IBM Transaction Analysis Workbench for z/OS

Lab

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This edition applies to Version 1 Release 1 of Transaction Analysis Workbench for z/OS® with the PTF for APAR PM26786 (“SPE”).

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Introduction

This lab is based on the tutorials in the *Transaction Analysis Workbench User's Guide*. The tutorials have been altered for this lab to take advantage of predefined sessions (and other definitions) available to IMPOT*nn* (*nn*: 01 to 50) user IDs on the Fundi Software demonstration system (FTSD).

Note: The CICS® DBCTL scenario requires IMS™ V11 with the PTF for APAR PM24076 (to enable IMS Performance Analyzer reports to show CICS transaction names and task numbers.)

Tutorial: Creating a session and browsing a log

This tutorial shows you how to create a session for a problem, manually specify a log file for the problem, and then browse the log file.

About this task

This tutorial is intended for first-time users.

Procedure

1. Start the Transaction Analysis Workbench dialog:
   a. On the ISPF primary option menu, select option 6 **Command**.
   b. Enter the following command:

      ```
      EX 'PRODUCTS.FUW.SFUWEXEC(FUWOREXX)' 'PRODUCTS.FUW'
      ```

   The following steps register (create) a session.
2. On the Transaction Analysis Workbench primary option menu, select option 1 **Sessions**.

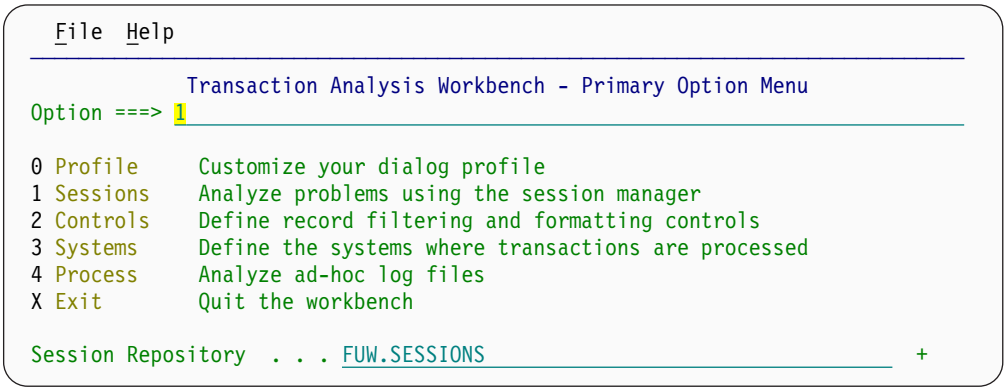

Figure 1. Panel: Transaction Analysis Workbench primary option menu

   The Session Manager panel is displayed. This panel shows the list of existing sessions. To scroll the list horizontally and see more columns, press the Right function key (F11).
3. Enter **NEW** on the command line.

```
  File  Help
──────────────────────────────────────────────────────────────────────────────
                              Session Manager           Row 1 of 11 More: < >
Command ===> new                                          Scroll ===> PAGE

Select a session or use the NEW command to register a new session.

/  Key       Status  Description
_  00000001  OPEN    Tutorial: Creating a session
_  00000002  OPEN    Tutorial: Batch report
_  00000003  OPEN    Tutorial: IMS log selection
_  00000004  OPEN    Tutorial: DB2 log selection
_  00000005  OPEN    Tutorial: CICS DB2
_  00000006  OPEN    Tutorial: CICS DBCTL
_  00000007  OPEN    Tutorial: IMS DB2
...
```

Figure 2. Panel: Session Manager (list of existing sessions)

The Problem Details panel for the new session is displayed.

4. Specify a summary such as `Getting started`. Leave the other problem details blank or accept their default values.

```
  File  Help
──────────────────────────────────────────────────────────────────────────────
                              Problem Details                Row 1 to 1 of 1
Command ===>                                                 Scroll ===> PAGE

Key  . . . . . : 00000099
Summary  . . . . Getting started                Description...
Severity . . . . _
Reference  . . . _____________    ── When problem occurred ──
Reported by  . . _____________         YYYY-MM-DD  HH.MM.SS.TH
Assigned to  . . _____________    From ____________  ____________
Status . . . . . OPEN            To   ____________  ____________  Zone . . LOCAL

Systems where problem occurred (maximum of 32):

/  System +   Type +

__ ________   ________
****************************** Bottom of data ********************************
```

Figure 3. Panel: Problem Details

The session manager assigns a numeric key to your new session. The assigned value depends on how many sessions are already in your repository. The example key used in the figures shown here is 00000099.

5. Press the Exit function key (F3) to save the session.

   The menu for the new session is displayed. The menu title shows the session key.

   The following steps select a log file for the new session.

6. On the session menu, select option 2 **Files**.

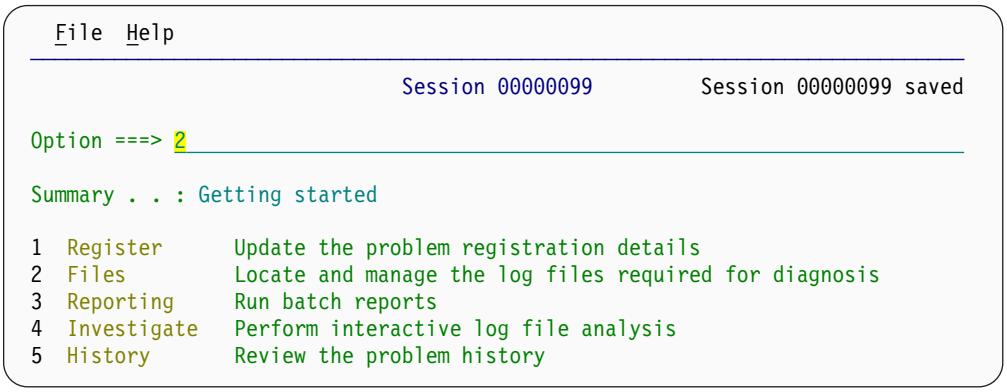

Figure 4. Panel: Session menu

The Locate and Manage Log Files panel is displayed.

7. Manually specify your SMF file:
   a. Select option 1 **Manually specify...** The Specify File Details pop-up window opens.
   b. Specify the following file details:

Field	Value	Notes
System Name	The SYSID of the MVS™ system that created the SMF file: MVSA	The system name does not have to match an MVS system definition. That is, you do not need to have previously defined this MVS system to Transaction Analysis Workbench under primary menu option 3 **Systems**. If you do want to select from the list of systems defined to Transaction Analysis Workbench, tab to the **System Name** field, and then press the Prompt function key (F4).
IMS Release	Blank	Required only for IMS log files.
System Type	IMAGE	IMAGE is an abbreviation of “MVS image”.
File Type	SMF	
File is a log stream	Unselected	In this example, we are using a data set, not a log stream.
Data Set Name	The fully qualified data set name of the SMF file, enclosed in single quotes: 'IMPOT01.FTS1.SMF'	If you omit the enclosing single quotes and your TSO user profile specifies a prefix to be used as the first qualifier of all non-fully-qualified data set names, that prefix is added to the data set name.

Tip: A plus sign (+) next to a field indicates that you can press the Prompt function key (F4) to select from a pop-up window that lists values for that field.

```
  File  Help
 ____________________________________________________________________________
                         Locate and Manage Log Files          Row 1 to 1 of 1
Command ===>                                                 Scroll ===> PAGE

Select an option to add log files to the session then press Enter
1  1. Manually specify the log files required for analysis
   2. Run automated file selection to locate the required log files
```

```
   File  Help
  ____________________________________________________________________________
                            Specify File Details
  Command ===> ____________________________________________________________

  Specify file details then press EXIT to save.

  System Name . . . MVSA     +  IMS Release ___  +
  System Type . . . IMAGE    +
  File Type . . . . SMF      +  _  File is a log stream

  Data Set Name . . 'IMPOT01.FTS1.SMF'_____________________________
```

Figure 5. Panel: Manually specifying an SMF file for a session (1 of 2)

c. Press the Exit function key (F3). The pop-up window closes.

The list at the bottom of the Locate and Manage Log Files panel shows the details of the file that you have just specified.

```
  File  Help
 ____________________________________________________________________________
                         Locate and Manage Log Files          Row 1 to 1 of 1
Command ===> ____________________________________________ Scroll ===> PAGE

Select an option to add log files to the session then press Enter
_  1. Manually specify the log files required for analysis
   2. Run automated file selection to locate the required log files

Automated File Selection:          ── Locate Files Interval ──
  System . . . ________  +              YYYY-MM-DD  HH.MM.SS.TH
  Type . . . . ________  +         From __________  ___________
                                   To   __________  ___________
Log Files:
                                                      ─── System ─── File
/        Data Set Name                                Name     Type    Type
________ IMPOT01.FTS1.SMF                             MVSA     IMAGE   SMF
******************************* Bottom of data ********************************
```

Figure 6. Panel: Manually specifying an SMF file for a session (2 of 2)

8. Press the the Exit function key (F3) to return to the session menu.
9. On the session menu, select option 4 **Investigate**.

   The Investigate panel is displayed. Use this panel to select which log files you want to browse, and whether you want to browse entire files starting at their first record or a *time slice* (a specific time period across one or more log files). Time slicing improves performance when browsing large log files.

The **Time Slice** heading shows the start and duration of the time slice, and whether time slicing is on or off.

For a new session, the time slice start time and date is set to the start time and date of the log file with the latest (most recent) start, and the time slice duration is set to five minutes.

The **Coverage** column indicates how much of the time slice each file covers.

The following figure illustrates the concept of time slice coverage.

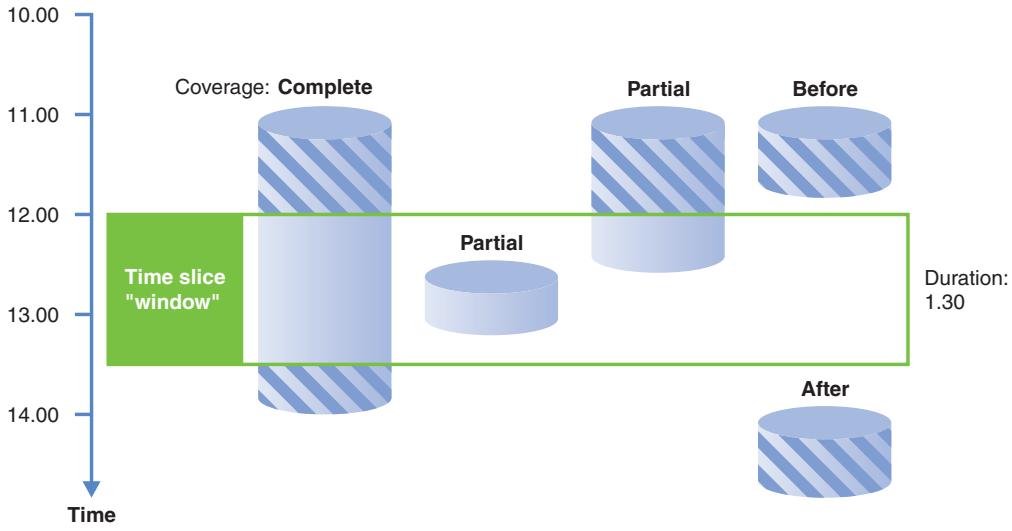

Figure 7. Time slice coverage provided by log files

For this tutorial, we will use the default time slice.

10. If the **Time Slice** heading shows **(OFF)**, enter `SLICE` on the command line to switch time slicing on.
11. Enter **S** on the first line under the **/** heading.

    Entering **S** in this top line shows a merged view of all log files for the session. In this example, we have only one file, so there is no difference between entering **S** on this line, or the line next to our single file.

    Tip: To set the time slice to the start and duration of a particular log file, enter **T** next to the file.

```
  File  Menu  Edit  Help
 ____________________________________________________________________________
                                 Time Slicing            Row 1 of 1 More: < >
Command ===> ____________________________________________________ Scroll ===> PAGE

                 ______________ Time Slice (ON) ________________
                 Time             Date            Duration
                 HH.MM.SS.thmiju  YYYY-MM-DD      HH.MM.SS  Zone   Filter +
                 13.10.07.840000  2005-01-15      00.05.00  LOCAL  ________
/
s________  Type  Start Time       Date            Duration         Coverage
________   SMF   13.10.07.840000  2005-01-15 Sat    8 days         COMPLETE
******************************* Bottom of data ********************************
```

Figure 8. Panel: Investigate (Time Slicing)

The log records are displayed in the log browser. Your screen should look similar to the following figure, although the details will depend on your particular log file.

```
  File  Menu  Mode  Filter  Time  Labels  Options  Help
-------------------------------------------------------------------------------
BROWSE    IMPOT01.FTS1.SMF                          Record 00000001 More: < >
Command ===> _____________________________________________ Scroll ===> CSR
   Slice . . Duration  00.05.00     Date  2005-01-15     Time  13.10.07.840000
   Code Description  < 00.05.00.000000 >  2005-01-15 Saturday  Time (LOCAL)
/  ---- ------------------------------------------------------ ---------------
__ 6E02 CICS TS Statistics                                     13.10.07.840000
   -------------------------------------------------------------------------
__ 1E   Job Step Total                                         13.10.15.940000
        TranCode=SMFDUMP Program=SMFDUMP Userid=GOD JOBID=JOB00054
   -------------------------------------------------------------------------
__ 1E   Job Termination                                        13.10.15.950000
        TranCode=SMFDUMP Userid=GOD JOBID=JOB00054
   -------------------------------------------------------------------------
__ 6E01 CICS Monitoring                                        13.10.28.120000
   -------------------------------------------------------------------------
s_ 6E13 CICS Transaction                                       21.08.17.936283
        TranCode=WMSC Program=EYU9XLOP Userid=CCVT31C
        RecToken=CCVT31C/BC6C720FB1C96261 Resp=0.001145 CPU=0.000016 File=4
        Task=29649
   -------------------------------------------------------------------------
__ 6E13 CICS Transaction                                       21.08.27.939226
        TranCode=WMSC Program=EYU9XLOP Userid=CCVT31C
        RecToken=CCVT31C/BC6C72193BE94440 Resp=0.001134 CPU=0.000016 File=4
        Task=29650
   -------------------------------------------------------------------------
__ 6E13 CICS Transaction                                       21.08.37.941710
        TranCode=WMSC Program=EYU9XLOP Userid=CCVT31C
        RecToken=CCVT31C/BC6C7222C5ECCA63 Resp=0.001250 CPU=0.000016 File=4
        Task=29651
   -------------------------------------------------------------------------
```

Figure 9. Panel: Browsing an SMF file

12. Browse the log.
    - To scroll forward or backward through the records, press the Forward function key (F8) or the Backward function key (F7).
    - To cycle through the four views on this log browser panel, press the Left function key (F10) or the Right function key (F11). The different views show or hide global fields, and show either the **Time** column or the **LSN** (log record sequence number) column.
    - To view all the fields of a particular record, enter **S** next to the record.
13. Press the Exit function key (F3) until you return to the Transaction Analysis Workbench primary option menu.

    You have completed this tutorial. Please proceed to the next tutorial.

Tutorial: Submitting a batch report

This tutorial shows you how to create a batch report for a session.

Procedure

1. On the Transaction Analysis Workbench primary option menu, select option 1 **Sessions**.
2. Select the session that you created previously.

```
  File  Help
──────────────────────────────────────────────────────────────────────────────
                              Session Manager                 Row 1 to 2 of 2
Command ===> ____________________________________________ Scroll ===> PAGE

Select a session or use the NEW command to register a new session.

/  Key       Status  Description
_  00000001  OPEN    CPU delay in DBCTL
s  00000099  OPEN    Getting started
****************************** Bottom of data ********************************
```

Figure 10. Panel: Session Manager: selecting an existing session

3. On the session menu, select option 3 **Reporting**.
   The Reporting menu is displayed.
4. Select option 3 **SMF**. This option uses SMF files for input.

```
  File  Help
──────────────────────────────────────────────────────────────────────────────
                                 Reporting
Option ===> 3 ___________________________________________________________

Select a reporting option then press Enter.

1  IMS      Transaction and system analysis using IMS PA
2  CICS     Transaction and system analysis using CICS PA
3  SMF      z/OS and subsystem analysis
4  OPERLOG  Sysplex operations log (SYSLOG)
```

Figure 11. Panel: Reporting menu

5. On the Reporting - z/OS and Subsystem Analysis panel, select the **Address space accounting** report by entering a forward slash (/) next to it. Do not press Enter yet. For this tutorial, we will leave the **Report Interval** blank to process all of the records in the file that we are about to select, regardless of date.
6. Select the SMF file:
   a. Select option 2 **SMF File**.
   b. Tab to the **SMF File** field.
   c. Press the Prompt function key (F4). A pop-up window opens, which lists the SMF files that are associated with the session.

d. Tab to the SMF file that you specified in the previous tutorial, and then press Enter. The pop-up window closes. The name of the SMF file that you selected is displayed in the **SMF File** field.

