

IPCS for Networkers Part 1 of 2: Introduction to IPCS for VTAM and TCPIP Systems Programmers

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8:00 AM-9:00 AM
Grand Ballroom Salon B
Session 15191

<https://ibm.biz/BdR29P>



Communication Server Diagnosis Detectives at Work



z/OS Analysis

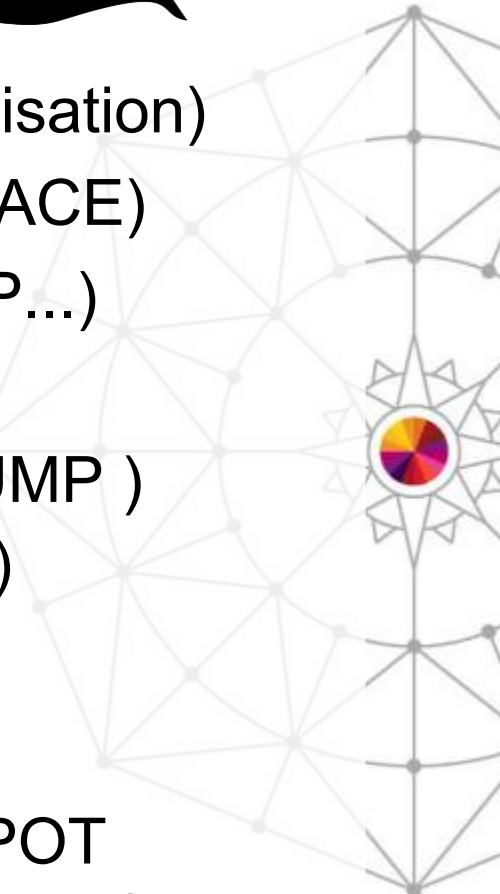
- Dumps (ABENDs, Storage Leaks, CPU Utilisation)
- Traces (CTRACE, GTF, SYSTRACE, MTRACE)
- Logs (SYSLOG, JOBLOG, NETLOG, EREP...)

VTAM Analysis

- Dumps (SLIP Dump, ABEND Dump, CSDUMP)
- Traces (VTAM Internal Trace, Buffer Trace)

TCPIP Analysis

- Dumps (TCPIP CS CLIST)
- Traces (SYSTPCDA, SYSTCPIP, SYSTCPOT
SYSTCPRT, SYSTCPIK, SYSTCPxx)



