

# **First Capture Analysis – skills for CICS Level 2 Support**

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# AGENDA

- Introduction
- Problem determination and lookup - site information
- Basic CICS Commands
- CICS Domains
- Debugging techniques
  - Abends
  - Hangs
  - Loop
  - Waits
- CICS Level 2 process

# Problem determination and lookup - site information

- CICS TS for VSE/ESA MustGathers
- <http://www.ibm.com/support/docview.wss?uid=swg21328819>
- CICS\_Transaction\_Server. To get to the MustGathers from the Support Portal you click on the "Troubleshooting" in the the right nav and then either "MustGather: Read first" or "Collect Troubleshooting data" in the Featured Troubleshooting links portlet.

## **MustGather: Read first when collecting troubleshooting data for CICS products**

MustGather documents aid in problem determination and save time resolving problem management records (PMRs). These documents contain a list of the documentation you should gather so CICS Support can diagnose your specific problem. These documents also include diagnostic tips that will aid in diagnosing and solving problems.

## Cause

- Collecting MustGather data early, even before opening a PMR, helps IBM<sup>®</sup> Support quickly determine if: Symptoms match known problems (rediscovery).
- There is a non-defect problem that can be identified and resolved.
- There is a defect that identifies a workaround to reduce severity.
- Locating root cause can speed development of a code fix.

## **Resolving the problem**

1. Gather the following general information for every problem record: A complete description of the problem, including the following:

1. When did the problem first occur?
2. Is the problem a one time failure or reoccurring?
3. Was software or hardware maintenance applied?
4. Did the failure occur while doing a specific task?
5. Is the failure occurring in more than one address space?

2. CICS product version, release, and maintenance level

3. Operating system version, release, and maintenance level

4. Related products version, and release levels

5. A valid contact phone number and email address



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Click on the problem type or component that best describes your CICS problem. This will provide you with a listing of the documentation that the support team requires to diagnose your problem. It might also include diagnostic hints and tips that will aid in diagnosing and solving problems.

[File control wait](#)

[Multiregion operation \(MRO\)](#)

[Program check or abend](#)

[Short on storage](#)

[Storage violation](#)

[Terminal hang](#)

[Wait or loop](#)

## Required doc:

CICS message log and the VSE system log.

[CICS Internal Trace](#) that is included in the VSE system dump when tracing is active. The trace should be at least 4096K and when possible level 1 tracing should be on for all CICS components and level 1-2 for the FC component.

A [VSE system dump](#) of the CICS region taken as soon as you notice the wait. Use the following VSE commands to capture the dump (where ***Fa*** is the CICS partition that you want to dump and ***cuu*** is the tape address where the dump will go):

**SUSPEND *Fa*** - temporarily take the partition out of the dispatch queue to prevent inconsistencies in the dump

[DUMP \*Fa,0-7FFFFFFF,cuu\*](#) - include the partition, SUP, and SVA in a single dump

**RESUME *Fa*** - put the partition back on the dispatch queue

(note that SUSPEND *Fa* and RESUME *Fa* are undocumented AR commands)

**Optional doc:** If feasible, save off the dataset by using [IDCAMS ALTER NEWNAME](#) to rename the dataset and save it in place. If this is not feasible, run [IDCAMS PRINT with SKIP](#) against the dataset and any alternate indexes associated with the dataset before continuing to see if the file is okay.

If you are able to recreate the problem, consider using [CICS Auxiliary Trace](#) in combination with the VSE system dump. The dump is unlikely to tell you anything about system activity in the period leading up to the wait or loop. This is because the trace table will probably wrap before you have had a chance to respond.

See [Exchanging information with IBM Technical Support](#) for FTP and e-mail instructions using the IBM Enhanced Customer Data Repository (ECuRep).

Go to [ServiceLink or IBMLink](#) to open an Electronic Technical Response (ETR). If you need instructions, see [open new PMRs or convert existing PMRs to electronic PMRs](#) using IBMLink ETR.

If you need to speak to an IBM technical support representative call your country representative. If you need to speak to an IBM technical support representative in the US call 1-800-IBM-SERV.

Always update the PMR to indicate that data has been sent.

Diagnostic tips: Review the logs and dumps generated at the point of failure. Use DFHPD410 dump formatter to format domains KE=3, TR=3, DS=1, and LM=3.

Search the [CICS support site](#) for known problems using symptoms like the message number and error codes.

If you find a fixing PTF, see [Ordering CICS products and maintenance](#) for the options that are available to order CICS maintenance.

