requests Image Capture Region=0004                   +0.009131
__ 50   Database Update Database=DI21PART Region=0004                   +0.009395
__ 50   Database Update Database=DI21PART Region=0004                   +0.009517
__ 50   Database Update Database=DI21PART Region=0004                   +0.009551
__ 50   Database Update Database=DI21PART Region=0004                   +0.009634
__ 50   Database Update Database=DI21PART Region=0004                   +0.009678
__ 5600 Sign-on to ESAF Region=0004 SSID=DB3A                           +0.011431
__ 5600 Thread created for ESAF SSID=DB3A                               +0.011460
__ 66   DB2 Performance 072 Create thread entry                         +0.011480
```

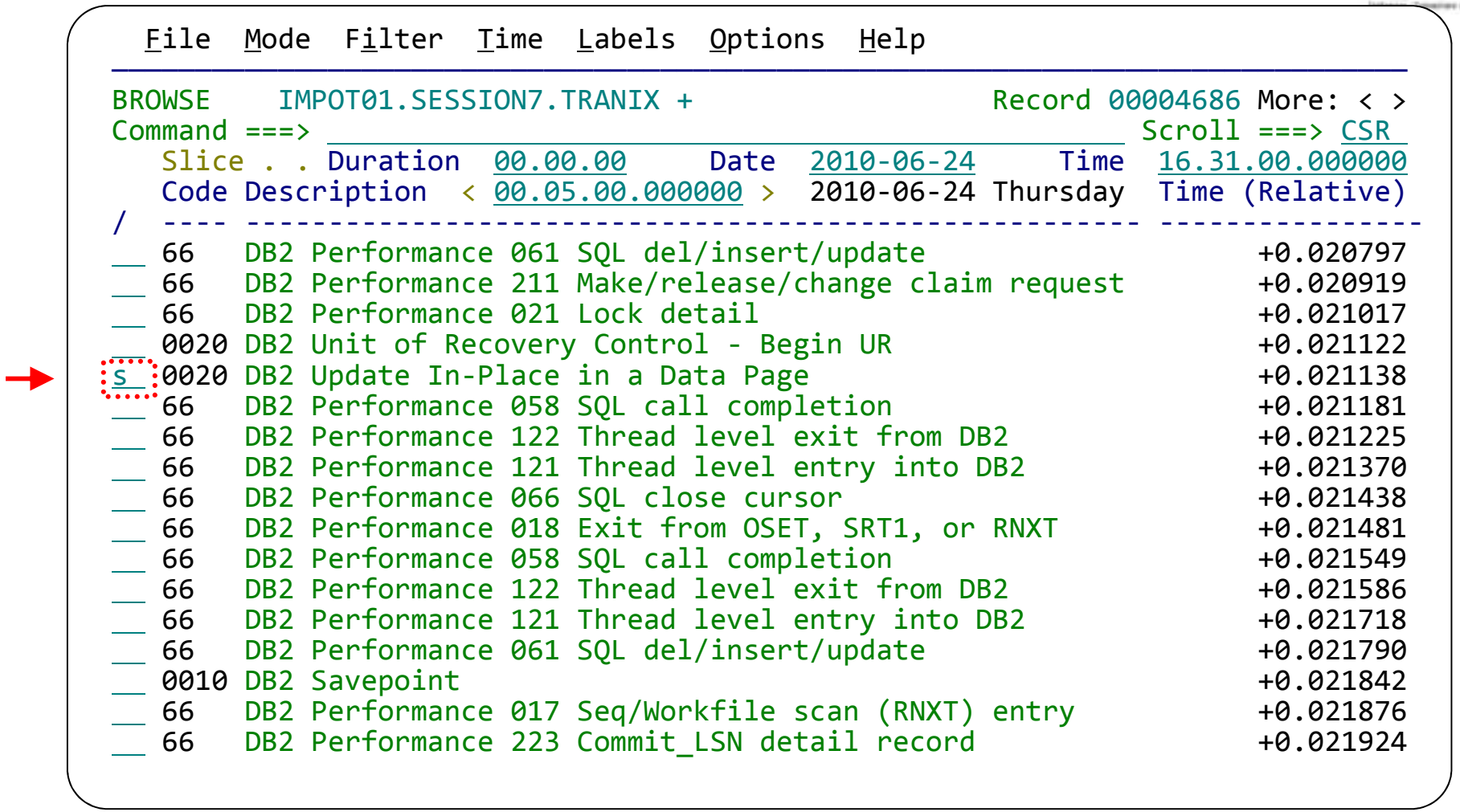
The Time column now shows relative times. Scroll forward through the related records.

IMS DB2 problem: interactive investigation