Communications Server Diagnosis

Books you should know about

z/OS MVS Diagnosis
Tools and Service Aids

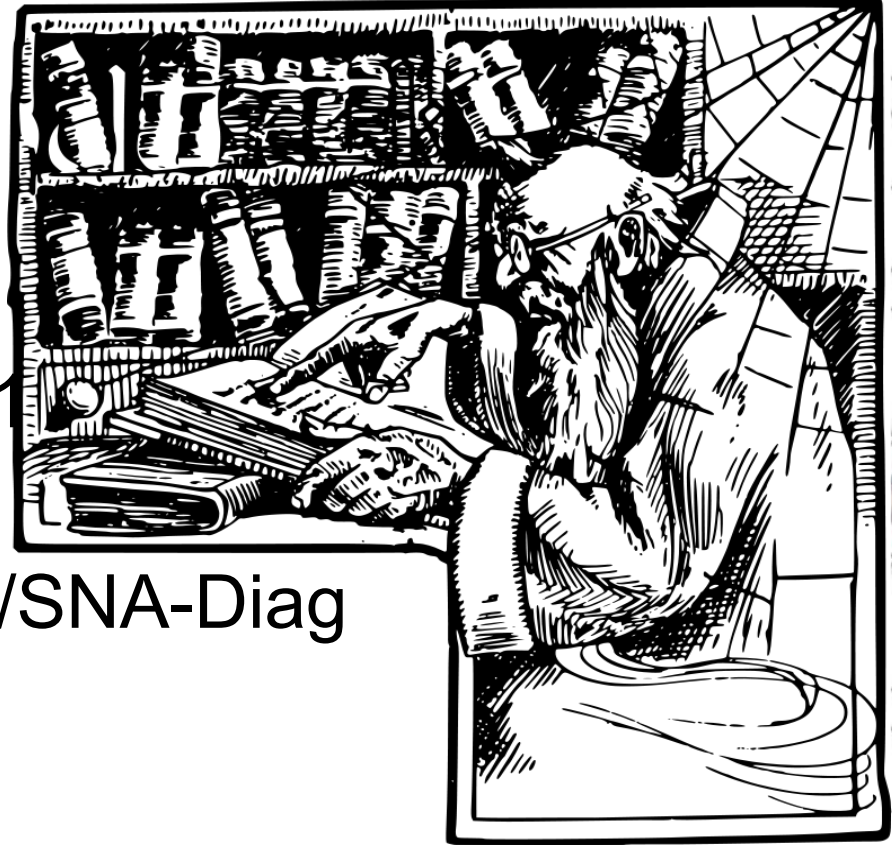
- GA32-0905-00

VTAM: SNA Diagnosis Vol 1

- GC27-3667-00
- V2R1: <http://tinyurl.com/SNA-Diag>

TCPIP Diagnosis Guide

- GC27-3552-00
- V2R1: <http://tinyurl.com/IP-Diagnosis>



Communication Server Diagnosis Books you should know about

z/OS MVS Diagnosis

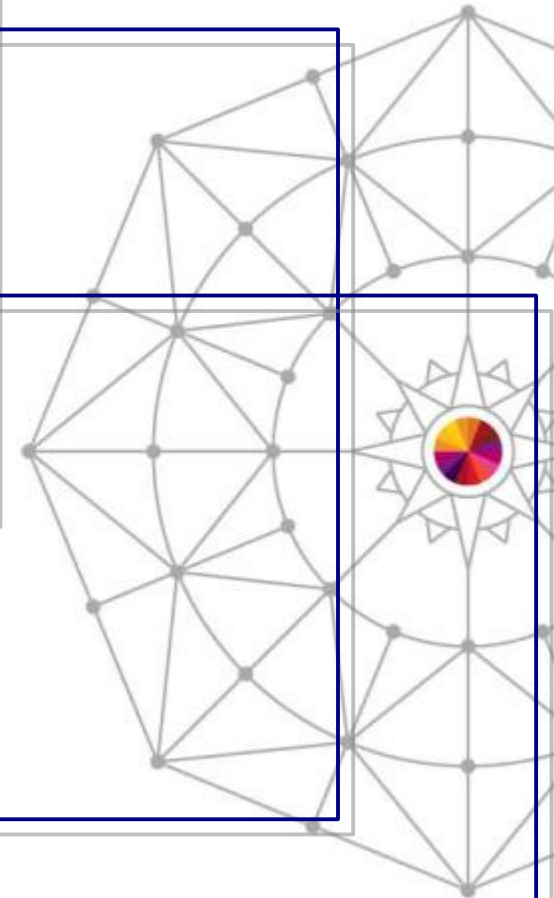
- GA32-0905-00
- V2R1: <http://tinyurl.com/MVS-Diag>

VTAM: SNA Diagnosis Vol 1

- GC27-3667-00
- V2R1: <http://tinyurl.com/SNA-Diag>

TCPIP Diagnosis Guide

- GC27-3552-00
- V2R1: <http://tinyurl.com/IP-Diagnosis>



Interactive Problem Control System Navigating through IPCS

----- IPCS PRIMARY OPTION MENU - z/OS 02.01.00 -----

OPTION ===>

0	DEFAULTS	- Specify default dump and options	* USERID - BURK
1	BROWSE	- Browse dump data set	* DATE - 14/02/27
2	ANALYSIS	- Analyze dump contents	* JULIAN - 14.058
3	UTILITY	- Perform utility functions	* TIME - 13:27
4	INVENTORY	- Inventory of problem data	* PREFIX - BURK
5	SUBMIT	- Submit problem analysis job to batch	* TERMINAL- 3278
6	COMMAND	- Enter subcommand, CLIST or REXX exec	* PF KEYS - 24
7	VTAM	- VTAM dump analysis commands	*****
8	TCPIP	- TCPIP dump analysis commands	
9	DFSMS	- DFSMS IPCS tools (some need DFSMS-NEW ipcs levels)	
T	TUTORIAL	- Learn how to use the IPCS dialog	
X	EXIT	- Terminate using log and list defaults	

