#SHAREorg

SHARE
Technology · Connections · Results

IMS Performance Solution Pack

Update

Session 11225

Jim Martin, Fundi Software

SHARE in Anaheim 2012

Part 1

- IMS Connect Extensions V2.3

Support for ODBM workloads

- Support for routing of DRDA requests.
- The Status Monitor and Active Sessions dialog have been enhanced to display information about ODBMs and aliases.
- CEX now provides ODBM security exit (CEXAUTH0)
  - Provides CEX level security checking, ACEE caching, etc
  - Security checking for DRDA consistent with PORT security
- New ODBMDEFAULTS control option specifies the default behaviour for ODBM routing.
  - Allows control of default routing supplied by CEXROUT0

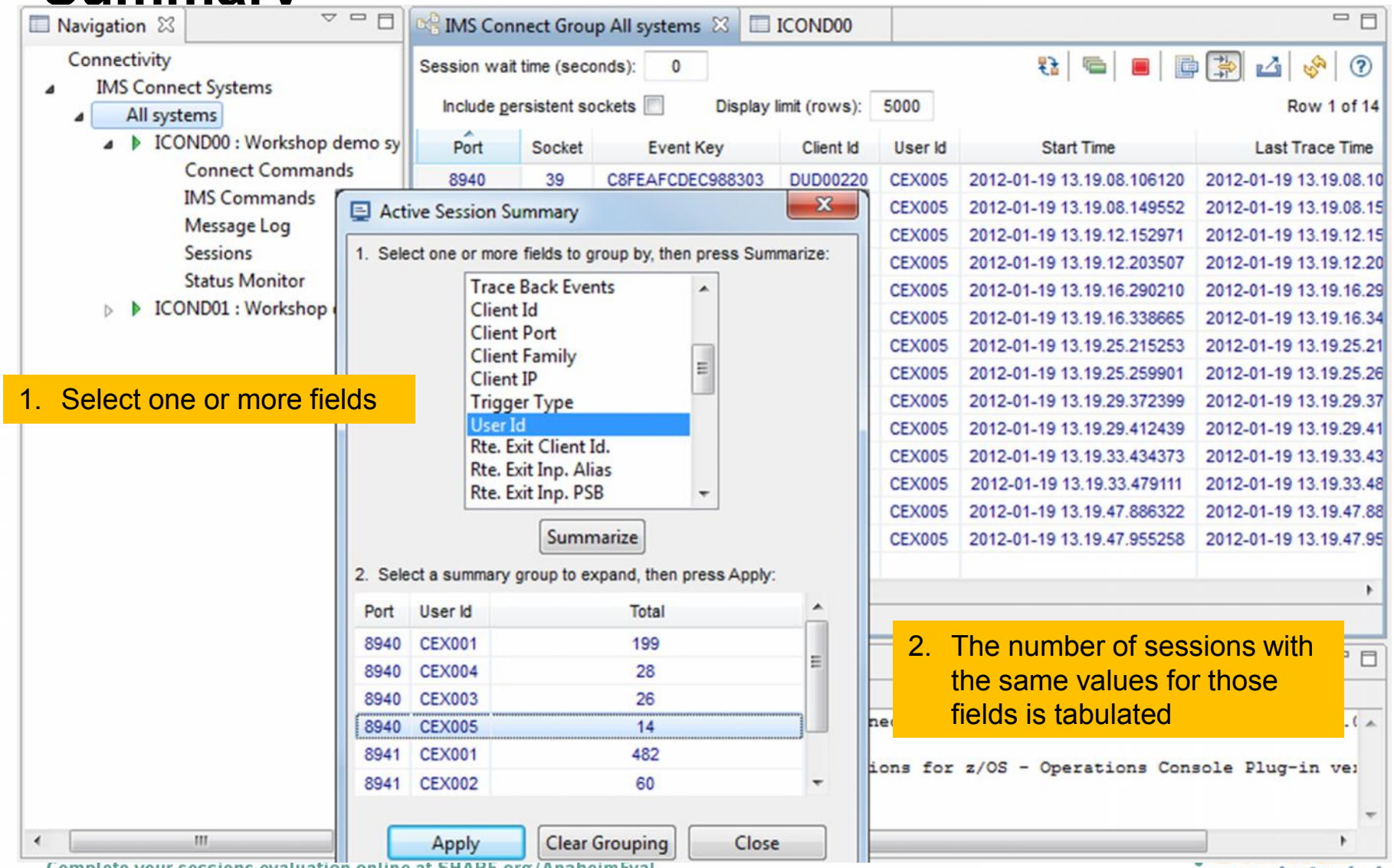
Support for MSC workloads

- Extends support for IMS Connect Peer to Peer communications
- New object types MSC and RICON (remote ICON) are supported in Status Monitor (ISPF dialog and Operations Console)
- Ability to Stop and Resume communications
- New object type MSC is supported in Active Sessions (ISPF dialog and Operations Console)
- Active Sessions FORM ‘PREFILL' option
  - Automatically selects the fields corresponding to the session type (OTMA | ODBM | MSC)

IMS Connect Extensions Operations Console

- Import/export facility
  - Simplifies GUI setup by export of ‘Standard’ configuration file
- Active sessions summary
  - Allows grouping of session by common items such as TRANCODE, DATASTORE, ETC.
    - Monitor Groups for problems and/or delays
- Highlight filters
  - Allows monitoring of session activity for certain types of events and conditions.

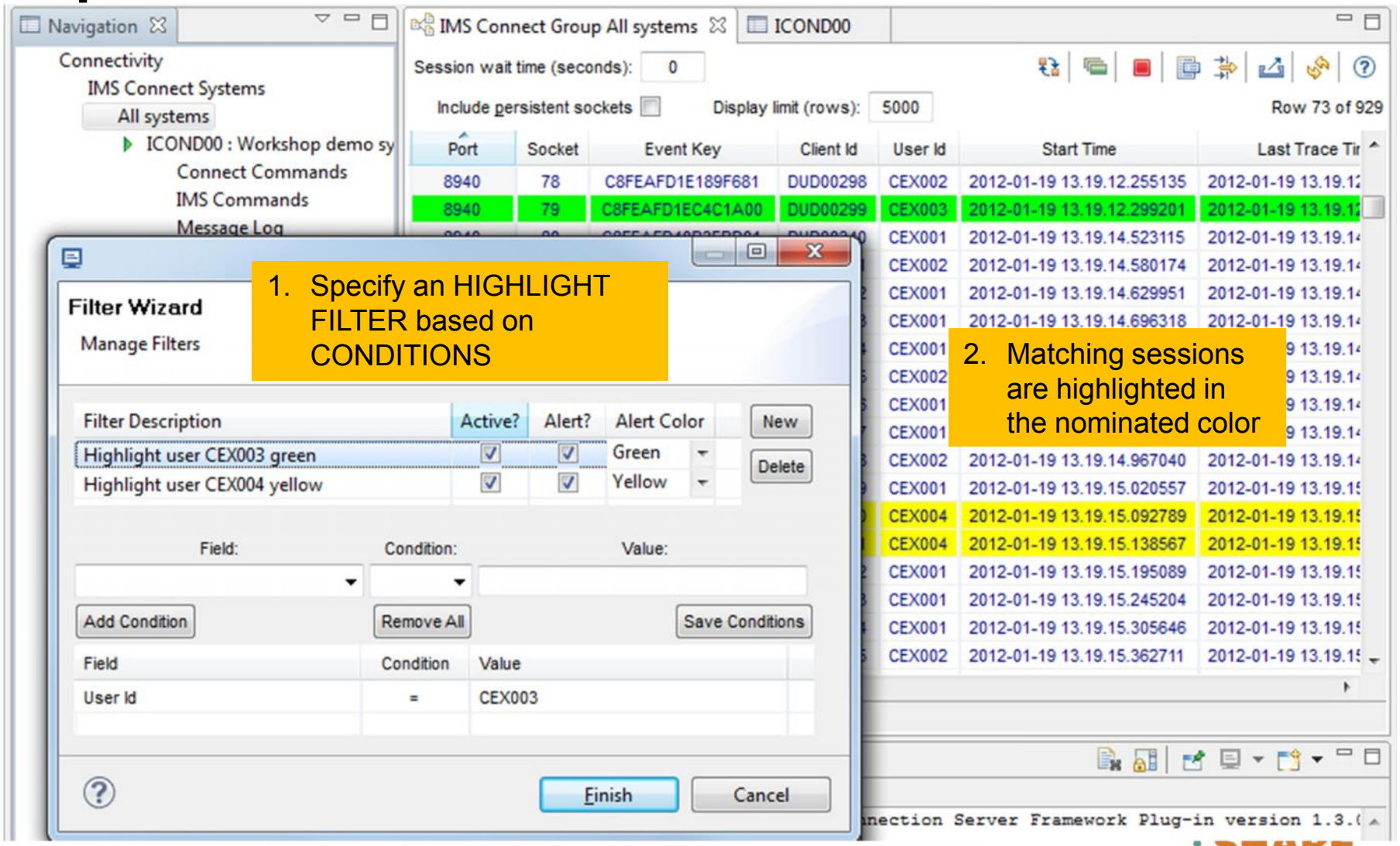
Operations Console: Active Sessions Summary



1. Select one or more fields

2. The number of sessions with the same values for those fields is tabulated

Operations Console: Alert filters



IMS commands

- ISPF command shell and the Operations Console now support:
  - Issuing IMS Type-1 commands
  - Issuing new IMS V12 Connect commands

Control options data set

- Optional CEXCTLIN DD statement enables selected options to be provided when IMS Connect Extensions restarts.
- Supported keywords include:
  - CEXTRACE (specify trace buffer length 1 KB - 7 KB)
  - CEXROUTE (enable routing of IMS commands)
  - ODBMDEFAULTS (specify default ODBM routing behavior)
  - SET SCOPE (apply control options to particular IMS Connect systems or groups)

Control options data set: Performance option

- New CEXCTLIN control option allows buffering of events before they are written to the active journal.