```
  File  Mode  Filter  Time  Labels  Options  Help
──────────────────────────────────────────────────────────────────────────────
BROWSE    IMPOT01.SESSION7.TRANIX +                    Record 00004631 More: < >
Command ===>                                                Scroll ===> CSR
   Slice . . Duration  00.00.00     Date  2010-06-24     Time  16.31.00.000000
   Code Description  < 00.05.00.000000 >  2010-06-24 Thursday  Time (Relative)
/  ---- ------------------------------------------------------ ----------------
__ 66   DB2 Performance 072 Create thread entry                      +0.011480
__ 66   DB2 Performance 021 Lock detail                              +0.011990
__ 66   DB2 Performance 112 Successful plan allocation(allied)       +0.012351
__ 66   DB2 Performance 073 Create thread exit                       +0.012442
__ 66   DB2 Performance 122 Thread level exit from DB2               +0.012550
__ 66   DB2 Performance 121 Thread level entry into DB2             +0.012705
__ 66   DB2 Performance 065 SQL open cursor                         +0.012949
__ 66   DB2 Performance 058 SQL call completion                     +0.013013
__ 66   DB2 Performance 122 Thread level exit from DB2              +0.013051
__ 66   DB2 Performance 121 Thread level entry into DB2             +0.013191
__ 66   DB2 Performance 059 SQL fetch                               +0.013259
__ 66   DB2 Performance 044 IRLM suspend entry                      +0.013491
__ 66   DB2 Performance 093 Suspend                                 +0.013599
__ 66   DB2 Performance 094 Resume                                  +0.017441
__ 66   DB2 Performance 045 IRLM suspend exit                       +0.017513
__ 66   DB2 Performance 021 Lock detail                             +0.017553
__ 66   DB2 Performance 017 Seq/Workfile scan (RNXT) entry          +0.017615
```

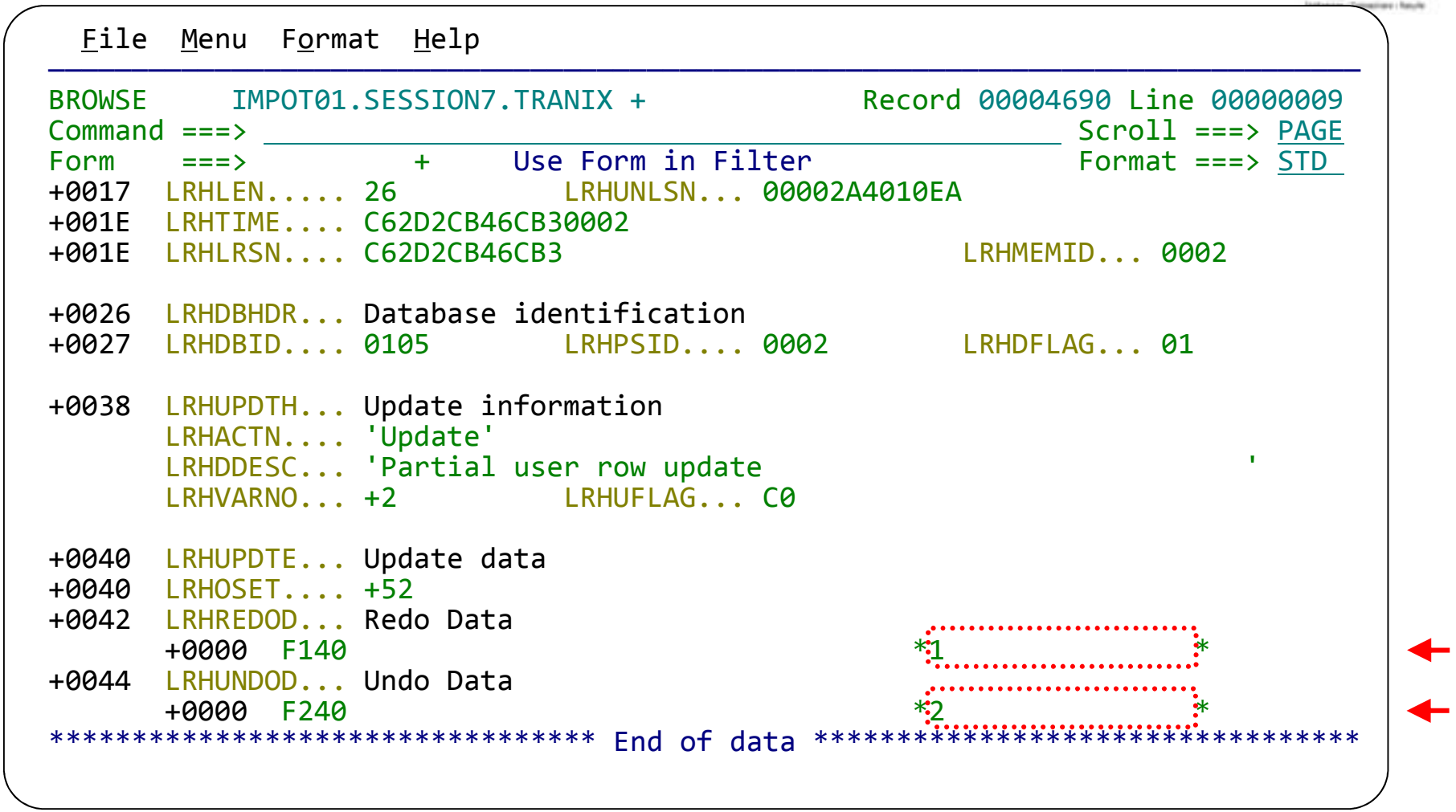
Scroll forward some more, past the DB2 performance records.

IMS DB2 problem: interactive investigation



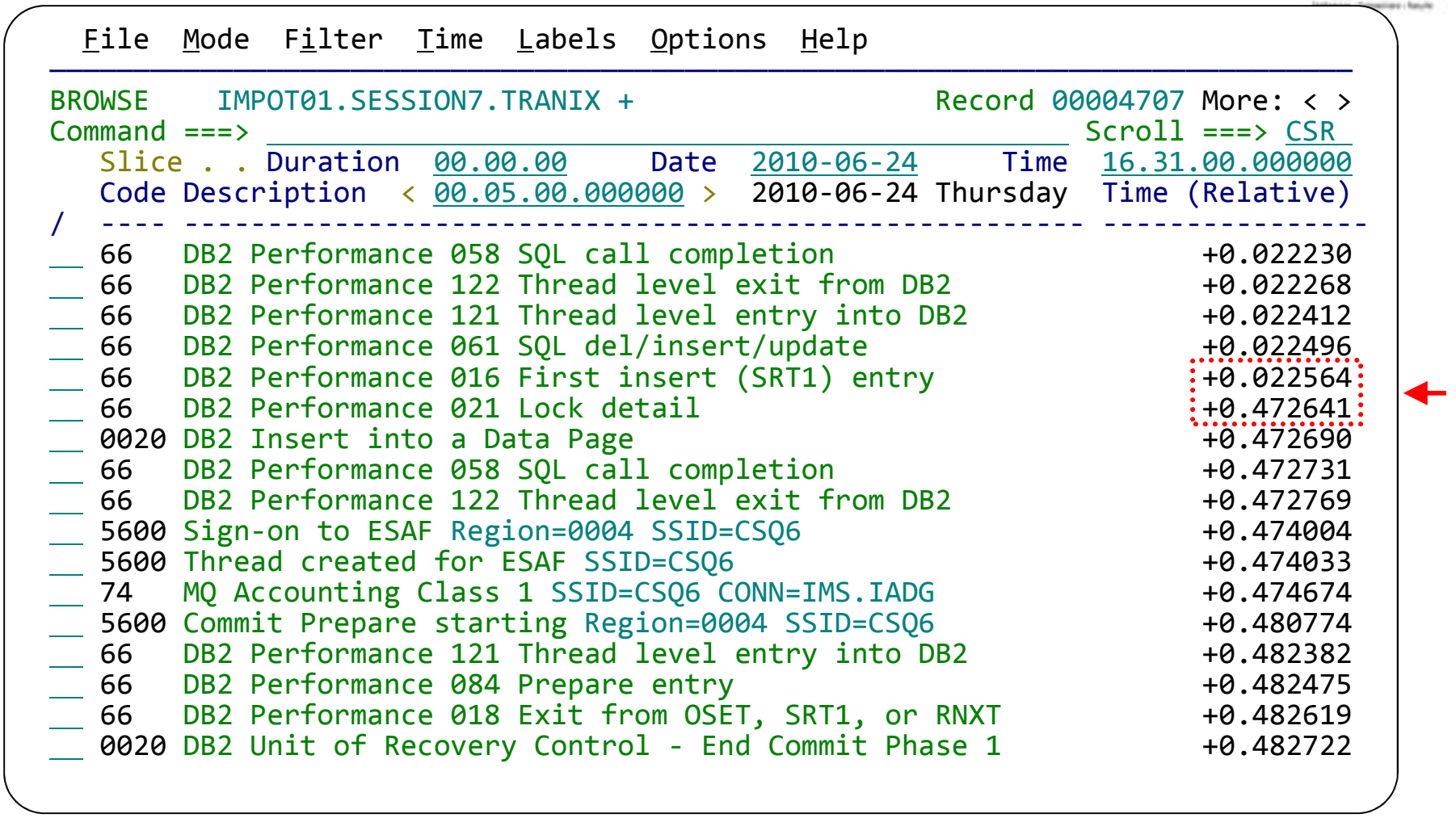
Select the 0020 DB2 Upate record.

IMS DB2 problem: interactive investigation



This record shows the actual data affected by the update (in this example, the update changed the value 2 to 1). Press F3 to return to the list of records.

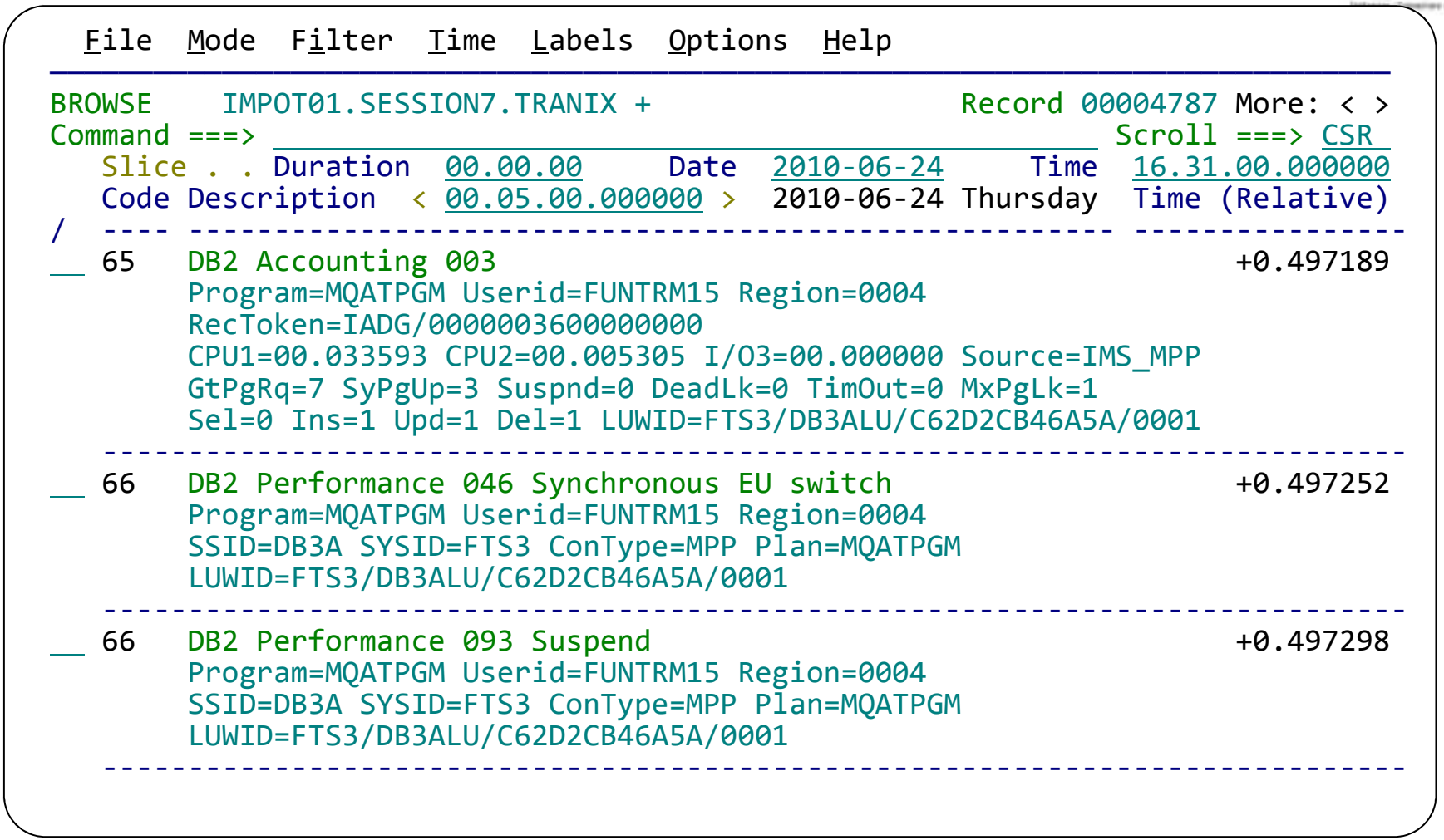
IMS DB2 problem: interactive investigation



