



IBM Software Group

Revealing the secrets of IMS Connect with IMS Connect Extensions

Jim Martin - Fundi Software

Session agenda

- **Introduction to the products used in this presentation**
- **Investigating an IMS Connect transaction**
- **Summary**

IMS Connect Extensions Highlights

- Recording of TCP/IP activity for IMS
 - Record IMS Connect events in journals for auditing and analysis
 - Provide a detailed log of activity
 - Capture performance and debugging information
- Single point of control
 - View and manage all instances of IMS Connect
 - Perform IMS Connect commands from a central console
 - Provide flexible access security for commands
 - Monitor and control TCP/IP sessions in real-time, across the sysplex
 - Gain a real-time summary of transaction activity
 - Load message exits dynamically

IMS Performance Analyser

- **IMS Performance Analyser (IMS PA) is a tool that uses the IMS and related logs to create performance and throughput reports**
- **IMS Performance Analyzer is the premier tool for:**
 - Service Levels and capacity planning
 - Response time analysis
 - Monitoring enterprise-wide indicators that can adversely affect IMS performance

IMS Problem Investigator

- **IMS Problem Investigator is a log analysis tool that allows you to interactively browse IMS and other related logs**
- **Consists of an ISPF-based dialog that provides an immediate formatted view of your logs (as well as batch reporting utilities)**
- **Intelligently navigates across logs and connects transaction records across systems and log types. For example:**
 - Tracks activity from a transaction across all IMS systems.
 - Tracks activity from a transaction across IMS log and monitor files, IMS Connect journals (collected by IMS Connect Extensions), DB2 logs, and SMF logs.

```

Forwards / Backwards . . 00.00.00.000100    Time of Day . . 03.55.07.774175
Code Description          Date 2009-07-17 Friday    Time (Elapsed)
/ -----
___ A03C Prepare READ Socket                12.22.18.130248
___ A049 READ Socket                        0.256393
___ A0A4 Event Collection IRM Trace         0.000023
___ A03D Message Exit called for READ      0.000004
___ A0A3 Event Collection OTMA Trace       0.000063
___ A03E Message Exit returned from READ  0.000005
___ A0A3 Event Collection OTMA Trace       0.000169
___ A041 Message sent to OTMA              0.000009
___ 01  Input Message TranCode=PART Source=Connect 0.001544
___ 35  Input Message Enqueue TranCode=PART 0.000138
___ 5607 Start of UOR Program=DFSSAM02 Region=0001 0.005443
___ 31  DLI GU TranCode=PART Region=0001    0.000026
___ 20  Database Open Database=DI21PART Region=0001 0.455100
___ 20  Database Open Database=DI21PART Region=0001 0.095290
___ 03  Output Message Response LTerm=7771 Source=Connect 0.008796
___ 31  DLI GU TranCode=PART Region=0001    0.000017
___ A0A3 Event Collection OTMA Trace       0.000495
___ A042 Message received from OTMA        0.000022
___ A0A3 Event Collection OTMA Trace       0.000185

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***** TOP OF DATA *****
                                IMS Performance Analyzer 4.2
                                Connect Transit Log

LIST0001 Printed at 15:47:57 17Jul2009    Data from 15.59.07 09Jan2006    Page 1

CON Tran      Target      CON Resp      Total      PreOTMA      ReadSock      OTMADlay      OTMAproc      PostOTMA      InputQ      Process Time
Start         Trancode  Dastator     Port      Time      IMS Time      Time      In Time      Time      Time      Time      Time      Time      Time
15.59.07.770681 PART      IMD3        3101     0.335919  0.067576  0.265722  0.265448  0.001998  0.069114  0.001081  0.000334  0.067242
15.59.24.903679 DSPALLI  IMD3        3102     0.277428  0.044120  0.231319  0.231086  0.001414  0.044955  0.001152  0.000154  0.043966
15.59.34.571792 IVTNO    IMD3        3101     0.223797  0.001417  0.220857  0.220721  0.000690  0.001954  0.000986  0.000096  0.001321
15.59.45.526963 DVPTRAN2 IMD3        3101     0.239365  10.00188  0.228180  0.227964  0.000466  0.010377  0.000807  0.000164  10.00172 T
***** BOTTOM OF DATA *****

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___ A0A3 Event Collection OTMA Trace       0.000044
___ A03E Message Exit returned from READ  0.000005
___ A0A3 Event Collection OTMA Trace       0.000141
___ A041 Message sent to OTMA Resp=ACK    0.000008
___ 33  Free Message                        0.000189
___ 5610 Start Phase 1 Syncpoint Region=0001 0.000023

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___	A03E Message Exit returned from READ TranCode=PART	0.000005
___	A0A3 Event Collection OTMA Trace	0.000169
___	A041 Message sent to OTMA	0.000009
___	01 Input Message TranCode=PART Source=Connect	0.001544
___	35 Input Message Enqueue TranCode=PART	0.000138
___	5607 Start of UOR Program=DFSSAM02 Region=0001	0.005443
___	31 DLI GU TranCode=PART Region=0001	0.000026
___	20 Database Open Database=DI21PART Region=0001	0.455100
___	20 Database Open Database=DI21PART Region=0001	0.095290
___	03 Output Message Response LTerm=7771 Source=Connect	0.008796
___	31 DLI GU TranCode=PART Region=0001	0.000017
___	A0A3 Event Collection OTMA Trace	0.000495
___	A042 Message received from OTMA	0.000022
___	A0A3 Event Collection OTMA Trace	0.000185
___	A0A3 Event Collection OTMA Trace	0.000008
___	A0A3 Event Collection OTMA Trace	0.000004
___	A0A3 Event Collection OTMA Trace	0.000004
___	A03D Message Exit called for XMIT	0.000004
___	A0A6 Event Recording EXIT Output Message Trace	0.000039
___	A03E Message Exit returned from XMIT	0.000005
___	A04A WRITE Socket	0.000240
___	A049 READ Socket	0.000562
___	A049 READ Socket	0.000039
___	A0A4 Event Collection IRM Trace	0.000021
___	A03D Message Exit called for READ	0.000004
___	A0A3 Event Collection OTMA Trace	0.000044
___	A03E Message Exit returned from READ TranCode=PART	0.000005
___	A0A3 Event Collection OTMA Trace	0.000141
___	A041 Message sent to OTMA Resp=ACK	0.000008
___	33 Free Message	0.000189
___	5610 Start Phase 1 Syncpoint Region=0001	0.000023