Enter END command to terminate IPCS dialog

Interactive Problem Control System

Setting Default Values: Where is my dump?

```
----- IPCS PRIMARY OPTION MENU - z/OS 02.01.00 -----
OPTION   ==>

0  DEFAULTS      - Specify default dump and options          * USERID   - BURK
1  B
2  A ----- IPCS Default Values -----
3  U Command ==>
4  I You may change any of the defaults listed below.  The defaults shown b
5  S any changes are LOCAL.  Change scope to GLOBAL to display global defau
6  C
7  V Scope   ==> LOCAL    (LOCAL, GLOBAL, or BOTH)
8  T
9  D If you change the Source default, IPCS will display the current default
T  T Address Space for the new source and will ignore any data entered in
X  E the Address Space field.

Source ==> DSNAME ('ONTOP.TCPIP.DBUG2014.TCPIP.ABEND4C5.T7620405')
Address Space ==>
Message Routing ==> NOPRINT TERMINAL NOPDS
Message Control ==> CONFIRM VERIFY FLAG(TERMINATING)
Display Content ==> NOMACHINE REMARK REQUEST NOSTORAGE SYMBOL
Press ENTER to update defaults.
```

ABEND Problem: ABEND4C5

Analysis – Symptom

```

          * * * * S Y M P T O M * * * *
----- Primary Symptom String:
OPTION =  RIDS/EZBTIINI#L RIDS/EZBXFPDX PIDS/5655HAL00 AB/S04C5 RIDS/EZBITDRC#R
          VALU/H86684190 REGS/B02B4 PRCS/77620405 VALU CTCP#IP
          0 DEF Symptom Symptom data Explanation
          1 BRO -----
          2 ANA RIDS/EZBTIINI#L EZBTIINI#L Routine identifier
          3 UTI RIDS/EZBXFPDX EZBXFPDX Routine identifier
----- PIDS/5655HAL00 5655HAL00 Component identifier
OPTION == AB/S04C5 04C5 ABEND code - system
          RIDS/EZBITDRC#R EZBITDRC#R Routine identifier
To display VALU/H86684190 86684190 Error related hexadecimal value
          REGS/B02B4 B02B4 Program register
          1 SYMPT PRCS/77620405 77620405 Return code
          2 STAT VALU/CTCP#IP TCP#IP Error related character value
          3 WORKSHEET - System environment worksheet * DATE -
          4 SUMMARY - Address spaces and tasks * JULIAN -
          5 CONTENTION - Resource contention * TIME -
          6 COMPONENT - MVS component data * PREFIX -
          7 TRACES - Trace formatting * TERMINAL-
                                     *****
Enter END command to terminate MVS dump analysis.

```

IP and SNA Codes SC27-3648-00

TCPIP ABENDs: 4C5

TCPIP code decided to issue an ABEND SVC (SVC D) to provide diagnostic information for this specific error

- Register 1 contains ABEND code
- Register 15 contains Reason Code

ABEND Problem: ABEND4C5

IP ERRNO CLIST – Resolve Reason Code

```
----- IPCS PRIMARY OPTION MENU - z/OS 02.01.00 -----  
OPTION   ==> IP ERRNO A 76620405
```

```
0  DEFAULTS      - Specify default dump and options  
1  BROWSE        - Browse dump data set  
2  ANALYSIS      - Analyze dump contents  
3  UTILITY       - Perform utility functions
```

```
*****
```

```
* USERID  - BURK  
* DATE    - 14/02/27  
* JULIAN   - 14.058  
* TIME    - 13:27
```

```
IPCS OUTPUT STREAM -----
```

```
Command ==> IP ERRNO A 76620405
```

```
*****
```

```
Abend Reason Code: 76620405
```

```
Module: EZBTCFAP Reason: TcpSysplexUnresponsive
```

```
Description: XCF Monitor detected TCP Sysplex Unresponsive
```

```
EFIX - BURK
```

```
RMINAL- 3278
```

```
KEYS - 24
```

```
*****
```

```
Levels)
```

```
Enter END command to terminate IPCS dialog
```

IP Configuration Guide: SC27-3650-00

- SYSPLEX MONITOR

ABEND Problem: ABEND4C5

System Trace Table Formatting

```

----- IPCS PRIMARY OPTION MENU - z/OS 02.01.00 -----
OPTION   ==>

0  DEFAULTS      - Specify default dump and options      * USERID   - BURK
1  BROWSE        - Browse dump
2  ANALYSIS     - Analyze dump

----- IPCS Trace Processing -----
OPTION   ==>

To display trace information, enter the corresponding

1  CTRACE        - Component trace
2  GTFTRACE      - Generalized trace facility
3  MTRACE        - Master trace
4  SYSTRACE     - System traces
5  MERGE         - Merge multiple traces

1  SYMPTOMS      - Symptom analysis
2  STATUS        - System status
3  WORKSHEET     - System work sheet
4  SUMMARY       - Add summary
5  CONTENTION    - Resource contention
6  COMPONENT     - MVS component data
7  TRACES       - Trace formatting

* TIME
* PREFIX
* TERMIN
*****

Enter END command to terminate MVS dump analysis.
  