```
  File  Mode  Filter  Time  Labels  Options  Help
BROWSE    IMPOT01.SESSION7.TRANIX +                    Record 00004707 More: < >
Command ===>                                            Scroll ===> CSR
   Slice . . Duration  00.00.00     Date  2010-06-24     Time  16.31.00.000000
   Code Description  < 00.05.00.000000 >  2010-06-24 Thursday  Time (Relative)
/  ---- ------------------------------------------------- ----------------
__ 66   DB2 Performance 058 SQL call completion                    +0.022230
__ 66   DB2 Performance 122 Thread level exit from DB2             +0.022268
__ 66   DB2 Performance 121 Thread level entry into DB2            +0.022412
__ 66   DB2 Performance 061 SQL del/insert/update                  +0.022496
__ 66   DB2 Performance 016 First insert (SRT1) entry              +0.022564
__ 66   DB2 Performance 021 Lock detail                            +0.472641
__ 0020 DB2 Insert into a Data Page                                +0.472690
__ 66   DB2 Performance 058 SQL call completion                    +0.472731
__ 66   DB2 Performance 122 Thread level exit from DB2             +0.472769
__ 5600 Sign-on to ESAF Region=0004 SSID=CSQ6                      +0.474004
__ 5600 Thread created for ESAF SSID=CSQ6                          +0.474033
__ 74   MQ Accounting Class 1 SSID=CSQ6 CONN=IMS.IADG              +0.474674
__ 