```

Form      ==> _____ + _ Use Form in Filter      Format ==> FORM
***** Top of data *****
+0004 Code... A0A4  Event Collection IRM Trace
+0096 STCK... C47EF6AFB2F95741      LSN.... 00000000000010E
      Date... 2009-07-17 Friday      Time... 12.22.18.130325.453

+0000 CERE_A4_LL..... 00A6
+0002 CERE_A4_ZZ..... 0000
+0004 CERE_A4_RECID..... A0  CERE_A4_EVTID..... A4
+0006 CERE_A4_PFXLL..... 0014
+0008 CERE_A4_EFLAG..... 00  CERE_A4_VER#..... 22
+000A CERE_A4_TASKID..... ID of task recording event
+000A CERE_A4_COL#..... 01  CERE_A4_TKS#..... 05
+000C CERE_A4_EVKEY..... C47EF6AFB2B17841
+0014 CERE_A4_BASE_LL.... 000E
+0016 CERE_A4_APAR..... 0001
+0018 CERE_A4_CONT..... 0C  CERE_A4_CODE..... 00
+001A CERE_A4_OEVTID..... 3D  CERE_A4_#SEG..... 0002
+001E CERE_A4_4LL..... 00000078

+0022 IRMMask.... IRM IMS Request Message section
+0022 IRM_Len.... 0058      IRM_ARCH... 00      IRM_F0..... 00
+0026 IRM_Id.... '*SAMPL1*'  IRM_NAK_RSNCDE..... 0000
+0032 IRM_F5.... 00      IRM_TIMER..... 36  IRM_SOCT... 10
+0035 IRM_ES.... 00      IRM_CLIENTID..... 'CLNAC10 '
+003E IRM_F1.... 00      IRM_F2..... 20      IRM_F3..... 01
+0041 IRM_F4.... 00      IRM_Trncod..... 'IXCTAN1'
+004A IRM_IMSDestId..... 'GENERIC '
+0052 IRM_Lterm..... 'LTAC10 '

+005A IRM_UsrDat..... User Security Data
+005A IRM_RACF_USERID.... 'CEX001 '
+0062 IRM_RACF_GRNAME.... 'RANDD '
+006A IRM_RACF_PW..... '*****'
+0072 IRM_APPL_NM..... '

+007A CERE_A4_APD..... IRM Application Data section
+007A CERE_A4_APD_LL..... 0018
+007C CERE_A4_APD_DATA... Application data
    
```



```

                                (continued from previous screen)
+007A  CERE_A4_APD..... IRM Application Data section
+007A  CERE_A4_APD_LL..... 0018
+007C  CERE_A4_APD_DATA... Application data
      +0000  0000D7C1 D9E340C1 D5F9F6F0 C3F1F040  *..PART AN960C10 *
      +0010  40404040 4040                                *
                                *
+0092  CERE_A4_APD..... IRM Application Data section
+0092  CERE_A4_APD_LL..... 0004
+0094  CERE_A4_APD_DATA... Application data
      +0000  0000                                *..
***** End of data *****
    
```

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A049	READ Socket		0.256393
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A03D	Message Exit called for READ		0.000004
A0A3	Event Collection OTMA Trace		0.000063
A03E	Message Exit returned from READ TranCode=PART		0.000005
A0A3	Event Collection OTMA Trace		0.000169