```

ABEND Problem: ABEND4C5

System Trace Table Formatting

```
----- IPCS - SYSTEM TRACE -----
Option ==>
  ALL ASIDs      ==>
  CURRENT ASID   ==> *      (default)
  ERROR ASID     ==> *      (default)
  TCBERROR ASID ==>
  ASID list      ==>
  Jobnames       ==>
  EXCLUDE (BR)   ==>
  EXCLUDE (MODE) ==>
  TIME format    ==> LOCAL (HEX, GMT or LOCAL)
  SORT by CPU    ==> (SHOW      ENTRIES BEFORE AND AFTER TIME
                      - MM/DD/YY, HH:MM:SS:DDDDDD)

  CPU list       ==>
  CPUMASK        ==>
  CPUTYPE        ==>      ZAAP      ZIIP  *      STANDARD

SYSTRACE specification:
SYSTRACE CURRENT ERROR TIME (LOCAL)

S = start SYSTRACE, U = get SYSTRACE performance data report,
R = reset panel fields, END/PF3 = terminate SYSTRACE
```

ABEND Problem: ABEND4C5

System Trace: ABEND 'SVC D'

Command ==> **IP SYSTRACE TI(LO**

```
-----
--
PR ASID W Command ==> IP L 286E4964-20 INSTR LE(x'20')
*****
LIST 286E4964. ASID(X'0069') POSITION(X'-20') LENGTH(X'20') INSTRUCTION
286E4944 | A7F4 0008 | BRC X'F',*+X'10'
286E4948 | A798 0001 | LHI R9,X'1'
286E494C | A7F4 0004 | BRC X'F',*+X'8'
286E4950 | A798 0001 | LHI R9,X'1'
286E4954 | 1299 | LTR R9,R9
286E4956 | A774 0037 | BRC X'7',*+X'6E'
286E495A | 5810 B02C | L R1,X'2C'(:,R11)
286E495E | 58F0 B028 | L R15,X'28'(:,R11)
286E4962 | 0A0D | SVC X'0D' ABEND, type 4, calls IEAVTRT2
00-0069 064BAC00 *SVCE D 00000000 286E4964 77620405 0A1046DD 844C5000 00000000
07040000 80000000 00000004 00000000
00-0069 064BAC00 SSRV 78 810722E2 4000EF50 00000A28 00F95110 Getmain
00010000
00-0069 064BAC00 *RCVY FRR 070C0000 A7CE3718 844C5000 77620405 00000000 00000000
00000002 00000000
```

ABEND Problem: ABEND4C5

System Trace PERFDATA: CPU Utilisation

Command ==> **IP SYSTRACE PERFDATA(DOWHERE)**
PERFDATA Analysis:

CPU#	Went from	To	Seconds	SRB Time	TCB Time	Idle Time	CPU Overhead
00	19:56:59.461918	19:57:07.843369	8.381451	4.793508	3.555153	0.018694	2.987559
02	19:56:59.463434	19:57:07.842614	8.379180	0.002475	0.002344	8.374351	0.000401
01	19:57:00.842044	19:57:07.828764	6.986720	4.914202	1.393535	0.669699	0.014926

SRB t
TCB t
Idle
CPU C

Command ==> **F ASID(**

886

ASID	Jobname	SRB	PSW	# of SRBs	Time	Where Info
-----	-----	-----	-----	-----	-----	-----
0001	*MASTER*	070C0000	81AEC5F0	1	1.404456	ASID (X'0001') 01AEC5F0. IEANUC01.IAXYG+20

					1.491327	
ASID	Jobname	SRB	PSW	# of SRBs	Time	Where Info
-----	-----	-----	-----	-----	-----	-----
0003	RASP	070C0000	8176C1D8	7	8.188089	ASID (X'0003') 0176C1D8. IEANUC01. IAXUO +08

1
1
1

0A44109

ABEND Problem: ABEND4C5

Summary

TCPIP's SYSPLEX Monitor Function detected that 'SYSPLEX' was unresponsive and took an ABEND S4C5
The Root Cause was RSM using too much CPU cycles on an LPAR with little CP horsepower