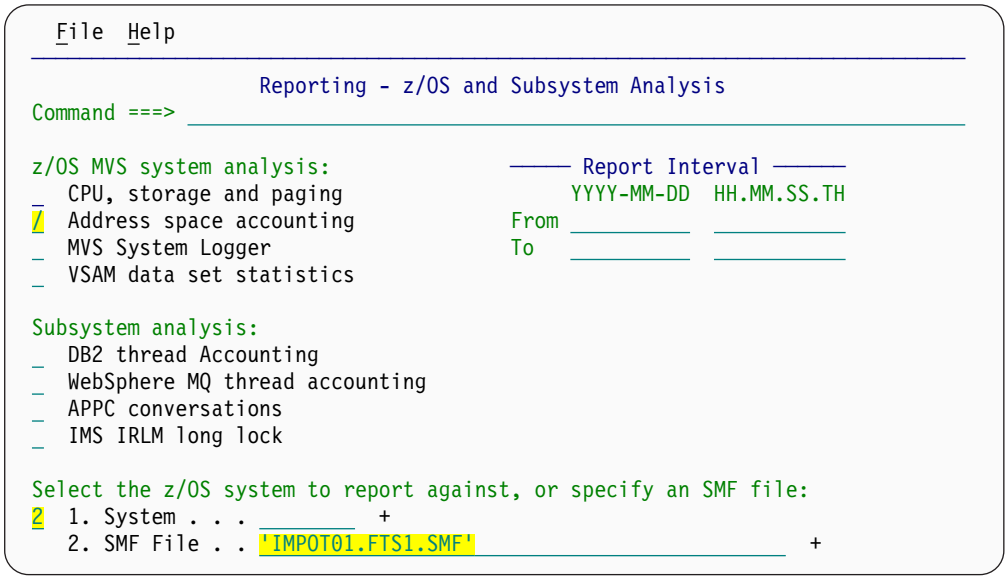

Figure 12. Panel: Selecting a report for an SMF file

7. Press Enter twice to generate the JCL for the report. The JCL is displayed in the ISPF editor.

   Tip: Look at the REPORT command in the in-stream SYSIN data set. The OUTPUT parameter specifies the ddname of the data set in the job output that will contain the report.
8. On the ISPF editor command line, enter **SUB** to submit the job.

```
  File  Edit  Edit_Settings  Menu  Utilities  Compilers  Test  Help
 ------------------------------------------------------------------------------
 EDIT       IMPOTnn.ISP01581.SPFTEMP1.CNTL                 Columns 00001 00072
 Command ===> sub                                           Scroll ===> PAGE
 ****** ***************************** Top of Data ******************************
 000001 //IMPOTnn JOB (ACCOUNT),'NAME'
 000002 //*
 000003 //FUWBATCH EXEC PGM=FUWBATCH
 000004 //*
 000005 //STEPLIB  DD  DSN=PRODUCTS.FUW.SFUWLINK,
 000006 //             DISP=SHR
 000007 //SYSPRINT DD  SYSOUT=*                   Messages
 000008 //JOBSTATS DD  SYSOUT=*                   Address Space accounting
 000009 //* SMF files
 000010 //SMFIN001 DD  DSN=IMPOT01.FTS1.SMF,
 000011 //             DISP=SHR
 000012 //SYSIN    DD  *                          Command input
 000013 REPORT SMF(30)    OUTPUT(JOBSTATS)     /* Address Space accounting
 000014 CODE(SMF,30.)                          /* Include...
 000015 COND PROGRAM EQ 'DFH*'                 /* ...CICS address spaces
 000016 COND PROGRAM EQ 'DFS*'                 /* ...IMS address spaces
 000017 COND PROGRAM EQ 'BPE*'                 /* ...IMS address spaces
 000018 COND PROGRAM EQ 'DSNYASCP'             /* ...DB2 address spaces
 000019 COND PROGRAM EQ 'DXRRLM00'             /* ...IRLM address spaces
 000020 /*
 ****** **************************** Bottom of Data ****************************
```

Figure 13. Panel: Submitting generated JCL from the ISPF editor

9. Press the Exit function key (F3) to exit the ISPF editor.

   A pop-up window opens, which offers you the option to create a note, which will save the JCL to the session history.

10. Press Enter to save the JCL for later reuse.

    Note: To view any saved JCL for a session, select option 5 **History** on the session menu.

11. Split your screen, start SDSF, view the job output, and then exit the split screen.

    The following figure shows an example report.

```
V1R1M0                                    Transaction Analysis Workbench                                  Page   1
                                        SMF Type=30 Address Space Activity

------------Interval-------------   System                          ---------- CPU ----------  EXCPs  ----Storage----- -Paging/Sec-
Start Date/Time      Duration Typ    Name   Jobname  Stepname Comp        TCB       SRB  %CPU  /Sec   <16M  >16M 64bit  In Out Swap

2005-01-14 22:15:15  00:24:27 STT  FTS1     CCVWSRP  MAS      0000 1424.32405 29.798010   1.7      0    6M  106M    0M   0   0    0
2005-01-15 22:42:52  00:23:11 STT  FTS1     CCVWSRP  MAS      0000 133.064250  5.041900   9.9      0    6M  105M    0M   0   0    0
2005-01-16 05:14:32  00:00:00 STT  FTS1     CCVCPSMB CSDXTRCT 0000   0.756920  0.008890 197.4      0    1M   11M    0M   0   0    0
2005-01-16 05:20:03  00:00:00 STT  FTS1     CCVCPSMB CSDXTRCT 0008   0.378460  0.006350 118.3   5943    1M   11M    0M   0   0    0
2005-01-16 05:20:45  00:00:00 STT  FTS1     CCVCPSMB CSDXTRCT 0000   0.528320  0.008890 159.3      0    1M   11M    0M   0   0    0
2005-01-16 05:21:54  00:00:00 STT  FTS1     CCVCPSMB CSDXTRCT 0000   0.563880  0.007620 165.5      0    1M   11M    0M   0   0    0
2005-01-16 05:22:44  00:00:00 STT  FTS1     CCVCPSMB CSDXTRCT 0000   0.466090  0.007620 167.3      0    1M   11M    0M   0   0    0
2005-01-16 05:23:40  00:00:00 STT  FTS1     CCVCPSMB CSDXTRCT 0000   1.452880  0.007620 328.4      0    1M   11M    0M   0   0    0
2005-01-16 05:32:12  00:00:00 STT  FTS1     CCVCPSMB CSDXTRCT 0000   0.463550  0.007620 143.0      0    1M   11M    0M   0   0    0
2005-01-16 05:48:07  00:00:00 STT  FTS1     CCVCPSMB CSDXTRCT 0000   1.144270  0.005080 283.3      0    1M   11M    0M   0   0    0
2005-01-16 05:55:46  00:00:00 STT  FTS1     CCVCPSMB CSDXTRCT 0000   0.676910  0.007620 193.2      0    1M   11M    0M   0   0    0
2005-01-16 05:56:13  00:00:00 STT  FTS1     CCVCPSMB CSDXTRCT 0000   0.427990  0.007620 135.2      0    1M   11M    0M   0   0    0
⋮
```

Figure 14. Example Address Space Activity report

12. Press the Exit function key (F3) until you return to the Transaction Analysis Workbench primary option menu.

    You have completed this tutorial. Please proceed to the next tutorial.

Tutorial: Automating selection of IMS logs

This tutorial shows you how to define an IMS system to Transaction Analysis Workbench, and then use that system definition to locate the related IMS log files (SLDS or OLDS) for a particular time interval.

Before you begin

The following prerequisite steps have already been performed for this lab environment. In a different system environment, you would need to perform these steps before you begin the tutorial.

- Ensure that IMS is installed. The Transaction Analysis Workbench automated file selection utility uses the IMS database recovery (DBRC) API to read RECON data sets.
- Determine the time interval (the "from" and "to" dates and times) of the IMS logs that you want to analyze.
- Obtain the following details about the IMS system that created the logs.
  - IMS subsystem identifier (IMSID)
  - IMS version
  - RESLIB data set name
  - Either of the following details:
    - Two or three IMS RECON data set names
    - MVS dynamic allocation (MDA) data set name

  If you do not know these details, contact your IMS system administrator.

Procedure

1. On the Transaction Analysis Workbench primary option menu, select option 3 **Systems**. The System Definitions Menu is displayed.
2. Select option 1 **IMS**.

```
  File  Help
                          System Definitions Menu
Command ===> ____________________________________________________

Select the type of system to display then press Enter.

1  1. IMS
   2. CICS
   3. DB2
   4. WebSphere MQ
   5. z/OS Image

System definition repositories:
  IMS  . . . . . . . . FUW.IPITABL                                  +
  CICS, DB2, more  . . FUW.HDB.REGISTER                             +
```

Figure 15. Panel: System Definitions Menu

The System Definitions panel is displayed. This panel lists any existing IMS and IMS Connect system definitions in the repository.

For this tutorial, we have predefined an IMS system, IADJ.

3. Enter **S** next to IADJ and review the DBRC settings for the definition. Skip to step 7 on page 15, bypassing the steps that you would follow to create a definition.

   Steps 4 to 6 describe how to create an IMS system definition. These steps are included here for illustration purposes only; for this tutorial, use the predefined system.

4. Enter **NEW** on the command line.

```
  File  Menu  Edit  Help
 ____________________________________________________________________________
                              System Definitions          Row 1 of 1 More: < >
Command ===> new                                           Scroll ===> PAGE

Specify IMS and Connect systems.

/ System   Type     VRM +              Description
_ IADJ     IMS      101   IMS V10 demonstration system
******************************* Bottom of data ********************************
```

Figure 16. Panel: System Definitions (IMS and IMS Connect)

   The IMS Subsystem panel is displayed.

5. Enter the details that you have obtained for the IMS system:
   a. In the fields at the top of the panel, specify the following details:
      - IMS subsystem ID
      - IMS version
      - A description of the IMS subsystem (this description is used only for selection lists in the dialog; it does not appear in reports)
      - RESLIB data set name
   b. Select the **DBRC Settings** view.
   c. Specify either of the following details:
      - Two or three IMS RECON data set names
      - MVS dynamic allocation (MDA) data set name
6. Select the **Log Data Sets are Cataloged** option by entering a forward slash (/) next to it.

   This step assumes that you want to use cataloged, primary system log data sets (SLDS). If the SLDS are uncataloged, if you want to use secondary SLDS, or if you want to use online log data sets (OLDS) instead of SLDS, see the online help by pressing the Help function key (F1) on the related options.

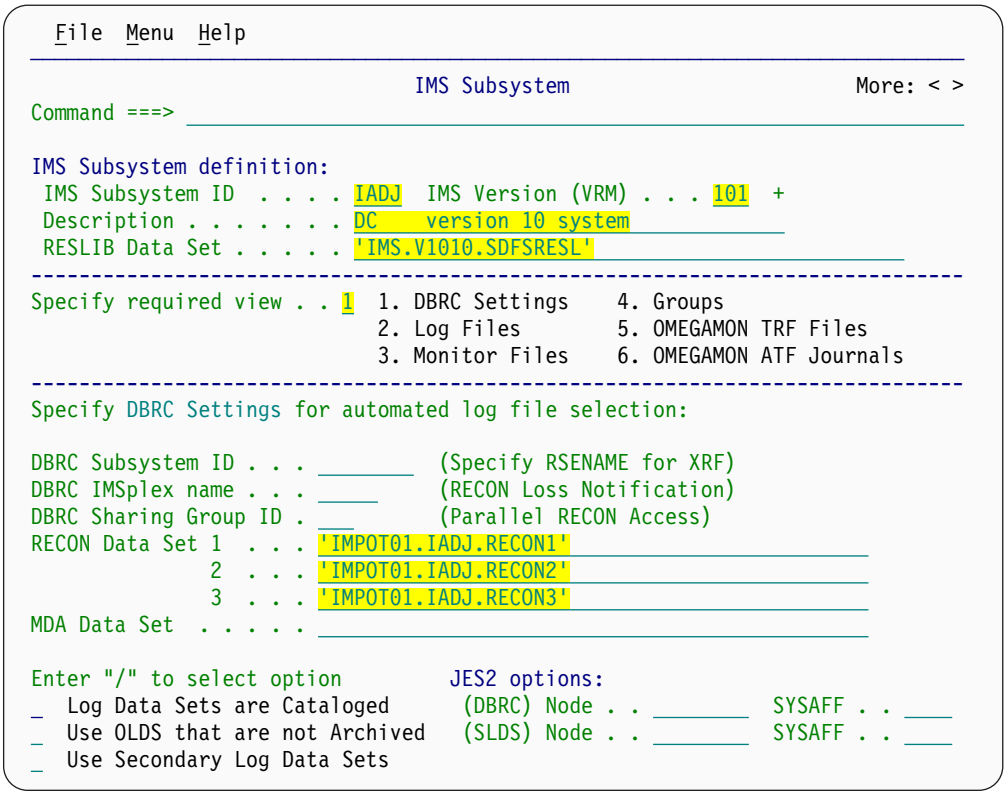

Figure 17. Panel: IMS Subsystem: definition with DBRC settings for automated file selection

7. Press the Exit function key (F3) to exit the IMS Subsystem panel. Press the Exit function key (F3) repeatedly until you return to the Transaction Analysis Workbench primary option menu.

   The following steps use the IMS system definition that you have just created to automate selection of the related log files for a particular time interval, and then add those selected files to a problem session.
8. On the primary option menu, select option 1 **Sessions**.
9. On the command line of the Session Manager panel, enter **NEW** to create a new session.
10. On the Problem Details panel for the new session, specify the following details (use the values highlighted in the following figure):
    - A summary (for example, `IMS log selection`).
    - The from and to dates and times of the period when the problem occurred.

      Tip: When specifying times, you can omit trailing parts that are all zeros. For example, to specify 5 a.m., instead of entering `05.00.00.00`, you can enter just the hour part, `05`.
    - The IMS system.

```
  File  Help
 ____________________________________________________________________________
                              Problem Details                 Row 1 to 1 of 1
Command ===> ____________________________________________________ Scroll ===> PAGE

Key  . . . . . : 00000100
Summary  . . . . IMS log selection_____________  Description...
Severity . . . . _
Reference  . . . ___________   ── When problem occurred ──
Reported by  . . ___________        YYYY-MM-DD  HH.MM.SS.TH
Assigned to  . . ___________   From 2010-01-28  05.00.00.00
Status . . . . . OPEN          To   2010-01-28  06.00.00.00  Zone . . LOCAL

Systems where problem occurred (maximum of 32):

/  System +   Type +
__ IADJ____   IMS_____
******************************* Bottom of data ********************************
```

Figure 18. Panel: Problem Details: session that refers to an IMS system

11. Press the Exit function key (F3) to save the new session. The session menu is displayed.
12. Select option 2 **Files**.
13. On the Locate and Manage Log Files panel, run automated file selection:
    a. Select option 2 **Run automated file selection...** Do not press Enter yet.
    b. Under the heading **Automated file selection**, specify the system that you defined previously. By default, automated file selection spans the same date and time interval as the problem session; however, you can override these default values.

```
  File  Help
 ____________________________________________________________________________
                        Locate and Manage Log Files
Command ===> ____________________________________________________ Scroll ===> PAGE

Select an option then press Enter
2  1. Manually specify the log files required for analysis
   2. Run automated file selection to locate the required log files

Automated file selection:          ─── Problem Interval ─────
  System . . . IADJ____   +             YYYY-MM-DD  HH.MM.SS.TH
  Type . . . . IMS_____   +        From 2010-01-28  05.00.00.00
                                   To   2010-01-28  06.00.00.00

Log Files:
                                                     ─── System ─── File
/        Data Set Name                               Name     Type    Type
******************************* Bottom of data ********************************
```

Figure 19. Panel: Running automated file selection for an IMS system

    c. Press Enter to generate the JCL for the automated file selection. The JCL is displayed in the ISPF editor.
14. On the ISPF editor command line, enter **SUB** to submit the job.

```
  File  Edit  Edit_Settings  Menu  Utilities  Compilers  Test  Help
EDIT       IMPOTnn.ISP31181.SPFTEMP1.CNTL                 Columns 00001 00072
Command ===> sub                                           Scroll ===> PAGE
****** ***************************** Top of Data ******************************
000001 //IMPOTnn JOB (ACCOUNT),'NAME'
000002 //*
000003 //FUWFILES EXEC PGM=FUWFILES
000004 //*
000005 //STEPLIB  DD  DSN=PRODUCTS.FUW.SFUWLINK,
000006 //             DISP=SHR
000007 //FUWPROBR DD  DSN=IMPOTnn.FUW.SESSIONS,
000008 //             DISP=SHR
000009 //SYSPRINT DD  SYSOUT=*
000010 //FUWPRINT DD  SYSOUT=*
000011 //FUWWRK1  DD  UNIT=SYSDA,SPACE=(TRK,(1,1,1))
000012 //FUWWRK2  DD  UNIT=SYSDA,SPACE=(CYL,(5,5))
000013 //SYSIN    DD  UNIT=SYSDA,SPACE=(TRK,(3,1))
000014 //FUWPARM  DD  *
000015 ZONE=LOCAL
000016 PROBLEM=00000100
000017 FROM=(2010-01-28,05.00.00.00)
000018 TO=(2010-01-28,06.00.00.00)
000019 IMSID=IADJ
000020   VRM=101
000021   RESLIB=IMS.V1010.SDFSRESL
000022   RECON1=IMPOT01.IADJ.RECON1
000023   RECON2=IMPOT01.IADJ.RECON2
000024   RECON3=IMPOT01.IADJ.RECON3
****** **************************** Bottom of Data ****************************
```

Figure 20. Panel: ISPF Edit session showing generated JCL for automated selection of IMS logs

15. Press the Exit function key (F3) to exit the ISPF editor and return to the Locate and Manage Log Files panel.
16. When the job is complete, enter **REFRESH** on the command line to refresh the list of log files and to see any files added by the job.

    Note: If the job completed with return code 4, it might mean that the log files did not completely cover the specified time range. For details, see the FUWPRINT job output data set.