A041	Message sent to OTMA		0.000009
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35	Input Message Enqueue TranCode=PART		0.000138
5607	Start of UOR Program=DFSSAM02 Region=0001		0.005443
31	DLI GU TranCode=PART Region=0001		0.000026
20	Database Open Database=DI21PART Region=0001		0.455100
20	Database Open Database=DI21PART Region=0001		0.095290
03	Output Message Response LTerm=7771 Source=Connect		0.008796
31	DLI GU TranCode=PART Region=0001		0.000017
A0A3	Event Collection OTMA Trace		0.000495
A042	Message received from OTMA		0.000022
A0A3	Event Collection OTMA Trace		0.000185
A0A3	Event Collection OTMA Trace		0.000008
A0A3	Event Collection OTMA Trace		0.000004
A0A3	Event Collection OTMA Trace		0.000004
A03D	Message Exit called for XMIT		0.000004
A0A6	Event Recording EXIT Output Message Trace		0.000039
A03E	Message Exit returned from XMIT		0.000005
A04A	WRITE Socket		0.000240
A049	READ Socket		0.000562
A049	READ Socket		0.000039
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A03D	Message Exit called for READ		0.000004
A0A3	Event Collection OTMA Trace		0.000044
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A041	Message sent to OTMA Resp=ACK		0.000008
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```

Form      ==> _____ + _ Use Form in Filter      Format ==> FORM

+0078  CERE_3E_SVT_START..... SVT section
+0078  CERE_3E_SVT_LL..... 0096
+007A  CERE_3E_SVT_APAR... 0004
+007C  CERE_3E_SVT_STATUS..... 80
+007E  CERE_3E_SVT_DSORIG..... 'GENERIC '
+0086  CERE_3E_SVT_DSTARG..... 'I9DV '
+008E  CERE_3E_SVT_TXNAME..... 'PART '
+0096  CERE_3E_SVT_UID.... 'CEX001 '
+009E  CERE_3E_SVT_GRPID..... 'RANDD '
+00A6  CERE_3E_SVT_MODNAME..... 0000000000000000
+00AE  CERE_3E_SVT_OLTERM..... 'LTAC10 '
+00B6  CERE_3E_SVT_ORIGID..... 'CLNAC10 '
+00BE  CERE_3E_SVT_RELE... 0002
+00C0  CERE_3E_SVT_FLAG... 58  CERE_3E_SVT_SYNCFLAG..... 21
+00C2  CERE_3E_SVT SOCKFLAG..... 10
+00C3  CERE_3E_SVT_AFLAG..... E0
+00C4  CERE_3E_SVT_AFLAG1..... 40
+00C5  CERE_3E_SVT_TFLAG1..... 04
+00C6  CERE_3E_SVT_ICLNTID..... 'CLNAC10 '
+00CE  CERE_3E_SVT_RERTNM..... ' '
+00D6  CERE_3E_SVT_TAG_ADPT..... ' '
+00DE  CERE_3E_SVT_TAG_MAP..... ' '
+00E6  CERE_3E_SVT_TFLAG2..... 80
+00EA  CERE_3E_SVT_CT_IMSID..... ' '
+00EE  CERE_3E_SVT_CT_MEMTK..... 0000000000000000
+00F6  CERE_3E_SVT_CT_AWETK..... 0000000000000000
+00FE  CERE_3E_SVT_CT_TPIPE..... ' '
+0106  CERE_3E_SVT_CT_USERID..... ' '
***** end of data *****
    
```