IPCS Commands used in this problem

- IP STATUS FAILDATA
- IP ERRNO
- IP SYSTRACE TIME(LOCAL)
- IP SYSTRACE PERFDATA(DOWHERE)

0A44109

ABEND Problems – ABEND0A8

Analysis – Symptom

SEARCH ARGUMENT ABSTRACT

```
PIDS/569511701 RIDS/UNKNOWN#L RIDS/ISTAICPT AB/S00A8 PRCS/00007001
REGS/B01A1 RIDS/ISTAPCFR#R
```

Symptom	Description
-----	-----
PIDS/569511701	Program id: 569511701
RIDS/UNKNOWN#L	Load module name: UNKNOWN
RIDS/ISTAICPT	Csect name: ISTAICPT
AB/S00A8	System abend code: 00A8
PRCS/00007001	Abend reason code: 0000 7001
REGS/0CE5E	Register/PSW difference for R0C: E5E
REGS/B01A1	Register/PSW difference for R0B:-01A1
RIDS/ISTAPCFR#R	Recovery routine csect name: ISTAPCFR

To display

1 SYMPT		
2 STATUS	- System environment summary	* USERID -
3 WORKSHEET	- System environment worksheet	* DATE -
4 SUMMARY	- Address spaces and tasks	* JULIAN -
5 CONTENTION	- Resource contention	* TIME -
6 COMPONENT	- MVS component data	* PREFIX -
7 TRACES	- Trace formatting	* TERMINAL-
		* PF KEYS -

Enter END command to terminate MVS dump analysis.

ABEND Problems – ABEND0A8 Analysis – Traces - MTRACE

```

----- IPCS Trace Processing -----
OPTION ==> 3

To display trace information, enter the corresponding option number.

0 DEF
1 BRO
2 ANA
3 UTI

1 CTRACE      - Component trace
2 GTFTRACE    - Generalized trace facility
3 MTRACE     - Master trace
4 SYSTRACE    - System traces
5 MERGE       - Merge multiple traces
T TUTORIAL    - Details on these traces

Enter END command to terminate IPCS trace processing.

1 SYMPTOMS    - Symptoms
2 STATUS      - System environment summary
3 WORKSHEET   - System environment worksheet
4 SUMMARY     - Address spaces and tasks
5 CONTENTION  - Resource contention
6 COMPONENT   - MVS component data
7 TRACES     - Trace formatting

*****
* USERID    -
* DATE      -
* JULIAN    -
* TIME      -
* PREFIX    -
* TERMINAL  -
* PF KEYS   -
*****

Enter END command to terminate MVS dump analysis.