    You can now browse these log files, or use them to generate batch reports or extracts.
17. To browse one of these log files, enter **S** next to the file.

```
  File  Help
──────────────────────────────────────────────────────────────────────────────
                        Locate and Manage Log Files          Row 1 to 5 of 5
Command ===> ____________________________________________ Scroll ===> PAGE

Select an option to add log files to the session then press Enter
_  1. Manually specify the log files required for analysis
   2. Run automated file selection to locate the required log files

Automated File Selection:          ── Locate Files Interval ──
  System . . . IADJ     +               YYYY-MM-DD  HH.MM.SS.TH
  Type . . . . IMS      +           From 2010-01-28  05.00.00.00
                                    To   2010-01-28  06.00.00.00
Log Files:
                                                    ─── System ─── File
/        Data Set Name                              Name     Type    Type
s_______ IMPOT01.IADJ.SLDSP.IMSLOG.G0106V00         IADJ     IMS     LOG
________ IMPOT01.IADJ.SLDSP.IMSLOG.G0107V00         IADJ     IMS     LOG
________ IMPOT01.IADJ.SLDSP.IMSLOG.G0108V00         IADJ     IMS     LOG
________ IMPOT01.IADJ.SLDSP.IMSLOG.G0109V00         IADJ     IMS     LOG
________ IMPOT01.IADJ.SLDSP.IMSLOG.G0110V00         IADJ     IMS     LOG

****************************** Bottom of data ********************************
```

Figure 21. Panel: IMS log files located by automated file selection

The log file opens in the log browser.

```
  File  Menu  Mode  Filter  Time  Labels  Options  Help
──────────────────────────────────────────────────────────────────────────────
BROWSE    IMPOT01.IADJ.SLDSP.IMSLOG.G0106V00         Record 00000001 More: < >
Command ===> ____________________________________________ Scroll ===> PAGE
   Slice . . Duration  00.05.00     Date  2010-01-28     Time  04.59.36.077898
   Code Description  < 00.05.00.000000 >  2010-01-28 Thursday  Time (LOCAL)
/  ---- ------------------------------------------------- ----------------
__ 01   Input Message                                          04.59.36.077898
        UTC=04.59.36.077877 TranCode=PART Userid=CEX001 LTerm=8945
        Terminal=8945 OrgUOWID=IADJ/C573BF6D08DFF420 Port=8945
        LogToken=C573BF6D08957F61 SSN=018A Socket=TRAN CM=1 SL=0 Source=Connect
   ------------------------------------------------------------------------
__ 35   Input Message Enqueue                                  04.59.36.077922
        UTC=04.59.36.077877 TranCode=PART Userid=CEX001 LTerm=8945
        Terminal=8945 OrgUOWID=IADJ/C573BF6D08DFF420 Port=8945
        LogToken=C573BF6D08957F61 SSN=018A Socket=TRAN CM=1 SL=0
   ------------------------------------------------------------------------
__ 08   Application Start                                      04.59.36.078467
        UTC=04.59.36.078460 TranCode=PART Region=0003
        RecToken=IADJ/000019AD00000000 RegTyp=MPP TClass=01 TPrty=07
   ------------------------------------------------------------------------
__ 5607 Start of UOR                                           04.59.36.078468
        UTC=10.04.52.461463 Program=DFSSAM02 Region=0003 IMSID=IADJ
        RecToken=IADJ/000019AD00000000
   ------------------------------------------------------------------------
__ 31   DLI GU                                                 04.59.36.078505
        UTC=04.59.36.078501 TranCode=PART Region=0003
        OrgUOWID=IADJ/C573BF6D08DFF420 RecToken=IADJ/000019AD00000000
   ------------------------------------------------------------------------
__ 01   Input Message                                          04.59.36.092619
        UTC=04.59.36.092198 TranCode=PART Userid=CEX001 LTerm=8946
```

Figure 22. Panel: Browsing an IMS log

18. Press the Exit function key (F3) until you return to the Transaction Analysis Workbench primary option menu.

    You have completed this tutorial. Please proceed to the next tutorial.

Tutorial: Automating selection of DB2 logs

This tutorial shows you how to define a DB2® system to Transaction Analysis Workbench, and then use that system definition to locate the related DB2 log files for a particular time interval.

Before you begin

The following prerequisite steps have already been performed for this lab environment. In a different system environment, you would need to perform these steps before you begin the tutorial.

- Ensure that DB2 is installed. To locate DB2 log files, the Transaction Analysis Workbench automated file selection utility uses output from the DB2-supplied print log map utility, DSNJU004.
- Determine the time interval (the "from" and "to" dates and times) of the DB2 logs that you want to analyze.
- Obtain the following details about the DB2 system that created the logs. If you already have a DB2 system definition that specifies these details (for example, your DB2 system definition repository is an existing CICS Performance Analyzer HDB register that contains shared system definitions), skip to step 10 on page 24.
  - DB2 subsystem identifier (SSID)
  - Optionally, the SYSID of the MVS image on which the DB2 system runs
  - DB2 version
  - Whether the DB2 system is in a data sharing group (yes or no)
  - DSNLOAD library data set name
  - DB2 bootstrap data set (BSDS) name

  If you do not know these details, contact your DB2 system administrator.

Procedure

1. On the Transaction Analysis Workbench primary option menu, select option 3 **Systems**. The System Definitions Menu is displayed.
2. Select option 3 **DB2**.

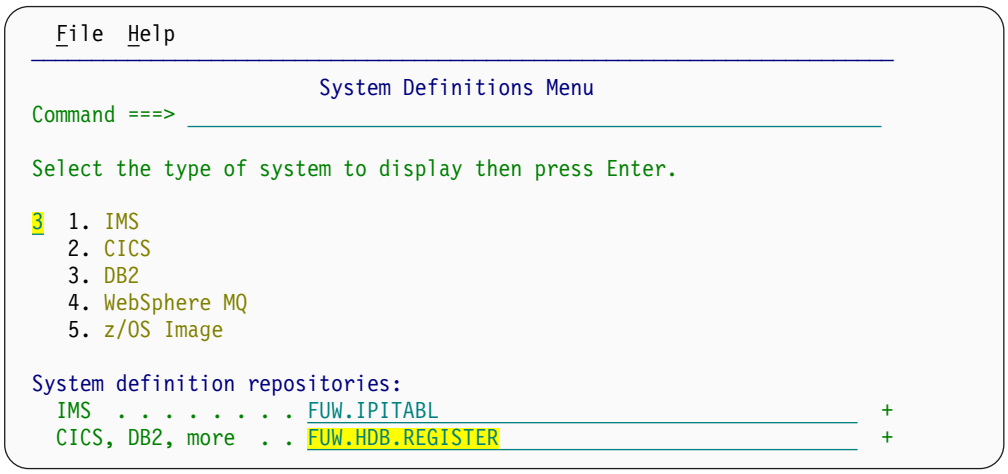

Figure 23. Panel: System Definitions Menu

The System Definitions panel is displayed. This panel lists any existing system definitions in the repository.

For this tutorial, we have predefined a DB2 system, DB2P.

3. Enter **S** next to DB2P, review the definition details. Skip to step 9 on page 24, bypassing the steps that you would follow to create a new definition.

   Steps 4 to 8 on page 24 describe how to create a DB2 system definition. These steps are included here for illustration purposes only; for this tutorial, use the predefined system.
4. Enter **NEW** on the command line. A pop-up window opens.
5. Specify the DB2 system name and, optionally, the MVS image (SYSID). Specify the system type as DB2.

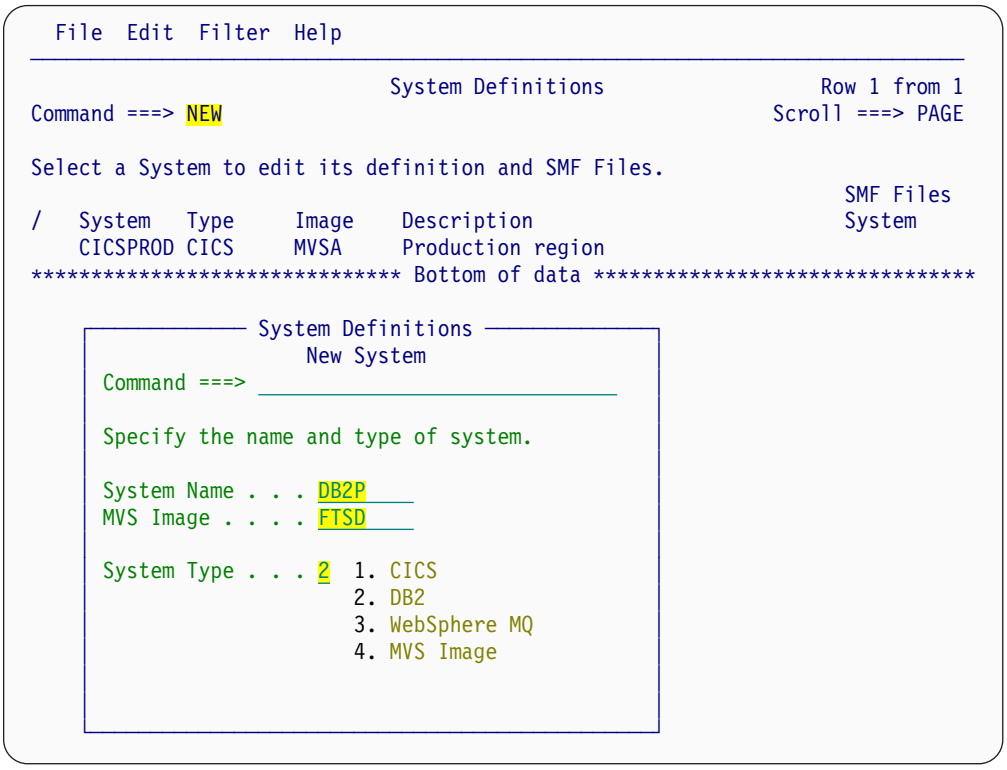

Figure 24. Panel: System Definitions (CICS, DB2, more)

6. Press Enter. The pop-up window closes.

   The DB2 Subsystem panel is displayed. This panel contains the details that you have just entered.
7. Specify the remaining details that you have obtained for the DB2 system:
   a. Select the **Definition** view.
   b. Specify the following details:
      - DB2 version
      - Whether the DB2 system is in a data sharing group (yes or no)
      - DSNLOAD library data set name
      - DB2 bootstrap data set (BSDS) name

```
  File  Help
 ____________________________________________________________________________
 EDIT                          DB2 Subsystem                        More: < >
 Command ===> ______________________________________________________________

 DB2 System definition:
  DB2 SSID  . . . . . . . DB2P  MVS Image . . . FTSD
  Description . . . . . . Production DB2

 System View:
  1  1. Definition   2. Cyclic SMF Files   3. Daily SMF Files

 Specify DB2 Subsystem Definition:
  DB2 Version (VRM) . . . 810
  Data sharing  . . . . . NO   (YES or NO)
  DSNLOAD library . . . . 'DB2.PROD.SDSNLOAD'
  DB2 bootstrap . . . . . 'IMPOT01.DB2P.BSDS01'
```

Figure 25. Panel: DB2 Subsystem definition

8. Press the Exit function key (F3) to save the DB2 system definition.
9. Press the Exit function key (F3) repeatedly until you return to the Transaction Analysis Workbench primary option menu.

   The following steps use the DB2 system definition that you have just created to automate selection of the related log files for a particular time interval, and then add those selected files to a problem session.
10. On the primary option menu, select option 1 **Sessions**.
11. On the command line of the Session Manager panel, enter **NEW** to create a new session.
12. On the Problem Details panel for the new session, specify the following details (use the values highlighted in the following figure):
    - A summary (for example, `DB2 log selection`)
    - The from and to dates and times of the log records that you want to analyze
    - The DB2 system

```
  File  Help
 ____________________________________________________________________________
                              Problem Details                 Row 1 to 1 of 1
 Command ===> ____________________________________________ Scroll ===> PAGE

 Key  . . . . . : 00000101
 Summary  . . . . DB2 log selection                Description...
 Severity . . . . _
 Reference  . . . ____________   ── When problem occurred ──
 Reported by  . . ____________        YYYY-MM-DD  HH.MM.SS.TH
 Assigned to  . . ____________   From 2010-06-24  15.20.00.00
 Status . . . . . OPEN           To   2010-06-24  16.50.00.00  Zone . . LOCAL

 Systems where problem occurred (maximum of 32):

 /  System +   Type +
 __ DB2P       DB2
 ******************************* Bottom of data ********************************
```

Figure 26. Panel: Problem Details: session that refers to a DB2 system

13. Press the Exit function key (F3) to save the new session. The session menu is displayed.
14. Select option 2 **Files**.
15. On the Locate and Manage Log Files panel, run automated file selection:
    a. Select option 2 **Run automated file selection...**
    b. Under the heading **Automated file selection**, specify the system that you defined previously. By default, automated file selection spans the same date and time interval as the problem session; however, you can override these default values.

```
  File  Help
──────────────────────────────────────────────────────────────────────────────
                          Locate and Manage Log Files
Command ===> ____________________________________________ Scroll ===> PAGE

Select an option then press Enter
2  1. Manually specify the log files required for analysis
   2. Run automated file selection to locate the required log files

Automated file selection:          ─── Problem Interval ────
  System . . . DB2P      +              YYYY-MM-DD  HH.MM.SS.TH
  Type . . . . DB2       +         From 2010-06-24  15.20.00.00
                                   To   2010-06-24  16.50.00.00

Log Files:
                                                      ─── System ─── File
/        Data Set Name                                Name     Type    Type
****************************** Bottom of data ********************************
```

Figure 27. Panel: Running automated file selection for a DB2 system

    c. Press Enter to generate the JCL for the automated file selection. The JCL is displayed in the ISPF editor.
16. On the ISPF editor command line, enter **SUB** to submit the job.

```
 File  Edit  Edit_Settings  Menu  Utilities  Compilers  Test  Help
EDIT       IMPOTnn.ISP07624.SPFTEMP1.CNTL                Columns 00001 00072
Command ===> ____________________________________________ Scroll ===> PAGE
****** ***************************** Top of Data ******************************
000001 //IMPOTnn JOB (ACCOUNT),'NAME'
000002 //*
000003 //* For DB2 log selection only
000004 //DSNJU004 EXEC PGM=DSNJU004
000005 //STEPLIB  DD  DISP=SHR,DSN=DB2.PROD.SDSNLOAD
000006 //SYSUT1   DD  DISP=SHR,DSN=IMPOT01.DB2P.BSDS01
000007 //SYSPRINT DD  DSN=&&DB2,DISP=(NEW,PASS),
000008 //             UNIT=SYSDA,SPACE=(CYL,(1,1))
000009 //*
000010 // IF RC = 0 THEN
000011 //*
000012 //FUWFILES EXEC PGM=FUWFILES
000013 //*
000014 //STEPLIB  DD  DSN=PRODUCTS.FUW.SFUWLINK,
000015 //             DISP=SHR
000016 //FUWPROBR DD  DSN=IMPOTnn.FUW.SESSIONS,
000017 //             DISP=SHR
000018 //DB2LOGIN DD  DISP=(OLD,DELETE),DSN=&&DB2
000019 //SYSPRINT DD  SYSOUT=*
000020 //FUWPRINT DD  SYSOUT=*
000021 //FUWWRK1  DD  UNIT=SYSDA,SPACE=(TRK,(1,1,1))
000022 //FUWWRK2  DD  UNIT=SYSDA,SPACE=(CYL,(5,5))
000023 //SYSIN    DD  UNIT=SYSDA,SPACE=(TRK,(3,1))
000024 //FUWPARM  DD  *
000025 ZONE=LOCAL
000026 PROBLEM=00000101
000027 FROM=(2010-06-24,15.20.00.00)
000028 TO=(2010-06-24,16.50.00.00)
000029 DB2ID=DB2P
000030 // ENDIF
****** ************************** Bottom of Data **************************
```

Figure 28. Panel: ISPF Edit session showing generated JCL for automated selection of DB2 logs

17. Press the Exit function key (F3) to exit the ISPF editor and return to the Locate and Manage Log Files panel.
18. When the job is complete, enter **REFRESH** on the command line to refresh the list of log files and to see any files added by the job.

    You can now browse these log files, or use them to generate batch reports or extracts.
19. To browse one of these log files, enter **S** next to the file.

```
  File  Help
──────────────────────────────────────────────────────────────────────────────
                        Locate and Manage Log Files          Row 1 to 3 of 3
Command ===> ____________________________________________ Scroll ===> PAGE

Select an option to add log files to the session then press Enter
_  1. Manually specify the log files required for analysis
   2. Run automated file selection to locate the required log files

Automated File Selection:          ── Locate Files Interval ──
  System . . . DB2P      +              YYYY-MM-DD  HH.MM.SS.TH
  Type . . . . DB2       +         From 2010-06-24  15.20.00.00
                                   To   2010-06-24  16.50.00.00

Log Files:
                                                      ─── System ─── File
/        Data Set Name                                Name     Type    Type
________ IMPOT01.DB2P.ARCHLOG1.A0003778               DB2P     DB2     LOG
________ IMPOT01.DB2P.ARCHLOG1.A0003779               DB2P     DB2     LOG
s_______ IMPOT01.DB2P.ARCHLOG1.A0003780               DB2P     DB2     LOG
****************************** Bottom of data ********************************
```

Figure 29. Panel: DB2 log file located by automated file selection

The log file opens in the log browser.

```
  File  Menu  Mode  Filter  Time  Labels  Options  Help
──────────────────────────────────────────────────────────────────────────────
BROWSE    IMPOT01.DB2P.ARCHLOG1.A0003780          Record 00000001 More: < >
Command ===> ____________________________________________ Scroll ===> PAGE
   Slice . . Duration  00.05.00     Date  2010-06-24     Time  15.47.16.152288
   Code Description  < 00.05.00.000000 >  2010-06-24 Thursday  Time (LOCAL)
/  ---- ------------------------------------------------- ----------------
__ 0020 DB2 Insert into a Data Page                        15.47.16.152288
        DBID=0130 PSID=008F URID=001C3B8CBEA5
   ------------------------------------------------------------------------
__ 0020 DB2 Update Area Map/Spacemap Bit Changes or Whole Byte 15.47.16.152352
        DBID=0130 PSID=008F URID=001C3B8CBEA5
   ------------------------------------------------------------------------
__ 0020 DB2 Type 2 Index Update                            15.47.16.152368
        DBID=0130 PSID=0092 URID=001C3B8CBEA5
   ------------------------------------------------------------------------
__ 0020 DB2 Insert into a Data Page                        15.47.16.152432
        DBID=0130 PSID=008F URID=001C3B8CBEA5
   ------------------------------------------------------------------------
__ 0020 DB2 Type 2 Index Update                            15.47.16.152448
        DBID=0130 PSID=0092 URID=001C3B8CBEA5
   ------------------------------------------------------------------------
__ 0020 DB2 Insert into a Data Page                        15.47.16.152496
        DBID=0130 PSID=008F URID=001C3B8CBEA5
...
```

Figure 30. Panel: Browsing a DB2 log

20. Press the Exit function key (F3) until you return to the Transaction Analysis Workbench primary option menu.

    You have completed this tutorial. Please proceed to the next tutorial.