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___	A03E Message Exit returned from READ TranCode=PART	0.000005
___	A0A3 Event Collection OTMA Trace	0.000141
___	A041 Message sent to OTMA Resp=ACK	0.000008
___	33 Free Message	0.000189
___	5610 Start Phase 1 Syncpoint Region=0001	0.000023

```

Form      ==>      +      Use Form in Filter      Format ==> FORM
+004C    OMHDRTOK... 00000000000000000000000000000000    OMHDRSXQ... 0000
+0054    OMHDRUID... 0000000000000000
+005C    OMHRCOR... 0000000000000000
+0064    OMHDRTIM... C47EF6AFB2FF1E61
+006C    OMHRCID... 00000000000000000000000000000000
+007C    OMHDRLTM... 'LTAC10 '    OMHDRLIU... 0000

+0086    CERE_A3_OT_SEC..... OTMA Security section
+0086    CERE_A3_SEC_LL..... 0068
+0088    CERE_A3_SEC_APAR... 0003
+008A    CERE_A3_SEC_UID.... 'CEX001 '
+0092    CERE_A3_SEC_GRP.... 'RANDD '
+009A    CERE_A3_SEC_TLEN... 006A
+009C    CERE_A3_SEC_CRLN... 00 CERE_A3_SEC_CRTY... 00
+009E    CERE_A3_SEC_CPRF... UTOKEN area
+0000    00000000 00000000 00000000 00000000    *.....*
+0010    00000000 00000000 00000000 00000000    *.....*
+0020    00000000 00000000 00000000 00000000    *.....*
+0030    00000000 00000000 00000000 00000000    *.....*
+0040    00000000 00000000 00000000 00000000    *.....*

+00EE    CERE_A3_OT_USR..... OTMA User section
+00EE    HWSOMUSR... User data
+00EE    OMUSRLN... 0100      OMUSR_DESTID..... 'I9DV '
+00FA    OMUSR_ORIGID..... 'CLNAC10 '
+0102    OMUSR_PORTID..... '7771 '
+010A    OMUSR_LTOKEN..... C47EF6AFB2B17841
+0112    OMUSR_RETCODE..... 00000000
+0116    OMUSR_RESCODE..... 0000000000000000
+011E    OMUSR_RTOKEN..... 1B17DD48
+0122    OMUSR_PASSTICK..... '*****'
+012A    OMUSR_FLAG1..... 10 OMUSR_FLAG2..... 00
+012C    OMUSR_FLAG3..... 20 OMUSR_TIMER..... 36
+012E    OMUSR_USTAT..... 00000000
+0132    OMUSR_APPL_NM..... ' '
+013A    OMUSR_RRS_RCD..... 00000000
+013E    OMUSR_ARCLEV..... 02 OMUSR_PROLEV..... 00
+014A    OMUSR_REROUT_NM..... ' '

