

# IBM Transaction Analysis Workbench:

**It's not just for IMS –  
we cover DB2, CICS, and more!**

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# Agenda

1. **IBM Transaction Analysis Workbench for z/OS** (“Workbench”) covers IMS, DB2, CICS, and more...
2. Workbench and big data: identifying transaction “exceptions” in instrumentation data
3. Why z/OS transaction analysis must be collaborative and span z/OS subsystems
4. Introducing Workbench
5. How Workbench can help application development teams
6. Coming soon: future Workbench features

Additional slides (for reference; not presented)

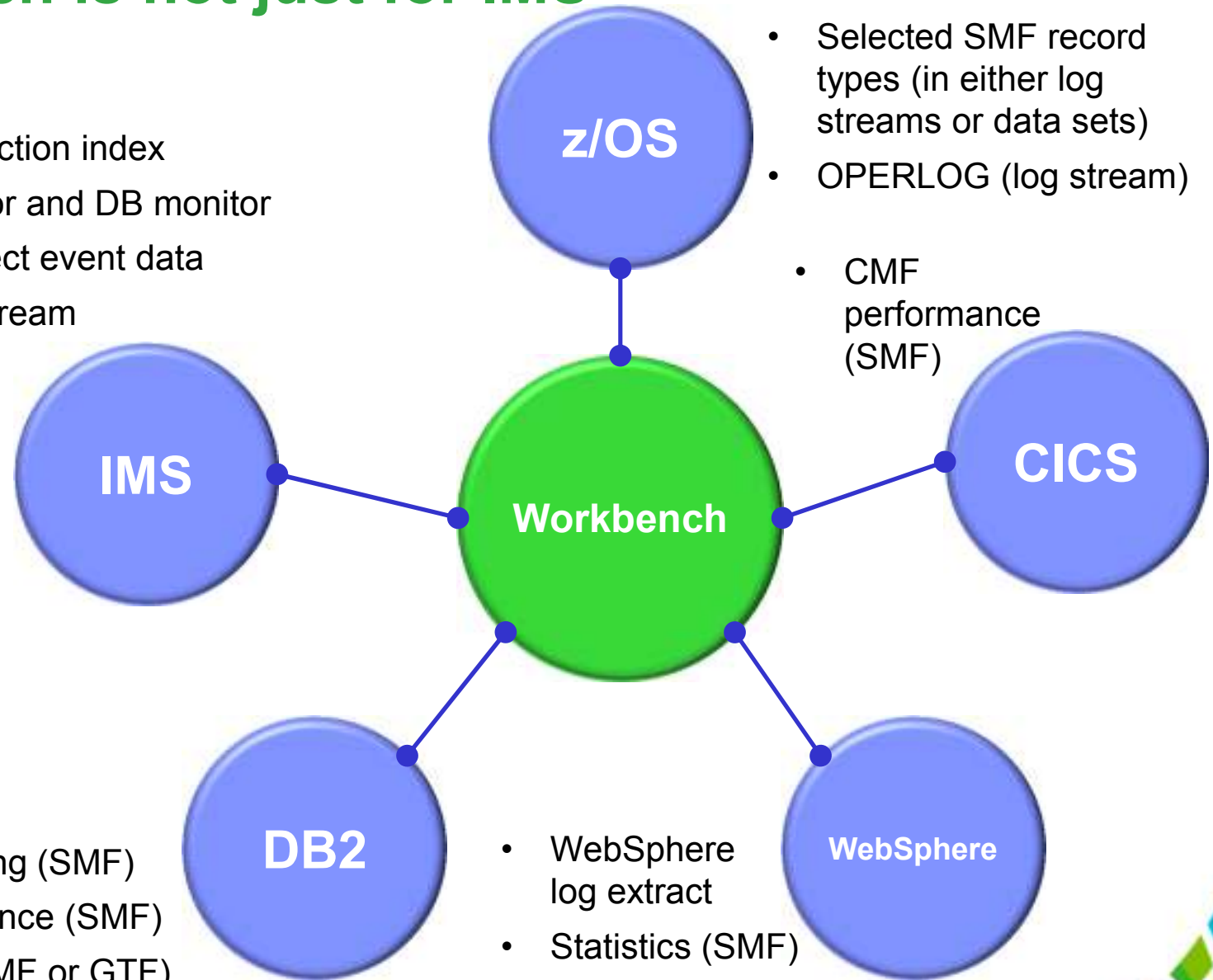
7. Scenario: IMS-DB2 problem



# Workbench is not just for IMS

- IMS log
- IMS transaction index
- IMS monitor and DB monitor
- IMS Connect event data
- CQS log stream

- Selected SMF record types (in either log streams or data sets)
- OPERLOG (log stream)
- CMF performance (SMF)



- DB2 log
- Accounting (SMF)
- Performance (SMF)
- Trace (SMF or GTF)


- WebSphere log extract
- Statistics (SMF)
- Accounting (SMF)



## Workbench is not just for IMS (cont.)

- Workbench merges logs from multiple subsystems to present a consolidated, cross-subsystem view of a transaction's life cycle
- Interactive ISPF dialog log browser provides a consistent interface to all log types from all subsystems (finding, navigating, filtering, formatting: when you know how to work with one log type, you know how to work with them all)
- Automated file selection for IMS logs, DB2 logs, and (soon) SMF
- Specific additional support for combined CICS-DBCTL reporting (other combinations coming soon: CICS-DB2, IMS-DB2)
- Various SMF record-type specific batch reports (aimed at transaction analysis)

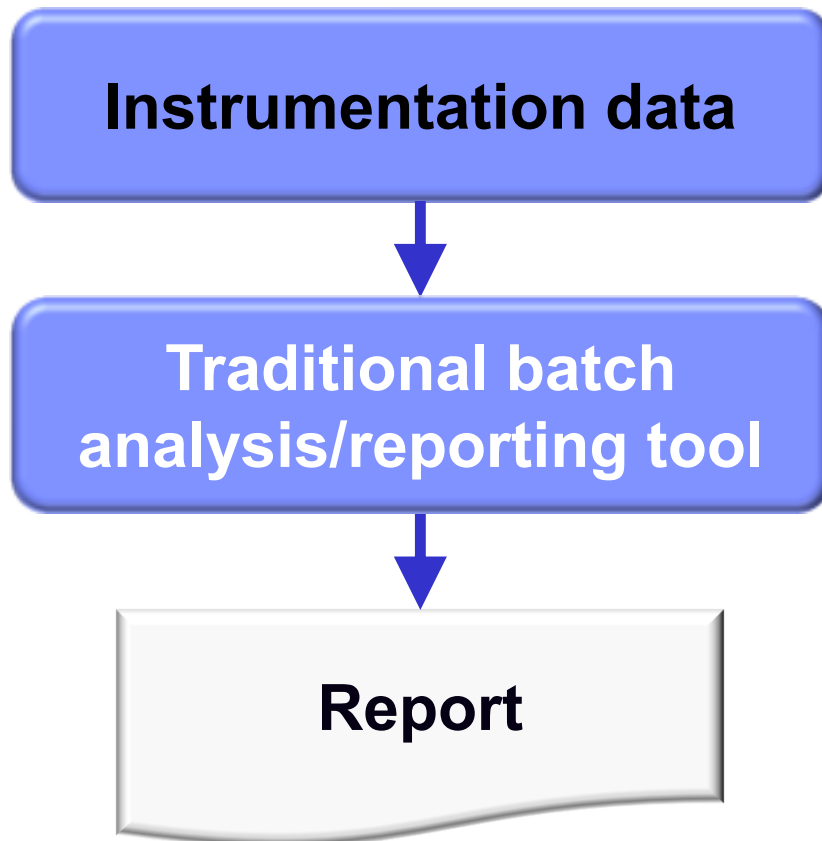




**Workbench and big data:  
identifying transaction  
“exceptions”  
in instrumentation data**

# Problem: today's instrumentation data overwhelms traditional tools

- Good performance monitoring should identify possible performance issues before they become critical
- Today's systems create so much instrumentation data that existing techniques cannot keep up: **takes too long, costs too much!**



- Processes and reports on all records
- Processing time and cost grows with size of instrumentation data, beyond practical limits
- Reports can grow too long to be useful, and contain unwanted detail