5600 Commit Prepare starting Region=0004 SSID=CSQ6              +0.480774
__ 66   DB2 Performance 121 Thread level entry into DB2            +0.482382
__ 66   DB2 Performance 084 Prepare entry                          +0.482475
__ 66   DB2 Performance 018 Exit from OSET, SRT1, or RNXT          +0.482619
__ 0020 DB2 Unit of Recovery Control - End Commit Phase 1          +0.482722
```

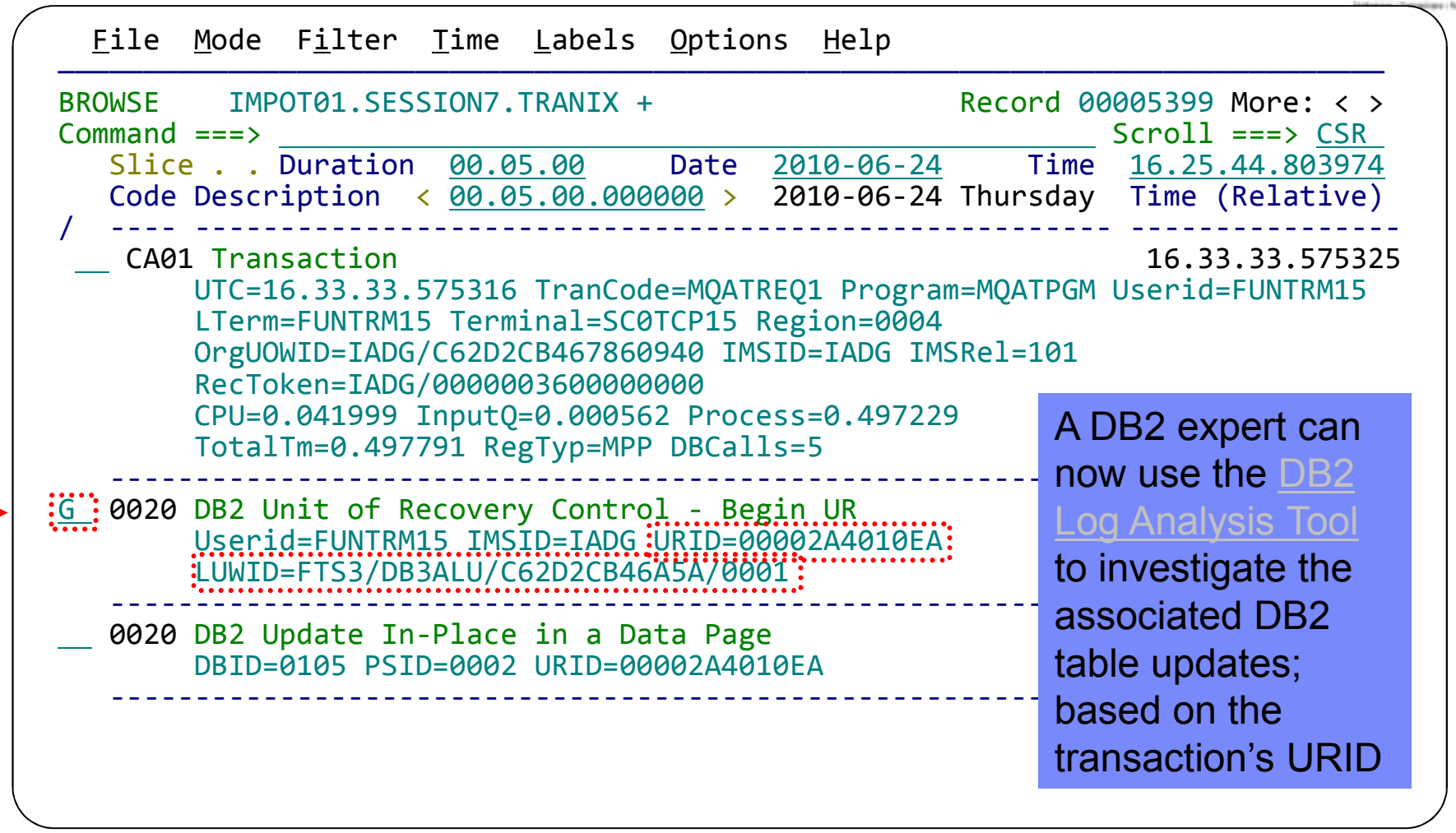
Keep scrolling forward until you see the jump in relative time, then scroll forward again to the 65 record.

IMS DB2 problem: interactive investigation



Scroll right (F5) to show the records in expanded view with relative times.

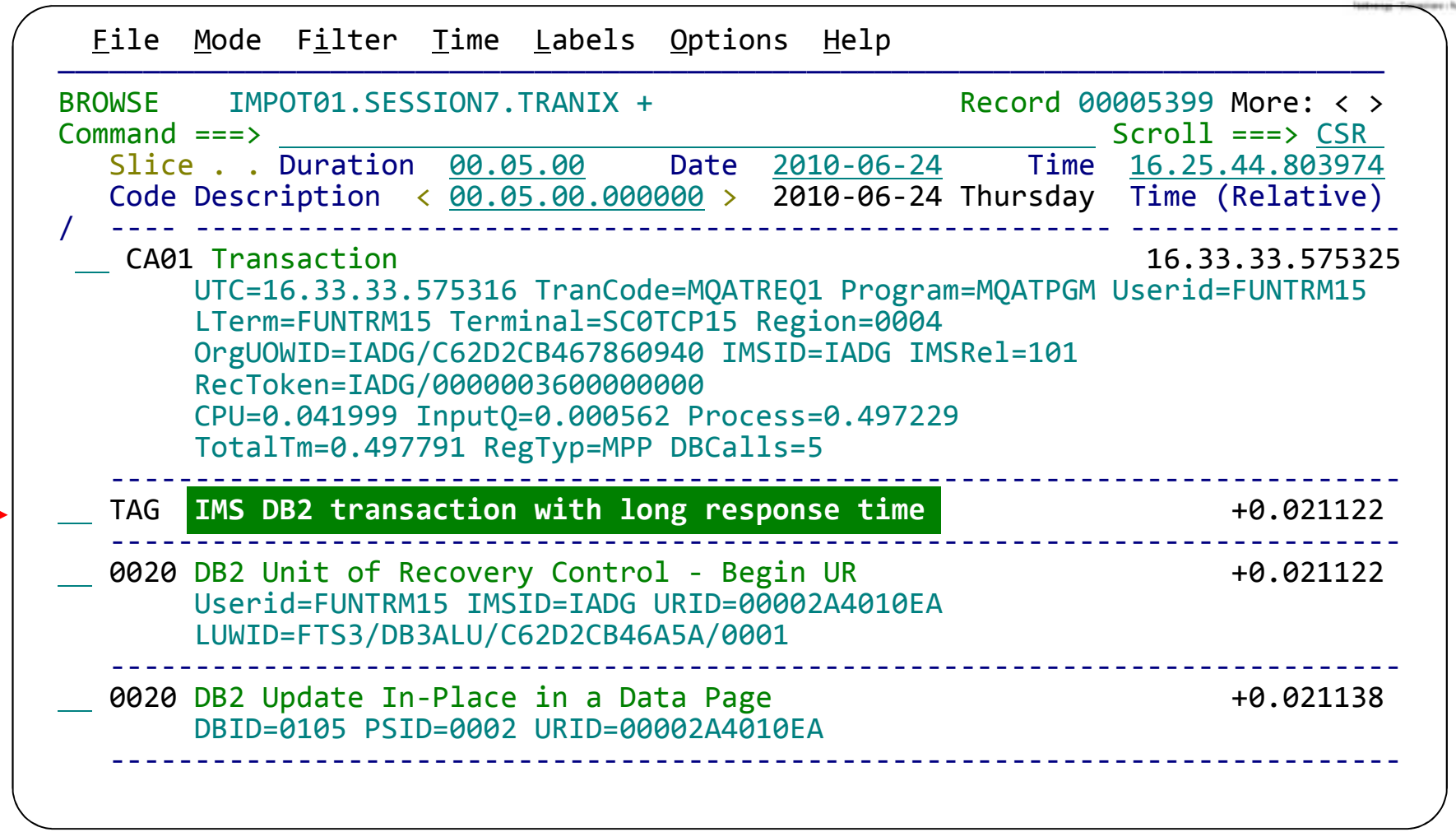
IMS DB2 problem: interactive investigation



A DB2 expert can now use the DB2 Log Analysis Tool to investigate the associated DB2 table updates; based on the transaction's URID

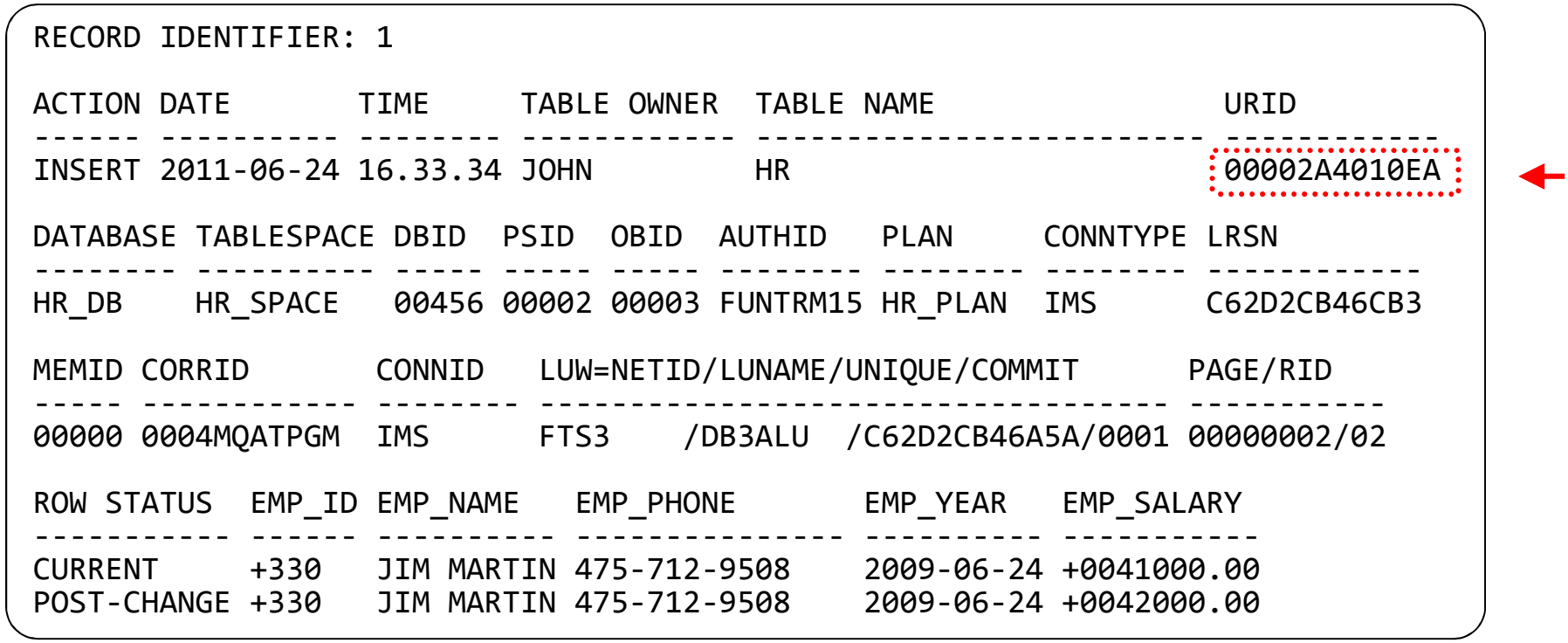
Press F5 (Right) to switch to a view that expands each record onto multiple lines, and then enter FIND LUWID on the command line. Enter **G** to "tag" (bookmark) this DB2 record.

IMS DB2 problem: tagging a specific log record



The tag is displayed in the log browser directly above the tagged record (with an identical time stamp).

IMS DB2 problem: DB2 Log Analysis Tool



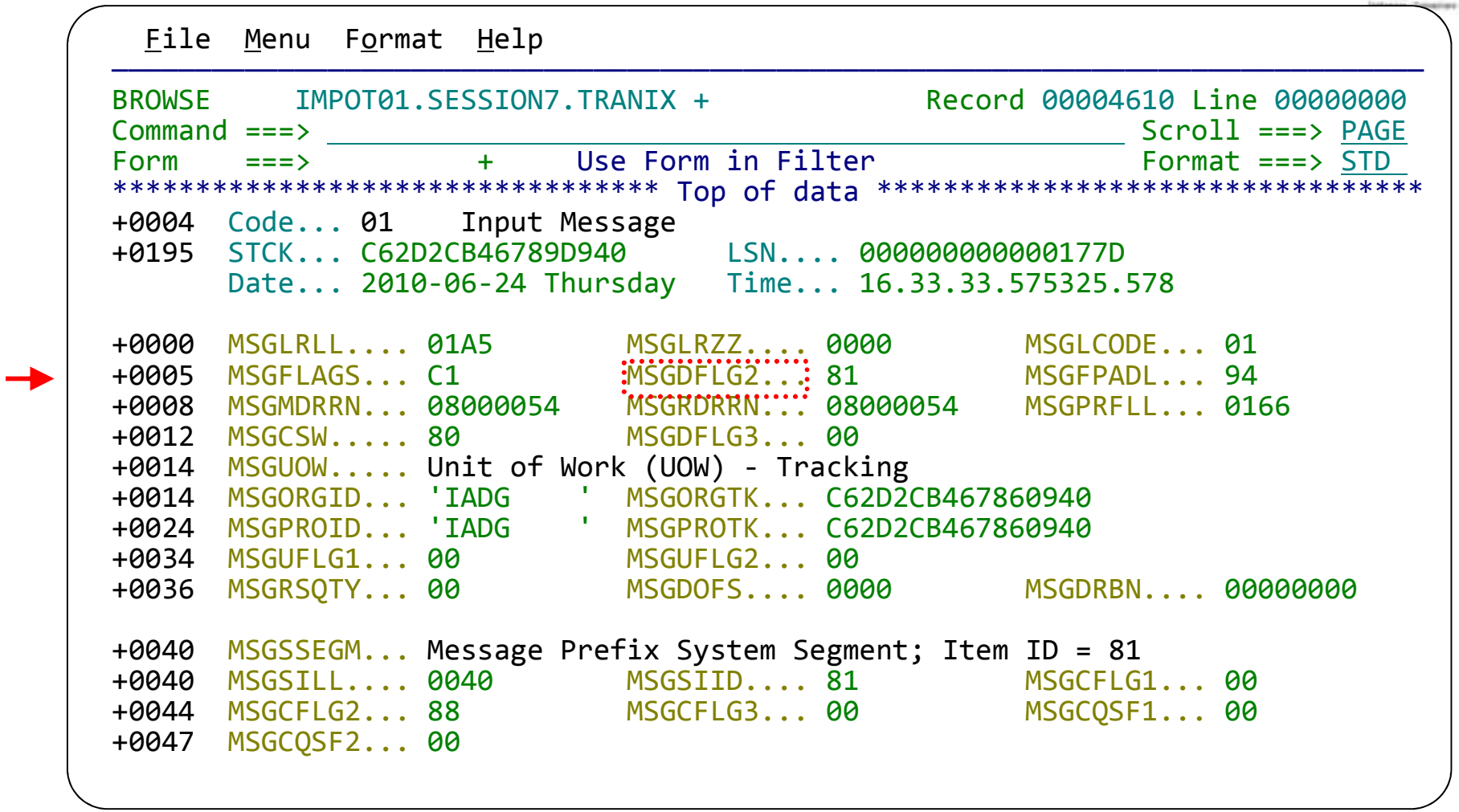
```
RECORD IDENTIFIER: 1