  EVENTLOGGING WRITE=BUFFER

  Or:

  EVENTLOGGING WRITE=IMMEDIATE

- WRITE=BUFFER reduces CPU usage for CEX but some events may be lost if ICON region is cancelled.
- WRITE=IMMEDIATE provides best protection from lost events if ICON region cancelled.

Print Utility Enhancements

- PRINT command enhancements
  - STATIME - indicates the time in the journal when printing should begin
  - STOTIME - indicates the time in the journal when printing should stop
- READ62 command enhancements
  - IPV4ADR – provides IPV4 address for qualification of printing
  - IPV6ADR – provides IPV6 address for qualification of printing

Better Session Statistics

- TCPIP PORT and DRDAPORT counts
  - Current session counts for PORT and DRDAPORT are now maintained from ICON startup
  - MAXSOC from HWS Configuration file reported in type 00 event
    - Enables IMSPA to better report session activity
    - Enables finding sources of abnormal session activity or MAX SOCKETS attainment using IMSPI

Security and Logging Improvements

- Access control by IP Address
  - Example: “If USER001 is entered from IP Address 11.22.33.44 then allow, otherwise reject”
- Authorized clients can now submit user data for logging to the journal

Recent New Features

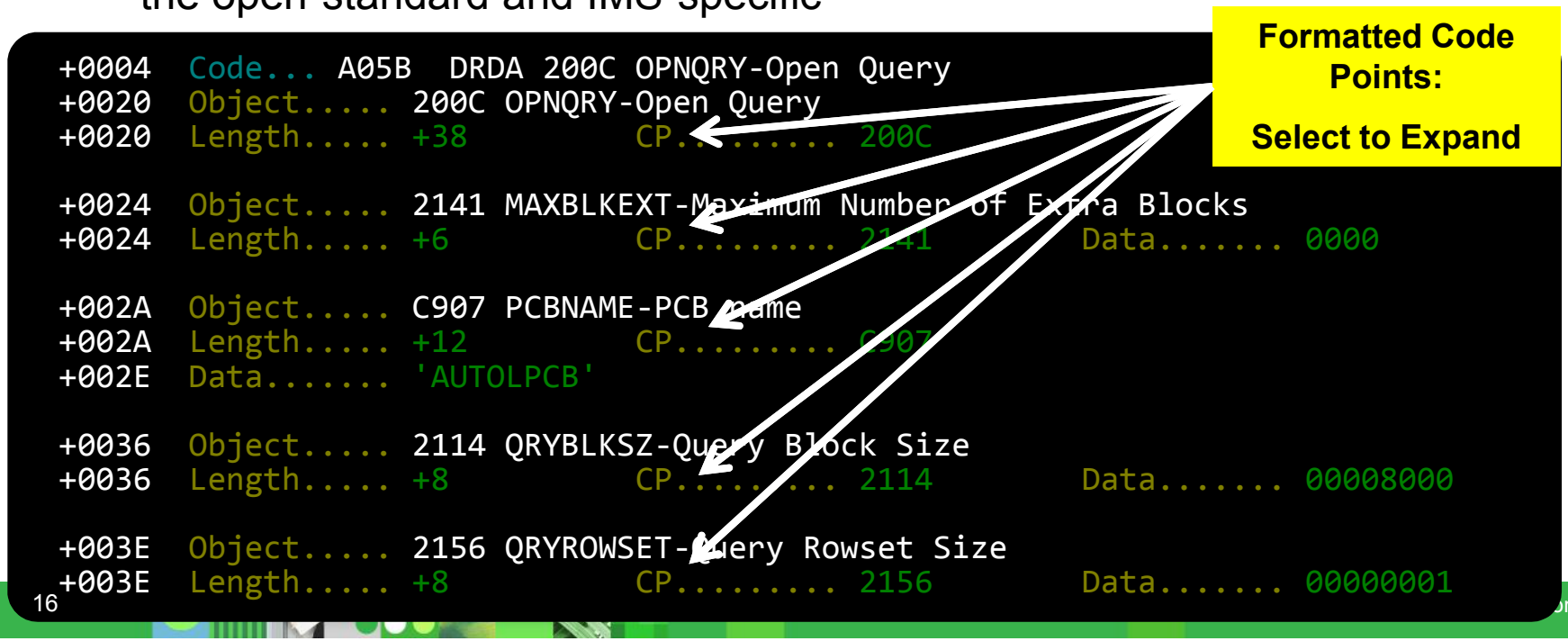
- Degraded Performance Global Warn Support
  - Global Degraded performance does not support ‘Global Fail’
  - New option to treat ‘Global Warn’ as ‘Global Fail’
- SYSPLEX Session Re-balancing
  - ICON failure can result in unbalanced Persistent sessions
  - New option to set limit on messages from a session
  - Session closed when message limit reached

Part 2

- IMS Problem Investigator for z/OS V2.3

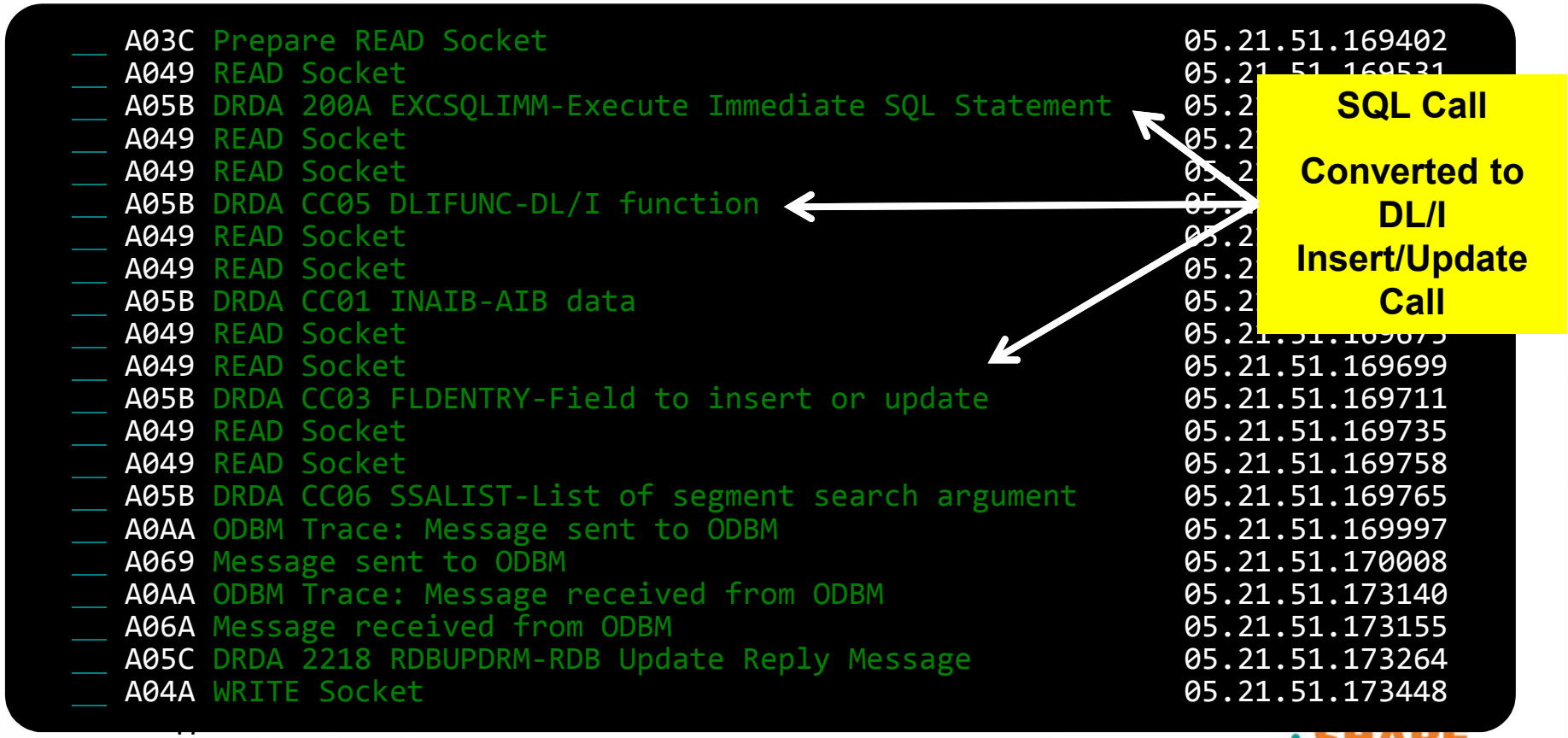
Open Database DRDA analysis using IMS Connect Extensions for z/OS