## Problem: today's instrumentation data overwhelms traditional tools (cont.)

- The increase in instrumentation data dictates a shift in how we approach performance monitoring
- Instead of reporting on the details of what happened, we need to be able to process the wealth of instrumentation data and identify areas where more in-depth performance evaluation is warranted

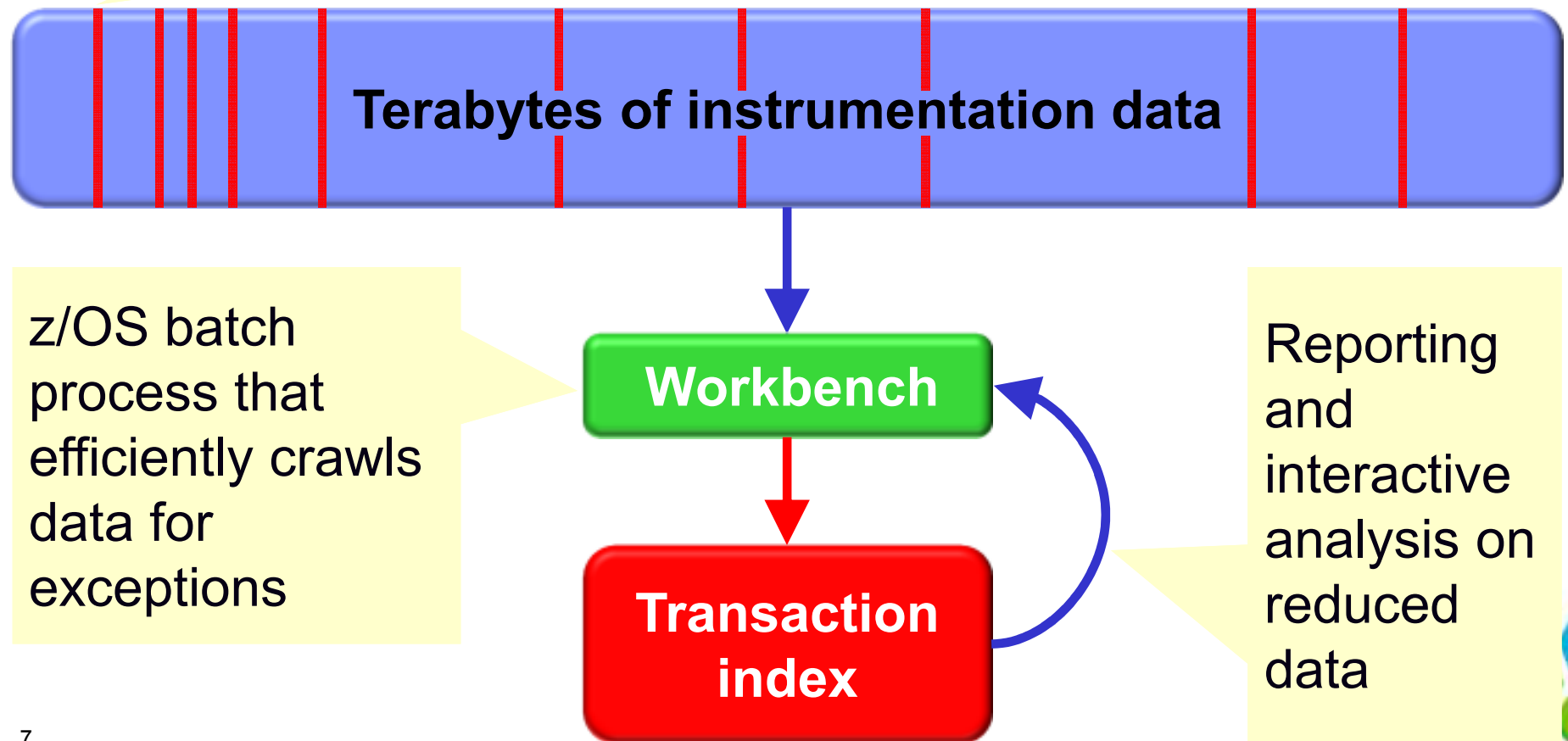


**Terabytes of instrumentation data**

For performance issues and problem analysis, we want to identify and then analyse the (typically, relatively few) records that exhibit *exceptional* behaviour, not get swamped by the bulk of “normal” instrumentation data

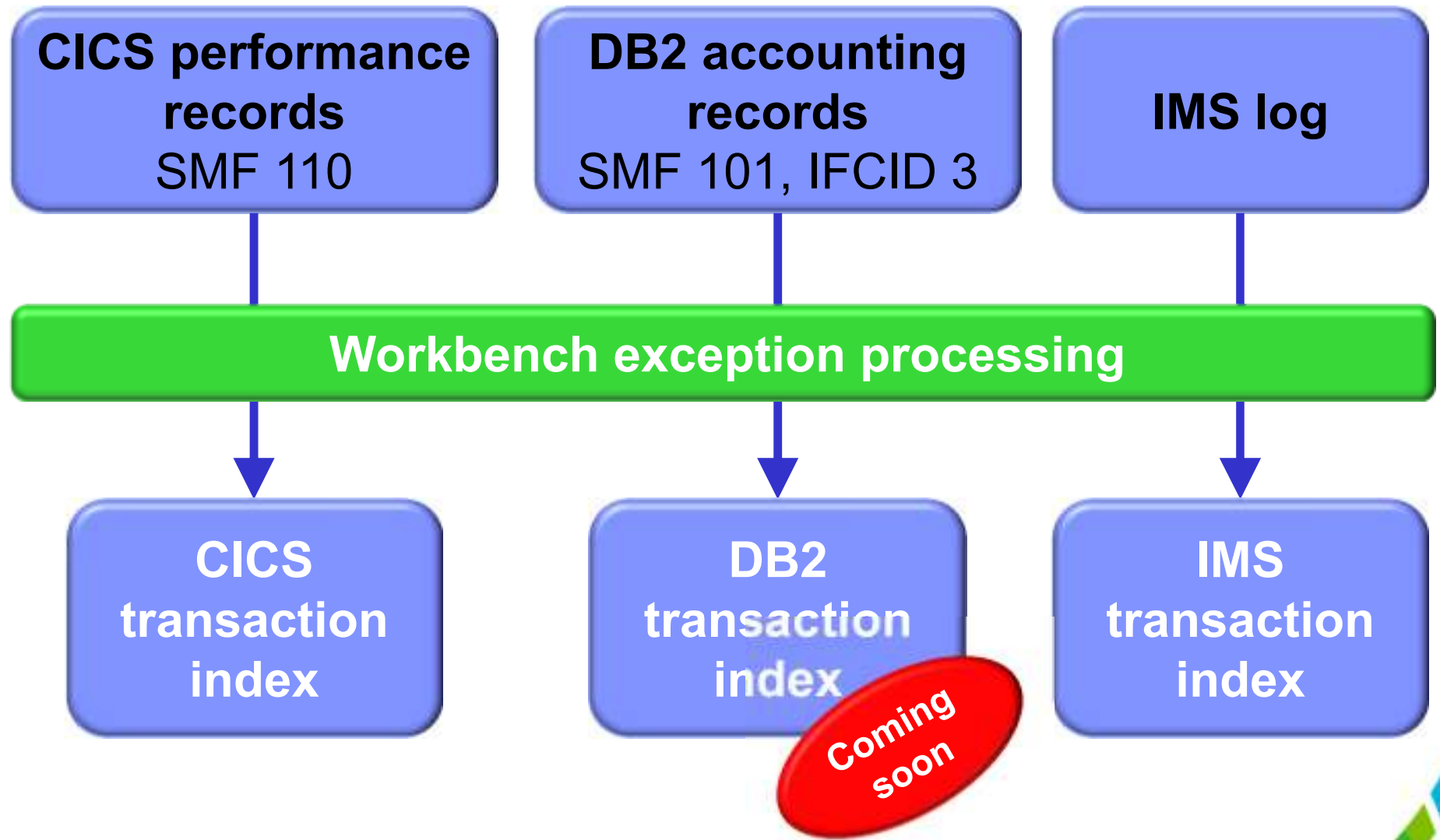
## Solution: Workbench exception processing