ACTION DATE       TIME     TABLE OWNER  TABLE NAME                 URID
------ ---------- -------- ------------ ------------------------ ------------
INSERT 2011-06-24 16.33.34 JOHN         HR                       00002A4010EA

DATABASE TABLESPACE DBID  PSID  OBID  AUTHID   PLAN     CONNTYPE LRSN
-------- ---------- ----- ----- ----- -------- -------- -------- ------------
HR_DB    HR_SPACE   00456 00002 00003 FUNTRM15 HR_PLAN  IMS      C62D2CB46CB3

MEMID CORRID       CONNID   LUW=NETID/LUNAME/UNIQUE/COMMIT      PAGE/RID
----- ------------ -------- ---------------------------------- -----------
00000 0004MQATPGM  IMS      FTS3    /DB3ALU  /C62D2CB46A5A/0001 00000002/02

ROW STATUS  EMP_ID EMP_NAME   EMP_PHONE       EMP_YEAR   EMP_SALARY
----------- ------ ---------- --------------- ---------- -----------
CURRENT     +330   JIM MARTIN 475-712-9508    2009-06-24 +0041000.00
POST-CHANGE +330   JIM MARTIN 475-712-9508    2009-06-24 +0042000.00
```

IMS DB2 problem: interactive investigation

```
  File  Mode  Filter  Time  Labels  Options  Help
------------------------------------------------------------------------------
BROWSE    IMPOT01.SESSION7.TRANIX +                        Tracking is active
Command ===> _____________________________________________  Scroll ===> CSR
   Slice . . Duration  00.00.00     Date  2010-06-24     Time  16.31.00.000000
   Code Description  < 00.05.00.000000 >  2010-06-24 Thursday  Time (Relative)
/  ---- ------------------------------------------------------ ---------------
__ CA01 Transaction TranCode=MQATREQ1 Region=0004                16.33.33.575325
s_ 01   Input Message TranCode=MQATREQ1                                +0.000000
__ 35   Input Message Enqueue TranCode=MQATREQ1                        +0.000025
__ 08   Application Start TranCode=MQATREQ1 Region=0004                +0.000521
__ 5607 Start of UOR Program=MQATPGM Region=0004                       +0.000522
__ 31   DLI GU TranCode=MQATREQ1 Region=0004                           +0.000557
__ 5616 Start of protected UOW Region=0004                             +0.000965
__ 5E   SB Handler requests Image Capture Region=0004                  +0.009128
__ 5E   SB Handler requests Image Capture Region=0004                  +0.009131
__ 50   Database Update Database=DI21PART Region=0004                  +0.009395
__ 50   Database Update Database=DI21PART Region=0004                  +0.009517
__ 50   Database Update Database=DI21PART Region=0004                  +0.009551
__ 50   Database Update Database=DI21PART Region=0004                  +0.009634
__ 50   Database Update Database=DI21PART Region=0004                  +0.009678
__ 5600 Sign-on to ESAF Region=0004 SSID=DB3A                          +0.011431
__ 5600 Thread created for ESAF SSID=DB3A                              +0.011460
```

Scroll back to the top of the tracked transaction (type M, then press F7). Select the 01 record.

IMS DB2 problem: interactive investigation