- **IMS Connect Extensions for z/OS** event journaling provides a comprehensive trace of every Distributed Relational Database Architecture (DRDA) call issued by the application.
- Use IMS Problem Investigator for z/OS to:
  - Provide easy-to-read formatting of all DRDA code-points, for both the open-standard and IMS-specific



Open Database DRDA analysis using IMS Connect Extensions for z/OS

- Show how relational model SQL calls are converted to DLI calls.



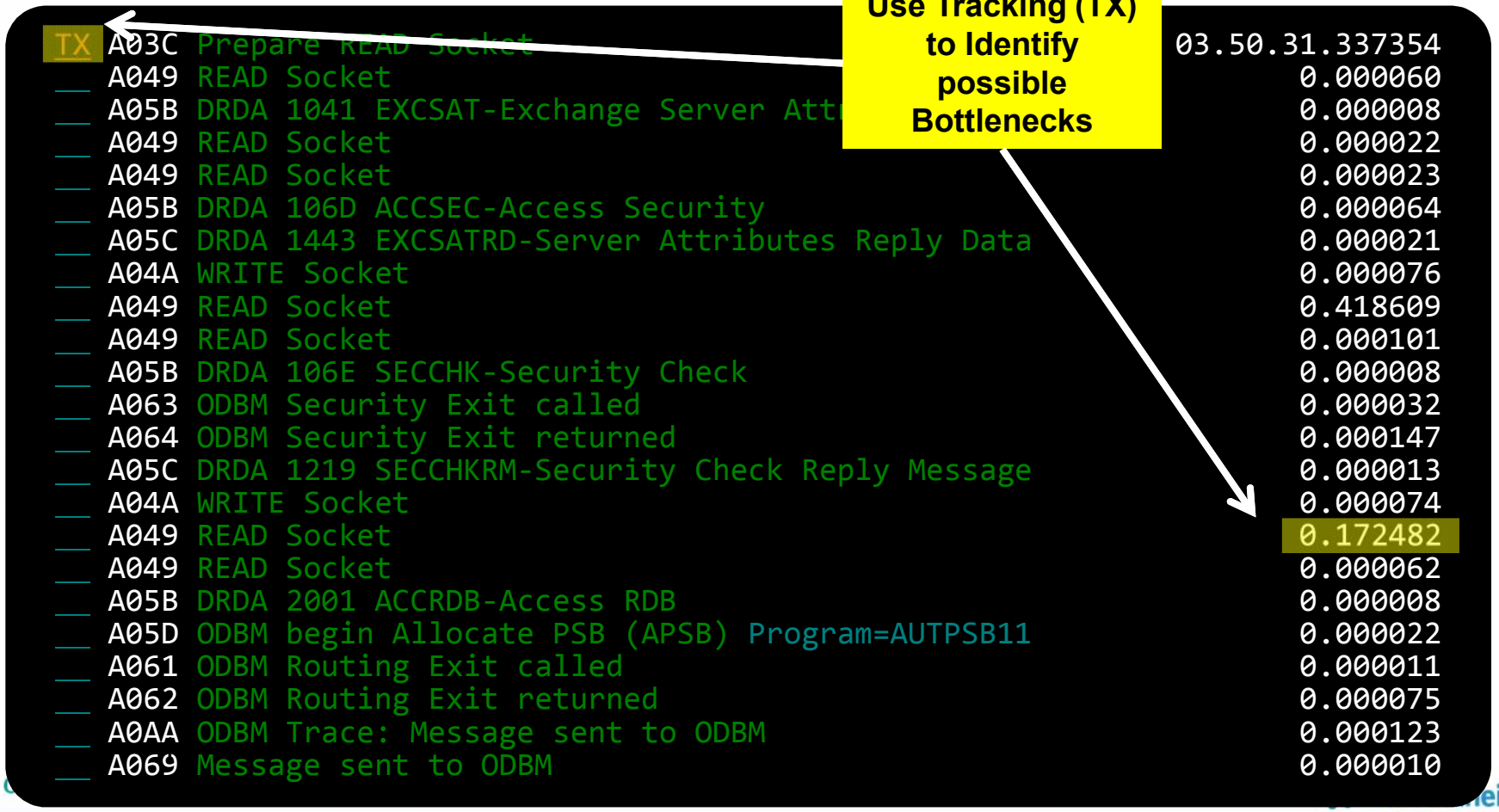
Open Database DRDA analysis using IMS Connect Extensions for z/OS

- Analyze DLI call results including I/O and feedback areas

```
+0004  Code... A05B  DRDA CC05 DLIFUNC-DL/I function
+002C  STCK... C5C223547DBCA260      LSN.... 0000000000000218
       Date... 2010-03-31 Wednesday  Time... 05.21.53.073098.148

+0000  CERE_5B_LL......... 003C
+0002  CERE_5B_ZZ......... 0000
+0004  CERE_5B_RECID...... A0  CERE_5B_EVTID...... 5B
+0006  CERE_5B_PFXLL...... 0014
+0008  CERE_5B_EFLAG...... 00  CERE_5B_VER#....... 22
+000A  CERE_5B_TASKID..... 0104
+000A  CERE_5B_COL#....... 01  CERE_5B_TKS#....... 04
+000C  CERE_5B_EVKEY...... C5C2234B85BA6C03
+0014  CERE_5B_VAR_LL..... 0006
+0016  CERE_5B_VAR_APAR... 0001
+0018  CERE_5B_VAR_CODEPOINT...... CC05

+001A  DSSHDR.....
+001A  DSSlen..... +18         DDMID...... D0         FormatID... 53
+001D  Type....... 03          RQSCRR..... 0001

+0020  Object.....
+0020  Length..... +12         CP......... CC05
+0024  Data....... 'RETRIEVE'
```

Open Database DRDA analysis using IMS Connect Extensions for z/OS

- Track application calls associated with a single thread and identifies bottlenecks.



Open Database DRDA analysis using IMS Connect Extensions for z/OS

- Merge the **IMS Connect Extensions for z/OS** Event Journal with the IMS log to see the complete end-to-end picture of the session thread of a distributed transaction

```
__ A05B DRDA 2001 ACCRDB-Access RDB                          03.50.31.929175
__ A05D ODBM begin Allocate PSB (APSB) Program=AUTPSB11      03.50.31.929198
__ A061 ODBM Routing Exit called                             0
__ A062 ODBM Routing Exit returned                           0
__ A0AA ODBM Trace: Message sent to ODBM                     0
__ A069 Message sent to ODBM                                 0
__ 08   Application Start Program=AUTPSB11 Region=0004       0
__ 5607 Start of UOR Program=AUTPSB11 Region=0004            0
__ 5616 Start of protected UOW Region=0004                   0
__ A0AA ODBM Trace: Message received from ODBM               0
__ A06A Message received from ODBM                           03.50.31.932873
__ A05E ODBM end Allocate PSB (APSB) Program=AUTPSB11        03.50.31.932951
__ A05C DRDA 2201 ACCRDBRM-Access RDB Reply Message          03.50.31.932976
__ A04A WRITE Socket                                         03.50.31.933180
__ A048 Trigger Event for ODBMMSG                            03.50.31.933213
```

Merged CEX Journals and IMS Log help to paint complete session thread picture

IMS V12 MSC enhancement using IMS Connect

- IMS version 12 can use IMS Connect to provide MSC connectivity.
- IMS Connect Extensions for z/OS, via its event journaling, provides comprehensive detail about the Connect-to-Connect events associated with MSC transaction processing.

```
__ A03D Message Exit called for READ                          04.53.45.883764
__ A0A3 Event Collection OTMA Trace                           04.53.45.883808
__ A03E Message Exit returned from READ                       04.53.45.883813
__ A07A MSC message received from remote ICON Msgtype=RSTRESP 04.53.45.883821
__ A07B MSC message sent to MSC Msgtype=RSTRESP               04.53.45.884072
__ A078 MSC message received from MSC Msgtype=RSTBWRSP        04.53.45.886683
__ A0A3 Event Collection OTMA Trace                           04.53.45.886802
__ A03D Message Exit called for XMIT                          04.53.45.886815
__ A0A6 Event Recording EXIT Output Message Trace             04.53.45.886842
__ A03E Message Exit returned from XMIT                       04.53.45.886846
__ A079 MSC message sent to remote ICON Msgtype=RSTBWRSP      04.53.45.886954
__ A07E ICON to ICON end of session                           04.53.45.886987
__ A049 READ Socket                                           04.53.45.895242
__ A049 READ Socket                                           04.53.45.895287
```