If the save area addresses are not in application code, gather the documentation and work with the CICS Level2 support team to resolve your problem.

# Problem determination and lookup - site information

Support Portal - The new URL is

[http://www.ibm.com/support/entry/portal/Overview/Software/Other\\_Software/](http://www.ibm.com/support/entry/portal/Overview/Software/Other_Software/)

# CICS Fix Lists – Known Problems

Fix lists for CICS/VSE V2.3 and CICS TS for VSE/ESA were created.

Here's the link to the Fixes by version document that links to all the CICS Fix lists:

<http://www.ibm.com/support/docview.wss?uid=swg27008833>.

# SENDING DOCUMENTATION to the Support Center

The biggest headache and problem which has plagued the CICS Level 2 support center from DAY 1 of CICS/TS for VSE has been the inability to get documentation from our customers.

The Rules that need to be followed exactly are as follows:

1. AR, STANDALONE or SVCDUMP DUMPS and AUXTRACES MUST BE FTPd IN RAW STATE and BINARY Mode. This is mandated by our Level 3 support in Hursley.

We have the capability of running Infoana on our machines.

2. Transaction dumps, Listqueue output must be FTPd in ASCII Mode.

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# SENDING DOCUMENTATION to the Support Center

Please send your CICS/VSE documentation using FTP via the internet.

1. Connect to our FTP site: ftp.emea.ibm.com (or 192.109.81.7)  
USER: anonymous      PASSWORD: your complete e-mail address
2. Specify **BIN**ary transfer mode for unformatted hex data (dumps,trace)  
(NOTE: Formatted data should be transferred in ASCII mode)
- 3 Place the dataset in the /toibm/vse directory with put command

Ensure the dataset name conforms to the following naming convention:  
PPPPP.BBB.CCC.DDD.DDD where: PPPPP =PMR #, BBB =Branch #,  
CCC =Country Code (USA=000), DDD.DDD =Short Descriptive Name

- 4 When transfer is complete, update the PMR to inform level 2 the doc  
has been transferred and include the name(s) of all files sent.

EXAMPLE YOUR FTP FILE WOULD BE NAMED:

55143.000.858.DUMP.untrs

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# Basic CICS Commands and Tools

Next we will go over a lot of the basic CICS commands and tools, and their uses in problem determination and debugging. Simple things such as starting, stopping AUX trace using the CETR transaction, or CEMT I AUX, switching AUX trace files (before you start the AUX so they are clean), printing AUX files, CEMT I DUMPDS, switching Dump datasets so they are clean.

CEMT S debugging commands, CEMT I INTTRACE, CEMT S SYD (xxxxxx) ADD SYS MAX(1), CEMT S TRD (xxxx) ADD SYS MAX(1), CSFE DEBUG,CHKSTSK=CURRENT.

Suggested sizes for AUXTRACE (A & B), Dump datasets (A & B), SYSDUMP datasets.

CEMT P SNAP/DUMP (their usage and repercussions). Usage of the VSE DEBUG command in conjunction with other tools and basic discussion on SDAIDS trace – setup requirements (from a VSE perspective) finding the location of a program in storage and setting up a Storage Alteration trace, STARTSD / STOPSD, command.

# CICS AUX TRACE

## How to turn on Aux trace in CICS

The CICS INTERNAL trace stays on always. But it doesn't get externalized, so the trace data may not be available when you need it. When trace data is needed, you can turn on Aux Trace by changing the Auxiliary Trace Status to "Stopped" to "Started" using CETR transaction. The Aux Trace data set has initial value of A which is defined as DFHAUXT in the CICS started task. When A gets filled, it automatically switches to B which is defined as DFHBUXT in the started task. When B gets filled the status changes to STOPPED. You can do a STANDARD trace or a SPECIAL trace (with only the components that you want to trace - Standard usually captures lot more data than required). To set up values for special tracing, press PF4 and set the values under "special" as needed. The component abbreviations are defined in the help screen (press PF1). Once you make the required changes in this screen, press PF5 to define the transaction for which you want Aux trace turned on.

# CICS AUX TRACE

CETR CICS Trace Control Facility

CICS PARTITION

Type in your choices.

Item		Choice	Possible choices
Internal Trace Status	====>	STARTED	STARTed, STOpped
Internal Trace Table Size	====>	400 K	16K - 1048576K
Auxiliary Trace Status	====>	STOPPED	STARTed, STOpped, Paused
Auxiliary Trace Dataset	====>	A	A, B
Auxiliary Switch Status	====>	NO	NO, NExt, All
GTF Trace Status	====>	STOPPED	STARTed, STOpped
Master System Trace Flag	====>	OFF	ON, OFF
Master User Trace Flag	====>	OFF	ON, OFF

When finished, press ENTER.