Tutorial: Analyzing an IMS DB2 transaction problem

This tutorial shows you how to analyze a problem with an IMS DB2 transaction.

Before you begin

The following prerequisite steps have already been performed for this lab environment. In a different system environment, you would need to perform these steps before you begin the tutorial.

- Determine the location of the IMS log file (SLDS) and DB2 log file for the time when the problem occurred.
- Create an IMS transaction index from the IMS log file (see the description later in this tutorial).

About this task

The problem has been reported as a long transaction response time for an IMS transaction performing DB2 updates.

Procedure

1. On the Transaction Analysis Workbench primary option menu, select option 1 **Sessions**. The Session Manager panel is displayed.
2. Select session 00000007, "Tutorial: IMS DB2". The session menu is displayed.
3. Select option 1 **Register**. The Problem Details panel for the session is displayed.

```
  File  Help
──────────────────────────────────────────────────────────────────────────────
                              Problem Details                  Row 1 to 2 of 2
Command ===> ____________________________________________________ Scroll ===> PAGE

Key  . . . . . : 00000007
Summary  . . . . Tutorial: IMS DB2                Description...
Severity . . . . _
Reference  . . . ____________    ── When problem occurred ──
Reported by  . . ____________         YYYY-MM-DD  HH.MM.SS.TH
Assigned to  . . ____________    From 2010-06-24  15.20.00.00
Status . . . . . OPEN            To   2010-06-24  16.50.00.00  Zone . . LOCAL

Systems where problem occurred (maximum of 32):

/  System +   Type +
__ IADG       IMS
__ DB3A       DB2
******************************** Bottom of data ********************************
```

Figure 31. Panel: Problem Details: session for an IMS DB2 transaction problem

The problem details refer to two systems: an IMS system and a DB2 system.

4. Press the Exit function key (F3) to return to the session menu.
5. Select option 2 **Files**. The Locate and Manage Log Files panel for the session is displayed.

```
  File  Help
 ____________________________________________________________________________
                         Locate and Manage Log Files          Row 1 to 3 of 3
Command ===> ____________________________________________ Scroll ===> PAGE

Select an option to add log files to the session then press Enter
_  1. Manually specify the log files required for analysis
   2. Run automated file selection to locate the required log files

Automated File Selection:          ── Locate Files Interval ──
  System . . . ________  +              YYYY-MM-DD  HH.MM.SS.TH
  Type . . . . ________  +         From 2010-06-24  15.20.00.00
                                   To   2010-06-24  16.50.00.00
Log Files:
                                                      ─── System ─── File
/        Data Set Name                                Name     Type    Type
________ IMPOT01.SESSION7.TRANIX                      IADG     IMS     EXTRACT
________ IMPOT01.SLDSP.IADG.D10175.T1624488.V25       IADG     IMS     LOG
________ IMPOT01.DB3A.ARCLG1.A0000037                 DB3A     DB2     LOG
******************************* Bottom of data ********************************
```

Figure 32. Panel: Log files for IMS DB2 transaction analysis

The session refers to the following three log files:

a. An IMS transaction index (a special type of extract created from an IMS log, described below)

b. An IMS SLDS

c. A DB2 log file

An IMS transaction index is a specialized extract file that IMS Performance Analyzer creates from an IMS log (such as an SLDS). Each record in the index represents an IMS transaction and contains cumulative information from the IMS log about that transaction.

IMS transaction indexes are especially useful in Transaction Analysis Workbench for identifying problematic IMS transactions, because they contain fields that offer cumulative information about an IMS transaction that are not available in any single IMS log record. For example, the Process field in an IMS transaction index record contains the total processing time for an IMS transaction.

In this tutorial, we will use the Process field to create a filter that identifies IMS transaction index records with long process times. Then we will use transaction tracking (by entering **TX** next to an IMS transaction index record) to show all of the individual records for that transaction from the original IMS log and the DB2 log. The relative elapsed times of these individual log records enable us to identify particular events that might be responsible for the long overall process time.

The order of the log files in this list is significant: the IMS transaction index appears first, so that, when we browse the files, each IMS transaction index is displayed before its corresponding IMS log records. (To reorder log files in the list, enter **M** next to the log file that you want to move, and then enter **A** next to the file that you want to move the selected file after, or enter **B** next to the file that you want to move the selected file before.)

For this tutorial, we have already created an IMS transaction index, and moved it to the top of the list.

Note: To create an IMS transaction index, enter **X** next to an IMS log file on the Locate and Manage Log Files panel for a session.

6. Press the Exit function key (F3) to return to the session menu.
7. Select option 4 **Investigate**. The Investigate panel is displayed.
8. If the **Time Slice** heading shows **(OFF)**, enter `SLICE` on the command line to switch time slicing on.

   For our time slice, we are going to use the full duration of the transaction index (which is the same as the duration of the IMS log from the index was created).
9. Enter **T** next to the transaction index.

   Tip: To help identify the transaction index in the list of files, scroll the **Data Set Name** column into view: press the Right function key (F11).

   The time slice duration is now the duration of the log file, rather than the default time slice of five minutes.
10. Enter **S** on the first line under the **/** heading, to browse a merged view of all three files.

```
  File  Menu  Time Slicing  Help
──────────────────────────────────────────────────────────────────────────────
                              Investigate              Row 1 of 3 More: < >
Command ===> ____________________________________________ Scroll ===> PAGE

               ──────────── Time Slice (ON) ──────────────
               Time            Date          Duration
               HH.MM.SS.thmiju YYYY-MM-DD    HH.MM.SS  Zone   Filter +
               16.25.44.803974 2010-06-24    00.09.12  LOCAL  ________
/
S_______  Type  Data Set Name                                  Coverage
________  IMS   IMPOT01.SESSION7.TRANIX                       COMPLETE
________  IMS   IMPOT01.SLDSP.IADG.D10175.T1624488.V25        COMPLETE
________  DB2   IMPOT01.DB3A.ARCLG1.A0000037                  COMPLETE
****************************** Bottom of data ********************************
```

Figure 33. Panel: Investigate: IMS DB2 transaction analysis

The log files are displayed in the log browser. IMS transaction index records have the log code CA01.

```
  File  Menu  Mode  Filter  Time  Labels  Options  Help
------------------------------------------------------------------------------
BROWSE    IMPOT01.SESSION7.TRANIX +                 Record 00000709 More: < >
Command ===> ____________________________________________ Scroll ===> PAGE
   Slice . . Duration  00.09.12     Date  2010-06-24     Time  16.25.44.803974
   Code Description  < 00.05.00.000000 >  2010-06-24 Thursday  Time (LOCAL)
/  ---- ------------------------------------------------------ ---------------
__ CA01 Transaction                                            16.25.44.803974
        UTC=16.25.44.803961 TranCode=IVTNV Program=DFSIVP2 Userid=FUNTRM15
        LTerm=FUNTRM15 Terminal=SC0TCP15 Region=0004
        OrgUOWID=IADG/C62D2AF55962ED21 IMSID=IADG IMSRel=101
        RecToken=IADG/0000003000000000
        CPU=0.002527 InputQ=0.000647 Process=0.008113 OutputQ=0.179880
        TotalTm=0.188640 RegTyp=MPP DBCalls=1
   ---------------------------------------------------------------------------
__ 01   Input Message                                          16.25.44.803974
        UTC=16.25.44.803961 TranCode=IVTNV Userid=FUNTRM15 LTerm=FUNTRM15
        Terminal=SC0TCP15 OrgUOWID=IADG/C62D2AF55962ED21
   ---------------------------------------------------------------------------
__ 35   Input Message Enqueue                                  16.25.44.804006
        UTC=16.25.44.803961 TranCode=IVTNV OrgUOWID=IADG/C62D2AF55962ED21
   ---------------------------------------------------------------------------
__ 08   Application Start                                      16.25.44.804569
        TranCode=IVTNV Region=0004 RecToken=IADG/0000003000000000
        RegTyp=MPP TClass=01 TPrty=01
   ---------------------------------------------------------------------------
__ 5607 Start of UOR                                           16.25.44.804570
        UTC=16.07.34.121913 Program=DFSIVP2 Region=0004 IMSID=IADG
        RecToken=IADG/0000003000000000
   ---------------------------------------------------------------------------
__ 31   DLI GU                                                 16.25.44.804613
        UTC=16.25.44.804608 TranCode=IVTNV Region=0004
```

Figure 34. Panel: Browsing an IMS transaction index

11. Define a filter that limits the display to IMS transaction index records with a Process time greater the 0.4 seconds.
    a. Enter **FILTER** on the command line.

       The Filter panel is displayed.
    b. Specify IMS under the Log column heading, and CA01 under the Code column heading.
    c. Enter **S** next to IMS CA01.

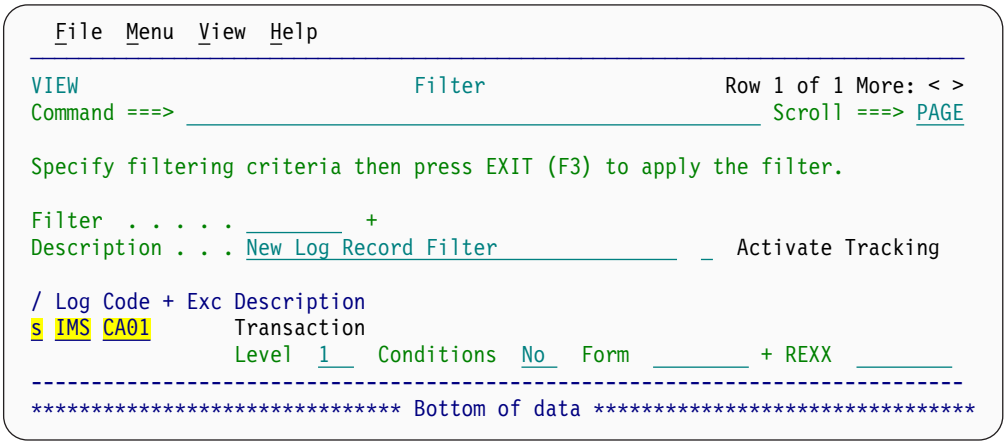

Figure 35. Panel: Filtering on IMS transaction index records (part 1 of 2)

The Conditions panel is displayed.

d. Specify the following condition:
   PROCESS GT 0.4

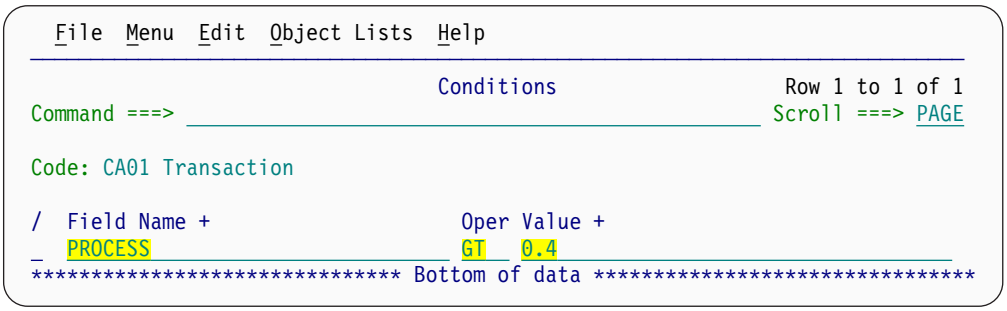

Figure 36. Panel: Filtering on IMS transaction index records (part 2 of 2)

e. Press the Exit function key (F3) to return to the Filter panel, and then press the Exit function key (F3) again to return to the log browser.

The log browser now shows only the records that match the filter.

12. Enter **TX** next to the first record.

```
  File  Menu  Mode  Filter  Time  Labels  Options  Help
-------------------------------------------------------------------------------
BROWSE    IMPOT01.SESSION7.TRANIX +                 Record 00001551 More: < >
Command ===> ____________________________________________ Scroll ===> PAGE
   Slice . . Duration  00.09.12     Date  2010-06-24     Time  16.25.44.803974
   Code Description  < 00.05.00.000000 >  2010-06-24 Thursday  Time (LOCAL)
/  ---- ------------------------------------------------------ ---------------
tx CA01 Transaction                                            16.33.18.743854
        UTC=16.33.18.743821 TranCode=MQATREQ1 Program=MQATPGM Userid=FUNTRM15
        LTerm=FUNTRM15 Terminal=SC0TCP15 Region=0001
        OrgUOWID=IADG/C62D2CA6428BBD20 IMSID=IADG IMSRel=101
        RecToken=IADG/0000003400000000
        CPU=0.026647 InputQ=0.004280 Process=0.468912
        TotalTm=0.473192 RegTyp=MPP DBCalls=5
   -------------------------------------------------------------------------
__ CA01 Transaction                                            16.33.26.293611
        UTC=16.33.26.293602 TranCode=MQATREQ1 Program=MQATPGM Userid=FUNTRM15
        LTerm=FUNTRM15 Terminal=SC0TCP15 Region=0001
        OrgUOWID=IADG/C62D2CAD75C30D80 IMSID=IADG IMSRel=101
        RecToken=IADG/0000003500000000
        CPU=0.032212 InputQ=0.000553 Process=0.407164
        TotalTm=0.407717 RegTyp=MPP DBCalls=5
   -------------------------------------------------------------------------
__ CA01 Transaction                                            16.33.33.575325
        UTC=16.33.33.575316 TranCode=MQATREQ1 Program=MQATPGM Userid=FUNTRM15
        LTerm=FUNTRM15 Terminal=SC0TCP15 Region=0004
        OrgUOWID=IADG/C62D2CB467860940 IMSID=IADG IMSRel=101
        RecToken=IADG/0000003600000000
        CPU=0.041999 InputQ=0.000562 Process=0.497229
        TotalTm=0.497791 RegTyp=MPP DBCalls=5
   -------------------------------------------------------------------------
__ CA01 Transaction                                            16.33.59.157812
```

Figure 37. Panel: Browsing an IMS transaction index (after defining a filter)

The **TX** line action activates tracking, which displays the records that belong to the same transaction as the selected record.

The log browser displays the related IMS log records and DB2 log records under the IMS transaction index record.

Note: Tracking ignores any active filter, with the following exception: if the filter unconditionally excludes a log code, tracking excludes that log code.

13. Press the Right function key (F11) to switch to a log browser view that collapses each record onto single line, with the Time column on the right-hand side of the panel.
14. Enter **R** next to the CA01 record.

    The **R** line action displays the time of each visible log record relative to the selected record.

    Notice the jump in elapsed times following the ESAF (External Subsystem Attach Facility) record (log code 5600) for the connection to subsystem ID CSQ6. The CSQ prefix indicates that this is a WebSphere® MQ subsystem. So, the problem is not in IMS or in DB2, but in WebSphere MQ.