```

ABEND Problems ABEND0A8

MTRACE: System Log Messages

Command: **IP VERBX MTRACE**

*** MASTER TRACE TABLE ***

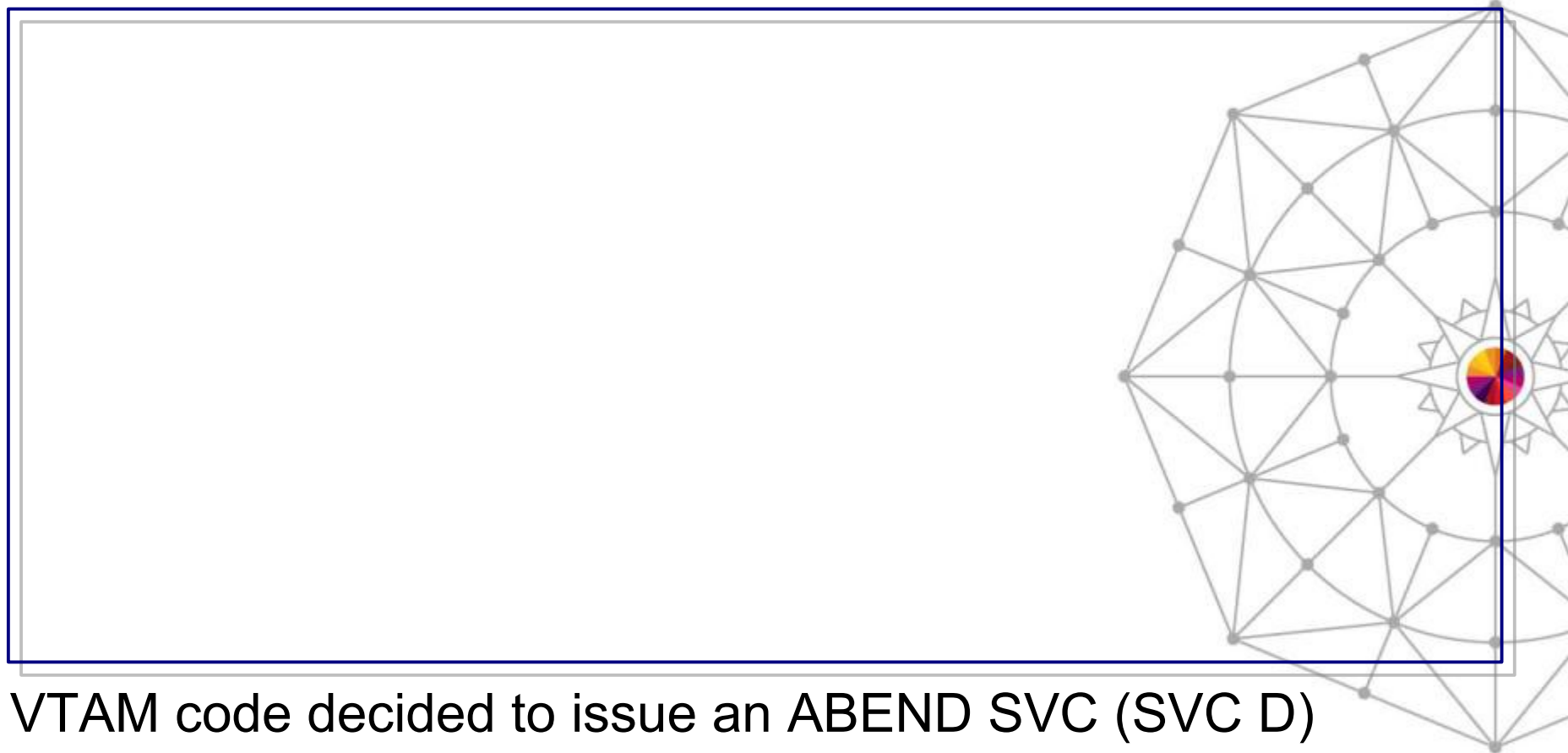
```

TAG  IMM DATA  |-----|
14054 00:45:41.78 ?XCOMM0714E VTAM COMMAND TIMEOUT, ABORTING SESSION WITH SLU=A20XCOM
14054 00:45:41.78 ?XCOMM0093E ERROR ACTIVATING SESSION - SESSION NOT ESTABLISHED
14054 00:45:41.79 ?A20XCOM REQ#=001006 ID=SSP9SISD      XCOMM0093E ERROR ACTIVATING SESSION - SESSION NOT
ESTABLISHED
14054 00:45:41.79 ?A20XCOM REQ#=001006 ID=SSP9SISD      XCOMM0737E SUM TOTAL ERROR RETRY LIMIT EXCEEDED,

14054 00:45:41.82 ?XCOMM0151I A20XCOM  SESSION ENDED      CID=9C000033
14054 00:45:41.83 ?XCOMM0162E NSEXIT NOTIFY ENTERED FOR PLU=A88XCOM  SLU=A20XCOM  SESSION SETUP,
NSE 0801 0000
14054 00:49:00.04 STC00216 00000084 ?CSQW123I %QJ20 CSQVSMF - TRACE RECORDING HAS BEEN RESUMED ON SMF
14054 00:49:09.01 STC00168 00000080  IST931I SYMPTOM STRING = AB/S00A8 LVLS/61D RIDS/ISTAPCFR#R 123
123 00000080  IST931I SYMPTOM STRING = PIDS/5695-11701 ADRS/000000E80 RIDS/UNKNOWN
123 00000080  IST931I SYMPTOM STRING = #L RIDS/ISTAICPT LVLS/11.045 PTFS/HVT61D0
123 00000080  IST931I SYMPTOM STRING = REGS/0CE5E PRCS/00007001 ASID/0070
123 00000080 ?IST314I END
14054 00:49:08.99 INTERNAL 00000084 ?IST413I VTAM DUMPING FOR JOB XCOM      STEP XCOM
14054 00:49:09.00      00000084 ?IEA045I AN SVC DUMP HAS STARTED AT TIME=00.49.08 DATE=02/23/2014
122 00000084  FOR ASIDS(0070,0046)
122 00000084  ERROR ID = SEQ04649 CPU80 ASID0070 TIME00.49.08.9
122 00000084  QUIESCE = NO
```