PF1=Help 3=Quit 4=Components 5=Ter/Trn 6=JVM 9=Error List

# CICS AUX TRACE

From the main CETR screen, press PF4 to get to the Component Trace Options screen where you can set the options for Standard and/or Special trace options.

Over-type where required and press ENTER.

Component Standard

Special

Component Standard		Special
AP	1	1
BF	1	1
BM	1	1
BR	1	1
CP	1	1
DC	1	1
DD	1	1
DH	1	1
DI	1	1
DM	1	1
DS	1	1
DU	1	1
EI	1	1
FC	1	1
GC	1	1
IC	1	1
IE	1	1

# CICS AUX TRACE

From the main CETR screen, press PF1 to get to this Trace Help screen where you can see the meanings of component abbreviations.

## (3) MEANINGS OF COMPONENT ABBREVIATIONS.

AP . . . Application domain	JC . . . Journal control
BF . . . Built-in function	KC . . . Task control
BM . . . Basic Mapping Support	KE . . . Kernel
BR . . . Bridge	LC . . . Local Catalog domain
CP . . . CPI-C interface	LD . . . Loader domain
DC . . . Dump compatibility layer	LM . . . Lock manager
DD . . . Directory manager	ME . . . Message domain
DH . . . Document Handler domain	MN . . . Monitoring domain
DI . . . Batch data interchange	PA . . . Parameter manager domain
DM . . . Domain manager domain	PC . . . Program control
DS . . . Dispatcher domain	PG . . . Program manager
DU . . . Dump domain	RC . . . Report Controller
EI . . . Exec interface	SC . . . Storage control
FC . . . File control	SM . . . Storage Manager domain
GC . . . Global Catalog domain	SO . . . Sockets domain
IC . . . Interval control	SP . . . Sync point
IE . . . ECI over TCP/IP domain	ST . . . Statistics domain
IS . . . ISC	
SZ . . . Front End Prog Interface	

I AUX

STATUS: RESULTS - OVERTYPE TO MODIFY

Aux Cur(A) Sto

SYSID=CIC1 APPLID=DBDCCICS

TIME: 07.54.46 DATE: 04.14.11

RESPONSE: NORMAL

PF 1 HELP 3 END

7 SBH 8 SFH 9 MSG 10 SB 11 SF

S AUX SWITCH

STATUS: RESULTS - OVERTYPE TO MODIFY

Aux Cur(B) Sto

NORMAL

SYSID=CIC1 APPLID=DBDCCICS

TIME: 08.00.54 DATE: 04.14.11

RESPONSE: NORMAL

PF 1 HELP 3 END

7 SBH 8 SFH 9 MSG 10 SB 11 SF

# Printing AuxTraces

Now that our customers have created the Auxiliary traces we need to format the output. This so that our customer wants to go through the trace, or wants to send CICS LEVEL 2 Support the output.

The job to format the output follows on the next page. The most important piece is name of the Auxtrace dataset, which we selected earlier in the presentation.

# CEMT I DUMPDS

Transaction dumps are written to either [DFHDMPPA or DFHDMPPB](#). Enter [CEMT I DUMPDS](#) to display information about the dump datasets.

Transaction dumps are typically the result of a transaction abend but can also be a result of a user request (EXEC CICS DUMP TRANSACTION or XPI call).

[Format the transaction dump](#) using the CICS dump utility program, DFHDUxxx.

I DUMPDS

STATUS: RESULTS - OVERTYPE TO MODIFY

Dum Cur(B) Ope Aut

SYSID=CIC1 APPLID=DBDCCICS

TIME: 08.05.37 DATE: 04.14.11

RESPONSE: NORMAL

PF 1 HELP 3 END

7 SBH 8 SFH 9 MSG 10 SB 11 SF

# CEMT SET SYDUMPCODE

SET SYDUMPCODE allows you to define the entries that you require in the system dump table. You control system dumps by creating an entry in the system dump table for each dump code that requires a change from the default action.

A system dump code is the CICS message number with the DFH prefix removed. Typically this leaves a 6-character code comprising 2 alphabetic characters and 4 numeric characters, for example AP0001.