Detailed Connect to Connect Communications Events Provided via CEX Journals

IMS V12 MSC enhancement using IMS Connect

- IMS PI then provides the usual interactive event formatting and Tracking across the front and back-end systems.

```
BROWSE    CEX000.QADATA.MSC.ICON.LOCAL.D110728                  Tracking active
Command ===>                                                  Scroll ===> CSR
   Forwards / Backwards . . 00.00.05.000000    Time of Day . . 06.03.23.625526
   Code Description                    Date                   Time (Elapsed)
/  ---- ---------------------------------------------------- ----------------
TX A07D ICON to ICON start of session                        04.53.45.871762
__ A078 MSC message received from MSC Msgtype=RESTART               0.000029
__ A0A3 Event Collection OTMA Trace                                 0.002129
__ A03D Message Exit called for XMIT                                0.000007
__ A0A6 Event Recording EXIT Output Message Trace                   0.000082
__ A03E Message Exit returned from XMIT                             0.000005
__ A079 MSC message sent to remote ICON Msgtype=RESTART             0.000145
__ A07A MSC message received from remote ICON Msgtype=RSTRESP       0.009659
__ A07B MSC message sent to MSC Msgtype=RSTRESP                     0.000250
__ A078 MSC message received from MSC Msgtype=RSTBWRSP              0.002611
__ A0A3 Event Collection OTMA Trace                                 0.000118
__ A03D Message Exit called for XMIT                                0.000013
__ A0A6 Event Recording EXIT Output Message Trace                   0.000026
__ A03E Message Exit returned from XMIT                             0.000004
__ A079 MSC message sent to remote ICON Msgtype=RSTBWRSP            0.000107
__ A07E ICON to ICON end of session                                 0.000032
```

IMS Trace

IMS Trace Table records are now interpreted, and can be tracked against the problem transaction:

```
BROWSE    JCH.IMSV12.LOGS.V05 +                          Record 00132074 More:  < >
Command ===>                                                     Scroll ===> CSR
   Slice . . Duration                 Date   2010-12-07       Time
   Code Description  < 00.00.00.000000 >  2010-12-07 Tuesday     Time (Elapsed)
   ---- -----------------------------------------------------------------------
TX CA01 Transaction                                                03.11.45.270005
        UTC=11.11.22.270003 TranCode=OE5C Program=PROGOE5C Userid=DSX11294
        LTerm=DSX11294 Terminal=DSW11294 Region=0022
        OrgUOWID=IMS1/C6FD2F1743CDEADE IMSID=IADG IMSRel=121
        RecToken=IMS1/000185E500000000
        CPU=0.138545 InputQ=0.000244 Process=0.608935
        TotalTm=0.609179 RegTyp=MPP DBCalls=18
```

Transaction Index

DLI Trace events in IMS log:

67FF SNAP Trace when transaction abends

67FA /TRACE SET ON TABLE DL/I , LOCK etc

```
   01   Input Message TranCode=OE5C                                    0.000000
   35   Input Message Enqueue TranCode=OE5C                            0.000015
   08   Application Start TranCode=OE5C Region=0022                    0.000212
   5607 Start of UOR Program=PROGOE5C Region=0022                      0.000000
   31   DLI GU TranCode=OE5C Region=0022
   AA   DLI Comms call: INIT Region=0022
   AA   DLI Comms call: INQY Region=0022
   AA   DLI Comms call: INQY Region=0022
   AA   DLI Comms call: GN Region=0022
   AA   DLI Database call: ISRT Region=0022
   50   Database Update Database=CUSTOMRC Region=0022
   50   Database Update Database=CUSTOMRC Region=0022
   50   Database Update Database=CUSTOMRC Region=0022
   50   Database Update Database=CUSINDXC Region=0022                  0.000102
   50   Database Update Database=CUSINDXC Region=0022                  0.002489
   AA   DLI Database call: ISRT Region=0022                            0.001076
   50   Database Update Database=CUSTMC4 Region=0022                   0.003114
   50   Database Update Database=CUSTMC4 Region=0022                   0.000006
   50   Database Update Database=CUSTMC4 Region=0022                   0.000004
   50   Database Update Database=CUSX2C2 Region=0022                   0.000077
   50   Database Update Database=CUSX2C2 Region=0022                   0.002572
   50   Database Update Database=CUSX1C1 Region=0022                   0.000125
   50   Database Update Database=CUSX1C1 Region=0022                   0.003005
   AA   DLI Database call: ISRT Region=0022                            0.001264
   50   Database Update Database=CUALTC2 Region=0022                   0.021042
   50   Database Update Database=CUALTC2 Region=0022                   0.000031
```

See every **DLI** call, then associate with the database updates (50's)

/TRACE SET ON TABLE LOCK

Part 2 of 2

```
BROWSE     JCH.ITR.EXTRACT                                  Record 00026435 More: < >
Command ===>                                                          Scroll ===> CSR
   Slice . . Duration  00.00.00      Date  2010-12-07      Time  03.11.45.554009
   Code Description  < 00.00.00.000000 >  2010-12-07 Tuesday   Time (Elapsed)
/  ---- ------------------------------------------------------- ---------------
___ AA   DLI Database call: REPL Region=0022                     03.11.46.246045
___ CA08 (PI) DLI call Region=0022                                        0.000000
___ E2   Byte locate (buffer handler) Region=0022                         0.000000
___ C802 Lock: LOCK Region=0022                                           0.000000
___ C8E2 Lock: SUSPEND Region=0022                                        0.000000
___ C8D9 Lock: RESUME Region=0022                                         0.000000
___ C902 Lock: LOCK exit Region=0022                                      0.000000
___ E2   Byte locate (buffer handler) Region=0022                         0.000000
___ E2   Byte locate (buffer handler) Region=0022                         0.000000
___ E2   Byte locate (buffer handler) Region=0022                         0.000000
___ C802 Lock: LOCK Region=0022                                           0.000000
___ C8E2 Lock: SUSPEND Region=0022                                        0.000000
___ C8D9 Lock: RESUME Region=0022                                         0.000000
___ C902 Lock: LOCK exit Region=0022                                      0.000000
___ C802 Lock: LOCK Region=0022                                           0.000000
___ C8E2 Lock: SUSPEND Region=0022                                        0.000000
___ C8D9 Lock: RESUME Region=0022                                         0.000000
___ C902 Lock: LOCK exit Region=0022                                      0.000000
___ C802 Lock: LOCK Region=0022                                           0.000000
___ C8E2 Lock: SUSPEND Region=0022                                        0.000000
___ C8D9 Lock: RESUME Region=0022                                         0.001550
___ C902 Lock: LOCK exit Region=0022                                      0.000000
___ C802 Lock: LOCK Region=0022                                           0.000000
___ C902 Lock: LOCK exit Region=0022                                      0.000000
___ C803 Lock: UNLOCK Region=0022                                         0.000000
___ C903 Lock: UNLOCK exit Region=0022                                    0.000000
___ F4   Retrieve by key record to chain from insert logical re           0.000000
___ E2   Byte locate (buffer handler) Region=0022                         0.000000
___ F2   Retrieve by key EQ or GT (buffer handler) Region=0022            0.001775
```

Locking events, including SUSPEND and RESUME and any Associated Delays

- Dispatcher
- DLI and Lock
- Log Router
- Scheduler
- Queue Manager
- DASD log
- External Subsystem
- OTMA
- Storage Manager
- Latch
- LU 6.2 (APPC)
- Fast Path
- RRS

Dialog useability enhancements

Part 1 of 3

1. Keep comments in the Process list to group log files and help explain the problem:

```
                                Process Log Files        Row 993 of 999 More: < >
Command ===>                                                     Scroll ===> CSR

Select a Log File to browse.                    IMS Release 111 +     Zone LOCAL

/         Log File                                          Rel + Filter + Zone
          * JIM'S PERFORMANCE PROBLEM 2012-01-17
          'JIM.TRAN.INDEX'
          'JIM.SDLS.EXTRACT'

          * PERFORMANCE PROBLEM IN IMSP
          'IMSP.TRANIX'
          'IMSP.SDDS.D12017.T155623.SDLS1'
********************************** Bottom of data ********************************
```