    If we had a WebSphere MQ log extract, we could further investigate the specific cause of the problem.

```
  File  Menu  Mode  Filter  Time  Labels  Options  Help
BROWSE    IMPOT01.SESSION7.TRANIX +                 Record 00001602 More: < >
Command ===> ____________________________________________ Scroll ===> PAGE
   Slice . . Duration  00.09.12     Date  2010-06-24     Time  16.25.44.803974
   Code Description  < 00.05.00.000000 >  2010-06-24 Thursday  Time (Relative)
/  ---- ------------------------------------------------------ ---------------
__ CA01 Transaction TranCode=MQATREQ1 Region=0001               16.33.18.743854
__ 01   Input Message TranCode=MQATREQ1                               +0.000000
__ 35   Input Message Enqueue TranCode=MQATREQ1                       +0.000027
__ 08   Application Start TranCode=MQATREQ1 Region=0001               +0.004210
__ 5607 Start of UOR Program=MQATPGM Region=0001                      +0.004210
__ 31   DLI GU TranCode=MQATREQ1 Region=0001                          +0.004251
__ 5616 Start of protected UOW Region=0001                            +0.004460
__ 5E   SB Handler requests Image Capture Region=0001                 +0.013044
__ 5E   SB Handler requests Image Capture Region=0001                 +0.013047
__ 50   Database Update Database=DI21PART Region=0001                 +0.013335
__ 50   Database Update Database=DI21PART Region=0001                 +0.013456
__ 50   Database Update Database=DI21PART Region=0001                 +0.013487
__ 50   Database Update Database=DI21PART Region=0001                 +0.013646
__ 50   Database Update Database=DI21PART Region=0001                 +0.013718
__ 5600 Sign-on to ESAF Region=0001 SSID=DB3A                         +0.015988
__ 5600 Thread created for ESAF SSID=DB3A                             +0.016018
__ 0020 DB2 Unit of Recovery Control - Begin UR                       +0.022865
__ 0020 DB2 Update In-Place in a Data Page                            +0.022881
__ 0010 DB2 Savepoint                                                 +0.023553
__ 0020 DB2 Delete from a Data Page                                   +0.023777
__ 0020 DB2 Insert into a Data Page                                   +0.024337
__ 5600 Sign-on to ESAF Region=0001 SSID=CSQ6                         +0.067829
__ 5600 Thread created for ESAF SSID=CSQ6                             +0.067859
__ 5600 Commit Prepare starting Region=0001 SSID=CSQ6                 +0.455190
__ 0020 DB2 Unit of Recovery Control - End Commit Phase 1             +0.458449
```

Figure 38. Panel: Tracking an IMS transaction using a transaction index record

This is as far as we will take this analysis. Before finishing, it is worth noting that the DB2 log records show the LUWID that you can use in products such as DB2 Log Analysis Tool to identify the specific table, row, and column of the data relating to the DB2 activity:

15. Press the Left function key (F10) to switch to a log browser view that expands each record onto multiple lines.
16. Enter **FIND LUWID** (or **F LUWID**) on the command line. The panel scrolls to a DB2 log record (log code 0020) showing the corresponding LUWID.

```
  File  Menu  Mode  Filter  Time  Labels  Options  Help
-------------------------------------------------------------------------------
BROWSE    IMPOT01.SESSION7.TRANIX +                          String found
Command ===> ____________________________________________ Scroll ===> PAGE
   Slice . . Duration  00.09.12     Date  2010-06-24     Time  16.25.44.803974
   Code Description  < 00.05.00.000000 >  2010-06-24 Thursday  Time (Relative)
/  ---- ------------------------------------------------- ----------------
__ 0020 DB2 Unit of Recovery Control - Begin UR                    +0.022865
        Userid=FUNTRM15 IMSID=IADG URID=00002A400AD5
        LUWID=FTS3/DB3ALU/C62D2CA64681/0001
   -------------------------------------------------------------------------
__ 0020 DB2 Update In-Place in a Data Page                         +0.022881
        DBID=0105 PSID=0002 URID=00002A400AD5
   -------------------------------------------------------------------------
__ 0010 DB2 Savepoint                                             +0.023553
        URID=00002A400AD5
   -------------------------------------------------------------------------
__ 0020 DB2 Delete from a Data Page                               +0.023777
        DBID=0105 PSID=0002 URID=00002A400AD5
   -------------------------------------------------------------------------
__ 0020 DB2 Insert into a Data Page                               +0.024337
        DBID=0105 PSID=0002 URID=00002A400AD5
   -------------------------------------------------------------------------
__ 5600 Sign-on to ESAF                                           +0.067829
        Region=0001 IMSID=IADG RecToken=IADG/0000003400000000 SSID=CSQ6
   -------------------------------------------------------------------------
__ 5600 Thread created for ESAF                                   +0.067859
        IMSID=IADG RecToken=IADG/0000003400000000 SSID=CSQ6
   -------------------------------------------------------------------------
__ 5600 Commit Prepare starting                                   +0.455190
        UTC=16.33.19.199042 Region=0001 IMSID=IADG
        RecToken=IADG/0000003400000000 SSID=CSQ6
```

Figure 39. Panel: Tracking an IMS transaction using a transaction index record

17. Press the Exit function key (F3) until you return to the Transaction Analysis Workbench primary option menu.

    You have completed this tutorial. Please proceed to the next tutorial.

Tutorial: Analyzing a CICS DBCTL transaction problem

This tutorial shows you how to analyze a problem with a CICS DBCTL transaction.

Before you begin

The following prerequisite steps have already been performed for this lab environment. In a different system environment, you would need to perform these steps before you begin the tutorial.

- Determine the location of the dumped SMF file that contains the records written by the CICS system for the time when the problem occurred.
- Define a system definition for the associated IMS system, so that you can use automated file selection to locate the IMS log for the time when the problem occurred.
- Create an extract of the OPERLOG.

  We are running this tutorial on a different system, and in a different sysplex, than the system that created the OPERLOG we want to analyze. If you want to analyze the records of a log stream (such as OPERLOG) on a system that cannot directly access that log stream, you can use Transaction Analysis Workbench to create an extract of the log stream.

  We used the Transaction Analysis Workbench ISPF dialog on the original system (where the problem occurred) to generate the following JCL. This JCL creates an extract of the OPERLOG records for a specific time period, filtered to contain messages that begin with the prefix “DFS” (that is, messages from IMS).

```
//FUWXTRAC JOB ,CLASS=W,NOTIFY=&SYSUID
//FUWBATCH EXEC PGM=FUWBATCH,PARM='V111'
//STEPLIB DD DISP=SHR,DSN=FUW110.MAINT.SFUWLINK
//SYSPRINT DD SYSOUT=*
//FUWPRINT DD SYSOUT=*
//EXTRACT DD DSN=IMPOT01.OPERLOG.EXTRACT,
//           DISP=(NEW,CATLG),
//           UNIT=SYSDA,SPACE=(CYL,(1,1))
//LOGRPT DD SYSOUT=*
//SYSIN DD *
LOGSTREAM OPERLOG:SYSPLEX.OPERLOG
START 2011-04-06-08.40.00.00
STOP 2011-04-06-09.00.00.00
EXTRACT
CODE(OPERLOG)
COND TEXT(2) EQ 'DFS'
/*
```

Figure 40. JCL to create a filtered extract of an OPERLOG

About this task

A user has reported that a CICS transaction abended with code ADCD (DLI deadlock detected) in a known time period. We will use batch reports from CICS Performance Analyzer and IMS Performance Analyzer to get details of the abending transaction, and then use tracking in the interactive log browser to investigate the associated IMS log records, CMF records, and OPERLOG records.

Procedure

1. On the Transaction Analysis Workbench primary option menu, select option 1 **Sessions**. The Session Manager panel is displayed.
2. Select session 00000006, "Tutorial: CICS DBCTL". The session menu is displayed.

   Let's review the files that have been added to this session.
3. On the session menu, select option 2 **Files**.

   The session has three associated log files: an SMF file, an IMS log file, and an extract file (created from an OPERLOG log stream).

```
  File  Help
──────────────────────────────────────────────────────────────────────────────
                        Locate and Manage Log Files          Row 1 to 3 of 3
Command ===> ____________________________________________ Scroll ===> PAGE

Select an option to add log files to the session then press Enter
_  1. Manually specify the log files required for analysis
   2. Run automated file selection to locate the required log files

Automated File Selection:          ── Locate Files Interval ──
  System . . . ________  +                YYYY-MM-DD  HH.MM.SS.TH
  Type . . . . ________  +           From 2011-04-06  08.40.00.00
                                     To   2011-04-06  09.00.00.00
Log Files:
                                                    ─── System ─── File
/        Data Set Name                              Name     Type    Type
________ IMPOT01.SMF.D110406.DEADLOK.FULL           FTS1     IMAGE   SMF
________ IMPOT01.SLDSP.IBB1.D11096.T0841415.V15     IBB1     IMS     LOG
________ IMPOT01.OPERLOG.EXTRACT                    FTS1     IMAGE   EXTRACT
****************************** Bottom of data ********************************
```

Figure 41. Panel: Analyzing a CICS DBCTL transaction: associated log files

4. Press the Exit function key (F3) to return to the session menu.
5. Select option 3 **Reporting**.

   The Reporting menu is displayed.
6. Select option 2 **CICS**.
7. Select all types of analysis.
8. Select all focus options.
9. Select the SMF file.

```
  File  Help
──────────────────────────────────────────────────────────────────────────────
                    Reporting - CICS Transaction Analysis
Command ===> ____________________________________________________________

                                        ──── Report Interval ────
Type of analysis:                            YYYY-MM-DD  HH.MM.SS.TH
/  Individual transaction detail        From 2011-04-06  08.40.00.00
/  Transaction statistical summary      To   2011-04-06  09.00.00.00
/  Transaction suspend time breakdown

Focus of transaction analysis:
/  Response time and CPU usage
/  VSAM files
/  Virtual storage
/  DB2
/  IMS DBCTL

Select the CICS system to report against, or specify an SMF file:
2  1. System . . . ________  +
   2. SMF File . . 'IMPOT01.SMF.D110406.DEADLOK.FULL'          +
```

Figure 42. Panel: CICS Performance Analyzer reporting to analyze a CICS DBCTL transaction

10. Press Enter twice to generate the JCL for the report.

    The JCL is displayed in the ISPF editor. This JCL uses CICS Performance Analyzer to create several reports.

11. On the ISPF editor command line, enter **SUB** to submit the job.

12. View the job output: split your screen and use SDSF, or use your site-specific procedures.

    The following figures show two of the reports. For other reports, see the job output.

    Note that CICS task number 170 is the abending transaction: it occurs in the time period reported by the user, and has the abend code reported by the user.

```
 V3R2M0                                          CICS Performance Analyzer
                                                     Performance List

LIST0001 Printed at 16:55:17  4/11/2011    Data from 08:39:21  4/06/2011
Transaction details: Response time and CPU

Start         APPLID   Tran SC Term Userid   RSID Program    TaskNo Response Dispatch User CPU  Suspend DispWait  FC Wait ABcu
Time                                                            Time     Time     Time     Time     Time     Time
08:43:19.3169 FUWTCIC  DBEU TO UW2B FUW2          TWM$UPD       150   7.3433    .0066    .0053   7.3367    .0006    .0000
08:43:34.0141 FUWTCIC  DBEU TO UW2B FUW2          TWM$UPD       152   7.3112    .0065    .0055   7.3047    .0008    .0000
08:47:22.0636 FUWTCIC  TWMU TO UW1B FUW1          TWM$UPD       170  14.0675    .0368    .0265  14.0308    .0031    .0000 ADCD
08:47:14.7397 FUWTCIC  DBEU TO UW2B FUW2          TWM$UPD       168  22.5172    .0082    .0061  22.5090    .0293    .0000
08:47:36.1434 FUWTCIC  TWMU TO UW1B FUW1          TWM$UPD       171  14.9865    .0360    .0271  14.9505    .0036    .0000 DE40
08:47:51.1429 FUWTCIC  TWMU TO UW1B FUW1          TWM$UPD       173  14.9860    .0355    .0265  14.9504    .0025    .0000 DE40
08:48:06.1409 FUWTCIC  TWMU TO UW1B FUW1          TWM$UPD       174   9.9797    .0324    .0237   9.9473    .0028    .0000 DE40
08:48:23.6799 FUWTCIC  TWMU TO UW1B FUW1          TWM$UPD       177  12.2973    .0073    .0056  12.2900    .0028    .0000
08:48:35.9894 FUWTCIC  TWMU TO UW1B FUW1          TWM$UPD       180  11.5511    .0067    .0055  11.5444    .0032    .0000
08:48:42.2989 FUWTCIC  DBEU TO UW2B FUW2          TWM$UPD       181  13.8540    .0359    .0253  13.8181    .0033    .0000 ADCD
```

Figure 43. Example CICS Performance Analyzer Transaction details: Response time and CPU report

```
 V3R2M0                                          CICS Performance Analyzer
                                                    Performance List

LIST0005 Printed at 16:55:17  4/11/2011    Data from 08:39:21  4/06/2011
Transaction details: IMS DBCTL

Start         APPLID   Tran TaskNo Response Dispatch User CPU IMS Reqs IMS Wait RMIDBCTL RMIEXDLI RMI Elap RMI Susp  Suspend
Time                                   Time     Time     Time             Time     Time     Time     Time      Time     Time
08:43:19.3169 FUWTCIC  DBEU    150   7.3433   .0066    .0053       37    .0298    .0217    .0103    .0320    .0298   7.3367
08:43:34.0141 FUWTCIC  DBEU    152   7.3112   .0065    .0055       37    .0167    .0061    .0127    .0189    .0167   7.3047
08:47:22.0636 FUWTCIC  TWMU    170  14.0675   .0368    .0265       29   8.7771    .0000   8.8515   8.8515   8.8186  14.0308
08:47:14.7397 FUWTCIC  DBEU    168  22.5172   .0082    .0061       37  15.1152    .0087  15.1092  15.1180  15.1152  22.5090
08:47:36.1434 FUWTCIC  TWMU    171  14.9865   .0360    .0271       33   8.5807    .0012   8.5816   8.5828   8.5807  14.9505
08:47:51.1429 FUWTCIC  TWMU    173  14.9860   .0355    .0265       33   8.6261    .0013   8.6266   8.6280   8.6261  14.9504
08:48:06.1409 FUWTCIC  TWMU    174   9.9797   .0324    .0237       18   6.5658    .0012   6.5659   6.5672   6.5658   9.9473
08:48:23.6799 FUWTCIC  TWMU    177  12.2973   .0073    .0056       37   5.0136    .0076   5.0090   5.0166   5.0136  12.2900
08:48:35.9894 FUWTCIC  TWMU    180  11.5511   .0067    .0055       37   4.2683    .0378   4.2330   4.2708   4.2683  11.5444
08:48:42.2989 FUWTCIC  DBEU    181  13.8540   .0359    .0253       24   9.6715    .0000   9.7441   9.7441   9.7122  13.8181
```

Figure 44. Example CICS Performance Analyzer Transaction details: IMS DBCTL report

13. Press the Exit function key (F3) to return to the Reporting menu.
14. Select option 1 **IMS**.
15. Select all types of analysis.
16. Select all focus options except for “Subsystem usage”.
17. Select the IMS log file.

```
  File  Help
 ──────────────────────────────────────────────────────────────────────────────
                Reporting - IMS Transaction and System Analysis
Command ===> ____________________________________________________________

Type of analysis:                          ──── Report Interval ────
/  Individual transaction detail                YYYY-MM-DD  HH.MM.SS.TH
/  Transaction statistical summary        From 2011-04-06  08.40.00.00
/  IMS system resources                   To   2011-04-06  09.00.00.00
/  Deadlock analysis

Focus of transaction analysis:
/  Response time breakdown and CPU usage
/  DLI calls
/  Fast Path database and buffers
_  Subsystem usage
/  CICS DBCTL

Select the IMS system to report against, or specify an IMS log file:
2  1. System . . . ____  +
   2. Log File . . 'IMPOT01.SLDSP.IBB1.D11096.T0841415.V15'      +
```

Figure 45. Panel: IMS Performance Analyzer reporting to analyze a CICS DBCTL transaction

18. Press Enter twice to generate the JCL for the report.

    The JCL is displayed in the ISPF editor. This JCL uses IMS Performance Analyzer to create several reports.
19. On the ISPF editor command line, enter **SUB** to submit the job.
20. View the job output: split your screen and use SDSF, or use your site-specific procedures.

    The following figures show two of the reports. For other reports, see the job output.

    We know from the earlier CICS Performance Analyzer reports that CICS task number 170 is the abending transaction that we want to analyze.

Note: IMS V11 has the improved instrumentation required to connect CICS and IMS events, and IMS Performance Analyzer now supports this (see APAR PM24076): the IMS Performance Analyzer reports show the CICS transaction name and task number.

```
                                    IMS Performance Analyzer
                                  Tran detail: Response & CPU

LIST0001 Printed at 11:41:35 12Apr2011     Data from 08.41.45 06Apr2011

CICS                 CICS          IMS Tran              DB Call    FP Call      CPU  Process   Total IO    DB IO ABEND
APPLID   Trancode   TaskNo Program  Start           PST      Count      Count     Time     Time      Count     Time Code
FUWTCIC  DBEU          150 DFHTWM04 08.43.19.317952   2         35         20 0.004429 7.340751          4 0.002947
FUWTCIC  DBEU          152 DFHTWM04 08.43.34.015461   2         35         20 0.004786 7.308276          5 0.004377
FUWTCIC  TWMU          170 DFHTWM04 08.47.22.064699   2         27         10 0.003550 13.98985          5 0.004129 U0777
FUWTCIC  DBEU          168 DFHTWM04 08.47.14.741096   1         35         20 0.004993 22.51250          4 0.003052
FUWTCIC  TWMU          171 DFHTWM04 08.47.36.145544   2         31         11 0.004575 14.97864          5 0.004057
FUWTCIC  TWMU          173 DFHTWM04 08.47.51.144257   2         31         11 0.003983 14.97902          5 0.003837
FUWTCIC  TWMU          174 DFHTWM04 08.48.06.141930   2         16          1 0.002785 9.973208          4 0.003090
FUWTCIC  TWMU          177 DFHTWM04 08.48.23.680926   2         35         15 0.005241 12.29449          6 0.004908
FUWTCIC  TWMU          180 DFHTWM04 08.48.35.990428   2         35         15 0.005737 11.54835          6 0.006388
FUWTCIC  DBEU          181 DFHTWM04 08.48.42.299975   1         22         15 0.002559 13.77870          1 0.000796 U0777
```

Figure 46. Example IMS Performance Analyzer Transaction details: Response time and CPU report

```
Start 06Apr2011 08.47.36.01                      IMS Performance Analyzer                End 06Apr2011 08.56.26.27
                                                    IMS Deadlock Summary

 ********** Losing Program **********              ********** Winning Program **********
 DMB-name  IMS-name  Tran/Job  PSB-name  PCB--DBD  Deadlocks   DMB-name  IMS-name  Tran/Job  PSB-name  PCB--DBD  # Waits
 --------  --------  --------  --------  --------  ---------   --------  --------  --------  --------  --------  --------
 DFSIVD3A  IBB1      FUWTCIC   DFHTWM04  IVPDB3            2   DFSIVD3B  IBB1      FUWTCIC   DFHTWM04  IVPDB3           1
                                                               DI21PART  IBB1      FUWTCIC   DFHTWM04  DI21PART         1

 DFSIVD3B  IBB1      FUWTCIC   DFHTWM04  IVPDB3            3   DI21PART  IBB1      FUWTCIC   DFHTWM04  DI21PART         3

 DI21PART  IBB1      FUWTCIC   DFHTWM04  DI21PART          9   DFSIVD3A  IBB1      FUWTCIC   DFHTWM04  IVPDB3           1
                                                               DFSIVD3B  IBB1      FUWTCIC   DFHTWM04  IVPDB3           2
                                                               DI21PART  IBB1      FUWTCIC   DFHTWM04  DI21PART         6

                     Total number of Deadlocks =          14
```

Figure 47. Example IMS Performance Analyzer Deadlock Summary report

Now that we have run some batch reports, let's use the interactive log browser to further investigate the details of the problem.