I SYD

STATUS: RESULTS - OVERTYPE TO MODIFY

Syd(AP0001 ) Sys Max( 001 ) Cur(0000)

SYSID=CIC1 APPLID=DBDCCICS

TIME: 11.36.35 DATE: 04.16.11

RESPONSE: NORMAL  
PF 1 HELP 3 END

7 SBH 8 SFH 9 MSG 10 SB 11 SF

# CEMT SET TRDUMPCODE

Change the status of a transaction dump.

Using the SET function, you can change entries in the transaction dump table to request a transaction dump. You can also set the maximum number of dumps that can be taken.

I TRD

STATUS: RESULTS - OVERTYPE TO MODIFY

Trd(AKCS)           Max( 001 ) Cur(0000)

Trd(AZCT)           Max( 001 ) Cur(0000)

SYSID=CIC1 APPLID=DBDCCICS

TIME: 12.05.18 DATE: 04.16.11

RESPONSE: NORMAL

PF 1 HELP    3 END

7 SBH 8 SFH 9 MSG 10 SB 11 SF

# CEMT INQUIRE INTTRACE

Show the status of CICS internal tracing. If the CICS internal trace is not active, we only see \*EXC exception trace entries and cannot see the error flow.

INQUIRE INTTRACE tells you whether CICS internal tracing is in progress.

This command is intended for use at terminals that do not support the full-screen tracing transaction CETR.

I INTRACE

STATUS: RESULTS - OVERTYPE TO MODIFY

Int Sta

SYSID=CIC1 APPLID=DBDCCICS

TIME: 12.14.21 DATE: 04.16.11

RESPONSE: NORMAL

PF 1 HELP 3 END

7 SBH 8 SFH 9 MSG 10 SB 11 SF

# CICS STORAGE CHECKER TRAP

Many times after our customer's receive a DFHSM0102 storage violation because the Beginning or Trailing SAA (Storage Accounting Area) has been overlaid. A lot of the time the overlaying data cannot be recognized by the application group and it is necessary to trap the failure to try to narrow down the failure to a specific program.

This is handled by activating the storage violation checker trap:

```
CSFE DEBUG,CHKSTSK=CURRENT
```

When the trap springs, a DFHSM0103 dump is taken and the trap is then disabled. You will receive the DFHSM0102 failure again. However send the dump to CICS Level 2 support for analysis.

# Suggested System Dataset Sizes

Here is the suggested sizes for System datasets. This is only a suggestion and will vary depending on our customer and their configuration:

AUXTRACE (A & B) - 5 Cylinders each dataset

Dump datasets (A & B) - 10 Cylinders each dataset

SYSDUMP datasets - 1200 Cylinders each dataset (However if it is not possible, at least 300 Cylinders has been the standard recommendation)

# CEMT PERFORM DUMP/SNAP (their usage and repercussions)

The big concern over taking a dump has been the time it takes to format the dump.

There are no definitive figures as it all is dependent on the dump command being used, and the partition or z/VSE being dumped, and how much activity etc.

I have discussed this with other support and customers to get their ideas and have come up with the following:

CEMT P SNAP/DUMP - 30 seconds

AR DUMP - 3 minutes

STANDALONE DUMP w/SUSPEND 3-5 minutes depending on tape drive  
(0-7FFFFFFFF) RESUME or 30 seconds

The bottom line is the dump is our main resource for debugging problems on CICS partitions. We don't ask for it unless we do need to see it.

# Automated Stand Alone Dump

I have been given a tool which will utilize the undocumented VSE commands STACK, STACKP, SUSPEND and RESUME. These commands will give our customers the capability of automating the dump process making it easier to use something the DEBUG command, or get a dump early on in the IPL process.

```
STACK DUMPCICS|SUSPEND &0|DUMP &0,0-7FFFFFFF,&1|RESUME &0
```

or to survive an IPL (CKD only):

```
STACKP DUMPCICS|SUSPEND &0|DUMP &0,0-7FFFFFFF,&1|RESUME &0
```

```
DUMPCICS F2,380 (DUMPCICS program follows)
```

# DUMPCICS Program Part 1

---

```
DUMPCICS START X'78'  
DUMPCICS AMODE 31  
DUMPCICS RMODE 24  
    LR  R12,R15  
    USING DUMPCICS,R12  
REPEAT DS 0H  
    SR  R0,R0  
    LA  R1,SVC30PL1  
    SVC 30          ISSUE AR COMMAND  
    LTR R15,R15     OK?  
    BZ  DONE        YES, WE CAN STOP NOW  
    CHI R15,4       BUSY?  
    BNE FAILED      NO, WTO AND DUMP  
    SETIME 1,ECB1   YES, WAIT BRIEFLY  
    WAIT ECB1
```