2. **FIND** command universally available, especially useful for long selection prompt

```
                          CA01 - Transaction Fields
Command ===> FIND 'RESPONSE TIME'                Row 61 to 76 of 439
                                                   Scroll ===> CSR
Select a Field Name then press Enter.

    Field Name
    RespIMS          IMS transaction end-user response time.
    SwitTime         Program switch time is the elapsed time from when
    SchedTm          Schedule time is the elapsed time from when the
    UORTime          Unit-of-recovery time is the elapsed time the
_   CM0Delay         OTMA Commit Mode 0 (Commit-Then-Send) delay time
_   CM1Delay         OTMA Commit Mode 1 (Send-Then-Commit) delay time
_   OutRTIMS         IMS Resume-Tpipe time.  Calculated as the elapsed
_   TotRTIMS         IMS Resume-Tpipe total elapsed time.  Calculated as
_   CPUtime          Program execution CPU time
_   WFItime          SUBQ6 time where the message region waited before
_   FPEMHIn          Shared EMHQ Input time is the elapsed time a
_   FPEMHOut         Shared EMHQ Output time is the elapsed time a
_   FPTermOt         Terminal output time is the elapsed time that the
_   FPPh1Ph2         Fast Path Syncpoint Phase 1 + Phase 2 time
_   Events           Transaction Event Time section
_   TO1              Transaction arrival                    (O1)
```

Dialog useability enhancements

Part 2 of 3

3. **Extract** the transaction tracking result set to an extract file for later analysis

```
BROWSE     ICDZ.VC10.OLP00                              Record 00000163 More: < >
Command ===> EXTRACT 'MY.IMSPI.EXTRACT'                  Scroll ===> CSR
   Forwards / Backwards . . 00.00.02.404000    Time of Day . . 09.01.02.956426
   Code Description                    Date 2012-01-13 Friday   Time (Relative)
/  ---- ---------------------------------------------------- ----------------
TX 01   Input Message TranCode=IVTNO                          12.58.39.257859
   35   Input Message Enqueue TranCode=IVTNO                        +0.000032
   08   Application Start TranCode=IVTNO Region=0004                +0.107066
   5607 Start of UOR Program=DFSIVP1 Region=0004                    +0.107068
   31   DLI GU TranCode=IVTNO Region=0004                           +0.107113
   5E   SB Handler requests Image Capture Region=0004               +0.134535
   5E   SB Handler requests Image Capture Region=0004               +0.134540
   20   Database Open Database=IVPDB1 Region=0004                   +0.135992
   20   Database Open Database=IVPDB1I Region=0004                  +0.463020
   5E   SB Handler requests Image Capture Region=0004               +0.467378
   5E   SB Handler requests Image Capture Region=0004               +0.470396
   03   Output Message Response LTerm=FUNTRM21                      +0.472817
   35   Output Message Enqueue LTerm=FUNTRM21 Region=0004           +0.472841
   3730 Syncpoint End of Phase 1 Region=0004                        +0.472868
   37   Syncpoint Message Transfer Region=0004                      +0.472900
   33   Free Message                                                +0.472933
   31   Communications GU LTerm=FUNTRM21                            +0.473037
   5612 Syncpoint End of Phase 2 Program=DFSIVP1 Region=0004        +0.474892
   36   Output Message Dequeue LTerm=FUNTRM21                       +0.740234
   33   Free Message                                                +0.740258
   07   Application Terminate TranCode=IVTNO Region=0004 ++++++++++++++++
********************************* Bottom of Data ********************************
```

- Retain the log records from a tracked transaction in a separate small file for later Analysis or Comparison.

Dialog useability enhancements

Part 3 of 3

4. SCRUB Utility

- Removes sensitive or confidential user data from IMS log records, preparing them for sending off-site or making them available in-house for problem analysis.

- IMS PI provides two ways of implementing Scrub:
  - **Non-compliance mode** – In House Analysis
    - User Authority Exit to enforce scrubbing of IMS log records prior to display in IMS PI; no log file preparation is required.
  - Full compliance mode – Send off-site for Analysis
    - A batch utility that creates a scrubbed extract data set

Improved DB2 log formatting

```
BROWSE      DB2P.ARCHLOG1.Y0003780                    Record 00056277 Line 00000000
Command ===>                                                          Scroll ===> CSR
Form    ===> DB2       +      Use Form in Filter                      Format ===> STD
****************************** Top of data ******************************
+0004   Code... 0020  DB2 Insert into a Data Page
+001E   STCK... C62D22691A390000       LSN.... 0000001C3D35E54F
        Date... 2010-06-24 Thursday    Time... 15.47.30.260880.000

+0000   LRHLL..... 00CE          LRHRTYPE... 0600          LRHSTYPE... 0001
+0008   LRHRMID.... 0E            LRHFLAGS... 80
+000A   LRHURID.... 001C3B8CBEA5
+0010   LRHLINK.... 001C3D35E4DC                          LRHREL..... 05
+0017   LRHLEN..... 26            LRHUNLSN... 001C3D35E4DC
+001E   LRHTIME.... C62D22691A390000
+001E   LRHLRSN.... C62D22691A39                          LRHMEMID... 0000

+0026   LGDBHEAD... Database Identification
+0027   LDBDBID.... 0130          LDBPSID.... 008F        LDBDPAGE... +2320
        LDBDFLAG... 70

+0038   LGBENTRY... Update Information
        LGBDDESC... 'Full user row insert (REDO)'

+0040   LGBAPP..... Update Data
+0040   LGBRHDR.... Row Header
        +0000  00008800 9013                          *..h...              *
+0046   LGBRDATA... Row Data
        +0000  00200510 04103324 25399400 F9F9F9F3    *.........m.9993*
        +0010  40404040 00C4E2C6 C6E2C3F6 C400D7C4    *    .DSFFSC6D.PD*
        +0020  E2C6E2C3 F6C400F1 F2F40040 40F40040    *SFSC6D.124.  4. *
        +0030  F100C140 00000000 000000BD 1B435265    *1.A ..........*
        +0040  27A20500 60404040 40404040 00F9F9F9    *.s..-       .999*
        +0050  F3404040 4000BDE8 C8ABD5DC 400700BF    *3     ..YH.N. ...*
        +0060  28848387 DF5CF200 80000000 00000000    *.dcg.*2........*
        +0070  00BF296D 4C33B539 3200BEB6 E935B91F    *...._<.......Z...*
        +0080  70DE                                   *..                  *
****************************** End of data ******************************
```

Improved coverage and presentation of DB2 log events

IMSPI batch reporting – SHORT

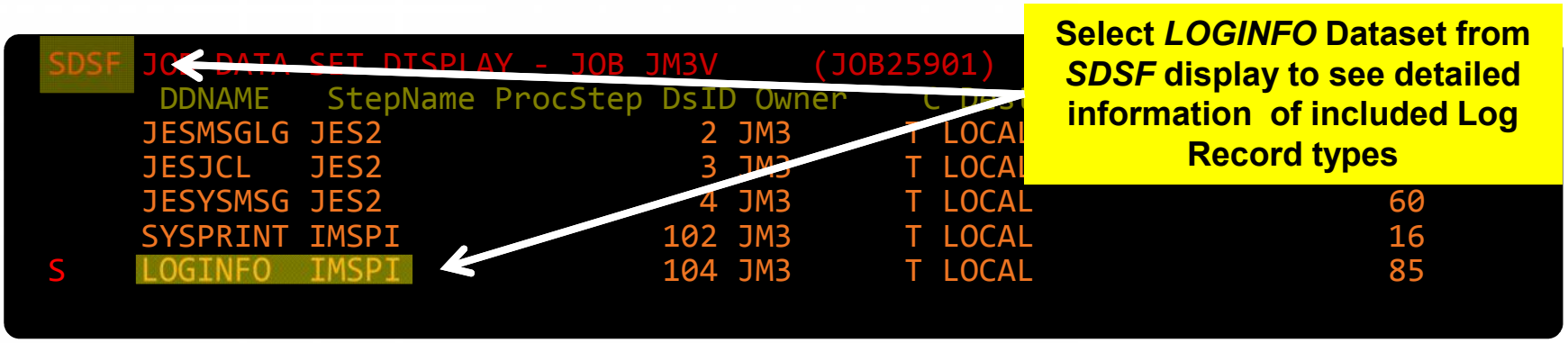
SHORT batch report mode – similar to the ISPF dialog view

```
Code Description                    Date 2011-06-17 Friday    Time                  Elapsed LSN                Rec#
---- ---------------------------------------------------- ------------------ -------------- ---------------- ---------
01   Input Message                                         21.57.00.950009.909      0.078041 0000000005AD82B0      9752
     TranCode=CDB41PDS Userid=EVHWBUDR LTerm=4012 Terminal=4012
     OrgUOWID=BUDR/C7EF90B3BC1BD08C Port=4012 LogToken=C7EE6AA5E342DC08
     SSN=087124 Socket=PERS CM=1 SL=0 Source=Connect
35   Input Message Enqueue                                 21.57.00.950025.284      0.000015 0000000005AD82B1      9753
     TranCode=CDB41PDS Userid=EVHWBUDR LTerm=4012 Terminal=4012
     OrgUOWID=BUDR/C7EF90B3BC1BD08C Port=4012 LogToken=C7EE6AA5E342DC08
     SSN=087124 Socket=PERS CM=1 SL=0
08   Application Start                                     21.57.00.950310.565      0.000285 0000000005AD82B2      9754
     TranCode=CDB41PDS Region=000F RecToken=BUDR/0021DB9C00000000
     RegTyp=MPP TClass=2D TPrty=01
5607 Start of UOR                                          21.57.00.950310.627      0.000000 0000000005AD82B3      9755
     Program=CDB41PT Region=000F IMSID=BUDR RecToken=BUDR/0021DB9C00000000
31   DLI GU                                                21.57.00.950329.127      0.000018 0000000005AD82B4      9756
     TranCode=CDB41PDS Region=000F OrgUOWID=BUDR/C7EF90B3BC1BD08C
     RecToken=BUDR/0021DB9C00000000
5600 Sign-on to ESAF                                       21.57.01.048592.688      0.098263 0000000005AD82B5      9757
     Region=000F IMSID=BUDR RecToken=BUDR/0021DB9C00000000 SSID=DSBR
```