```
  File  Menu  Format  Help
─────────────────────────────────────────────────────────────────────────────
BROWSE     IMPOT01.SESSION7.TRANIX +              Record 00004610 Line 00000000
Command ===> ____________________________________________ Scroll ===> PAGE
Form    ===>          +     Use Form in Filter          Format ===> STD
******************************** Top of data ********************************
+0004  Code... 01    Input Message
+0195  STCK... C62D2CB46789D940      LSN.... 000000000000177D
       Date... 2010-06-24 Thursday   Time... 16.33.33.575325.578

+0000  MSGLRLL.... 01A5        MSGLRZZ.... 0000        MSGLCODE... 01
+0005  MSGFLAGS... C1          MSGDFLG2... 81          MSGFPADL... 94
+0008  MSGMDRRN... 08000054    MSGRDRRN... 08000054    MSGPRFLL... 0166
+0012  MSGCSW..... 80          MSGDFLG3... 00
+0014  MSGUOW..... Unit of Work (UOW) - Tracking
+0014  MSGORGID... 'IADG    '  MSGORGTK... C62D2CB467860940
+0024  MSGPROID... 'IADG    '  MSGPROTK... C62D2CB467860940
+0034  MSGUFLG1... 00          MSGUFLG2... 00
+0036  MSGRSQTY... 00          MSGDOFS.... 0000        MSGDRBN.... 00000000

+0040  MSGSSEGM... Message Prefix System Segment; Item ID = 81
+0040  MSGSILL.... 0040        MSGSIID.... 81          MSGCFLG1... 00
+0044  MSGCFLG2... 88          MSGCFLG3... 00          MSGCQSF1... 00
+0047  MSGCQSF2... 00
```

To “zoom” on a field, move your cursor to the field, and then press Enter.

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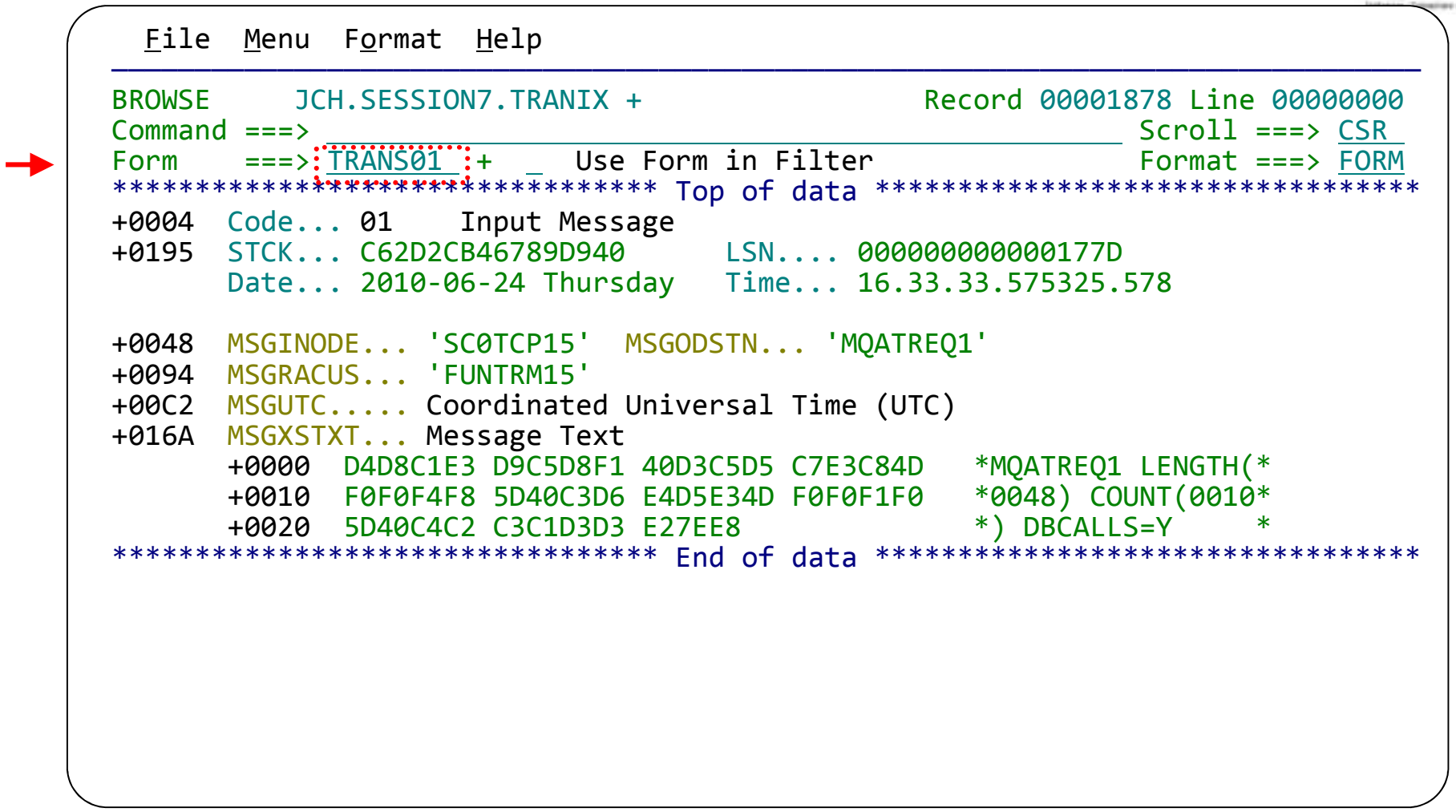
IMS DB2 problem: interactive investigation

```
  File  Menu  Help
 ──────────────────────────────────────────────────────────────────────────
BROWSE    IMPOT01.SESSION7.TRANIX +                          Line 00000000
Command ===> ____________________________________________ Scroll ===> PAGE
****************************** Top of data ******************************
+0006  MSGDFLG2... 81   Flags from QDFLG2 of QDEST