# DUMPCICS Program Part 2

```

AP  COUNT,=P'1'      ADD TO RETRY COUNT
CP  COUNT,=P'10'     TRY AGAIN?
BL  REPEAT           YES
FAILED DS  0H
LR  R2,R15
WTO  'ERROR PROCESSING THE STACK COMMAND'
JDUMP
*
DONE  EOJ
*
ECB1  DC  F'0'
COUNT DC  PL2'0'
SVC30PL1 DC  AL2(L'SVC30CM1)
        DC  AL4(SVC30CM1)
SVC30CM1 DC  C'STACK DUMPCICS|SUSPEND &&0|DUMP &&0,
        0-7FFFFFFFF, &&1|RES*
        UME &&0'
```

# DUMPCICS Program Part 3

```
R0    EQU 0
R1    EQU 1
R2    EQU 2
R3    EQU 3
R4    EQU 4
R5    EQU 5
R6    EQU 6
R7    EQU 7
R8    EQU 8
R9    EQU 9
R10   EQU 10
R11   EQU 11
R12   EQU 12
R13   EQU 13
R14   EQU 14
R15   EQU 15
      END
```

# Using the *LOCATE Command*

The LOCATE command scans the virtual storage for the next occurrence of either a character-string or a hexadecimal-character string in which parts of the string may be unknown. The total string is limited to 16 characters or 32 hexadecimal digits.

The syntax of the LOCATE command is as follows:

**LOCATE [id,][']string [[FROM=start][,TO=end][,RUN]]**

And example of the LOCATE command is as follows to find the different locations of the CICS DFHSIP module (this points to the beginning of the CICS partition:

**LOCATE F2,'DFHSIP**

The single, special character that must be used to indicate that the following string is a character string. If the ' is missing, the string is assumed to be hexadecimal digits.

# Use of the DEBUG Command

DEBUG consists of a set of tracing "hooks" placed at various points within the z/VSE system (but mainly within the supervisor), which are activated using a z/VSE operator command. Once it has been activated, DEBUG will:

1. Create trace entries.
2. Save these trace entries in 31-bit fixed SVA storage, in wrap-around mode.

The command DEBUG ON activates a standard set of traces. The trace types which are defined by default, monitor the:

1. Dispatcher program
2. First level interrupts
3. I/O activity

If you do not explicitly specify the size of the buffer, the system allocates three buffers where each has a size of 16KB.

# SDAID Trace

Use the [SDAID trace](#) to isolate a problem in a system or in an application program by tracing specific events in your system. SDAID traces user and system programs.

SDAID trace offers you several different types of traces and a choice of output to be recorded for each event.

More than one trace can be run concurrently, each with a different set of output and options.

SDAIDS trace runs in the shared V=R area at the end of the supervisor for mode=370 or ESA. This area can be increased with the SDSIZE parameter of the [SYS command](#) at IPL.

# SDAID Storage Alter Trace Job

```
* $$ JOB JNM=SDAIDS2,CLASS=0,DISP=D,PRI=3,LDEST=*  
// JOB SDAIDS    SDAID STORAGE ALTER TRACE  
// EXEC SDAID  
  OUTDEV T=188  
  TRACE ST AR=F2 ADD=500000:50138E OUTPUT=GREG  
/*  
// PAUSE .. ENTER 0 TO PRINT OUT THE TRACE  
/*  
/&  
* $$ EOJ  
***** END OF FILE *****
```

# OPERATING SDAIDS TRACE PART 1

```
BG 0001 1Q47I  BG SDAIDS2 00925 FROM (CRJS) , TIME=18:50:03
BG 0000 // JOB SDAIDS   SDAID STORAGE ALTER TRACE
    DATE 04/18/2011, CLOCK 18/50/03
BG 0000 4C40I SDAID
BG 0000 4C05I PROCESSING OF SDAID  COMMAND SUCCESSFUL
BG 0000 4C40I OUTDEV T=188
BG 0000 4C05I PROCESSING OF OUTDEV  COMMAND SUCCESSFUL
BG 0000 4C40I TRACE ST AR=F2 ADD=500000:50138E OUTPUT=GREG
BG 0000 4C05I PROCESSING OF TRACE  COMMAND SUCCESSFUL
BG 0000 4C40I READY
BG 0000 4C05I PROCESSING OF READY  COMMAND SUCCESSFUL
BG 0000 4C44I ENTER 'STARTSD' ATTENTION COMMAND TO ACTIVATE
SDAID
BG-0000 // PAUSE .. ENTER 0 TO PRINT OUT THE TRACE
startsd                <<<<<< ACTIVATE SDAID
```