```

```

Form      ==> _____ + _____ Use Form in Filter      Format ==> FORM
+00EE    HWSOMUSR... User data
+00EE    OMUSRLN... 0100          OMUSR_DESTID..... 'I9DV  '
+00FA    OMUSR_ORIGID..... 'CLNAC10 '
+0102    OMUSR_PORTID..... '7771  '
+010A    OMUSR_LTOKEN..... C47EF6AFB2B17841
+0112    OMUSR_RETCODE..... 00000000
+0116    OMUSR_RESCODE..... 0000000000000000
+011E    OMUSR_RTOKEN..... 1B17DD48
+0122    OMUSR_PASSTICK..... '*****'
+012A    OMUSR_FLAG1..... 10  OMUSR_FLAG2..... 00
+012C    OMUSR_FLAG3..... 20  OMUSR_TIMER..... 36
+012E    OMUSR_USTAT..... 00000000
+0132    OMUSR_APPL_NM..... '      '
+013A    OMUSR_RRS_RCD..... 00000000
+013E    OMUSR_ARCLEV..... 02  OMUSR_PROLEV..... 00
+014A    OMUSR_REROUT_NM..... '      '
+0152    OMUSR_EWLMCORR..... EWLM Correlator; OMHRCFL=OMHDREW when present
+0152    OMUSR_ADPTNM..... 0000000000000000
+015A    OMUSR_DRVNM..... 0000000000000000
+0194    OMUSR_UTC_TO..... Transaction expiry timeout UTC time
+0194    OMUSR_UTC_TO..... 00000000000000000000000000000000
+01A4    OMUSR_CORTKN..... SYNCH CALLOUT Correlator
+01A4    OMUSR_CT_LEN..... 0000
+01A6    OMUSR_CT_RESV1..... 0000
+01A8    OMUSR_CT_IMSID..... 00000000
+01AC    OMUSR_CT_MEMTK..... 0000000000000000
+01B4    OMUSR_CT_AWETK..... 0000000000000000
+01BC    OMUSR_CT_TPIPE..... 0000000000000000
+01C4    OMUSR_CT_USERID..... 0000000000000000

+01EE    CERE_A3_OT_APD..... OTMA Application section
+01EE    CERE_A3_APD_LL..... 0018
+01F0    CERE_A3_APD_ZZ..... 0000
+01F2    CERE_A3_APD_DATA... OTMA Application data
+0000    D7C1D9E3 40C1D5F9 F6F0C3F1 F0404040  *PART AN960C10  *
+0010    40404040                                *                *
***** End of data *****

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Form ==> _____ + _ Use Form in Filter Format ==> FORM

***** Top of data *****

```
+0004 Code... A0A6 Event Recording EXIT Output Message Trace
+0150 STCK... C47EF6B03D7E7541 LSN.... 000000000000011B
Date... 2009-07-17 Friday Time... 12.22.18.697703.328
```

```
+0000 CERE_A6_LL..... 0160
+0002 CERE_A6_ZZ..... 0000
+0004 CERE_A6_RECID..... A0 CERE_A6_EVTID..... A6
+0006 CERE_A6_PFXLL..... 0014
+0008 CERE_A6_EFLAG..... 00 CERE_A6_VER#..... 22
+000A CERE_A6_TASKID..... ID of Task recording Event
+000A CERE_A6_COL#..... 01 CERE_A6_TKS#..... 05
+000C CERE_A6_EVKEY..... C47EF6AFB2B17841
+0014 CERE_A6_BASE_LL.... 000E
+0016 CERE_A6_APAR..... 0001
+0018 CERE_A6_CONT..... 00 CERE_A6_CODE..... 04
+001A CERE_A6_OEVTID..... 3E CERE_A6_#SEG..... +0
+001E CERE_A6_MSGLEN..... 0000012C
```