**Exception:** a transaction that matches specific *exception criteria*, such as long response time or an abend





# Exception processing for CICS, DB2, and IMS



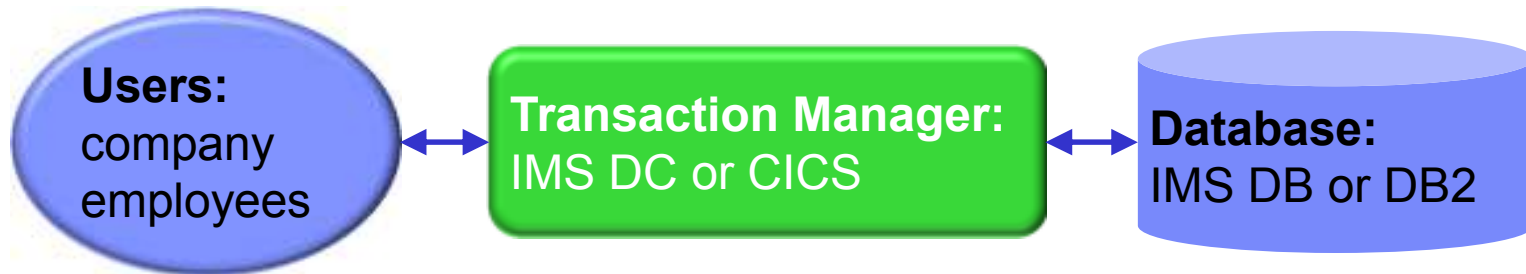
**Why z/OS transaction analysis must be collaborative and span z/OS subsystems**



# It's about application evolution

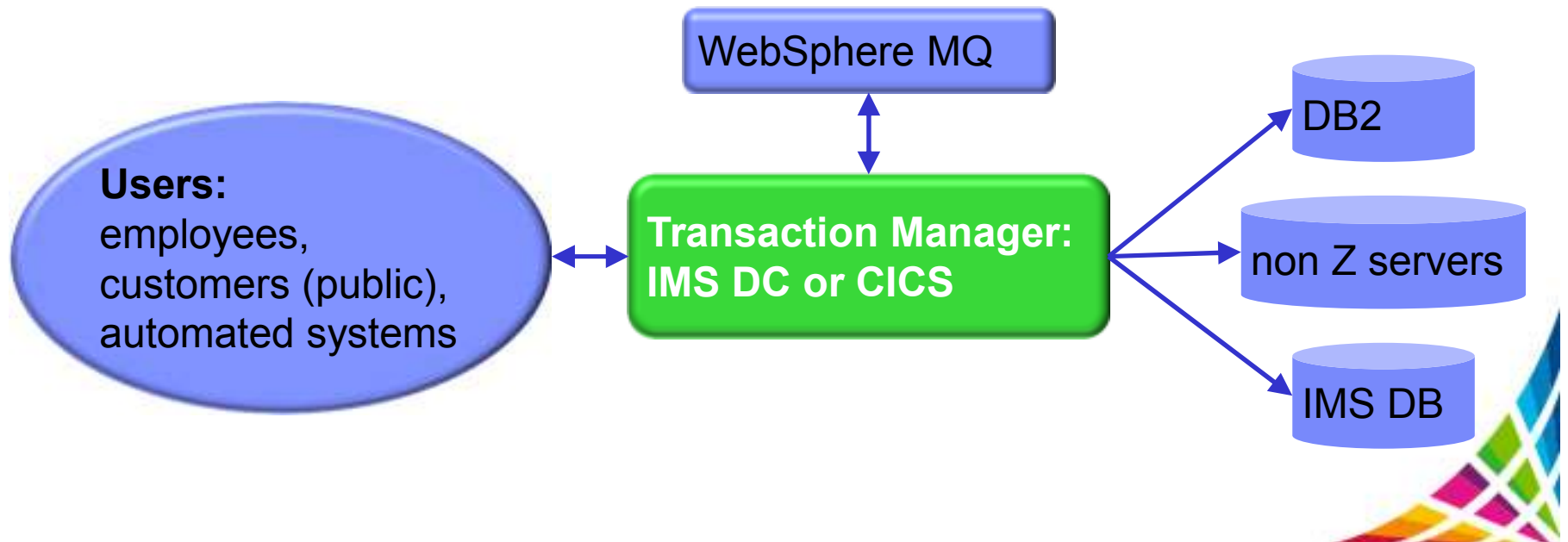
## 1980s application:

in-house users only; **simple** data, single data store



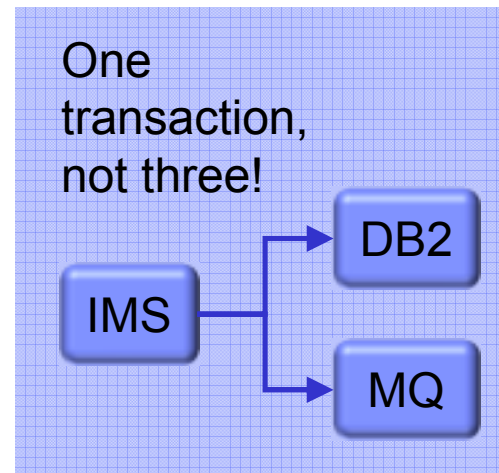
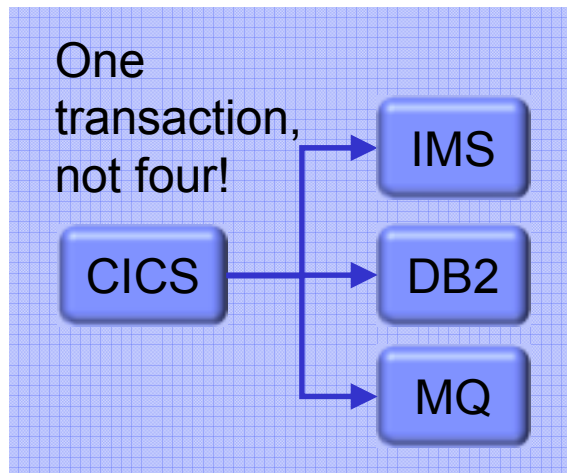
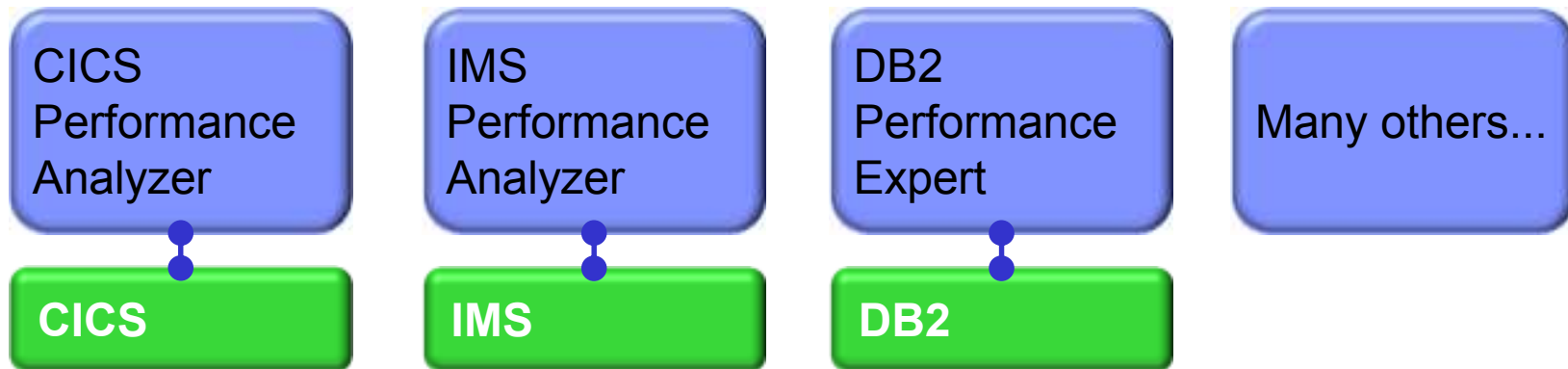
## Today:

users are customers; data is **complex, heterogeneous**, often distributed



# Traditional tools based on “silo” model

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

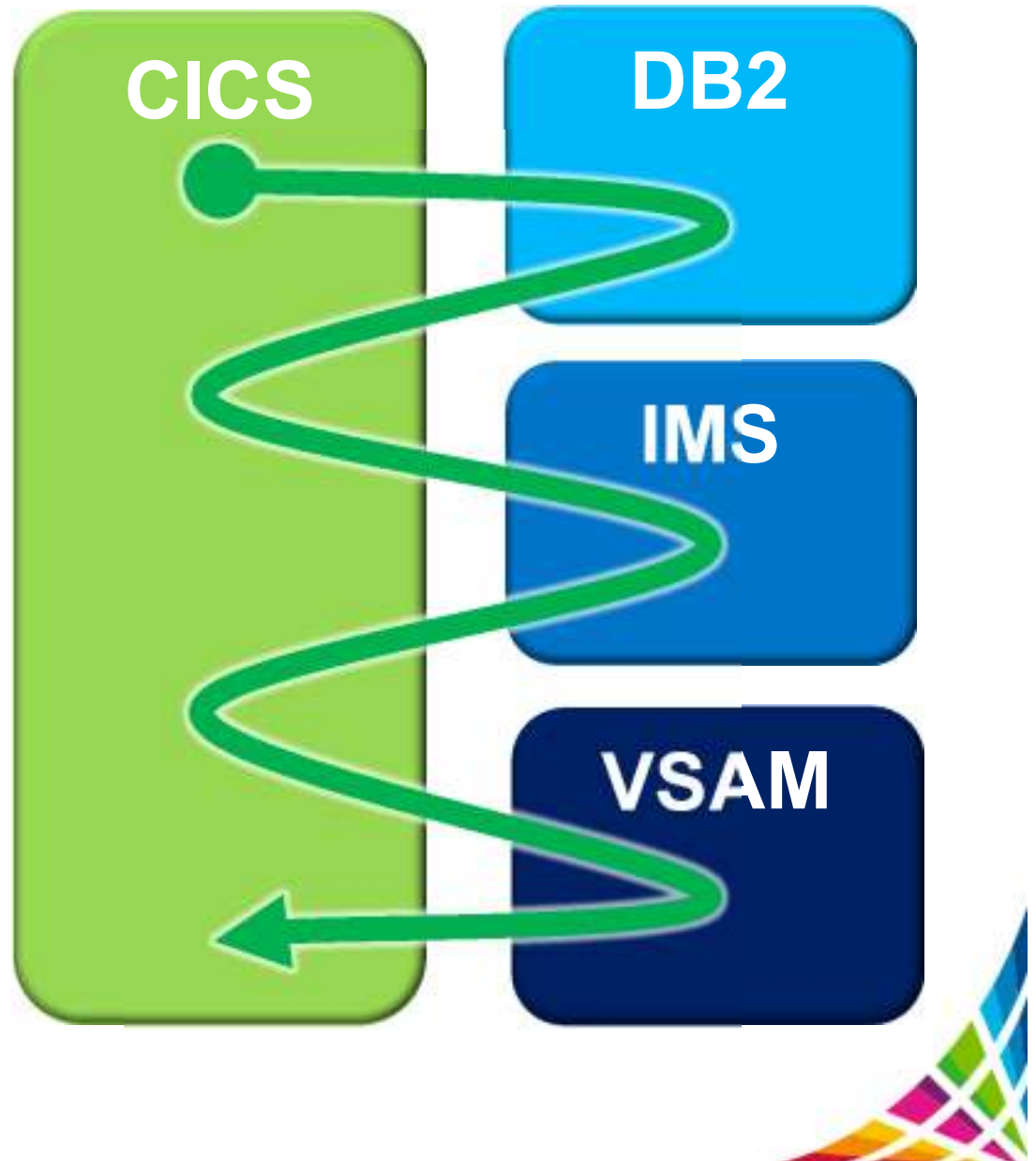


Each tool is well-suited to its environment, but you often need a subject-matter expert to use each tool



## Where did the delay occur?

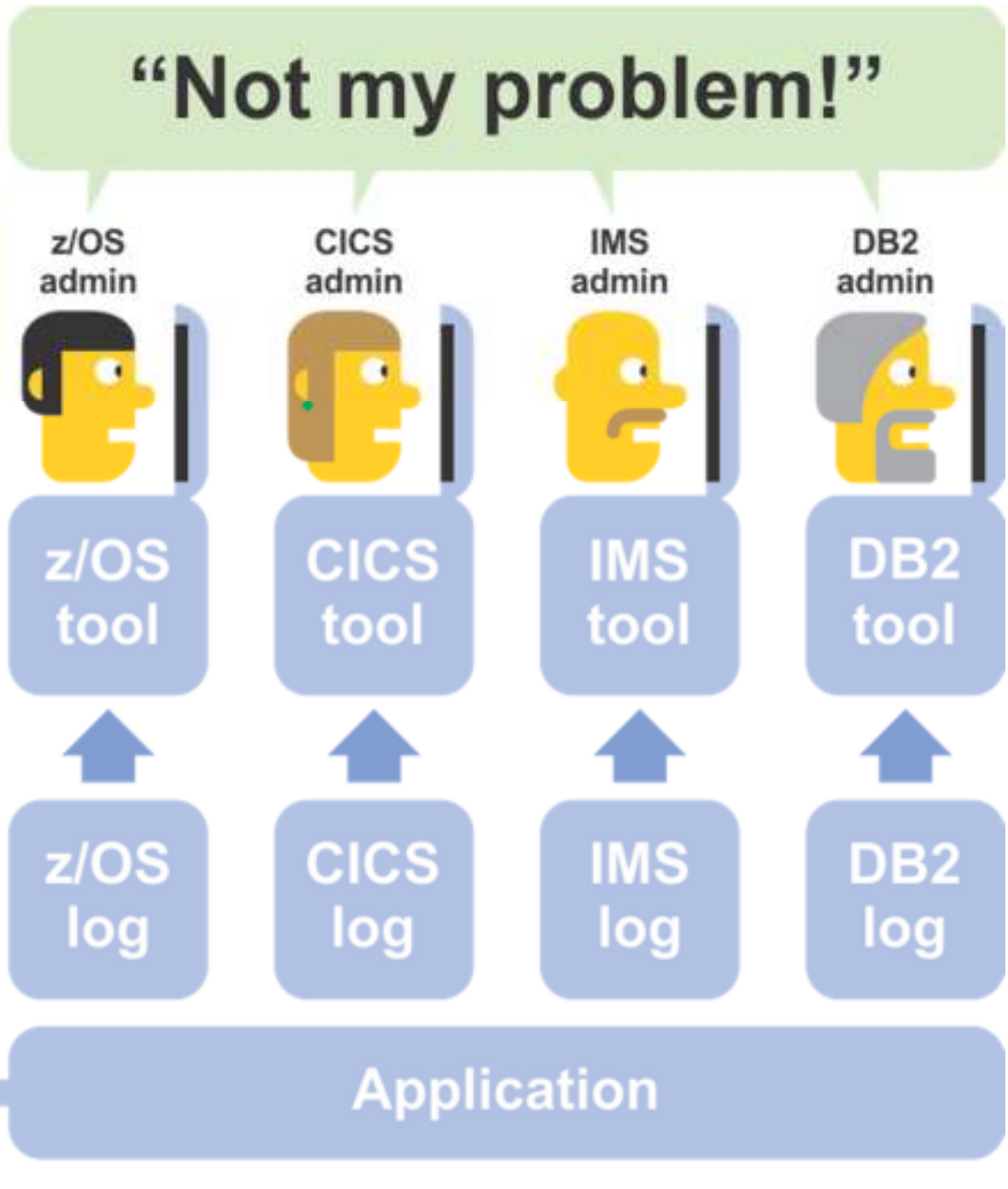
- A single transaction can involve activity across many subsystems
- Subsystem-specific tools offer a limited perspective
- To quickly identify performance issues, you need to track activity across subsystems
- Each subsystem has its own activity log



## The problem

Traditional tools are not collaborative and are subsystem-specific

“I have a problem!”