# OPERATING SDAIDS TRACE PART 2

AR 0015 4C36I SDAID SETS OFF THE PSEUDO PAGE FAULT PORTION  
AR 0015 4C05I PROCESSING OF STARTSD COMMAND SUCCESSFUL  
AR 0015 1I40I READY

msg f2

AR 0015 1I40I READY

F2-0106

106 CEMT I TA

F2-0106

F2 0109

Tas(0000023) Tra(CXPB) Sus Tas Pri( 001 )  
Sta(S ) Use(DBDCCICS) Rec(X'C7A45C71401B98DE') Hty(OPEN\_ANY)  
Tas(0000025) Tra(ICVS) Sus Tas Pri( 001 )  
Sta(S ) Use(CICSUSER) Rec(X'C7A45C71401E8D1E') Hty(USERWAIT)  
Tas(0000026) Tra(IESO) Sus Tas Pri( 020 )  
Sta(S ) Use(CICSUSER) Rec(X'C7A45C714010E25E') Hty(EKCWAIT )  
Tas(0000042) Tra(I\$\$Q) Sus Tas Pri( 001 )  
Sta(S ) Use(CRJS ) Rec(X'C7A45D569E9E885C') Hty(EKCWAIT )  
Tas(0000098) Tra(CEMT) Fac(CNSL) Run Ter Pri( 255 )

# OPERATING SDAIDS TRACE PART 3

F2 0109

Tas(0000023) Tra(CXPB) Sus Tas Pri( 001 )  
Sta(S ) Use(DBDCCICS) Rec(X'C7A45C71401B98DE') Hty(OPEN\_ANY)  
Tas(0000025) Tra(ICVS) Sus Tas Pri( 001 )  
Sta(S ) Use(CICSUSER) Rec(X'C7A45C71401E8D1E') Hty(USERWAIT)  
Tas(0000026) Tra(IESO) Sus Tas Pri( 020 )  
Sta(S ) Use(CICSUSER) Rec(X'C7A45C714010E25E') Hty(EKCWAIT )  
Tas(0000042) Tra(I\$\$Q) Sus Tas Pri( 001 )  
Sta(S ) Use(CRJS ) Rec(X'C7A45D569E9E885C') Hty(EKCWAIT )  
Tas(0000098) Tra(CEMT) Fac(CNSL) Run Ter Pri( 255 )

F2 0109 Sta(TO) Use(CNSL ) Rec(X'C7A4627C74357FDE')

# OPERATING SDAIDS TRACE PART 4

RESPONSE: NORMAL TIME: 18.50.54 DATE: 04.18.11

SYSID=CIC1 APPLID=DBDCCICS

**stopsd**

**<<<<<<<<< END SDAIDS**

AR 0015 4C37I SDAID SETS ON THE PSEUDO PAGE FAULT  
PORTION

AR 0015 4C05I PROCESSING OF STOPSD COMMAND  
SUCCESSFUL

AR 0015 1I40I READY

0

BG 0000 EOJ SDAIDS MAX.RETURN CODE=0000

DATE 04/18/2011, CLOCK 18/51/08, DURATION 00/01/05

# CICS DOMAINS

CICS/TS for VSE/ESA we know was ported over from CICS/ESA for MVS R410.

These CICS system is made up of a domain structure which separates various functions into their own piece of the CICS code.

The next pages are going to show the most common domains CICS LEVEL 2 Support uses to debug problems.

AP . . . Application domain  
BF . . . Built-in function  
BM . . . Basic Mapping Support  
BR . . . Bridge  
CP . . . CPI-C interface  
DC . . . Dump compatibility layer  
DD . . . Directory manager  
DH . . . Document Handler domain  
DI . . . Batch data interchange  
DM . . . Domain manager domain  
DS . . . Dispatcher domain  
DU . . . Dump domain  
EI . . . Exec interface  
FC . . . File control  
GC . . . Global Catalog domain  
IC . . . Interval control  
IE . . . ECI over TCP/IP domain  
IS . . . ISC  
SZ . . . Front End Prog Interface

JC . . . Journal control  
KC . . . Task control  
KE . . . Kernel  
LC . . . Local Catalog domain  
LD . . . Loader domain  
LM . . . Lock manager  
ME . . . Message domain  
MN . . . Monitoring domain  
PA . . . Parameter manager domain  
PC . . . Program control  
PG . . . Program manager  
RC . . . Report Controller  
SC . . . Storage control  
SM . . . Storage Manager domain  
SO . . . Sockets domain  
SP . . . Sync point  
ST . . . Statistics domain

# CICS Domains PART 1

## **Application Domain (AP)**

Application programs run in the application domain. The CICS management programs within the AP domain are not restructured, but nevertheless, communication between the AP domain and the other domains is also through the new domain interface.