21. Press the Exit function key (F3) until you return to the session menu.
22. On the session menu, select option 4 **Investigate**. The Investigate panel is displayed.

    For our time slice, we are going to use the duration of the IMS log.
23. If the **Time Slice** heading shows **(OFF)**, enter `SLICE` on the command line to switch time slicing on.
24. Enter **T** next to the IMS log file.

    The time slice is now set to the start and duration of the IMS log file.
25. Enter **S** on the first line under the **/** heading, to begin browsing a merged view of the time slice across all of the files.

```
  File  Menu  Time Slicing  Help
──────────────────────────────────────────────────────────────────────────────
                                Investigate              Row 1 of 3 More: < >
Command ===> ____________________________________________ Scroll ===> PAGE

               ──────────── Time Slice (ON) ──────────────
               Time             Date           Duration
               HH.MM.SS.thmiju  YYYY-MM-DD     HH.MM.SS  Zone   Filter +
               08.41.41.519325  2011-04-06     00.14.19  LOCAL  ________
/
s_______  Type  Data Set Name                                    Coverage
________  SMF   IMPOT01.SMF.D110406.DEADLOK.FULL                COMPLETE
________  IMS   IMPOT01.SLDSP.IBB1.D11096.T0841415.V15          COMPLETE
________  N/A   IMPOT01.OPERLOG.EXTRACT                        PARTIAL
****************************** Bottom of data ********************************
```

Figure 48. Panel: Investigate: CICS DBCTL transaction analysis

The log browser displays the log records.

To locate the CMF record for the abending transaction, we will define a filter that selects only CMF records for transactions that abended (that is, with non-blank abend codes).

26. Enter **FILTER** on the command line.

```
  File  Mode  Filter  Time  Labels  Options  Help
──────────────────────────────────────────────────────────────────────────────
BROWSE    IMPOT01.SMF.D110406.DEADLOK.FULL +         Record 00000059 More: < >
Command ===> filter                                   Scroll ===> CSR
   Slice . . Duration  00.14.19     Date  2011-04-06     Time  08.41.41.519325
   Code Description  < 00.05.00.000000 >  2011-04-06 Wednesday Time (LOCAL)
/  ---- ------------------------------------------------- ---------------
__ 50   Database Update Database=DI21PART Region=0002          08.41.41.519325
__ 50   Database Update Database=DI21PART Region=0002          08.41.41.519601
__ 50   Database Update Database=DI21PART Region=0002          08.41.41.519659
__ 43   Log Data Set Control                                   08.41.41.567359
__ 42   Log Buffer Control                                    08.41.41.567362
__ CA52 DFS3257I ONLINE LOG NOW SWITCHED - FROM DFSOLP00 TO DF 08.41.41.567883
__ CA52 DFS3257I ONLINE LOG NOW SWITCHED - FROM DFSOLS00 TO DF 08.41.41.569543
__ 5C   File System Activity                                  08.41.42.250000
__ 50   Database Update Database=DI21PART Region=0002          08.41.42.570369
__ 50   Database Update Database=DI21PART Region=0002          08.41.42.570810
__ 50   Database Update Database=DI21PART Region=0002          08.41.42.570886
__ 50   Database Update Database=DI21PART Region=0002          08.41.42.571126
__ 50   Database Update Database=DI21PART Region=0002          08.41.42.571174
__ CA52 DFS2484I JOBNAME=IBB1#ARC GENERATED BY LOG AUTOMATIC A 08.41.42.576963
__ 1E   Job Start TranCode=IBB1#ARC                           08.41.42.710000
__ 40   VSAM Status IBB1.VB10.RECON3.DATA                     08.41.43.450000
__ 40   VSAM Status IBB1.VB10.RECON3.INDX                     08.41.43.450000
```

Figure 49. Panel: Browsing a merged view of SMF, IMS log, and OPERLOG records

The Filter panel is displayed.

27. Specify CMF under the Log column heading, and 6E13 under the Code column heading.
28. Enter **S** next to CMF 6E13.

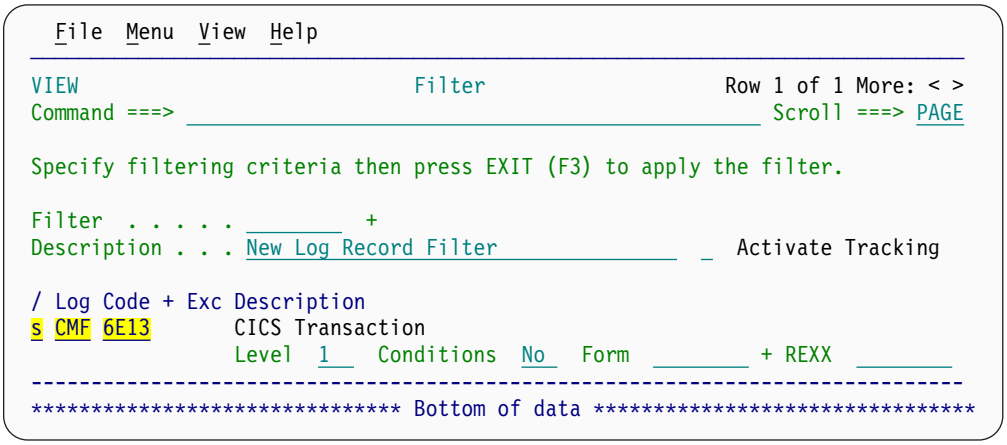

Figure 50. Panel: Filter for CMF records

The Conditions panel is displayed.

29. Specify the following condition:

    ABEND NE ' '

    This condition uses the global field ABEND: we could have used the equivalent CMF-specific field names ABCU or ABOR.

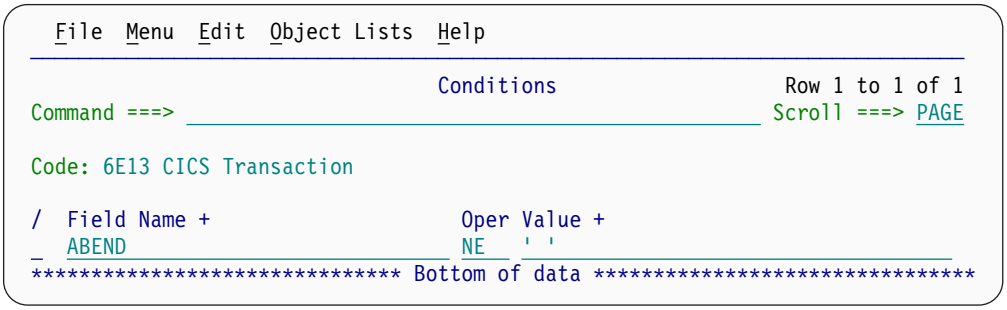

Figure 51. Panel: Filter condition using the ABEND global field

30. Press the Exit function key (F3) to return to the Filter panel, and then press the Exit function key (F3) again to return to the log browser.

    The log browser now shows only the records that match the filter.

31. Enter **TX** next to the CMF record (code 6E13) for task 170.

```
  File  Mode  Filter  Time  Labels  Options  Help
-------------------------------------------------------------------------------
BROWSE    IMPOT01.SMF.D110406.DEADLOK.FULL +         Record 00002825 More: < >
Command ===> ____________________________________________________ Scroll ===> CSR
   Slice . . Duration  00.14.19     Date  2011-04-06     Time  08.41.41.519325
   Code Description  < 00.05.00.000000 >  2011-04-06 Wednesday Time (LOCAL)
/  ---- ------------------------------------------------------ ----------------
tx 6E13 CICS Transaction TranCode=TWMU Task=170 Abend=ADCD     08.47.22.063694
__ 6E13 CICS Transaction TranCode=TWMU Task=171 Abend=DE40     08.47.36.143484
__ 6E13 CICS Transaction TranCode=TWMU Task=173 Abend=DE40     08.47.51.142989
__ 6E13 CICS Transaction TranCode=TWMU Task=174 Abend=DE40     08.48.06.140979
__ 6E13 CICS Transaction TranCode=DBEU Task=181 Abend=ADCD     08.48.42.298937
__ 6E13 CICS Transaction TranCode=DBEU Task=183 Abend=ADCD     08.48.56.165539
__ 6E13 CICS Transaction TranCode=TWMU Task=185 Abend=DE40     08.49.10.328848
__ 6E13 CICS Transaction TranCode=DBEU Task=188 Abend=ADCD     08.49.29.735139
__ 6E13 CICS Transaction TranCode=DBEU Task=189 Abend=ADCD     08.49.41.183492
__ 6E13 CICS Transaction TranCode=DBEU Task=193 Abend=ADCD     08.50.03.586072
__ 6E13 CICS Transaction TranCode=TWMU Task=201 Abend=DE40     08.50.56.233561
__ 6E13 CICS Transaction TranCode=DBEU Task=200 Abend=ADCD     08.50.50.772178
__ 6E13 CICS Transaction TranCode=TWMU Task=223 Abend=ADCD     08.55.31.495953
******************************** Bottom of Data ********************************
```

Figure 52. Panel: Browsing log records (after defining a filter)

The log browser shows just the selected CMF record, because the CMF record has the latest time stamp of all related records, and so it appears at the bottom of the list of related records. We want to scroll to the top of the related records.

32. Scroll to the top of data. Either:
    - Type `M` on the command line, and then press the Backward function key (F7).
    - Type `TOP` on the command line, and then press Enter.

```
  File  Mode  Filter  Time  Labels  Options  Help
-------------------------------------------------------------------------------
BROWSE    IMPOT01.SMF.D110406.DEADLOK.FULL +              Tracking is active
Command ===> m___________________________________________ Scroll ===> CSR
   Slice . . Duration  00.14.19     Date  2011-04-06     Time  08.41.41.519325
   Code Description  < 00.05.00.000000 >  2011-04-06 Wednesday Time (LOCAL)
/  ---- ------------------------------------------------------ ----------------
__ 6E13 CICS Transaction TranCode=TWMU Task=170 Abend=ADCD     08.47.22.063694
******************************** Bottom of Data ********************************
```

Figure 53. Panel: Tracking a CICS DBCTL transaction: CMF record is the last record (scroll up to see the others)

The log browser scrolls the display to the top of the records from the selected SMF file and IMS log that are related to the CMF record, and all records from the OPERLOG extract that are in the corresponding time period. The first of these records is an IMS 08 log record, marking the start of the IMS unit of work for CICS task number 170.

For the following screen, we have pressed the Right function key (F11) to switch to a log browser view that expands each record onto multiple lines, to show details such as the task number.

```
  File  Mode  Filter  Time  Labels  Options  Help
-------------------------------------------------------------------------------
BROWSE    IMPOT01.SMF.D110406.DEADLOK.FULL +         Record 00002252 More: < >
Command ===> ____________________________________________ Scroll ===> CSR
   Slice . . Duration  00.14.19     Date  2011-04-06     Time  08.41.41.519325
   Code Description  < 00.05.00.000000 >  2011-04-06 Wednesday Time (LOCAL)
/  ---- ------------------------------------------------------ ---------------
__ 08   Application Start                                        08.47.22.064705
        UTC=08.47.22.064699 TranCode=TWMU Program=DFHTWM04 Region=0002
        RecToken=FUWTCIC/C79459EA853EFB03 RegTyp=DBC Task=170
   ------------------------------------------------------------------------------
__ 5607 Start of UOR                                             08.47.22.064706
        UTC=08.33.00.631046 Program=DFHTWM04 Region=0002 IMSID=IBB1
        RecToken=FUWTCIC/C79459EA853EFB03
   ------------------------------------------------------------------------------
__ 50   Database Update                                          08.47.22.066178
        UTC=08.33.00.631046 Program=DFHTWM04 Database=DI21PART RBA=00003B5E
        Region=0002 RecToken=FUWTCIC/C79459EA853EFB03
   ------------------------------------------------------------------------------
__ 50   Database Update                                          08.47.22.066466
        UTC=08.33.00.631046 Program=DFHTWM04 Database=DI21PART RBA=00003B5E
        Region=0002 RecToken=FUWTCIC/C79459EA853EFB03
   ------------------------------------------------------------------------------
__ 50   Database Update                                          08.47.22.066498
```

Figure 54. Panel: Tracking a CICS DBCTL transaction: start of the unit of work

33. Press the Forward function key (F8) to scroll down until you see a 67FF (Exception Condition SNAP - DEADLOCK) IMS log record.

    This record contains details of the deadlock.

34. Enter **S** next to the Exception Condition SNAP record.

```
  File  Mode  Filter  Time  Labels  Options  Help
-------------------------------------------------------------------------------
BROWSE    IMPOT01.SMF.D110406.DEADLOK.FULL +         Record 00002368 More: < >
Command ===> ____________________________________________ Scroll ===> CSR
   Slice . . Duration  00.14.19     Date  2011-04-06     Time  08.41.41.519325
   Code Description  < 00.05.00.000000 >  2011-04-06 Wednesday Time (LOCAL)
/  ---- ------------------------------------------------------ ---------------
s_ 67FF Exception Condition SNAP - DEADLOCK                      08.47.36.016740
        UTC=08.47.36.016343 Region=0002
        Winner: IMS=IBB1 Job/Tran=FUWTCIC  PST=0001 PSB=DFHTWM04 DMB=DI21PART
        Victim: IMS=IBB1 Job/Tran=FUWTCIC  PST=0002 PSB=DFHTWM04 DMB=DI21PART
   ------------------------------------------------------------------------------
__ 38   Release Input Message after Application ABEND            08.47.36.019855
        Region=0002 RecToken=FUWTCIC/C79459EA853EFB03
   ------------------------------------------------------------------------------
__ 5938 FP SYNC Fail-Application Program or Pseudo ABEND         08.47.36.030531
        UTC=08.47.36.030522 Program=DFHTWM04 Region=0002
        OrgUOWID=IBB1/C79459F7D7136603 RecToken=FUWTCIC/C79459EA853EFB03
        RegTyp=DBC DBCall=10 DBGet=4 DBUpd=6 DBWait=0
   ------------------------------------------------------------------------------
__ 50   Database Update                                          08.47.36.047752
        UTC=08.33.00.631046 Program=DFHTWM04 Database=DI21PART RBA=00008B5E
        Region=0002 RecToken=FUWTCIC/C79459EA853EFB03
   ------------------------------------------------------------------------------
```

Figure 55. Panel: Tracking a CICS DBCTL transaction: scrolling to the Exception Condition SNAP record

The details of the deadlock are displayed, including the key of the affected segment. Press the Forward function key (F8) to scroll the key into view.

```
  File  Menu  Format  Help
-------------------------------------------------------------------------------
BROWSE     IMPOT01.SMF.D110406.DEADLOK.FULL +     Record 00002368 Line 00000032
Command ===> ____________________________________________ Scroll ===> CSR
Form    ===>          +     Use Form in Filter            Format ===> STD
+0080  DIPWAITR... Waiter Entry
+0080  DIPWOWU.... 00AABBB71BBB7060
+0088  DIPWRWU.... 00AABBB71BBB7060
+0090  DIPWDBMS... 'IBB1    '  DIPWWRTH... 5C          DIPWFUNC... 02
+009A  DIPWSTAT... 06          DIPWFROM... 00          DIPWDURA... 00
+009D  DIPWCLS.... 00          DIPWFLG.... 0B

+00A0  DLKDLD..... IRLM supplied UserData
+00A0  DLKDJOB.... 'FUWTCIC '  DLKDSTEP... 'FUWTCIC '
+00B0  DLKDPSB.... 'DFHTWM04'  DLKDPCBN... 'DI21PART'
+00C0  DLKDBNM.... 'DI21PART'  DLKLRPRM... 30400378    DLKLRIPM... 30400358
+00D0  DLKDCALL... 01          DLKDFLG1... 80          DLKDFLG2... 00
+00D4  DLKDMBTY... 09          DLKDRTYP... 02          DLKDPSTN... 0001
+00D8  DLKDSTCK... 9459EC803E0A41                      DLKDKYLN... +16
+00E0  DLKDKEY.... Key of Data Base record
       +0000  F0F2F9F2 F5F3F6F3 60F1F3F6 40404040   *02925363-136     *

+01E0  DIPENTRY... Deadlock Information Parameter List Entry
+01E0  DIPFLAG2... C0
```

Figure 56. Panel: Analyzing a CICS DBCTL transaction: viewing the key of the affected segment

35. Press the Exit function key (F3) to return to the list panel of log records.

    We want to bookmark this record to help other users, such as an IMS subject-matter expert, to find this record later. (To list the tags for a session, select **History** from the session menu.)