# Collaboration is key with fewer staff

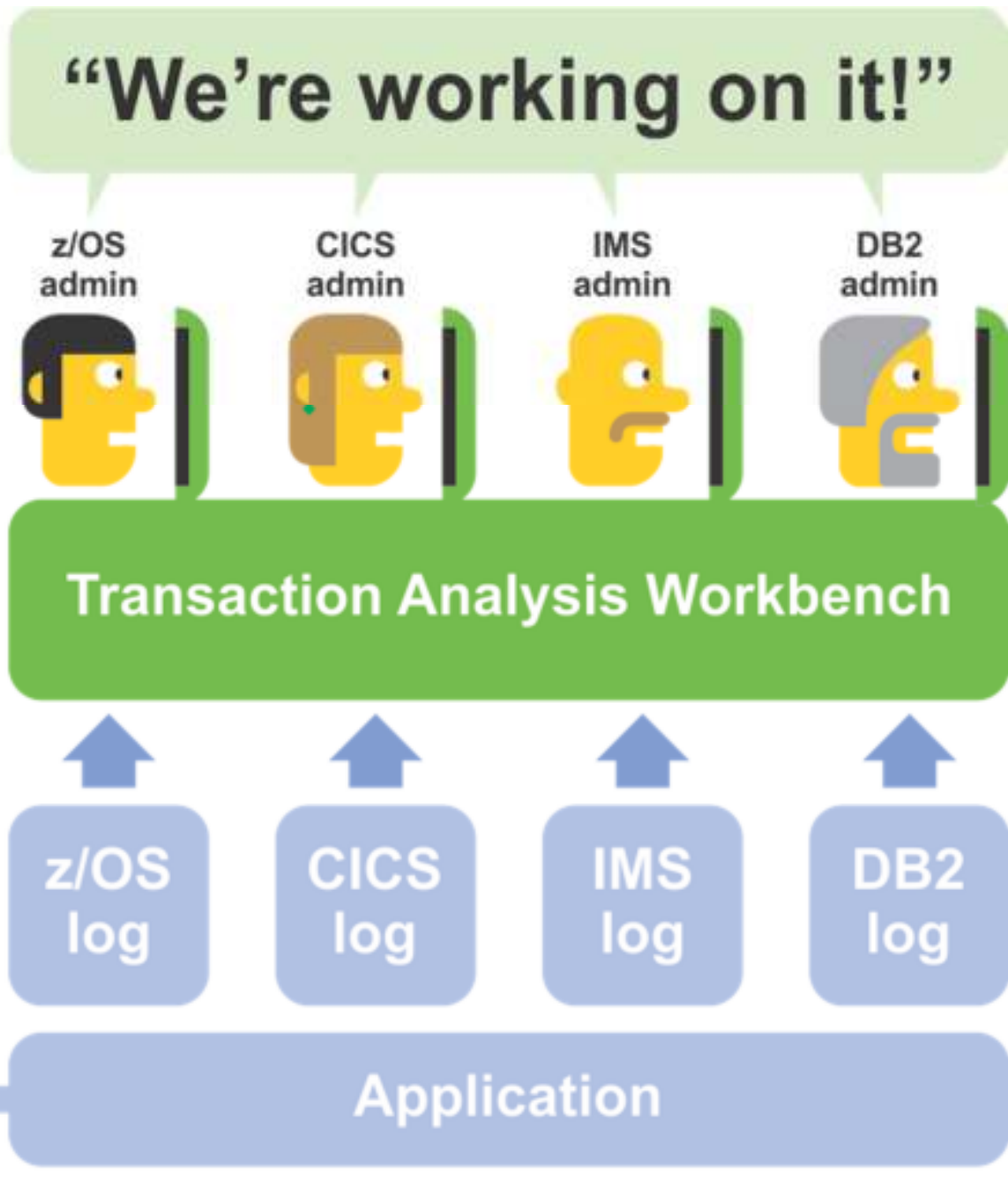
- Why is collaboration so difficult?
  - SME may be in silos
    - Unable or unwilling to cooperate easily
    - Takes too much time using current tools
- What do good collaboration tools achieve?
  - Conservation of SMEs' time (a valuable, limited resource)
  - Transparency of information (everyone using the same data)
- We need to encourage SMEs to see the benefit of collaboration
  - Reduced time to resolution
  - More SME time focused on problem resolution
  - Cross-training of first responders and SMEs



## The solution

A collaborative tool that spans subsystems; experts work together

“I have a problem!”







# Introducing Workbench

# IBM Transaction Analysis Workbench for z/OS

- A tool for **collaborative problem solving**:
  - Between “first responders” and subject-matter experts (SMEs)
  - Between SMEs in different areas
- Provides a life cycle view of transaction activity across subsystems
  - Changes the way problem resolution is performed
  - Ensures everyone is looking at the same transactional data
- Goes in-depth.
  - Uses SMF, trace, and log records to follow transaction flow
- Better assignment of problems to the correct group
  - Improved confidence in problems assigned to experts



# How Workbench can help application development teams



# Application releases must work and perform when deployed

- Application teams perform validation testing during roll-out
  - Is performance a part of validation testing?
  - If performance validation is done, who does the validation?
  - What criteria are used?
- Does the evaluation occur at the transaction level?
- What is the cost of performance validation testing?
- What is the cost of a failed roll-out due to poor performance?
- Do the system programming staff have time to help?



# Value of instrumentation data to application development teams

- Same value as for system programmers and DBAs:
  - Evaluate transaction response time
  - Evaluate application database update patterns
  - Diagnose application errors and/or performance issues



# Inhibitors to instrumentation use by application development teams

- Value of instrumentation data not known
  - May not know what is available and how to use it
  - Not a traditional development tool
- Do not know how to obtain the data or data access not allowed
  - May not have access to system parts
- Limited or no knowledge of tools that use instrumentation data
- Limited access to system programmers' time
  - Reluctant to bother system programmers to get help



## How Workbench can help

- Automates gathering of instrumentation data
  - Application development teams do not have to acquire those skills
- Performs automated reporting of validation testing
  - Includes reporting via CICS PA and/or IMS PA, in addition to its own reports
- Analyses instrumentation data for performance exceptions
  - Provides easy recognition of validation testing against expected results
- Provides transaction life cycle views of transaction exceptions
  - Identify what part of transaction is causing problem
- Saves results of each validation testing run
- Facilitates collaboration with system programmers and/or DBAs for help with transaction exception diagnosis



# Summary of application team benefits

- Automate task often unfamiliar to application teams
  - Data acquisition – get the data needed for problem analysis
  - Autonomics – automated transaction analysis (life cycle)
  - Reporting – basic reporting without tool-specific knowledge
- Enables collaboration with other experts when required
  - Shared data approach to collaboration
    - DBA, system programmer provide assistance when needed
- Analysis of applications performance testing
  - Exceptions process provides evaluation of validation testing runs
  - Deeper transaction evaluation if exception process reports issues







**Coming soon:  
future Workbench features**

## Coming soon

- **Enhanced support for DB2 trace records**  
Detailed field-by-field formatting for more than 60 IFCIDs.
- **Workflows and session templates**  
SMEs can define a workflow (a sequence of analysis tasks) and save them in a session template. When creating a new session, users can select the session template that best matches the problem.
- **Eclipse-based rich client platform (RCP) user interface**  
Implements a subset of the ISPF dialog. Primarily aimed at “first responders”: create a session; run a workflow; assign to appropriate SME.
- **Automated SMF file selection**
- **SMF 42.6 DASD Data Set I/O report**



# Enhanced support for DB2 trace records

- New DB2 trace (“DTR”) log type for IFCID records (from SMF record types 100, 101, 102, or GTF data set records)

```
File  Mode  Filter  Time  Labels  Options  Help
-----
BROWSE    FUW000.QADATA.FBOSPM4C.SMF.D130703.FULL    Record 00000927 More: < >
Command ===>                               Scroll ===> CSR
/         Navigate < 00.05.00.000000 >      Date/Time 2013-07-03 16.39.00.000000
/         Tracking ----- Wednesday 2013-07-03 Time (LOCAL)
--- 112 Thread allocate                      DBA6 16.39.36.459771
--- 073 Create thread end                   DBA6 16.39.36.459816
--- 122 Thread level exit from DB2         DBA6 16.39.36.459831
--- 121 Thread level entry into DB2       DBA6 16.39.36.459880
--- 177 Successful package allocation      DBA6 16.39.36.465465
--- 380 SP entry FBOSPM4C                  DBA6 16.39.36.465827
--- 177 Successful package allocation      DBA6 16.39.36.465969
--- 060 SQL SELECT                          STMT=000009 DBA6 16.39.36.466073
--s-- 058 SQL call completion              SQLCODE=0 STMT=000009 DBA6 16.39.36.474645
--- 060 SQL SELECT                          STMT=000010 DBA6 16.39.36.474704
--- 058 SQL call completion              SQLCODE=0 STMT=000010 DBA6 16.39.36.474912
--- 061 SQL DELETE                         STMT=000011 DBA6 16.39.36.474952
--- 325 Trigger entry USERDEL             STMT=000011 DBA6 16.39.36.479901
--- 177 Successful package allocation      DBA6 16.39.36.479978
--- 061 SQL INSERT                         STMT=000002 DBA6 16.39.36.480037
--- 058 SQL call completion              SQLCODE=0 STMT=000002 DBA6 16.39.36.483035
--- 061 SQL DELETE                         STMT=000003 DBA6 16.39.36.483086
--- 058 SQL call completion              SQLCODE=0 STMT=000003 DBA6 16.39.36.497707
--- 325 Trigger exit                      SQLCODE=0 DBA6 16.39.36.497722
```