## **Dispatcher Domain (DS)**

The dispatcher domain controls attaching, running, and detaching tasks, and controls the scheduling of VSE tasks.

# CICS Domains PART 2

## **Kernel Domain (KE)**

The kernel domain is the main CICS control structure. The kernel tracks the existence of domains, and is involved in every call from one domain to another, thereby providing a consistent linkage and recovery environment for CICS.

Serious system errors can result in the termination of the kernel domain with a system dump containing diagnostic and problem determination information.

## **Loader Domain (LD)**

The loader domain is used by the other domains to gain access to storage-resident copies of nucleus and application programs, maps, and tables.

# CICS Domains PART 3

## **Lock Manager Domain (LM)**

The lock manager domain provides both locking and associated queueing facilities for CICS resources. Each resource is associated with a unique lock name that is used to access locking facilities.

## **Program Manager Domain (PG)**

The program manager domain provides support for the following areas of CICS:

- Program control functions such as EXEC CICS LINK, XCTL, LOAD, RELEASE and RETURN.
- Transaction abend and condition handling functions such as EXEC CICS ABEND, HANDLE ABEND, HANDLE CONDITION, and HANDLE AID.
- Related functions such as invoking user-replaceable programs, global user exits, and task-related user exits.
- Autoinstall for programs, map sets, and partition sets.

# CICS Domains PART 4

## **Security Manager Domain (XS)**

The security function (previously provided by the security identification program DFHACEE) controls:

- Multiple sign-ons by the same user
- Security messages
- Warnings when a password is about to expire
- Idle terminal sign-off time-out

It also provides an optional facility for checking user authority to run transactions and access resources.

The security function is split into two domains, the user domain and the security domain. The security domain manages the security capabilities of users, and handles all the interfaces to the external security manager (ESM).

# CICS Domains PART 5

## **Storage Manager Domain (SM)**

The storage manager domain manages virtual storage requests for the CICS system.

## **Trace Domain (TR)**

The trace domain is used by CICS system code and application programs to record details of the sequence of events occurring in the CICS system. The basic unit of information created for this purpose is the trace entry. The trace domain can write entries to:

- Internal trace, which is a wraparound table in main storage in a CICS address space.
- Auxiliary trace, which is a pair of CICS-controlled SAM data sets used alternatively.

# CICS Domains PART 6

## **Transaction Manager Domain (XM)**

The transaction manager domain provides transaction-related services to:

- Create tables
- Terminate, purge and inquire about tasks
- Manage transaction definitions and classes

The transaction manager domain also provides a transaction environment that allows other CICS components to implement transaction-related services.

# CICS Problem Determination

## ABENDS

### **SCENARIO:**

Running normally and all of a sudden the CICS partition crashes.

### **MESSAGES:**

DFHXM0303 XXXXXXXXX A severe error (code X'131B') has occurred while initializing task number 04319 with transaction identifier XXXX. Terminal G1O1 has not been released. The task is suspended indefinitely.

# CICS Problem Determination

## ABENDS Example 1

DFHXM0303 applid A severe error (code X'code') has occurred while initializing task number tasknum with transaction identifier tranid. Terminal termid has not been released. The task is suspended indefinitely.

Explanation: An internal error has prevented the initialization of task number tasknum with identifier tranid.

The task cannot run and cannot be abended. The principal facility of the task is a terminal. No message may be sent to the terminal and it is unusable by CICS. Rather than terminate CICS, the transaction manager keeps CICS running and preserves its integrity by suspending the task.

The suspended task will hold its MXT slot until CICS is terminated.

# CICS Problem Determination

## ABENDS Example 1

Note that the task may hold resources (for example, locks and enqueues) so you should cancel CICS at your earliest convenience. Otherwise you may risk other tasks being prevented from running because they also need access to the same resources. You may wish to add a dump table entry to always terminate CICS on this message.

**System Action:** The task is suspended indefinitely. First failure diagnostics should be produced by the component which first detects the error. The transaction manager also takes a dump. Message DFHME0116 is normally produced containing the symptom string for this problem.

The terminal principal facility of the task is unusable by CICS until CICS is cancelled.