New Log Information report

Part 1 of 2

- The Log Information report provides a synopsis of the log record types in the IMS log, including record count, lengths, rate per second, and volume.
- Selected record types are broken down further to provide additional information about transaction arrival and processing rates.
- Available when Requesting Extract, CSV Extract, or Reporting in **IMS Problem Investigator for z/OS**.

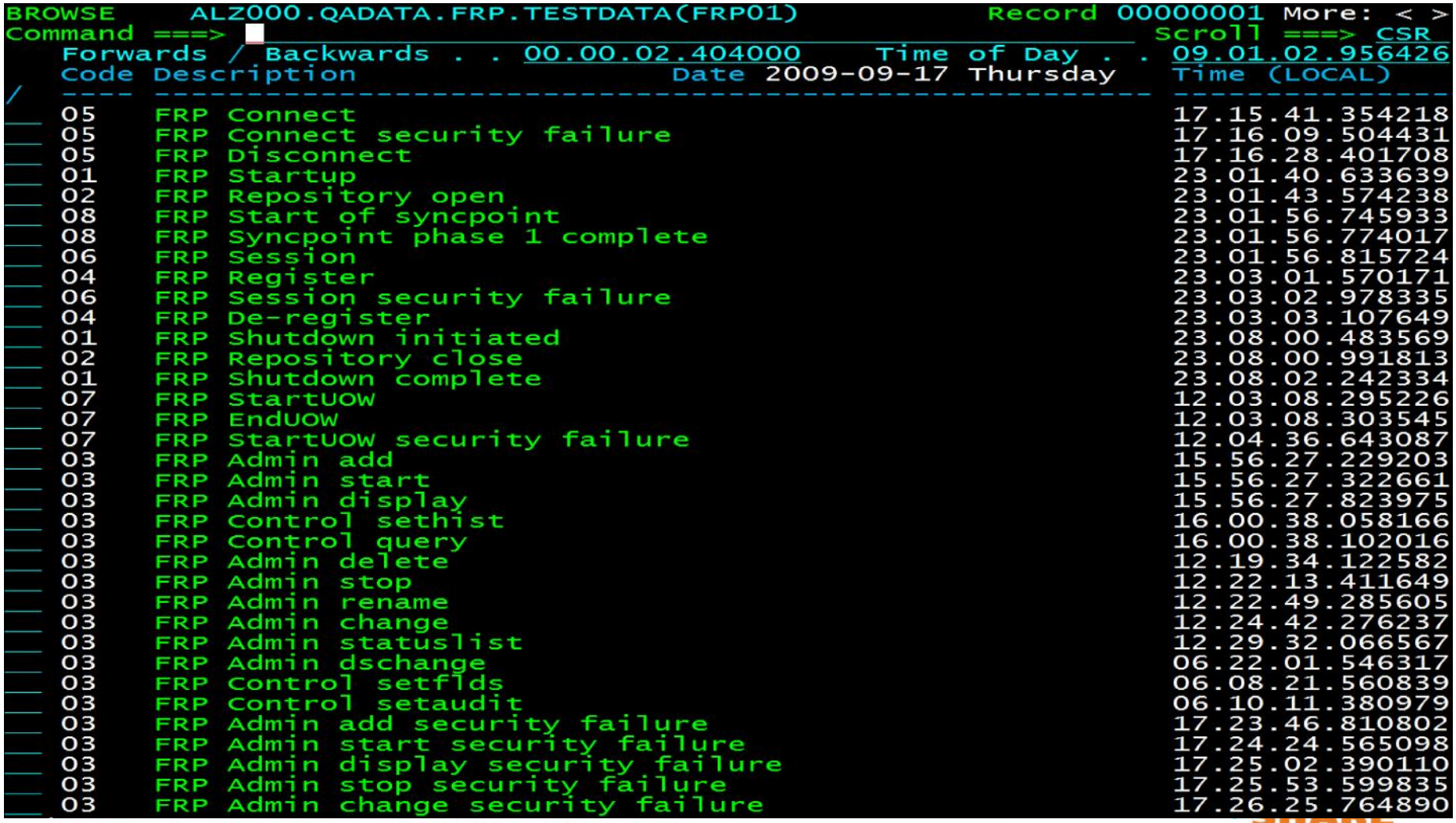


New Log Information report

Part 2 of 2

```
 V2R3M0              IMS V11.1                 IMS Problem Investigator - Log Infor

Log data From 2010-03-31 05:41:04.825015   To 2010-03-31 05:49:20.789441       D

          ---------------------------------------  In ----------------------------
Code              Count        MCNT    Recs/Sec  Avg len  Max Len    Byte/Sec
01 OUT                1                        0    1,378    1,378           2
 MSG SWI              1                        0    1,378    1,378           2
02                    3                        0       74       86           0
03 OUT               53                        0      478    1,769          51
 MSG SWI             53                        0      478    1,769          51
0403                  1                        0       56       56           0
06                    2                        0       84       84           0
07                    1           0            0      456      456           0
 DBCTL                1           0            0      456      456           0
08                    1                        0      148      148           0
 ODBM                 1                        0      148      148           0
20                    2                        0      732      732           2
31                   30                        0      104      120           6
 COMMS               30                        0      104      120           6
33                   30                        0       68       68           4
35                   54                        0      124      148          13
36                   30                        0      168      168          10
37                    2                        0      104      104           0
 3730                 2                        0      104      104           0
38                    1                        0      112      112           0
4001                  1                        0      500      500           1
4003                  4                        0    3,738    3,976          30
```

IMS version 12 support; including the IMS Repository (FRP) audit log stream



```
BROWSE     ALZ000.QADATA.FRP.TESTDATA(FRP01)          Record 00000001 More: < >
Command ===>                                                 Scroll ===> CSR
   Forwards / Backwards . . 00.00.02.404000    Time of Day . . 09.01.02.956426
   Code Description                      Date 2009-09-17 Thursday   Time (LOCAL)
/  ---- ---------------------------------------------------------- ---------------
___ 05   FRP Connect                                                17.15.41.354218
___ 05   FRP Connect security failure                                17.16.09.504431
___ 05   FRP Disconnect                                             17.16.28.401708
___ 01   FRP Startup                                                23.01.40.633639
___ 02   FRP Repository open                                        23.01.43.574238
___ 08   FRP Start of syncpoint                                     23.01.56.745933
___ 08   FRP Syncpoint phase 1 complete                             23.01.56.774017
___ 06   FRP Session                                                23.01.56.815724
___ 04   FRP Register                                               23.03.01.570171
___ 06   FRP Session security failure                               23.03.02.978335
___ 04   FRP De-register                                           23.03.03.107649
___ 01   FRP Shutdown initiated                                    23.08.00.483569
___ 02   FRP Repository close                                      23.08.00.991813
___ 01   FRP Shutdown complete                                     23.08.02.242334
___ 07   FRP StartUOW                                              12.03.08.295226
___ 07   FRP EndUOW                                                12.03.08.303545
___ 07   FRP StartUOW security failure                             12.04.36.643087
___ 03   FRP Admin add                                             15.56.27.229203
___ 03   FRP Admin start                                           15.56.27.322661
___ 03   FRP Admin display                                         15.56.27.823975
___ 03   FRP Control sethist                                       16.00.38.058166
___ 03   FRP Control query                                         16.00.38.102016
___ 03   FRP Admin delete                                          12.19.34.122582
___ 03   FRP Admin stop                                            12.22.13.411649
___ 03   FRP Admin rename                                          12.22.49.285605
___ 03   FRP Admin change                                          12.24.42.276237
___ 03   FRP Admin statuslist                                      12.29.32.066567
___ 03   FRP Admin dschange                                        06.22.01.546317
___ 03   FRP Control setflds                                       06.08.21.560839
___ 03   FRP Control setaudit                                      06.10.11.380979
___ 03   FRP Admin add security failure                            17.23.46.810802
___ 03   FRP Admin start security failure                          17.24.24.565098
___ 03   FRP Admin display security failure                        17.25.02.390110
___ 03   FRP Admin stop security failure                           17.25.53.599835
___ 03   FRP Admin change security failure                         17.26.25.764890
```