## Enhanced support for DB2 trace records (cont.)

▶ <b>SP entry FBOSPM4C</b>		DTR 233
SP entry FBOSPM4C		DTR 380
Successful package allocation		DTR 177
▶ <b>SQL SELECT STMT=000009</b>		DTR 060
◀ SQL call completion SQLCODE=0 STMT=000009	0.008572s	DTR 058
▶ <b>SQL SELECT STMT=000010</b>		DTR 060
◀ SQL call completion SQLCODE=0 STMT=000010	0.000208s	DTR 058
▶ <b>SQL DELETE STMT=000011</b>		DTR 061
▶ <b>Trigger entry USERDEL STMT=000011</b>		DTR 325
Successful package allocation		DTR 177
▶ <b>SQL INSERT STMT=000002</b>		DTR 061
◀ SQL call completion SQLCODE=0 STMT=000002	0.002998s	DTR 058
▶ <b>SQL DELETE STMT=000003</b>		DTR 061
◀ SQL call completion SQLCODE=0 STMT=000003	0.014621s	DTR 058
◀ Trigger exit SQLCODE=0	0.017821s	DTR 325
◀ SQL call completion SQLCODE=0 STMT=000011	0.022827s	DTR 058
▶ <b>SQL SELECT STMT=000013</b>		DTR 060
◀ SQL call completion SQLCODE=0 STMT=000013	0.007439s	DTR 058
▶ <b>SQL SELECT STMT=000014</b>		DTR 060
◀ SQL call completion SQLCODE=0 STMT=000014	0.000307s	DTR 058
SP statement execution detail		DTR 499
◀ SP exit FBOSPM4C =0	0.039876s	DTR 233
SP exit FBOSPM4C =0		DTR 380

Web page created by a REXX exec: presents DB2 trace records as a nested hierarchy, rather than a flat list

By matching start and end records, we can calculate elapsed times (for example, for stored procedures)



# Eclipse-based rich client platform (RCP) UI

The screenshot displays the Eclipse-based RCP UI for IBM Tools Base Connection Server. The window title is "Connection Server - IBM Tools Base Connection Server". The menu bar includes File, Edit, Navigate, Project, Workbench, Window, and Help. The toolbar contains various icons for file operations and navigation. The main interface is divided into several panes:

- Navigation Pane:** Shows a tree view of connection servers, including "FTS1 JCH [Connection Server]", "GXH#FSRV [Connection Server]", and "GXHEG".
- Workbench Repository Pane:** Displays a table of issues. The table has columns for Key, Summary, Status, Severity, Age (Days), Created, Updated, and Time Updated. The data is as follows:

Key	Summary	Status	Severity	Age (Days)	Created	Updated	Time Updated
00000001	Long response time from CICS transaction	OPEN	4	0	2013-08-19	2013-08-19	16.26.23.99
00000003	Web application server not responding	OPEN		0	2013-08-19	2013-08-19	16.27.55.32
00000004	Slow IMS transaction response	OPEN		0	2013-08-19	2013-08-19	16.28.06.42
00000005	XYZ application performance benchmark testing	OPEN		0	2013-08-19	2013-08-19	16.28.15.61
00000006	Post-implementation XYZ application analysis	OPEN		0	2013-08-19	2013-08-19	16.28.25.96

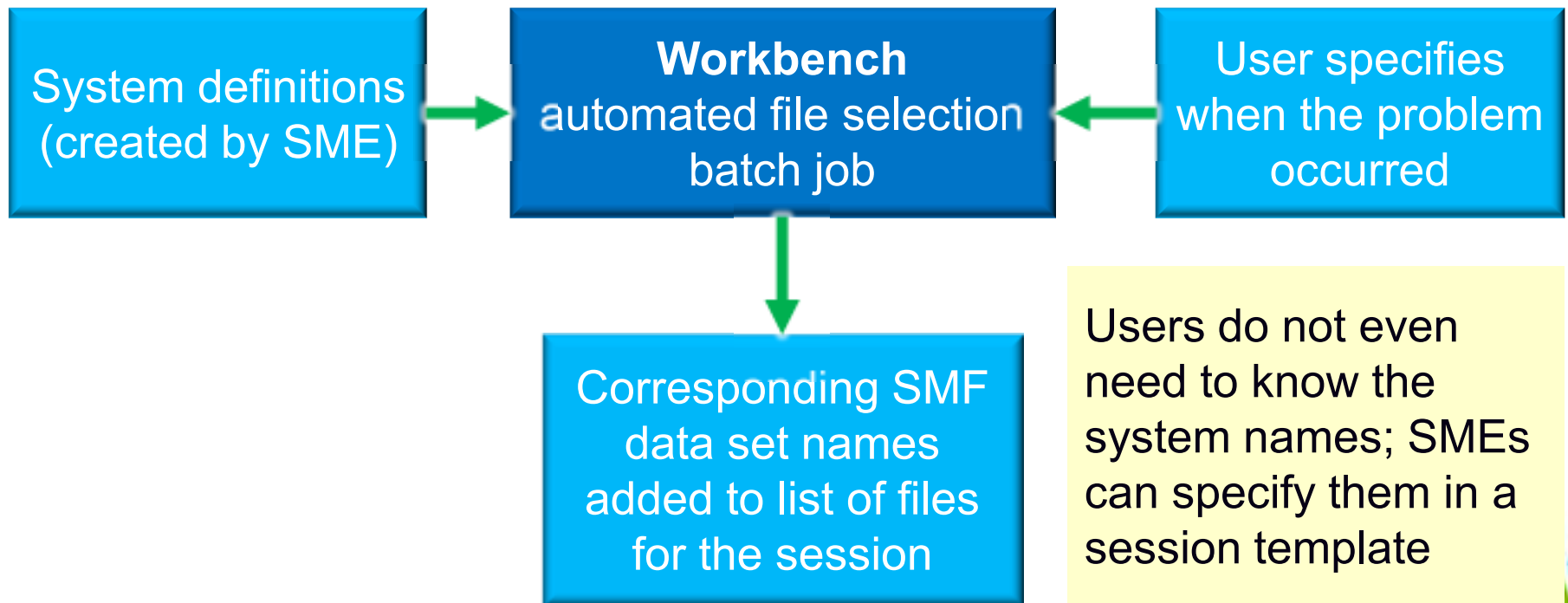
The bottom pane shows the details for the selected issue (Key: 00000001). The summary is "Long response time from CICS transaction". The details are as follows:

- Repository: GXHEG
- Created On: 19/08/2013 4:22:58 PM by GXH
- Timezone: LOCAL
- Assigned To: [Empty] [Assign to Me](#)
- Severity: 4
- Reference Id: [Empty]
- Reporter: [Empty]
- Status: OPEN
- Age (Days): 1077952576 days
- Last Updated On: 19/08/2013 4:26:23 PM by GXH
- Session Template: --- Approximate time issue occurred ---
- From: 2013-08-19 8:00:00 AM
- To: 2013-08-19 8:30:00 AM

The bottom pane also includes tabs for Details, Systems, Workflow, and Report Viewer.