36. Enter **G** next to the Exception Condition SNAP record.

    An empty ISPF Edit panel (with the title Notepad) is displayed. Enter details about the record to help other users understand why the tagged record is significant. For example, “Cause of abend in CICS DBCTL transaction”.

37. Press the Exit function key (F3) to return to the list panel of log records.

    The tag appears directly above its associated log record, and with the same time stamp.

    Finally, if you scroll down further, you can see IMS message DFS968I (“...SUCCESSFULLY BACKED OUT...”) in the OPERLOG.

```
  File  Mode  Filter  Time  Labels  Options  Help
------------------------------------------------------------------------------
BROWSE    IMPOT01.SMF.D110406.DEADLOK.FULL +         Record 00002368 More: < >
Command ===> ____________________________________________ Scroll ===> CSR
   Slice . . Duration  00.14.19     Date  2011-04-06     Time  08.41.41.519325
   Code Description  < 00.05.00.000000 >  2011-04-06 Wednesday Time (LOCAL)
/  ---- ------------------------------------------------------ ---------------
__ TAG  Cause of abend in CICS DBCTL transaction                 08.47.36.016740
__ 67FF Exception Condition SNAP - DEADLOCK                      08.47.36.016740
__ 38   Release Input Message after Application ABEND            08.47.36.019855
__ 5938 FP SYNC Fail-Application Program or Pseudo ABEND
...
__ 07   Application Terminate Region=0002                        08.47.36.054614
__ CA52 DFS554A FUWTCIC  00002 FUWTCIC  DFHTWM04(3)          0 08.47.36.056209
__ CA52 DFS968I  DBD=DI21PART WITHIN PSB=DFHTWM04 SUCCESSFULLY 08.47.51.053525
__ CA52 DFS980I BACKOUT PROCESSING HAS ENDED FOR DFHTWM04 IBB1 08.47.51.056589
```

Figure 57. Panel: Tracking a CICS DBCTL transaction: tagged Exception Condition SNAP record

38. Press the Exit function key (F3) until you return to the Transaction Analysis Workbench primary option menu.

    You have completed this tutorial.

    This is the end of the lab. The next tutorial is optional.

Tutorial: Analyzing a CICS DB2 transaction problem

This tutorial shows you how to analyze a problem with a CICS DB2 transaction.

Before you begin

The following prerequisite steps have already been performed for this lab environment. In a different system environment, you would need to perform these steps before you begin the tutorial.

- Determine the location of the dumped SMF file that contains the records written by the related CICS and DB2 systems for the time when the problem occurred.

  To analyze the problem using the procedure described here, the SMF file must contain at least the following types of record:

  – CICS monitoring facility (CMF) performance class (SMF type 110, subtype 1, class 3) records

  – DB2 performance (SMF type 102) records
- Determine the location of the DB2 log file for the time when the problem occurred. (Either manually, or using Transaction Analysis Workbench automated file selection to select the appropriate DB2 log file.)
- Create a session that refers to the SMF file and the DB2 log file.

About this task

A user has reported an abend in CICS transaction. We know that this transaction, TWMU, is a CICS DB2 transaction (that is, a CICS transaction that accesses DB2 data).

Procedure

1. On the Transaction Analysis Workbench primary option menu, select option 1 **Sessions**. The Session Manager panel is displayed.
2. Select session 00000005, “Tutorial: CICS DB2”. The session menu is displayed.

   Let's review the files that have been added to this session.
3. On the session menu, select option 2 **Files**.

   The session has two associated log files: an SMF file and a DB2 log file.

```
  File  Help
──────────────────────────────────────────────────────────────────────────────
                        Locate and Manage Log Files          Row 1 to 2 of 2
Command ===> ____________________________________________ Scroll ===> PAGE

Select an option to add log files to the session then press Enter
_  1. Manually specify the log files required for analysis
   2. Run automated file selection to locate the required log files

Automated File Selection:          ── Locate Files Interval ──
  System . . . ________  +              YYYY-MM-DD  HH.MM.SS.TH
  Type . . . . ________  +           From 2011-04-29  15.40.00.00
                                     To   2011-04-29  15.45.00.00
Log Files:
                                                    ─── System ─── File
/        Data Set Name                              Name     Type    Type
________ IMPOT01.SMF.D110429.CICSDB2.FULL           FTS3     IMAGE   SMF
________ IMPOT01.DBA3.ARCLG1.A0000034               DB3A     DB2     LOG
****************************** Bottom of data ********************************
```

Figure 58. Panel: Analyzing a CICS DB2 transaction: associated log files

4. Press the Exit function key (F3) to return to the session menu.
5. Select option 3 **Reporting**.
   The Reporting menu is displayed.
6. Select option 2 **CICS**.
7. Select the reporting options and the SMF file as shown in the following figure.

```
  File  Help
──────────────────────────────────────────────────────────────────────────────
                    Reporting - CICS Transaction Analysis
Command ===> ____________________________________________________________

                                        ─── Report Interval ───
Type of analysis:                            YYYY-MM-DD  HH.MM.SS.TH
/  Individual transaction detail         From 2011-04-29  15.40.00.00
/  Transaction statistical summary       To   2011-04-29  15.45.00.00
/  Transaction suspend time breakdown

Focus of transaction analysis:
/  Response time and CPU usage
_  VSAM files
_  Virtual storage
/  DB2
_  IMS DBCTL

Select the CICS system to report against, or specify an SMF file:
2  1. System . . . ________  +
   2. SMF File . . 'IMPOT01.SMF.D110429.CICSDB2.FULL'          +
```

Figure 59. Panel: CICS Performance Analyzer reporting to analyze a CICS DB2 transaction

8. Press Enter twice to generate the JCL for the report.
   The JCL is displayed in the ISPF editor. This JCL uses CICS Performance Analyzer to create several reports.
9. On the ISPF editor command line, enter **SUB** to submit the job.
10. Use SDSF to view the job output (enter **SDSF** on the command line).

The following figures show extracts from two of the reports (job output data sets LIST0001 and LIST0004). For other reports, see the job output.

Note that CICS task number 168 (labelled **1** in the following figures) is the abending transaction: it occurs in the time period reported by the user, and has the abend code reported by the user.

```
 V3R2M0                                              CICS Performance Analyzer
                                                        Performance List

LIST0001 Printed at 14:25:46  6/16/2011    Data from 15:38:34  4/29/2011
Transaction details: Response time and CPU

Start         APPLID   Tran SC Term Userid   RSID Program    TaskNo Response Dispatch User CPU  Suspend DispWait  FC Wait ABcu
Time                                                             Time     Time     Time     Time     Time     Time
⋮
15:42:23.3905 FUWTCIC  TWMU TO CP13 TWM1          TWM$UPD       164    .0394    .0353    .0214    .0041    .0035    .0000
15:42:24.9909 FUWTCIC  DB2U TO CP14 TWM           TWM$UPD       165    .0545    .0500    .0236    .0046    .0046    .0000
15:42:30.6702 FUWTCIC  TWMU TO CP13 TWM1          TWM$UPD       166    .1280    .1182    .0822    .0098    .0105    .0000
15:43:14.3336 FUWTCIC  TWMU TO CP13 TWM1          TWM$UPD       168   3.4167   3.3130    .0413    .1037    .0024    .0000 DB40 1
15:43:13.9496 FUWTCIC  DB2U TO CP14 TWM           TWM$UPD       167   9.8728   1.3573    .0391   8.5155    .0028    .0000
⋮
```

Figure 60. Example CICS Performance Analyzer Transaction details: Response time and CPU report

```
 V3R2M0                                              CICS Performance Analyzer
                                                        Performance List

LIST0004 Printed at 14:25:46  6/16/2011    Data from 15:38:34  4/29/2011
Transaction details: DB2

Start         APPLID   Tran Program    TaskNo Response Dispatch User CPU DB2 Reqs DB2ThdWt DB2ConWt DB2SQLWt RMI Elap RMI Susp  Suspend
Time                                         Time     Time     Time              Time     Time     Time     Time     Time     Time
⋮
15:42:23.3905 FUWTCIC  TWMU TWM$UPD       164    .0394    .0353    .0214       27    .0000    .0000    .0000    .0316    .0000    .0041
15:42:24.9909 FUWTCIC  DB2U TWM$UPD       165    .0545    .0500    .0236       27    .0000    .0000    .0000    .0439    .0000    .0046
15:42:30.6702 FUWTCIC  TWMU TWM$UPD       166    .1280    .1182    .0822      133    .0000    .0000    .0000    .1016    .0000    .0098
15:43:14.3336 FUWTCIC  TWMU TWM$UPD       168   3.4167   3.3130    .0413       17    .0000    .0000    .0000   3.2237    .0393    .1037 1
15:43:13.9496 FUWTCIC  DB2U TWM$UPD       167   9.8728   1.3573    .0391       52    .0000    .0000    .0000   1.3498    .0001   8.5155
⋮
```

Figure 61. Example CICS Performance Analyzer Transaction details: DB2 report

Note the long RMI elapsed time of 3.2 seconds for this CICS task compared to the response time of 3.4 seconds. This indicates that the problem is not in CICS, but in DB2.

Now that we have run some batch reports, let's use the interactive log browser to further investigate the details of the problem.

11. Press the Exit function key (F3) until you return to the session menu.
12. On the session menu, select option 4 **Investigate**. The Investigate panel is displayed.

    For our time slice, we are going to use the 1-minute period within which the problem occurred.
13. If the **Time Slice** heading shows **(OFF)**, enter `SLICE` on the command line to switch time slicing on.
14. Enter the time slice time, date, and duration shown in the following figure.
15. Enter **S** on the first line under the **/** heading, to begin browsing a merged view of the time slice across both files.

```
  File  Menu  Time Slicing  Help
──────────────────────────────────────────────────────────────────────────────
                                Investigate              Row 1 of 2 More: < >
Command ===> ____________________________________________ Scroll ===> PAGE

               ──────────── Time Slice (ON) ──────────────
               Time            Date          Duration
               HH.MM.SS.thmiju YYYY-MM-DD    HH.MM.SS  Zone   Filter +
               15.43.00.000000 2011-04-29    00.01.00  LOCAL  ________
/
s_______ Type  Start Time      Date            Duration        Coverage
________ SMF   15.30.00.390000 2011-04-29 Fri 00.44.59        COMPLETE
________ DB2   15.15.15.477696 2011-04-29 Fri 01.02.53        COMPLETE
****************************** Bottom of data ********************************
```

Figure 62. Panel: CICS Performance Analyzer reporting to analyze a CICS DB2 transaction

The files are displayed in the log browser.

Let's use a filter to locate the CICS monitoring facility (CMF) performance class record (in the SMF file) for the abending task.

16. Enter **FILTER** on the command line.

```
  File  Mode  Filter  Time  Labels  Options  Help
──────────────────────────────────────────────────────────────────────────────
BROWSE    IMPOT01.SMF.D110429.CICSDB2.FULL +         Record 00000592 More: < >
Command ===> filter                                   Scroll ===> PAGE
   Slice . . Duration  00.01.00     Date  2011-04-29     Time  15.43.00.000000
   Code Description  < _____________ >  2011-04-29 Friday    Time (LOCAL)
/  ---- ------------------------------------------------- ----------------
__ 66   DB2 Performance 044 IRLM suspend entry              15.43.00.688309
__ 66   DB2 Performance 093 Suspend SSID=DBA3 SYSID=FTS3    15.43.00.688404
__ 66   DB2 Performance 094 Resume SSID=DBA3 SYSID=FTS3     15.43.00.688998
__ 66   DB2 Performance 045 IRLM suspend exit               15.43.00.689076
__ 66   DB2 Performance 021 Lock detail SSID=DBA3 SYSID=FTS3 15.43.00.689121
__ 66   DB2 Performance 021 Lock detail SSID=DBA3 SYSID=FTS3 15.43.00.689889
__ 66   DB2 Performance 044 IRLM suspend entry              15.43.01.690464
__ 66   DB2 Performance 093 Suspend SSID=DBA3 SYSID=FTS3    15.43.01.690580
__ 66   DB2 Performance 094 Resume SSID=DBA3 SYSID=FTS3     15.43.01.691328
__ 66   DB2 Performance 045 IRLM suspend exit               15.43.01.692748
__ 66   DB2 Performance 021 Lock detail SSID=DBA3 SYSID=FTS3 15.43.01.692802
__ 66   DB2 Performance 021 Lock detail SSID=DBA3 SYSID=FTS3 15.43.01.701748
__ 0010 DB2 System Event - No Log Activity                  15.43.01.942032
__ 66   DB2 Performance 032 Begin wait for log manager      15.43.01.942084
__ 66   DB2 Performance 093 Suspend SSID=DBA3 SYSID=FTS3    15.43.01.942172
__ 66   DB2 Performance 094 Resume SSID=DBA3 SYSID=FTS3     15.43.01.942234
__ 66   DB2 Performance 038 Begin wait for active log write 15.43.01.942309
```

Figure 63. Panel: Browsing log files

The Filter panel is displayed.

17. Specify `CMF` under the Log column heading, and `6E13` under the Code column heading.

    In Transaction Analysis Workbench, 6E13 is the log code that identifies CICS monitoring facility (CMF) performance class records:
    - The first two digits, 6E, are the hexadecimal representation of the decimal SMF record type, 110
    - The third digit represents the record subtype, 1 (CICS monitoring)
    - The fourth digit represents the class of data, 3 (performance)

18. Enter **S** next to CMF 6E13.

```
  File  Menu  View  Help
 ------------------------------------------------------------------------------
 VIEW                            Filter                   Row 1 of 1 More: < >
 Command ===> ____________________________________________ Scroll ===> PAGE

 Specify filtering criteria then press EXIT (F3) to apply the filter.

 Filter  . . . . . ________  +
 Description . . . New Log Record Filter_____________  _  Activate Tracking

 / Log Code + Exc Description
 s CMF 6E13       CICS Transaction
                  Level  1__  Conditions  ___  Form  ________ + REXX  ________
 ------------------------------------------------------------------------------
 ******************************* Bottom of data ********************************
```

Figure 64. Panel: Specifying a filter to show only CMF records with a specific abend code (part 1 of 2)

The Conditions panel is displayed.

19. Specify the condition ABEND EQ DB40 as shown in the following figure.

```
  File  Menu  Edit  Object Lists  Help
 ------------------------------------------------------------------------------
                                  Conditions                  Row 1 to 1 of 1
 Command ===> ____________________________________________ Scroll ===> PAGE

 Code: 6E13 CICS Transaction

 /  Field Name +                    Oper Value +
 _  ABEND                           EQ   DB40
 ******************************* Bottom of data ********************************
```

Figure 65. Panel: Specifying a filter to show only CMF records with a specific abend code (part 2 of 2: filter conditions)

20. Press the Exit function key (F3) to return to the Filter panel, and then press the Exit function key (F3) again to return to the log browser.

    The log browser now shows only the records that match the filter. In this instance, there is only one such record, for CICS task 168.

    Note: In addition to the CMF record that matches the filter, if other users have previously performed this tutorial with the same user ID, you might also see one or more records with the log code TAG. We will explain these records soon.

21. Press the Left function key (F10) to switch to a log browser view that expands the log record onto multiple lines, as shown in the following figure. (The single-line view showed enough details to confirm that this was the record that we want; this expanded view shows a few more details.)

    Imagine that you work at a technical support help desk, and that you have taken the problem analysis to this stage (identifying the relevant CICS task and its corresponding log record). Now you want to hand the problem over to a CICS subject matter expert.

To help that next person to pick up the problem analysis from where you left it, we are going to "tag" (bookmark) the CMF record, to make it easy for that person to return to this record in the log browser.

Note: If you can already see tags when browsing this session, that's okay: continue with this procedure. A record can have multiple tags.

22. Enter **G** next to the CMF record.

```
  File  Mode  Filter  Time  Labels  Options  Help
-------------------------------------------------------------------------------
BROWSE    IMPOT01.SMF.D110429.CICSDB2.FULL +         Record 00001133 More: < >
Command ===> _____________________________________________ Scroll ===> PAGE
   Slice . . Duration  00.01.00     Date  2011-04-29     Time  15.43.00.000000
   Code Description  < _____________ >  2011-04-29 Friday    Time (LOCAL)
/  ---- ---------------------------------------------------- ----------------
g  6E13 CICS Transaction                                     15.43.14.333665
        TranCode=TWMU Program=TWM$UPD Userid=TWM1 LTerm=SC0TCP13 Terminal=CP13
        RecToken=FUWTCIC/C7B1A1C77C91A063 Resp=3.416706 CPU=0.041252 DB2=17
        Task=168 Abend=DB40
   ------------------------------------------------------------------------------
******************************** Bottom of Data ********************************
```

Figure 66. Panel: Browsing a filtered SMF file

An ISPF edit panel is displayed.

23. Enter a note describing the tag. For example, "CICS Transaction Abend=DB40". (If a tag with this description already exists, you might like to use a slightly different description. Different tags can have the same description.)

```
  File  Edit  Edit_Settings  Help
-------------------------------------------------------------------------------
EDIT                          Notepad                    Columns 00001 00072
Command ===> _____________________________________________ Scroll ===> PAGE
****** ***************************** Top of Data ******************************
''''''  CICS Transaction Abend=DB40
''''''
''''''
''''''
''''''
''''''
''''''
''''''
''''''
''''''
''''''
''''''
''''''
''''''
''''''
''''''
''''''
''''''
''''''
****** **************************** Bottom of Data ****************************
```

Figure 67. Panel: Creating a tag (writing the description in an edit panel)

Tip: The note can contain multiple lines. The log browser displays the start of the first line of the note as the tag description.