Part 3

- IMS Performance Analyzer for z/OS V2.3

IMSPA Form-based transit reporting evolution

Part 1 of 3

1. Customizable reporting; complete coverage of all transaction workload types – breakdown of response time and resource usage
2. Three report output formats – Printed, CSV, DB2
3. Flexible summarization, including distributions or service levels – "what percentage of transactions had a response time greater than 1 second?"
4. Transaction Index; for use in IMS Problem Investigator
5. Combined IMS and Connect (via CEX) transaction analysis

1. CICS-DBCTL
   - Improved identification of CICS transaction in the IMS log – tie the transaction back to the CICS Performance Analyzer report
   - DBCTL thread availability and scheduling delay
2. Syncpoint time breakdown
   - PH1, PH2, PH1+PH2
   - OTHREAD – how long did the (asynchronous) OTHREAD process take to update the FP areas?
3. Improved BMP analysis – syncpoint/checkpoint activity
4. Individual database update activity. Which transactions update which databases?
5. External subsystem activity. Which transactions use DB2, and for update or read-only?

Database and ESAF cross-reference

Part 2 of 3

Form-based reporting enhancements, focusing on:

- Databases updated by the transaction
- External subsystems used by the transaction

List of transactions, with their database and ESAF activity

List of transactions with DB and XREF usage

Trancode	IMS Tran Start	CPU Time	InputQ Time	Process Time	OutputQ Time	Total IMS Time	DB Call Count	DB IO Time	DB Lock Time	Database Name	ESAF Name
NEWORDER	09.56.21.101795	0.006942	0.067237	0.022835	0.000000	0.090072	17	0.003110	0.000000	ORDERS	DB2P
										INVENTRY	
										CUSTOMER	
WITHDRAW	09.56.23.738099	0.013405	0.000340	0.245464	0.000000	0.245804	14	0.000491	0.000000	ACCOUNT	DB2P
										CUSTOMER	MQP1
SUPPLIER	09.56.49.995508	0.005473	0.000539	0.009268	0.000124	0.009931	10	0.000386	0.000000	SUPPLIER	DB2P
										INVENTRY	MQP1
										AUDIT	

Database and ESAF cross-reference

Part 3 of 3

Transaction/DB XREF

Database DBD Name	Trancode	Tran Count	Avg InputQ Time	Avg Process Time	Avg CPU Time
-	QUERY	37	0.045726	0.582065	0.010254
CUSTOMER	NEWORDER	126	0.008482	0.610832	0.030402
	SUPPLIER	371	0.028547	0.147213	0.025370
	WITHDRAW	647	0.000715	0.505773	0.043120

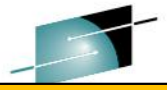
1. QUERY did not update any databases
2. DB CUSTOMER updated by 3 transactions

Transaction/ESAF XREF

ESAF Name	Trancode	Tran Count	Avg InputQ Time	Avg Process Time	Avg CPU Time
-	QUERY	718	0.000212	2.249543	0.187361
-	STOCK	15	0.000023	67.47718	0.004363
DB2P	ORDER	137	0.409783	0.893747	0.011848
DB2P	SUPPLIER	125	0.003254	0.625000	0.022185
MQP1	SUPPLIER	261	1.038247	0.807217	0.007447
MQP1	WITHDRAW	315	0.000233	0.134941	0.010274

1. QUERY and STOCK did not use any external subsystems
2. SUPPLIER used 2 subsystems; DB2 and MQ

LOGINFO – IMS log information report



Both PA and PI always produce this report; useful to profile your IMS log

Code	Count	MCNT	Recs/Sec	Avg len	Max Len	Byte/Sec	MB	%	
01 IN	21,342		0	1,725	3,240	96	36.8	6.3	IMS Message
INPUT	15,072		0	1,727	3,240	67	26.0	4.5	Input message
MSC FE	134		0	1,032	1,912	0	0.1	0.0	MSC front end
MSC BE	3,418		0	1,193	3,240	10	4.0	0.7	MSC back end
CONTINUE	2,718		0	2,417	3,240	17	6.5	1.1	Continuation record
03 OUT	15,256		0	2,081	3,240	82	31.7	5.4	IMS Message
OUTPUT	14,602		0	2,138	3,240	81	31.2	5.3	Output message
MSC BE	137		0	1,749	2,672	0	0.2	0.0	MSC back end
MSG SWI	517		0	551	800	0	0.2	0.0	Message switch
07	41,039	50,985	0	456	456	48	18.7	3.2	Program schedule end
MPP	32,753	34,446	0	456	456	38	14.9	2.6	MPP
QUICK	8,190	16,463	0	456	456	9	3.7	0.6	MPP quick reschedule
FALSE	12	0	0	456	456	0	0.0	0.0	MPP false schedule
BMP	15	0	0	456	456	0	0.0	0.0	BMP
ABEND	69	76	0	456	456	0	0.0	0.0	Abended transaction
08	41,040		0	148	148	15	6.0	1.0	Program schedule start
MPP	32,835		0	148	148	12	4.8	0.8	MPP
QUICK	8,190		0	148	148	3	1.2	0.2	MPP quick reschedule
BMP	15		0	148	148	0	0.0	0.0	BMP
31	76,983		0	223	832	44	17.2	2.9	GU from the Message Queue
DLI	61,447		0	115	126	18	7.0	1.2	DLI (application input)
COMMS	15,536		0	652	832	26	10.1	1.7	Communications (output)
4001	1		0	1,516	1,516	0	0.0	0.0	Checkpoint begin
50	259,638		0	340	3,964	230	88.4	15.1	Database Update
Total	1,366,218		3	427	4,140	1,524	584.6	100.0	

Part of the "KBLA equivalency" initiative - the Log Record Processing Rate Analysis utility (DFSKRSR0)

Synchronous callout – IMSPA report Part 1 of 2

Transactions w/ synch-callout

SUMM0001 Data from 10.18.37 19Apr2011 to 10.21.06 19Apr2011

Trancode	Tran Count	Avg CPU Time	Avg InputQ Time	Avg Process Time	Avg SyncCout RespTime	Avg Total IMS Time	Avg SyncCout ACK Cnt	Avg SyncCout NAK Cnt
MYORDER	57760	0.0023	0.0052	0.5673	0.4723	0.5725	1	0

The sync callout response time is a large percentage of the overall processing time: indicative of a delay

Synchronous callout – IMSPI tracking Part 2 of 2

```
BROWSE    IPI000.QADATA.JASDEEP2.VB10.IM01001        Record 00000057 More: < >
Command ===> _____________________________________________ Scroll ===> PAGE
   Forwards / Backwards . . HH.MM.SS.THMIJU    Time of Day . . HH.MM.SS.THMIJU
   Code Description                 Date 2011-04-20 Wednesday  Time (Relative)
/  ---- Search limit reached (+5000) ------------------------ ---------------
__ 01   Input Message TranCode=SMQLG                          01.19.00.003853
__ 35   Input Message Enqueue TranCode=SMQLG                        +0.000001
__ 31   DLI GU TranCode=SMQLG Region=0006                          +0.000057
__ 6701 YOUT Sync callout message sent                             +0.000125
__ 6701 YACK Received ACK                                          +0.000618
__ 6701 YRSP Sync callout response received                        +0.201386
__ 03   Output Message Response LTerm=OTM00001                     +0.201420
__ 35   Output Message Enqueue LTerm=OTM00001 Region=0006          +0.201422
__ 37   Syncpoint Region=0006                                      +0.201424
__ 37   Syncpoint message transfer Region=0006                     +0.201425
__ 33   Free Message                                              +0.201428
__ 5612 End of Phase 2 Syncpoint Program=PSBLG Region=0006         +0.201431
__ 31   Communications GU LTerm=OTM00001                           +0.201440
__ 36   Output Message Dequeue LTerm=OTM00001                      +0.203894
__ 33   Free Message                                              +0.203895
__ 07   Application Terminate TranCode=SMQLG Region=0006           +0.220357
******************************** Bottom of Data ********************************
```