## Automated SMF file selection

- One-time task: SMEs create system definitions that specify your enterprise-specific data set naming conventions (patterns) for SMF files
- Based on these definitions, the user can specify when a problem occurred; Workbench identifies the specific SMF files that contain the corresponding log records, and adds those files to your session



# Summary: Transaction Analysis Workbench

- **Saves time and money**
  - Well-defined problems are almost solved
  - Focus on areas with highest payback
- Much faster problem resolution
  - Better assignment of problems to the correct group
- Enables **collaborative problem solving**
  - Develop company-wide approach
  - Between first responders and subject-matter experts
  - Between experts in different areas
- Improves confidence in problem definition
  - Cross training
  - Better communication



## More information

- IBM DB2 and IMS Tools website:  
[www.ibm.com/software/data/db2imstools/](http://www.ibm.com/software/data/db2imstools/)
- IBM Transaction Analysis Workbench for z/OS:  
[www.ibm.com/software/data/db2imstools/imstools/trans-analysis/](http://www.ibm.com/software/data/db2imstools/imstools/trans-analysis/)
- Jim Martin, US Representative, Fundi Software:  
[jim\\_martin@fundi.com.au](mailto:jim_martin@fundi.com.au)
- James Martin, US Representative, Fundi Software:  
[james\\_martin@fundi.com.au](mailto:james_martin@fundi.com.au)
- John Hancy, CICS and IMS Tools development, Fundi Software:  
[john\\_hancy@fundi.com.au](mailto:john_hancy@fundi.com.au)





# Scenario: IMS-DB2 problem



# Scenario: IMS DB2 problem

1. On the following slides, we present an example scenario: a user has reported a long transaction response time for an IMS transaction performing DB2 updates
- The analysis is divided into two parts:
  1. The **first responder**:
    - Registers the problem in the Workbench session manager and collects the log files
    - Follows a process orientated script to assign problem to initial expert
      - Based on what is found
  2. The **subject-matter expert** performs a “deep dive” on the problem: reviewing the reports, and using interactive analysis to identify the specific log records for the cause of the problem



# First responder: Creating a session

```
File Help
-----
                                Problem Details                                Row 1 to 3 of 3
Command ==> _____ Scroll ==> PAGE

Key . . . . . : 00000007
Summary . . . . : IMS DB2 problem Description...
Severity . . . . : -
Reference . . . . : _____ — When problem occurred —
Reported by . . : _____ YYYY-MM-DD HH.MM.SS.TH
Assigned to . . : _____ From 2012-06-24 15.20.00.00
Status . . . . . : OPEN To 2012-06-24 16.50.00.00 Zone . . LOCAL

Where problem occurred . . . . : Payroll +

/ System + Type +
— IADG — IMS
— DB3A — DB2
— FTS1 — IMAGE
***** Bottom of data *****
```

Create a session (main menu ▶ option 1 **Sessions** ▶ **NEW**).

Select the environment where the problem occurred. This populates the system list.

# Coming soon: Eclipse-based GUI

Task: SMF reporting of system activity

<Find Value>

**Selection**

Select a Job to list the reports within it, then select a report to view content.

**Jobs:**

Job Name	Job Number	Max RC	DSN
JCH#RSUB	JOB57555	CC 0000	JCH.FUW.D130504.T001857.OUTPUT
JCH#RPT1	JOB87483	CC 0000	JCH.FUW.D130507.T203054.OUTPUT
JCH#CCV	JOB14254	CC 0000	JCH.FUW.D130509.T180815.OUTPUT
JDN#B14	JOB62618	CC 0000	JCH2.TEMP.OUTPUT

**Reports:**

DD Name	Procedure Name	Step Name	Lines	Pages
MQ1SUMM		REPORT	29	0
CICSSUMM		REPORT	346	0
SYSPRINT		SUBMIT	4	0

**Content**

V1R1M0 2013-05-07 Tuesday CICS-DBCTL Summary Page 1

Tran	APPLID	CMF	Count	Response	CPU Time	IMS Reqs	IMS wait	ABEND	Rate/Sec
CATA	CCVQ51D1		6	0.015795	0.003129			0	0
CATA	CCVQ51D2		4	0.013209	0.002748			0	0
CATA	CCVQ51D5		1	0.021016	0.003563			0	0
CATA	CCVQ51T		9	0.028717	0.003147			0	0
CATA	CCVT42M		2	0.027612	0.002117			0	0
CATA	CCVWSRP		4	0.033013	0.002101			0	0
CATD	CCVQ51D1		1	0.088915	0.002059			0	0
CATD	CCVQ51D2		2	0.044653	0.002047			0	0
CATD	CCVQ51D5		1	0.034221	0.001989			0	0
CATD	CCVQ51T		2	0.020892	0.002000			0	0
CATD	CCVT42M		2	0.030976	0.001893			0	0
CATD	CCVT51M		1	0.032636	0.002789			0	0

Details Workflow Systems History Reports

Console

1. Register a new problem; work on an existing problem
2. Execute the workflow to locate the required diagnostic data
3. Run reports; view the output

# Subject-matter expert: Exception candidate investigation

```

File  Mode  Filter  Time  Labels  Options  Help
-----
BROWSE  IMPOT01.SESSION7.TRANIX +                      Record 00004609 More: < >
Command ===>                                     Scroll ===> CSR
Slice . . Duration 00.03.00      Date 2012-06-24      Time 16.31.00.000000
Code Description < 00.05.00.000000 > 2012-06-24 Thursday Time (LOCAL)
-----
/ TX 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
UTC=16.33.59.157802 TranCode=MQATREQ1 Program=MQATPGM Userid=FUNTRM15
LTerm=FUNTRM15 Terminal=SC0TCP15 Region=0004
OrgUOWID=IADG/C62D2CCCCD3E6F81 IMSID=IADG IMSRel=101
RecToken=IADG/0000003A00000000
CPU=0.013980 InputQ=0.000543 Process=0.424378
TotalTm=0.424921 RegTyp=MPP
-----
_ CA01 Transaction                               16.34.30.389305

```

This display has been filtered to show **IMS transaction index (CA01) records** with a process time of greater than 0.4 seconds. Enter TX to show records related to a transaction

# Transaction life cycle investigation

```

BROWSE      JCH.FUW.P0000003.D130625.T094351.EXTRACT      Record 00003211 More: < >
Command ===> _____ Scroll ===> CSR
/           Navigate < 00.00.01.000000 >      Date/Time 2013-06-22 14.57.57.969312
/           Tracking _____      Saturday 2013-06-22 Time (Relative)
TX CA01 IMS Transaction TranCode=FB0IAT42 Region=0001      15.18.02.863040
___ 01 Input Message TranCode=FB0IAT42      +0.000000
___ 35 Input Message Enqueue TranCode=FB0IAT42      +0.000016
___ 08 Application Start TranCode=FB0IAT42 Region=0001      +0.022361
___ 5607 Start of UOR Program=FB0IAP42 Region=0001      +0.022361
___ 31 DLI GU TranCode=FB0IAT42 Region=0001      +0.022378
___ 5616 Start of protected UOW Region=0001      +0.022635
___ 5600 Sign-on to ESAF Region=0001 SSID=DBA6      +0.043671
___ 5600 Thread created for ESAF SSID=DBA6      +0.043684
___ 380 SP entry FBOSPM3C      DBA6      +0.044408
___ 0020 DB2 Unit of Recovery Control - Begin UR      +0.082207
___ 0010 DB2 Savepoint      +0.082223
___ 0020 DB2 Type 2 Index Update      +0.082223
___ 0020 DB2 Delete from a Data Page      +0.136815
___ 0020 DB2 Update Spacemap      +0.136831
___ 233 SP exit FBOSPM3C      SQLCODE=0000 DBA6      +0.488788
___ 380 SP exit FBOSPM3C      SQLCODE=0000 DBA6      +0.488800
___ 5600 Commit Prepare starting Region=0001 SSID=DBA6      +0.489774
___ 0020 DB2 Unit of Recovery Control - End Commit Phase 1      +0.490271
___ 03 Output Message Response LTerm=FUNTRM06      +0.490908
___ 35 Output Message Enqueue LTerm=FUNTRM06 Region=0001      +0.490918
___ 3730 Syncpoint End of Phase 1 Region=0001      +0.490931
___ 0020 DB2 Unit of Recovery Control - Begin Commit Phase 2      +0.491423
___ 0020 DB2 Unit of Recovery Control - End Commit Phase 2      +0.492095
___ 239 Package accounting-Native SP      DBA6      +0.492299
___ 003 Thread accounting      DBA6      +0.492321
___ 5600 Commit Continue completed Region=0001 SSID=DBA6      +0.492947
___ 37 Syncpoint Message Transfer Region=0001      +0.492964
___ 33 Free Message      +0.492977
___ 5612 Syncpoint End of Phase 2 Program=FB0IAP42 Region=0001      +0.492987
___ 31 Communications GU LTerm=FUNTRM06      +0.493048
___ 07 Application Terminate TranCode=FB0IAT42 Region=0001      +0.493201
    
```

1. Start tracking a CICS or IMS transaction
2. See the transaction life cycle events from the IMS and DB2 logs, SMF and traces; merged together with no preparation required
3. Notice when the response time starts to increase rapidly
4. In this case, the problem was caused by a table scan in a DB2 stored procedure.