 On    QDF2PRM.... 80   This Destination is permanent and implies that
                        fields exist for
                        1. Average Msg length
                        2. Enqueue and Dequeue counts
                        3. Name field If the above  bit is off, the
                        fields  are assumed to be absent
 Off   QDF2BKR.... 40   Backup queue is required, either for Resend or
                        Conversational process
 Off   QDF2QMOV... 20   QMOVE in Process : XRF
 Off   QDF2LQUE... 10   Local QPOOL in Use : XRF
 Off   QDF2CLNR... 08   Cleanup Check Request Flag : XRF
 Off   QDF2MDEL... 04   Message Deletion in Progress Flag : XRF
 Off   QDF2BTYP... 03   Destination Type bits
 On    QDF2SMB.... 81   Generated SMB - Transaction
 Off   QDF2CNT.... 82   Generated CNT - Logical Terminal
****************************** End of data ******************************
```

IMS DB2 problem: interactive investigation



To reduce “noise”, and show only the fields that are of interest to you, use a form.

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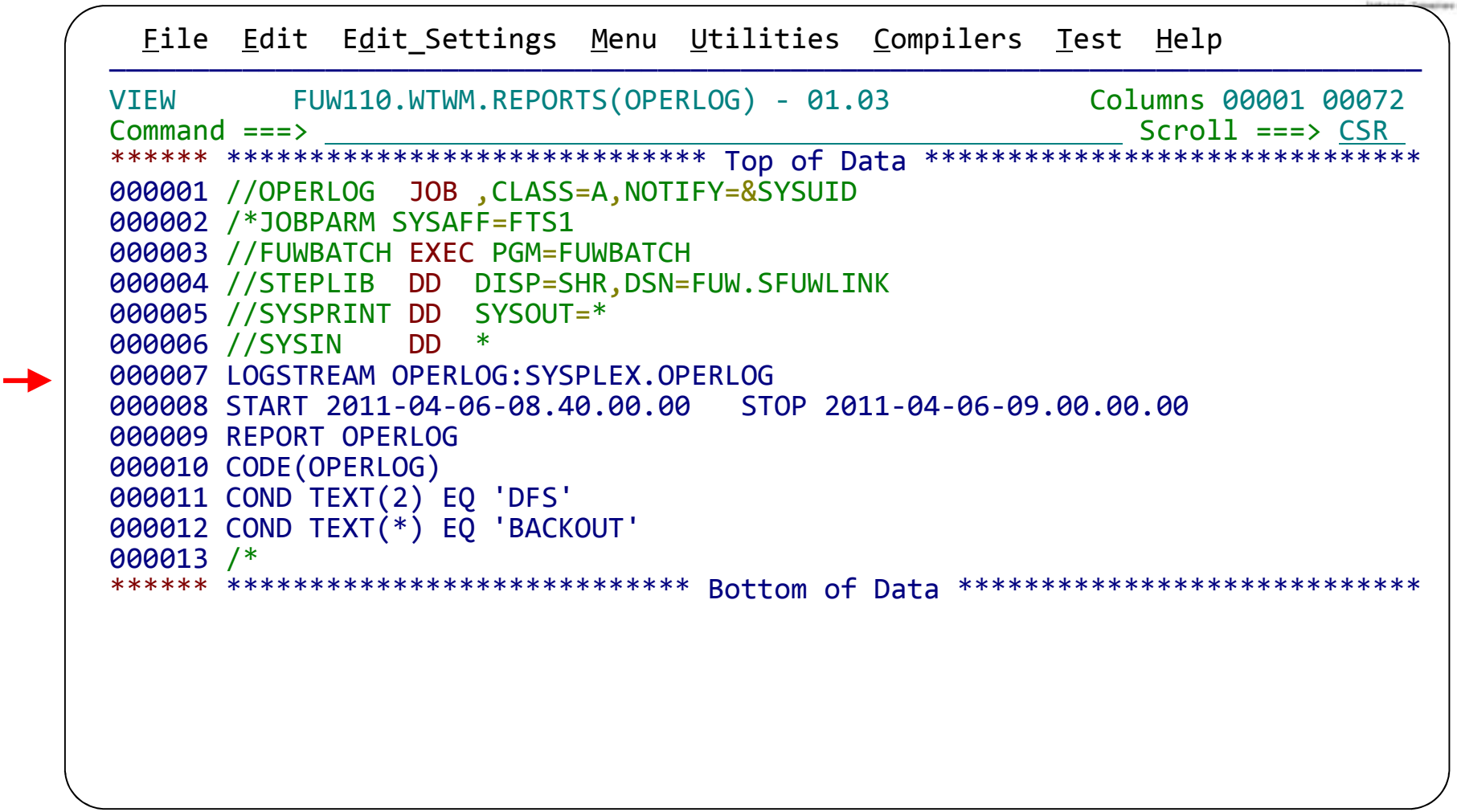
End of scenario

- The cause of the IMS transaction problem has been narrowed down to a slowdown in DB2
- Sufficient information about the DB2 update activity has been collected and can be passed on to the DB2 DBA for further investigation

Return to agenda

Restart this scenario

OPERLOG report: JCL



```
  File  Edit  Edit_Settings  Menu  Utilities  Compilers  Test  Help
VIEW       FUW110.WTWM.REPORTS(OPERLOG) - 01.03            Columns 00001 00072
Command ===> _____________________________________________ Scroll ===> CSR
****** ***************************** Top of Data ********************************
000001 //OPERLOG  JOB ,CLASS=A,NOTIFY=&SYSUID
000002 /*JOBPARM SYSAFF=FTS1
000003 //FUWBATCH EXEC PGM=FUWBATCH
000004 //STEPLIB  DD  DISP=SHR,DSN=FUW.SFUWLINK
000005 //SYSPRINT DD  SYSOUT=*
000006 //SYSIN    DD  *
000007 LOGSTREAM OPERLOG:SYSPLEX.OPERLOG
000008 START 2011-04-06-08.40.00.00   STOP 2011-04-06-09.00.00.00
000009 REPORT OPERLOG
000010 CODE(OPERLOG)
000011 COND TEXT(2) EQ 'DFS'
000012 COND TEXT(*) EQ 'BACKOUT'
000013 /*
****** ***************************** Bottom of Data *****************************
```

Note the LOGSTREAM command in the SYSIN data set, identifying the input log stream. The COND statements filter the reported OPERLOG records.

OPERLOG report: output

```
FTS3     2011096 08.41.42.57 STC36951  DFS2484I JOBNAME=IBB1#ARC
                                                GENERATED BY LOG AUTOMATIC ARCHIVING IBB1
FTS2     2011096 08.41.48.71 STC37128  DFS058I 08:41:48 START COMMAND IN PROGRESS   ICDZ
FTS2     2011096 08.41.49.80 STC37128  DFS551I IFP  REGION ICDZIFP1 STARTED
                                                ID=00001 TIME=0841  ICDZ
FTS2     2011096 08.41.49.89 STC37128  DFS551I MESSAGE REGION ICDZMPP1 STARTED
                                                ID=00002 TIME=0841 CLASS=001,000,000,000 ICDZ
FTS2     2011096 08.41.52.04 STC37128  DFS551I IFP  REGION ICDZIFP3 STARTED
                                                ID=00003 TIME=0841  ICDZ
FTS3     2011096 08.47.36.05 STC36951  DFS554A FUWTCIC  00002 FUWTCIC  DFHTWM04(3)
                                                000,0777   2011/096  8:47:36
                                                RTKN=FUWTCIC C79459EA853EFB03 IBB1
FTS3     2011096 08.47.51.05 STC36951  DFS968I  DBD=DI21PART WITHIN PSB=DFHTWM04
                                                 SUCCESSFULLY BACKED OUT IBB1
FTS3     2011096 08.47.51.05 STC36951  DFS980I BACKOUT PROCESSING HAS ENDED FOR DFHTWM04 IBB1
```

From the previous JCL request, it is simple to identify the IMS subsystem messages associated with the transaction failure.

SMF 33-2: APPC/MVS Conversation List report

```
                  Local                  Partner
Start Time        LU Name    Direction   UserId       Job Name   SyncLvl

18:16:47.624543   MVSLU02    Outbound                 TWM#RBAT   Syncpt
                  ** Partner ** TPname=IADGEXP_PROFILE

18:16:47.796620   IADGAPPC   Inbound                  IADGMPPA   Syncpt
                  *** Local *** TPname=IADGEXP_PROFILE
```

APPC requests processed on z/OS are logged to SMF. These requests may end up being processed by an IMS or CICS transaction.

A breakdown of processing inside MVS can identify bottlenecks and other performance related issues.