Delay due to sync callout

Program Switch: Transaction list

Part 1 of 2

IMS Performance Analyzer
Program Switch List

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

Transaction BANK0001 originated from lterm NEWYORK at 14.58.02.023922

It switched to trancode BANK0010

Trancode BANK0010 then switched to BANK0011

Four (4) further switches to Trancode BANK0015 completed the sequence

The overall transaction response time is always reported against the originating transaction – 4.467306 seconds – from when the originating transaction arrived on the message queue to when a response was sent back to the terminal

The last transaction in the sequence responded back to the terminal – you can tell because it has an output queue time

Notice the long switch times for the last 2 transactions – this contributed to almost 0.5 seconds of the response time

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

Program Switch: Summary

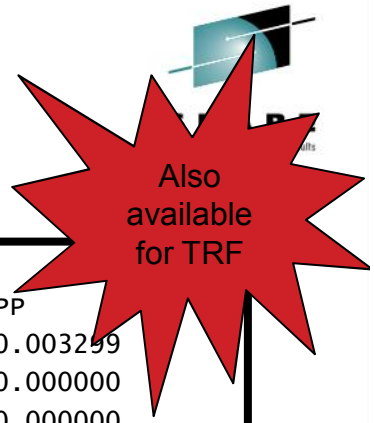
Part 2 of 2

```
                                                    IMS Performance Analyzer
                                                     Program Switch Summary
SUMM0001 Printed at 22:35:20 06Jul2011     Data from 14.58.00 27Jun2011 to 15.12.39
                                    Avg      Avg      Max      Avg      Max      Avg
Org                        Tran   InputQ PgmSwtch PgmSwtch  Process  Process  OutputQ
Trancode Trancode         Count     Time     Time     Time     Time     Time     Time
BANK0101 BANK0101           932 0.011484        -        - 0.044661 3.590554 0.000000
...
BANK0101 BANK0150           126 0.188746 0.188721 7.246319 0.507465 5.454976 0.000000
BANK0101 BANK0153           309 0.006004 0.005973 0.549195 0.396116 4.169538 0.000000
BANK0101 BANK0154           607 0.002426 0.002396 0.337522 0.313873 1.866285 0.000000
```

The switch time for trancode BANK0150 stands out as a potential bottleneck

```
 27Jun2011
     Avg       Avg       Avg
   Total IMS Resp       CPU
IMS Time      Time      Time
0.056145 0.498563 0.004940

0.696186         - 0.014304
0.402089         - 0.020677
0.316269         - 0.019530
```

OMEGAMON for IMS ATF with IF3 support




```
Transaction  . . . . MPX00110    Date-Time  . . . . . 2011-07-09-02.51.26.382999
Jobname  . . . . . . IMS9YMS1    Region ID  . . . . . 002         Region Type  . . . . MPP
Elapsed Time . . . .  2.200601   Total CPU Time . . .  0.007901   Dependent Region CPU  0.003299
DLI CPU Time . . . .  0.005478   DB2 CPU Time . . . .  0.000000   MQ CPU Time  . . . .  0.000000
Control Region CPU .  0.000000   DLISAS Region CPU  .  0.004601   Other Regions CPU  .  0.000000
Elapsed time DL/I  .  0.666187   Elapsed time DB2 . .  0.000000   Elapsed time MQ  . .  0.000000
```

Elapsed and CPU times per IMS Region and External Subsystem

Time hh.mm.ss.thmiju		ss.thmiju	ss.thmiju	CPU Time	Description	Resources		FC	SC
02.51.26.382999		0	2.200601	0.000000	SUMMARY COMPLETION				
02.51.27.861013	+	1.478013	0.000011	0.000008	DLI CALL (TM)		I/O PCB	GU	
02.51.27.861041	+	1.478041	0.528531	0.004565			00 BD#AASEG	GU	
02.51.28.389595	+	2.006595	0.042433	0.000423			00 BC#AASEG	GHU	
02.51.28.432044	+	2.049044	0.001128	0.000122			00 BC#BASEG	GHNP	
02.51.28.433182	+	2.050183	0.093938	0.000215	DLI CALL (DB)	BC$HDLO0	BC#BASEG	REPL	
02.51.28.527134	+	2.144134	0.000028	0.000028	DLI CALL (DB)	BC$HDLO0	BC#BASEG	GHNP	
02.51.28.527170	+	2.144171	0.000044	0.000044	DLI CALL (DB)	BC$HDLO0	BC#BASEG	REPL	
02.51.28.527221	+	2.144221	0.000012	0.000012	DLI CALL (DB)	BC$HDLO0	BC#BASEG	GHNP	
02.51.28.527239	+	2.144240	0.000018	0.000017	DLI CALL (DB)	BC$HDLO0	BC#BASEG	REPL	
02.51.28.527371	+	2.144371	0.000015	0.000015	DLI CALL (DB)	BC$HDLO0	BC#BASEG	GHNP	

Elapsed and CPU times per DLI and ESAF call

IMSPA useability enhancements

1. Support for incorrect or mixed IMS versions, useful for mixed version shared queues and continuity during release migration:
   ```
   IPI0331I  System IMSP changed from version 10 to 12
   ```
2. ITKB enabled:
   - Write reports directly to the ITKB repository
   - View the reports from the IMS Tools Admin Console WUI
3. Transaction Index exceptions by processing time and ABEND – to reduce the extract to problem trans only
4. Improved documentation; including:
   - Form field explanations
   - More scenarios and examples
   - Enabled for IBM Infocenter

Syncpoint analysis

Transaction analysis with focus on Syncpoint

IMS Tran Start	Trancode	CPU Time	Process Time	Syncpt Time	Sync PH1 Time	Sync PH2 Time	Sync PH2 FP Time	Othread Time
15.32.04.8237	BANKING1	0.0022	4.1844	0.0236	0.0209	0.0027	0.0017	0.0262
15.32.27.8967	BANKING2	0.0102	0.5698	0.0276	0.0257	0.0018	0.0009	0.0326
15.37.59.3642	BANKING3	0.0044	3.3046	0.0514	0.0290	0.0224	0.0215	0.0561
15.42.37.1134	BANKING1	0.0007	0.0045	0.0024	0.0000	0.0024	0.0023	0.2768
16.38.44.1141	BANKING3	0.0020	0.0572	0.0307	0.0284	0.0024	0.0014	0.0321
16.38.47.1217	BANKING4	0.0020	0.0854	0.0569	0.0479	0.0090	0.0010	0.0586
16.38.48.6416	BANKING2	0.0018	0.0432	0.0150	0.0134	0.0016	0.0008	0.0167
16.44.29.3784	BANKING7	0.0019	0.0554	0.0366	0.0345	0.0021	0.0008	0.0390

- Total syncpoint elapsed time
- Phases 1 and 2 elapsed times
- Phase 2 elapsed time that is attributable to Fast Path
- Fast Path OTHREAD elapsed time. Phase 2 syncpoint processing queues updated DEDB buffers to OTHREAD for IO processing. OTHREAD is an asynchronous process that may complete before or after the transaction ends. Long OTHREAD times (that will not be reflected in transaction processing time) may indicate that OTHREAD is a system bottleneck.

Syncpoint analysis

Transaction analysis with focus on Syncpoint

IMS Tran Start	Trancode	CPU Time	Process Time	Syncpt Time	Sync PH1 Time	Sync PH2 Time	Sync PH2 FP Time	Othread Time
15.32.04.8237	BANKING1	0.0022	4.1844	0.0236	0.0209	0.0027	0.0017	0.0262
15.32.27.8967	BANKING2	0.0102	0.5698	0.0276	0.0257	0.0018	0.0009	0.0326
15.37.59.3642	BANKING3	0.0044	3.3046	0.0514	0.0290	0.0224	0.0215	0.0561
15.42.37.1134	BANKING1	0.0007	0.0045	0.0024	0.0000	0.0024	0.0023	0.2768
16.38.44.1141	BANKING3	0.0020	0.0572	0.0307	0.0284	0.0024	0.0014	0.0321
16.38.47.1217	BANKING4	0.0020	0.0854	0.0569	0.0479	0.0090	0.0010	0.0586
16.38.48.6416	BANKING2	0.0018	0.0432	0.0150	0.0134	0.0016	0.0008	0.0167
16.44.29.3784	BANKING7	0.0019	0.0554	0.0366	0.0345	0.0021	0.0008	0.0390

- Total syncpoint elapsed time
- Phases 1 and 2 elapsed times
- Phase 2 elapsed time that is attributable to Fast Path
- Fast Path OTHREAD elapsed time. Phase 2 syncpoint processing queues updated DEDB buffers to OTHREAD for IO processing. OTHREAD is an asynchronous process that may complete before or after the transaction ends. Long OTHREAD times (that will not be reflected in transaction processing time) may indicate that OTHREAD is a system bottleneck.

Contact Info:

james_martin@fundi.com.au

Jim_martin@fundi.com.au