```
+0022 CERE_A6_DMP..... Output message section
```

```
+0022 CERE_A6_DMP_LL..... 012E
```

```
+0024 CERE_A6_DMP_DTA.... Dump data
```

```
+0000 0000012C 00500300 40404040 40404040 *.....&.. *
+0010 4040D781 99A34B4B 4B4B4B4B 4B4B4B4B * Part..... *
+0020 4B404040 4040C1D5 F9F6F0C3 F1F05E40 * AN960C10; *
+0030 C485A283 4B4B4B4B 4B4B4B4B 4B4B4B40 *Desc..... *
+0040 E6C1E2C8 C5D94040 40404040 40404040 *WASHER *
+0050 40404040 00440300 40404040 40404040 * ..... *
+0060 4040D799 968340C3 9684854B 4B4B4B4B * Proc Code..... *
+0070 4B404040 40404040 40404040 F7F45E40 * 74; *
+0080 C995A540 C3968485 4B4B4B4B 4B4B4B40 *Inv Code..... *
+0090 40404040 404040F2 00440300 40404040 * 2.... *
+00A0 40404040 4040D481 928540C4 8597A34B * Make Dept.*
+00B0 4B4B4B4B 4B404040 40404040 40F1F260 *..... 12-*
+00C0 F0F05E40 D7938195 40D985A5 40D5A494 *00; Plan Rev Num*
+00D0 4B4B4B40 40404040 40404040 00440300 *... .. *
+00E0 40404040 40404040 4040D481 928540E3 * Make T*
+00F0 8994854B 4B4B4B4B 4B404040 40404040 *ime..... *
```



```

Forwards / Backwards . . 00.00.00.000100    Time of Day . . 03.55.07.774175
Code Description                               Date 2009-07-17 Friday    Time (Relative)
/-----
___ A0A4 Event Collection IRM Trace                -0.001798
___ A03D Message Exit called for READ            -0.001793
___ A0A3 Event Collection OTMA Trace             -0.001729
___ A03E Message Exit returned from READ TranCode=PART -0.001724
___ A0A3 Event Collection OTMA Trace             -0.001554
___ A041 Message sent to OTMA                   -0.001544
___ 01 Input Message TranCode=PART Source=Connect 12.22.18.132123
___ 35 Input Message Enqueue TranCode=PART       +0.000138
___ 5607 Start of UOR Program=DFSSAM02 Region=0001 +0.005582
___ 31 DLI GU TranCode=PART Region=0001         +0.005608
___ 20 Database Open Database=DI21PART Region=0001 +0.460709
___ 20 Database Open Database=DI21PART Region=0001 +0.555999
___ 03 Output Message Response LTerm=7771 Source=Connect +0.564795
___ 31 DLI GU TranCode=PART Region=0001         +0.564813
___ A0A3 Event Collection OTMA Trace             +0.565308
___ A042 Message received from OTMA             +0.565331
___ A0A3 Event Collection OTMA Trace             +0.565517
___ A0A3 Event Collection OTMA Trace             +0.565526
___ A0A3 Event Collection OTMA Trace             +0.565530
___ A0A3 Event Collection OTMA Trace             +0.565535
___ A03D Message Exit called for XMIT           +0.565540
___ A0A6 Event Recording EXIT Output Message Trace +0.565579
___ A03E Message Exit returned from XMIT        +0.565585
___ A04A WRITE Socket                            +0.565825
___ A049 READ Socket                             +0.566387
___ A049 READ Socket                             +0.566427
___ A0A4 Event Collection IRM Trace                +0.566449
___ A03D Message Exit called for READ            +0.566453
___ A0A3 Event Collection OTMA Trace             +0.566497
___ A03E Message Exit returned from READ TranCode=PART +0.566503
___ A0A3 Event Collection OTMA Trace             +0.566645
___ A041 Message sent to OTMA Resp=ACK          +0.566653
___ 33 Free Message                              +0.566843
___ 5610 Start Phase 1 Syncpoint Region=0001    +0.566866
___ 37 Syncpoint Region=0001                    +0.566908
___ 33 Free Message                              +0.566957

```


Summary

- **IMS Connect can be complex**
- **You must have data and tools to understand, tune, and fix**
- **CEX, IMSPA, and IMSPI are the tools you need**
- **IBM DB2 and IMS Tools website:**

<http://www.ibm.com/software/data/db2imstools/>