```
----------- Time -----------  ------ Bytes ------
  InputQ    Process     Total  Received       Sent

            .324737   .324737        68         83


 .166232    .154551   .320783        83         68
```

SMF 79-15: IRLM Long Lock Detection report

Time	Cycle Number	Entry Type	IMS ID	Trancode	PSBname	PST	Reg Typ	Duration	Max Locks
08:51:47.440	25853771	Wait	ISA2	CI1CSAC3	PCM0F0	49		11.534336	0
08:51:47.440	25853771	Block	ISA3	CI1ESAE1	PCM0F0	127		111.149056	44
08:54:36.250	25854107	Wait	ISA3	CI1ESAE5	PCM0F0	102		11.534336	0
08:54:36.250	25854107	Block	ISA4	CI1FSAF3	PCM0F0	40		98.566144	44
15:25:31.580	25900783	Wait	ISA1	CI1ASAA2	PRE0F0	90		11.534336	26
15:25:31.580	25900783	Block	ISA1	CI1ASAA1	PSA0F0	60		11.534336	2

IMS database locks that are held by transactions for an extended period (several seconds) are logged to SMF; and can be analyzed to determine if there is an application problem.

Recovery Token	Resource	CICS Task
CI1CSAC3/C5BF632F08B62783	HNMTRM01	00088603
CI1ESAE1/C5BF62D0456F8085		00036462
CI1ESAE5/C5BF63D077B36503	HNMTRM01	00088040
CI1FSAF3/C5BF637DEF1A2001		00032398
CI1ASAA2/C5BFBB316C472003	SHSECN08	00013029
CI1ASAA1/C5BFBB3166E1F584		00048273

SMF 101: DB2 Thread Accounting Summary report

All transactions that use DB2 cut accounting records that show how DB2 performed in the application and across into DB2.

```
DB2    Plan       ---------- Connection -----------   Thread
SSID   Name       Name     Type                        Count

DB3A   CEXTPGM    IADG     IMS MPP                        68
```

```
                                                          Start: 2010-06-24 15:27:39
                                                          End:   2010-06-24 16:44:00
Class1: Thread Time    Avg: Elapsed=70.43305  CPU= .011006          Interval:         01:16:20
                       Max: Elapsed=2045.732  CPU= .013724          Rate/sec:              < 1
Class2: In-DB2 Time    Avg: Elapsed= .015108  CPU= .006035
                       Max: Elapsed= .033537  CPU= .008234
Class3: Suspend Time   Avg: Total  = .008709  I/O= .000000  Lock/Latch= .002404  Other= .006305
                       Max: Total  = .017377  I/O= .000000  Lock/Latch= .007199  Other= .010178
Buffer Manager Summary Avg: GtPgRq=     7.0  SyPgUp=     3.0
                       Max: GtPgRq=       7  SyPgUp=       3
Locking Summary        Avg: Suspnd=      .0  DeadLk=      .0  TmeOut=      .0  MxPgLk=     1.0
                       Max: Suspnd=       0  DeadLk=       0  TmeOut=       0  MxPgLk=       1
SQL DML Query/Update   Avg: Sel=       .0  Ins=     1.0  Upd=     1.0  Del=     1.0
                       Max: Sel=        0  Ins=       1  Upd=       1  Del=       1
SQL DML 'Other'        Avg: Des=       .0  Pre=      .0  Ope=     1.0  Fet=     9.0  Clo=     1.0
                       Max: Des=        0  Pre=       0  Ope=       1  Fet=       9  Clo=       1
```

SMF 116: WebSphere MQ Accounting reports

```
MQACCT4  Printed at 10:50:30  2/03/2011  Data from 09:00:40 03/03/2010 to 09:59:52 03/03/2010


SSID: SYSB  Type: CICS     Name: CICSSYSP  Tran: TRTI      Threads:         2
  Other     Avg Count                6.0   Avg Elapsed    0.000116  Avg CPU      0.000112

  In-MQ Time (Total)      Elapsed:  0.000233   CPU:   0.000224
  In-MQ Time (Average)    Elapsed:  0.000116   CPU:   0.000112

SSID: SYSB  Type: CICS     Name: CICSSYSP  Tran: TRTL      Threads:         4

  In-MQ Time (Total)      Elapsed:         0   CPU:          0
  In-MQ Time (Average)    Elapsed:         0   CPU:          0

  Queue: APPLICATION_A_REQUEST
  QType: LOCAL    IType: NONE       GDisp: Q_MGR    QCount:         4

              Count     Elapsed      CPU      Susp Elp  JnlWrt Elp   PS Req's  PS Rd Elp   Ex
            _________  _________  _________  _________  __________  _________  _________  ___
    OPEN          15.0   0.000019   0.000009
    CLOSE         15.0   0.000002   0.000002
    INQ           15.0   0.000009   0.000008

    In-MQ Time (Total)     Elapsed: 0.001861   CPU: 0.001222
    In-MQ Time (Average)   Elapsed: 0.000465   CPU: 0.000305
```

Detailed MQ accounting can be requested to show the impact of MQ on transaction performance.

SMF 30: Address Space Activity report

----------Interval----------			System			---------- CPU ----------		
Start Date/Time	Duration	Type	Name	Jobname	Comp	TCB	SRB	%CPU
2011-03-04 15:37:01	00:01	STE	MVS1	IMSCTL1	0004	0.445357	0.023205	15.1
2011-03-04 15:37:01	00:01	STT	MVS1	IMSCTL2	0004	0.445357	0.023205	15.0
2011-03-04 15:37:06	00:01	STE	MVS1	IMSCTL3	0004	0.404175	0.011985	19.3
2011-03-04 15:37:06	00:01	STT	MVS1	IMSCTL4	0004	0.404175	0.011985	19.2
2011-03-04 15:43:24	00:01	STE	MVS1	IMSCTL5	0004	0.904357	0.046920	18.9
2011-03-04 15:43:24	00:01	STT	MVS1	IMSVTL6	0004	0.904357	0.046920	18.9
2011-03-04 15:44:05	00:01	INT	MVS2	CICSPR1	0000	7.966200	0.241357	15.2
2011-03-04 15:44:58	00:01	INT	MVS2	CICSPR2	0000	0.141780	0.004335	11.2

At regular intervals, every address space can be monitored for unusual spikes (or lulls) in system-related resource consumption including CPU and I/O.

EXCPs	----Storage-----			-Paging/Sec-		
/Sec	<16M	>16M	64bit	In	Out	Swap
477	1M	11M	0M	0	0	0
476	1M	11M	0M	0	0	0
309	1M	11M	0M	0	0	0
309	1M	11M	0M	0	0	0
590	1M	11M	0M	0	0	0
589	1M	11M	0M	0	0	0
140	4M	1366M	0M	0	0	0
100	0M	12M	0M	0	0	0

SMF 70-1: RMF Processor Activity report

- Interval Start -- Date	Time	System Name	- %CPU Busy - LPAR	MVS	IO Rate
2010-08-17	23:45:00	FTS1	68.75	87.42	2282.4
		FTS2	4.07	4.50	9.4
		FTS3	4.03	4.39	12.6
2010-08-18	00:00:00	FTS1	61.15	72.16	1934.8
		FTS2	4.15	4.72	8.4
		FTS3	3.88	4.41	11.7

CPU constraints are one of the most common causes of a slowdown in performance, and often has flow-on effects including contention.

CPU Busy and ***IO Rate*** are the classical system performance indicators.

Look for spikes that might indicate a slowdown.

---------- Number of Address Spaces ----------							
---- In ---		-In Ready-		-Out Ready-		-Out Wait-	
Avg	Max	Avg	Max	Avg	Max	Avg	Max
151	156	7	86	0	1	0	0
77	80	1	15	0	0	0	0
69	72	1	9	0	0	0	0

Out Ready identifies the number of address spaces waiting for dispatching on the CPU

Summary: Transaction Analysis Workbench

- Companion to the popular IMS and CICS Performance Analyzer tools, allowing systems programmers to look outside of IMS and CICS for the source of problems
- Exploits the wealth of system performance and activity information available in SMF, OPERLOG, and event traces
- Allows medium-skilled analysts to perform expert analysis of their enterprise

More information

- IBM DB2 and IMS Tools website: www.ibm.com/software/data/db2imstools/
- IBM Transaction Analysis Workbench for z/OS: www.ibm.com/software/data/db2imstools/imstools/trans-analysis/
- Jim Martin, US Representative, Fundi Software: jim_martin@fundi.com.au

Thank you!

Your feedback is important to us.

Please complete the evaluation.