A drill down of the DB2 trace was able to determine this.

# Detail DB2 event data view using forms view

```
***** Top of data *****
+018C Code... 058   SQL Call completion          RC=0000 STMT=002896 DBA6
+0198 Date... 2012-11-21 Wednesday   Time... 17.40.04.013647.813

Package
+0034 Location..... 'DB2ALOC'           Collection ID..... 'CSQ5L710'
+0056 Package name... 'CSQ5L710'       Consistency token... 193153A81425EA0D

+0072 SQLCA..... SQL communication area (SQLCA)
+0072 SQLCAID.... 'SQLCA'   SQLCABC.... +136   SQLCODE.... +0
+0082 SQLERRML... +0       SQLERRM.... ' '
+00CA SQLERRP.... 'DSN'     SQLERRD1... +0       SQLERRD2... +0
+00DA SQLERRD3... +0       SQLERRD4... FFFFFFFF SQLERRD5... +0
+00E6 SQLERRD6... +0       SQLWARN0... ' '       SQLWARN1... 'N'
+00EC SQLWARN2... ' '       SQLWARN3... ' '       SQLWARN4... ' '
+00EF SQLWARN5... '1'       SQLWARN6... ' '       SQLWARN7... ' '
+00F2 SQLWARN8... ' '       SQLWARN9... ' '       SQLSTATE... '00000'

+00FC Statement number... +2896
+0106 Query command ID... 00000000   Query instance ID.... 00000000

+0118 QW0058ID... Scantype
+0118 Data type.... 'INDX'   Rows processed... +234   Rows examined.... +12
+012C Rows qualified... +7   After stage 1... +4     After stage 2.... +3
+0140 Rows inserted.... +17   Rows updated.... +12    Rows deleted..... +24
+0158 Pages scanned.... +76
+015C Pages scanned (RI)... +0       Rows deleted (RI)... +0
+0160 Pages scanned (LOB).. +0       Pages updated (LOB).. +0

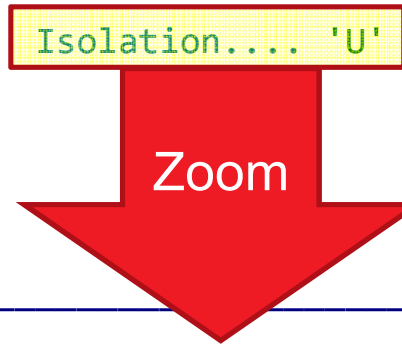
+0188 QWHS..... Product section standard header
+0194 DB2 subsystem.... 'DBA1'

+01BC QWHSLOWID... LUWID
+01BC Network ID... 'FTS1'   LU name.... 'DBA1LU '
+01C4 Uniqueness value... CA80E6B51165 Commit count... +1
***** Bottom of data *****
```

Program statement number 2896 caused an index scan that processed 234 rows in the table

# Zoom to see more detail about log record fields

```
+002C QW0065..... IFCID data
Package
+002C Location... 'DB2BLOC'   Collection ID.... 'MQATPGM'
+004E Package name... 'MQATPGM'
+0060 Consistency token.... 189E34F81745545D
Statement
+006A Statement type... 91      Cursor name.... 'C1'
+0080 Reoptimization... 0000   Statement number... +835
+0088 Cursor scrollability... 40
+0089 Cursor sensitivity... 40
+008A Result table type.... 40  Close commit... D5
+0094 Query command ID... 0
```



```
Field Zoom
File  Menu  Help
-----
BROWSE      JCH.FUW.P0000003.D130625.T094351.EXTRACT +      Line 00000000
Command ==>                               Scroll ==> PAGE
***** Top of data *****
+007F QW0065I.... 'U' Isolation level of the SQL statement.

Off  QW0065RR... 'R' RR (repeatable read)
Off  QW0065RS... 'T' RS (read stability)
Off  QW0065CS... 'S' CS (cursor stability)
On   QW0065UR... 'U' UR (uncommitted read)
Off  QW0065XR... 'X' XR (Repeatable read with X lock)
Off  QW0065XS... 'L' XS (Read stability with X lock)
***** End of data *****
```



# Life cycle events: expanded summary view

```

File  Mode  Filter  Time  Labels  Options  Help
-----
BROWSE      JCH.FUW.P0000003.D130625.T094351.EXTRACT  Record 00003251 More: < >
Command ==> _____ Scroll ==> CSR
          Navigate < 00.00.01.000000 >      Date/Time 2013-06-22 14.57.57.969312
/  _____ Tracking _____ Saturday 2013-06-22 Time (Elapsed
--- 380  SP entry FBOSPM3C                      DBA6 15.18.02.907449
      TranCode=FB0IAP42 Userid=FUNTRM06 ClientID=ICDG
      LUWID=FTS3/DBA6LU/CB8C9439E347/0001
-----
--- 380  SP exit  FBOSPM3C                      SQLCODE=0000 DBA6          0.444391
      TranCode=FB0IAP42 Userid=FUNTRM06 ClientID=ICDG
      LUWID=FTS3/DBA6LU/CB8C9439E347/0001
-----
--- 003  Thread accounting                      DBA6          0.003521
      TranCode=FB0IAP42 Program=FB0IAP42 Userid=FUNTRM06 Region=0001
      RecToken=ICDG/0000000100000000 ClientID=ICDG
      RESP=0.448242 CPU1=0.324230 CPU2=0.000791 I/O3=0.003360 Source=IMS_MPP
      GtPgRq=284 SyPgUp=6 Suspnd=0 DeadLk=0 TimOut=0 MxPgLk=2
      Sel=4 Ins=0 Upd=0 Del=1 LUWID=FTS3/DBA6LU/CB8C9439E347/0002
-----
***** Bottom of Data *****

```

Scroll right to show the records in expanded view with elapsed or relative times:  
 Elapsed – time between log record events  
 Relative – time since start of transaction (or other selected event)

# Identifying events for review or collaboration

```
File  Mode  Filter  Time  Labels  Options  Help
-----
BROWSE  IMPOT01.SESSION7.TRANIX +          Record 00005399 More: < >
Command ==>                          Scroll ==> CSR
Slice . . Duration 00.05.00      Date 2012-06-24      Time 16.25.44.803974
Code Description < 00.05.00.000000 > 2012-06-24 Thursday Time (Relative)
/
-----
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
-----
TAG  IMS DB2 transaction with long response time
-----
G 0020 DB2 Unit of Recovery Control - Begin UR
   Userid=FUNTRM15 IMSID=IADG URID=00002A4010EA
   LUWID=FTS3/DB3ALU/C62D2CB46A5A/0001
-----
0020 DB2 Update In-Place in a Data Page
   DBID=0105 PSID=0002 URID=00002A4010EA
-----
```

A DB2 expert can now use the [DB2 Log Analysis Tool](#) to investigate the associated DB2 table updates, based on the transaction's URID



Enter **FIND LUWID** on the command line.  
Enter **G** to “tag” (bookmark) this DB2 record.

# DB2 Expert Help using DB2 Log Analysis Tool

RECORD IDENTIFIER: 1

ACTION	DATE	TIME	TABLE OWNER	TABLE NAME	URID
INSERT	2012-06-24	16.33.34	JOHN	HR	00002A4010EA

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

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

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



## Problem resolution: end of scenario

- The cause of the IMS transaction problem has been narrowed down to a slowdown in DB2
- Sufficient information about the DB2 update activity has been collected and can be passed on to the DB2 DBA for further investigation
- Automatically locates log files for the problem time range for supported subsystems
  - SMF
  - IMS logs
  - DB2 recovery log
- Enables a collaborative problem analysis:
  - Between first responders and subject-matter experts
  - Between experts in different areas