IP and SNA Codes SC27-3648-00

VTAM ABENDs: 0A7-0AD



VTAM code decided to issue an ABEND SVC (SVC D) to provide diagnostic information for this specific error

- Register 15 contains Reason Code

ABEND Problems – ABEND0A8

VTAMMAP Analysis Menu

```

----- IPCS PRIMARY OPTION MENU - z/OS 02.01.00 -----
OPTION ==>
0  DEF Command ==>
1  BROV (C) Copyright IBM Corporation 1993,2006. All rights reserved.
2  ANA Select one of the following. Then press Enter.
3  UTII
4  INVE — 1.  APPC . . - APPLCONV, PARTNRLU, APPLMODE, APPMODAL
5  SUBM 2.  APPN . . - APPNBASE, FNDADJCP, FNDANDCB, FNDCOS, FNDDECB, etc
6  COMM 3.  General. - HOST, VTAM, VTBASIC, VTFNDMOD, VTMODS, VITAL, VTVIT
7  VTAM 4.  Queues . - PABSCAN, VTCVTPAB, VTREADYQ
8  TCP 5.  Resource - RDTCHECK, RDTFULL, RDTHIER, RDTSUM, VTNODE
9  DFSM 6.  Session. - ATMDATA, FINDDSIB, FINDSIB, MNPS, SES, SIBCHECK
T  TUTO 7.  Search . - SRTFIND
X  EXIT 8.  Storage. - SPANC, STORAGE, VTBUF, VTRPH
9.  CSM. . . - CSMALL, CSMBUF, CSMCMPID, CSMOWNER, CSMPOOL
10. Waits. . - VTWRE
11. ERs/VRs. - ROUTES, VTVRBLK
12. CLISTs . - ISTVABND, ISTVDUMP, ISTVMAP, ISTVSAVE, ISTVSLIP
13. APPN2. . - TRSTRACE
Enter END

```

ABEND Problems – ABEND0A8

ISTVABND – ISTAICPT 0A8 - 7001

Command ==> **IP ISTVABND**

CLIST ISTVABND STARTED AT 20:57:46.

(ISTVABND) SYMBOL SDWA WAS FOUND TO BE ALREADY EQUATED.

THE SDWA AT ADDRESS 00FBB7F8 WILL BE USED.

SYSTEM COMPLETION CODE = 0A8

PROGRAM INTERRUPT CODE = 000D INSTRUCTION LENGTH CODE = 0002

PSW AT TIME OF ABEND: 070C1000 9DEF1F98

THE FAILING INSTRUCTION IS: **0A0D**

Module name: ISTAICPT

Compile date: 11.045

PTF Number: HVT61D0

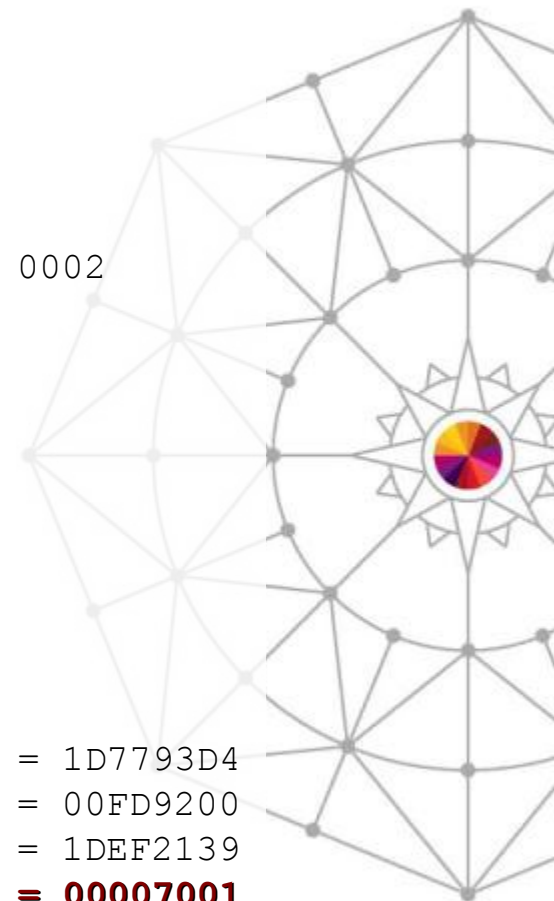
Address entered: 1DEF1F98

Module entry point: 1DEF1118

Displacement into module: E80

REGISTERS AT TIME OF ABEND:

REG0 = 84000000	REG1 = 84 0A8 000	REG2 = 00000060	REG3 = 1D7793D4
REG4 = 00000000	REG5 = 1D779484	REG6 = 1AE89EB8	REG7 = 00FD9200
REG8 = 1F30A1E8	REG9 = 1F30A1E8	REGA = 00000000	REGB = 1DEF2139
REGC = 9DEF113A	REGD = 1D7793F0	REGE = 1D715F00	REGF = 00007001



ABEND Problems – ABEND0A8 VTBASIC – VTAM Internal Trace

Command: IP VERBX VTAMMAP 'VTBASIC'

UP ASID 70 TYPE 17 EXTDS 40 CODES 000000 RPL **1F30A1E8** ECB 1F309038 AREA 1F30A258
RLEN 00000024 CID **FE000030** FBK2 00000000

ABND CODE 84**0A8**000 PST 1BE7BED0 RPH 1D779010
SDWA **00FBB7F8** FLGS 04130001 PSW 070C1000 9DEF1F98
MSG AISD 70 SAVE 1DF755F0 **MSGID 931I** ISSR 9DEF7EAC MODID RACKW DEST TYPE U
MSG2 TEXT **AB/S00A8** LVLS/61D RIDS/ISTAP
MSG2 TEXT CFR#R PIDS/5695-.....
MSG AISD 70 SAVE 1DF755F0 **MSGID 931I** ISSR 9DEF7EAC MODID RACKW DEST TYPE U
MSG2 TEXT #L RIDS/**ISTAICPT** LVLS/11.045
MSG2 TEXT PTFS/HVT61D0 RE.....
MSG AISD 70 SAVE 1DF755F0 **MSGID 931I** ISSR 9DEF7EAC MODID RACKW DEST TYPE U
MSG2 TEXT

RPL pointed to by REG8,REG9

1F30A1E8		00000000	00000000			W	DEST	TYPE	U	
1F30A1F0	00000000	00000000	00001004	00800000			R	DEST	TYPE	U
1F30A200	000282AC	00000000	1F30A258	FE000030		..b.....s....				
1F30A210	29800000	00000000	00000024	00000100						
1F30A220	90308050	00000000	80800000	40 FF 0000		...&.....				
1F30A230	00000000	1F3096AC	00000100	00000088		o.....h				
1F30A240	00000000	00000000	00208018	00000000						
1F30A250	00000000	00000000								

ABEND Problems – ABEND0A8

VTVIT – VTAM Internal Trace in HVCOMMON

Command: VTVIT SCAN(X'1F30A1E8') LIST(N)

VTAM internal trace options active at the time of this dump

API PIU MSG SSCP CIO NRM

Pages in VTAM internal trace table (Decimal) = 1024

VIT - Start of VTAM internal trace table: 000001EF_81200000

VITC - Current VTAM internal trace table entry: 000001EF_81557CA0

VITO - Oldest VTAM internal trace table entry: 000001EF_81557CC0

VITE - End of VTAM internal trace table: 000001EF_81600000

VITENTRY: 000001EF_813B1F80

+0000 C9D6F1**1F** 70400029 1F30A1E8 **9C000033** 00000480 10800000 10309450 80038010 | IO1.

VITENTRY: 000001EF_813B2940

+0000 E4D7**1F**40 70000000 1F30A1E8 1F309038 00000000 00000000 **9C000033** 00000000 | UP.

VITENTRY: 000001EF_813B4240

+0000 E4D7**17**44 70100100 1F30A1E8 1F309038 1F30A258 00000024 **9C000033** 80000000 | UP..

VITENTRY: 000001EF_81557640

+0000 E4D7**17**40 70000000 1F30A1E8 1F309038 1F30A258 00000024 **FE000030** 00000000 | UP.

The VTAM application is using the same RPL to terminate a different session (CLSDST 1F) before the OPNDST (17) is posted by VTAM

ABEND Problem: ABEND0A8 7001

Summary

VTAM's API code tried to post an OPENDST RPL but the RPL's ECB pointer was not (no longer) valid.

The VIT shows the application is closing a session just before the ABEND using the same RPL

IPCS Commands used in this problem diagnosis

- IP VERBX MTRACE
- IP ISTVABND
- IP VERBX VTAMMAP 'VTBASIC'
- IP VERBX VTAMMAP 'VTVIT SCAN(X'1F30A1E8')



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Session 15191

<https://ibm.biz/BdR29P>