24. Press the Exit function key (F3) to return to the log browser. The new tag is displayed above the CMF record, as shown in the following figure.

```
  File  Mode  Filter  Time  Labels  Options  Help
------------------------------------------------------------------------------
BROWSE    IMPOT01.SMF.D110429.CICSDB2.FULL +         Record 00001133 More: < >
Command ===> ____________________________________________ Scroll ===> PAGE
   Slice . . Duration  00.01.00     Date  2011-04-29     Time  15.43.00.000000
   Code Description  < _____________ >  2011-04-29 Friday    Time (LOCAL)
/  ---- ------------------------------------------------------ ---------------
__ TAG  CICS Transaction Abend=DB40                             15.43.14.333665
   ------------------------------------------------------------------------------
__ 6E13 CICS Transaction                                        15.43.14.333665
        TranCode=TWMU Program=TWM$UPD Userid=TWM1 LTerm=SC0TCP13 Terminal=CP13
        RecToken=FUWTCIC/C7B1A1C77C91A063 Resp=3.416706 CPU=0.041252 DB2=17
        Task=168 Abend=DB40
   ------------------------------------------------------------------------------
****************************** Bottom of Data ******************************
```

Figure 68. Panel: Tag

You have found and tagged the CMF record for the abending CICS transaction. You are ready to hand over the problem to a CICS subject matter expert.

25. Press the Exit function key (F3) until you return to the Transaction Analysis Workbench primary option menu.

    Now "swap hats": imagine that you are the CICS subject matter expert who has been handed this problem for further analysis. You have received an email from the technical support help desk containing the relevant session number and tag description, and you have just started the Transaction Analysis Workbench ISPF dialog.

26. On the Transaction Analysis Workbench primary option menu, select option 1 **Sessions**.
27. Select session 00000005, "Tutorial: CICS DB2".
28. On the session menu, select option 5 **History**.

    Notice that, in addition to the tag we explicitly created with the description "CICS Transaction Abend=DB40" (or similar), the history contains a "personal savepoint" tag. Each time a user exits the log browser for a session, the log browser automatically saves this tag in the session history, bookmarking the current position (the record at the top of the panel), and enabling the user to resume browsing at that position later.

```
  File  Help
------------------------------------------------------------------------------
                                History                      Row 1 to 3 of 3
Command ===> ____________________________________________ Scroll ===> PAGE

Select a history item or use the NEW command to create a new note.

/  Type      Description                    Changed             ID
_  TAG       Personal savepoint for IMPOT20 2011-06-17 10.15.01 IMPOTnn
r  TAG       CICS Transaction Abend=DB40    2011-06-17 10.01.30 IMPOTnn
****************************** Bottom of data ******************************
```

Figure 69. Panel: Session history

(If other users have previously performed this tutorial with the same user ID, the session history might contain more tags than shown in the previous figure.)

Tip: The **Resume Investigate** option (under dialog option 0.1 **Workbench Personal Settings**) controls whether or not the log browser automatically resumes from your personal savepoint when you select option 4 **Investigate** on the session menu, or displays the Investigate panel.

29. Enter **R** (resume) next to the tag that you created previously (in your role as technical support help desk operator) for "CICS Transaction Abend=DB40".

    The log browser resumes at the tagged position.

```
  File  Mode  Filter  Time  Labels  Options  Help
-------------------------------------------------------------------------------
BROWSE    IMPOT01.SMF.D110429.CICSDB2.FULL +         Record 00000690 More: < >
Command ===> _____________________________________________ Scroll ===> PAGE
   Slice . . Duration  00.01.00     Date  2011-04-29     Time  15.43.14.333665
   Code Description  < _____________ >  2011-04-29 Friday    Time (LOCAL)
/  ---- ------------------------------------------------------ ----------------
__ TAG  Personal savepoint for IMPOT20                          15.43.17.362315
   ------------------------------------------------------------------------------
__ TAG  CICS Transaction Abend=DB40                             15.43.14.333665
   ------------------------------------------------------------------------------
tx 6E13 CICS Transaction                                        15.43.14.333665
        TranCode=TWMU Program=TWM$UPD Userid=TWM1 LTerm=SC0TCP13 Terminal=CP13
        RecToken=FUWTCIC/C7B1A1C77C91A063 Resp=3.416706 CPU=0.041252 DB2=17
        Task=168 Abend=DB40
   ------------------------------------------------------------------------------
******************************** Bottom of Data ********************************
```

Figure 70. Panel: Tracking a CICS DB2 transaction: scroll backward to see more records

As the CICS subject matter expert, we want to delve into the detail of the CICS transaction activity. We will use transaction tracking to display the log records related to this transaction, from all selected log files (in this case, the SMF file and the DB2 log).

30. Enter **TX** next to the CMF record.

    The message "Tracking is active" is displayed at the top right of the panel, but otherwise, the **TX** line action appears to have had little effect. This is because we are using a CMF record for tracking. CICS writes CMF records at the end of a CICS transaction, after all other log records related to the transaction (such as related records in the DB2 log) have been written. To see the related records, all we need to do is scroll backwards.

    However, before we scroll backwards, there is one more issue to consider that is specific to CMF records. The log browser displays CMF records in the position they were written to SMF (that is, according to the SMF time stamp). However, the log browser **Time** column displays the CICS transaction start time, not the SMF time stamp. This behavior is useful because it means that we can display records that are related to the CICS transaction with elapsed times relative to the transaction start time. The following steps demonstrate this technique.

31. Enter **R** (display relative times) next to the CMF record.

```
  File  Mode  Filter  Time  Labels  Options  Help
-------------------------------------------------------------------------------
BROWSE    IMPOT01.SMF.D110429.CICSDB2.FULL +                Tracking is active
Command ===> ____________________________________________________ Scroll ===> PAGE
   Slice . . Duration  00.01.00     Date  2011-04-29     Time  15.43.14.333665
   Code Description  < _____________ >  2011-04-29 Friday    Time (LOCAL)
/  ---- ------------------------------------------------------ ---------------
__ TAG  CICS Transaction Abend=DB40                             15.43.14.333665
   -------------------------------------------------------------------------
r_ 6E13 CICS Transaction                                        15.43.14.333665
        TranCode=TWMU Program=TWM$UPD Userid=TWM1 LTerm=SC0TCP13 Terminal=CP13
        RecToken=FUWTCIC/C7B1A1C77C91A063 Resp=3.416706 CPU=0.041252 DB2=17
        Task=168 Abend=DB40
   -------------------------------------------------------------------------
****************************** Bottom of Data ******************************
```

Figure 71. Panel: Tracking a CICS DB2 transaction (viewing elapsed times relative to the transaction start)

Again, not much appears to have changed. Now let's scroll backwards to view the related records.

32. Scroll to the top of data. Either:
    - Type `M` on the command line, and then press the Backward function key (F7).
    - Type `TOP` on the command line, and then press Enter.

    We now see the related records for this transaction, showing elapsed times relative to the start of the transaction.
33. Press the Right function key (F11) to compress each record onto a single line.

```
  File  Mode  Filter  Time  Labels  Options  Help
-------------------------------------------------------------------------------
BROWSE    IMPOT01.SMF.D110429.CICSDB2.FULL +         Record 00000463 More: < >
Command ===> ____________________________________________________ Scroll ===> PAGE
   Slice . . Duration  00.01.00     Date  2011-04-29     Time  15.43.14.333665
   Code Description  < _____________ >  2011-04-29 Friday    Time (Relative)
/  ---- ------------------------------------------------------ ---------------
__ 66   DB2 Performance 072 Create thread entry                      +0.001485
__ 66   DB2 Performance 021 Lock detail SSID=DBA3 SYSID=FTS3         +0.002021
__ 66   DB2 Performance 112 Successful plan allocation(allied)      +0.002446
__ 66   DB2 Performance 073 Create thread exit                      +0.002545
__ 66   DB2 Performance 122 Thread level exit from DB2              +0.002604
__ 66   DB2 Performance 121 Thread level entry into DB2             +0.002663
__ 66   DB2 Performance 044 IRLM suspend entry                      +0.002901
__ 66   DB2 Performance 093 Suspend SSID=DBA3 SYSID=FTS3            +0.002964
__ 66   DB2 Performance 094 Resume SSID=DBA3 SYSID=FTS3             +0.004113
__ 66   DB2 Performance 045 IRLM suspend exit                       +0.004172
__ 66   DB2 Performance 021 Lock detail SSID=DBA3 SYSID=FTS3        +0.004222
__ 66   DB2 Performance 177 Successful package allocation           +0.004361
__ 66   DB2 Performance 065 SQL open cursor                         +0.004689
__ 66   DB2 Performance 058 SQL call completion                     +0.004877
__ 66   DB2 Performance 122 Thread level exit from DB2              +0.004932
__ 66   DB2 Performance 121 Thread level entry into DB2             +0.005273
__ 66   DB2 Performance 059 SQL fetch SSID=DBA3 SYSID=FTS3          +0.005392
```

Figure 72. Panel: Tracking a CICS DB2 transaction (from the start of the related records)

34. Press the Forward function key (F8) several times to scroll forward until you see the elapsed time jump from less than 1 second to greater than 3 seconds.

```
  File  Mode  Filter  Time  Labels  Options  Help
-------------------------------------------------------------------------------
BROWSE    IMPOT01.SMF.D110429.CICSDB2.FULL +         Record 00000603 More: < >
Command ===> ____________________________________________________ Scroll ===> PAGE
   Slice . . Duration  00.01.00     Date  2011-04-29     Time  15.43.14.333665
   Code Description  < _____________ >  2011-04-29 Friday    Time (Relative)
/  ---- ------------------------------------------------------ ----------------
__ 0020 DB2 Delete from a Data Page                                  +0.014190
__ 66   DB2 Performance 044 IRLM suspend entry                       +0.014239
__ 66   DB2 Performance 093 Suspend SSID=DBA3 SYSID=FTS3             +0.014285
__ 66   DB2 Performance 094 Resume SSID=DBA3 SYSID=FTS3              +3.018812
__ 66   DB2 Performance 045 IRLM suspend exit                        +3.018924
__ 66   DB2 Performance 046 Synchronous EU switch                    +3.019268
__ 66   DB2 Performance 049 EU switch TCB entry                      +3.019600
__ 66   DB2 Performance 093 Suspend SSID=DBA3 SYSID=FTS3             +3.019386
__ 66   DB2 Performance 050 EU switch TCB exit                       +3.027132
__ 66   DB2 Performance 094 Resume SSID=DBA3 SYSID=FTS3              +3.028490
__ 66   DB2 Performance 197 Reserved SSID=DBA3 SYSID=FTS3            +3.028575
s  66   DB2 Performance 172 Deadlock data SSID=DBA3 SYSID=FTS3       +3.028649
__ 66   DB2 Performance 021 Lock detail SSID=DBA3 SYSID=FTS3         +3.028742
__ 66   DB2 Performance 046 Synchronous EU switch                    +3.072437
__ 66   DB2 Performance 093 Suspend SSID=DBA3 SYSID=FTS3             +3.072561
__ 66   DB2 Performance 049 EU switch TCB entry                      +3.072689
```

Figure 73. Panel: Tracking a CICS DB2 transaction (finding the cause of the problem)

The jump in elapsed time occurs because the lock manager (IRLM) has suspended the transaction due to a lock (and has probably timed out waiting, hence the transaction abend). Looking at the surrounding log records, we see the probable cause: the previous DB2 activity, a delete (log record shown before the IRLM suspend) has resulted in a deadlock (log record shown after the IRLM resume).

35. Enter **S** next to the "DB2 Performance 172 Deadlock data" record to view its details.

    The full details of the deadlock record are displayed.

36. Press the Forward function key (F8) to scroll past the header fields to the Blocker section.

    Here, TWMU, the CICS transaction that abended, is the waiter. DB2U is the CICS transaction that is the blocker in this deadlock.

```
  File  Menu  Format  Help
-------------------------------------------------------------------------------
FUWBRLFM   IMPOT01.SMF.D110429.CICSDB2.FULL +    Record 00000690 Line 00000019
Command ===> ____________________________________________ Scroll ===> PAGE
Form    ===>          +     Use Form in Filter              Format ===> STD
+0068  QW0172HP... Blocker
+0068  QW0172HP... 'TWM$UPD '  QW0172HR... 'POOLDB2U0001'
+007C  QW0172HN... 'FUWTCIC '  QW0172HL... 'FTS3    DBA3LU  G..D....'
+009C  QW0172HT... 000001AD    QW0172HO... 008E00FF1CB6FFD0
+00AC  QW0172HI... 'DBA3    '  QW0172HS... 08          QW0172HD... 40
+00B6  QW0172HF... 12
+00B8  QW0172WP... Waiter
+00B8  QW0172WP... 'TWM$UPD '  QW0172WR... 'ENTRTWMU0002'
+00CC  QW0172WN... 'FUWTCIC '  QW0172WL... 'FTS3    DBA3LU  G..D.)..'
+00EC  QW0172WT... 000001AE    QW0172WW... 008E000A1CB70AF0
+00FC  QW0172WO... 008E000A1CB70A48                   QW0172WF... 02
+0105  QW0172WS... 05          QW0172WD... 20          QW0172WG... 30
+0108  QW0172WA... 11          QW0172WI... 'DBA3    '
+0114  QW0172HB... Holder
+0114  QW0172HB... 'TWM     '  QW0172HC... '        '
+012C  QW0172HJ... '        '  QW0172HK... '        '  QW0172H9... 00000000
+0162  QW0172HQ... Holders package/DBRM name
+0162  QW0172Q1... 'TWM$UPD '  QW0172Q2... 'TWM$UPD'
+017C  QW0172Q3... '        '  QW0172Q4... 18BCFE730734BC9D
```

Figure 74. Panel: Browsing the details of a DB2 performance "deadlock" record (from an SMF file)

37. Press the Exit function key (F3) to return to the list panel of log records.
38. Enter **S** next to the "DB2 Delete from a Data Page" record to view its details.

    Here we can see the details of the activity that the transaction was attempting to perform before it abended, including the actual data that the transaction was attempting to delete.

```
  File  Menu  Format  Help
-------------------------------------------------------------------------------
BROWSE     IMPOT01.SMF.D110429.CICSDB2.FULL +    Record 00000603 Line 00000009
Command ===> ____________________________________________ Scroll ===> CSR
Form    ===>          +     Use Form in Filter              Format ===> STD
+0017  LRHLEN..... 26          LRHUNLSN... 0000419DAAE1
+001E  LRHTIME.... C7B1A1C479750003
+001E  LRHLRSN.... C7B1A1C47975                      LRHMEMID... 0003

+0026  LRHDBHDR... Database identification
+0027  LRHDBID.... 0110        LRHPSID.... 0002        LRHDFLAG... 40

+0038  LRHUPDTH... Update information
       LRHACTN.... 'Delete'
       LRHDDESC... 'Full user row delete (UNDO)                        '

+0040  LRHUPDTE... Update data
+0040  LRHRHDR.... Row Header
       +0000  02003600 000D                        *......         *
+0046  LRHRDATA... Row Data
       +0000  C9F2F200 F0F0F0F1 F0F0C5F0 F100E3E6   *I22.000100E01.TW*
       +0010  D45BE4D7 C440F140 4D404040 5D400020   *M$UPD 1 (   ) ..*
       +0020  C2D9C1D5 C3C840D6 C6C6C9C3 C540C9F2   *BRANCH OFFICE I2*
******************************** End of data ********************************
```

Figure 75. Panel: Browsing the details of a DB2 delete record (from a DB2 log)

39. Press the Exit function key (F3) to return to the list panel of log records.

    Finally, if we scroll forward a little further, we can see the "DB2 Unit of Recovery Control - Begin Abort" record that corresponds to the DB2 "Delete..." record (matching URIDs; for clarity, we have omitted from the following figure all but these two log records.). Any other activity in this unit of recovery will also be rolled back.

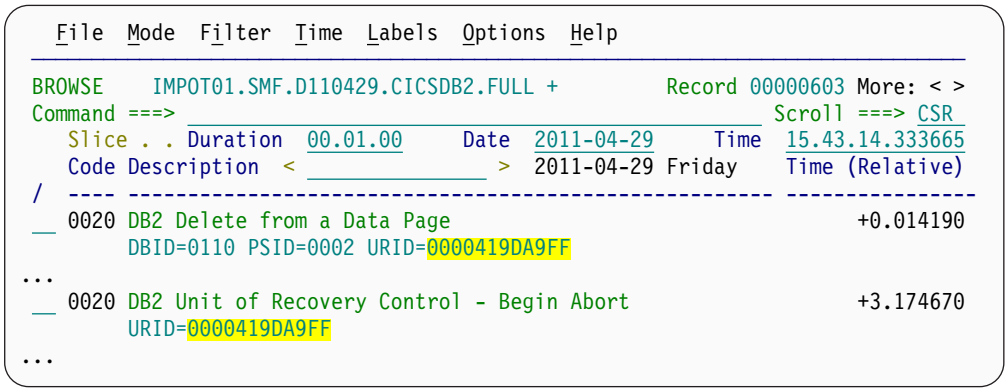

Figure 76. Panel: Tracking a CICS DB2 transaction (matching the delete and abort URID)

At this point, you would probably hand over the problem to a DB2 subject matter expert, perhaps after tagging one or more of the relevant log records discussed in this tutorial.

You have completed the last tutorial. Your sessions repository includes additional predefined sessions that are not specifically covered by these tutorials. Please feel free to explore those other sessions now.

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