# CICS Problem Determination

## ABENDS Example 1

The task is suspended with a resource type of FOREVER and a resource name of DFHXMTA.

User Response: You must cancel CICS if you need to release the terminal associated with the task. You cannot quiesce CICS since this task will not terminate. You cannot purge or force-purge the task.

Note the error code X'code'. You need further assistance from IBM to resolve this problem. See Part 4 of the CICS Problem Determination Guide for guidance on how to proceed.

Destination: Console

Modules: DFHXMTA.

# CICS Problem Determination

## ABENDS Example 1

We issue: **CALL DFHPD410 DATA KE=3** in the Infoana job to see what the running task is doing:

```
00A2 027CA400 ***Running** 0072B080 04319 XXXX 020CFE80 06790020
```

We then display this task's stack entry to see what the module flow is:

```
00A2 027CE020 0120 Bot 867C9BE8 867C9EB8 02D0 DFHKETA
00A2 027CE140 01F0 Dom 867EE6F8 867EE7E6 00EE DFHDSKE
00A2 027CE330 03F0 Dom 86869898 8686C6FA 2E62 DFHXMTA
      Int +224E 8686A222 098A PROCESS_ATTACH_
      ERROR
      Int +2A24 8686BBC2 232A ATTACH_WAIT_
      FOREVER
      Int +2E00 8686C4A8 2C10 WAIT_FOREVER
00A2 027CE720 0F80 Dom 8681DDD8 868214C8 36F0 DFHMEME
```

---

# CICS Problem Determination

## ABENDS Example 1

We then examine KE Domain Error Summary to see the error flow:

==KE: KE Domain Error Table Summary

ERR_NUM	ERR_TIME	KE_NUM	ERROR TYPE	ERR_CODE	MODULE
0000022	07:00:12	00C2	TRAN_ABEND_PERCOLATE	---/ATCV	DFHTFRF
000004EE					
0000023	07:00:19	00A2	ABEND	2C5/AKEB	UNKNOWN

---

# CICS Problem Determination

## ABENDS Example 1

We see the initial abend2C5 happened so we find this KERRD information:

Error Code: 2C5/AKEB Error Type: ABEND

Timestamp: C6E6C09C18A757C4

CICS DUMP: SYSTEM=XXXXXXXX

Reason Code: 00601000

Date (GMT) : 18/11/10 Time (GMT) : 23:00:19.730037

Date (LOCAL) : 19/11/10 Time (LOCAL) : 07:00:19.730037

KE\_NUM: 00A2 KE\_TASK: 027CA400 TCA\_ADDR: 0072B080

DS\_TASK: 020CFE80

Program DFHXSRC was in control, but the PSW was elsewhere.

Registers and PSW.

PSW: 07AD3000 802CA05C Instruction Length: 2

REGISTERS 0-15

00002800 042C5000 802C9E70 00000000

00000001 00000001 8687C256 00000001

00000000 8027A48C 027CEE08 027CEE10

002C9E70 027CEE10 0000A0B8 00601000

---

# CICS Problem Determination

## ABENDS Example 1

We now print storage go to the PSW address area x'0086E372' and go backwards to find the beginning of the module:

The PSW address of x'802CA05C' is at offset x'1EA' in the module which is loaded at x'002C9E70':

e .01..BSTBSMR DY4 e \*  
e 5623 06265 15392 e \*  
e 9Licensed Materi e \*  
e als - Property o e \*  
e f IBM 5686-CF7 ( e \*  
e C) Copyright IBM e \*  
e Corp. 1996,2004 e \*  
e . All Rights Res e \*  
e erved. US Govern e \*  
e ment Users Restr e \*  
e icted Rights - U e \*

---

---

# CICS Problem Determination

## ABENDS Example 1

There is also the following return which describes the reason for this error:

60100

During processing of a RACROUTE request GETVIS failed to allocate stack for dynamic storage areas.

===SM: STORAGE MANAGER DOMAIN - SUMMARY

SM Domain status: INITIALISED

Storage recovery: YES

Storage protection requested: YES

Storage protection active: YES

Reentrant program option: PROTECT

**Current DSA limit: 9216K <<<<<<< TOO MUCH!!!!**

Current DSA total: 3840K

Currently SOS below 16M: NO

Current EDSA limit: 75M

Current EDSA total: 19M

Currently SOS above 16M: NO

---

---

# CICS Problem Determination

## ABENDS Example 1

### **Cause**

We recommended that our customer should increase the partition size and lower the EDSA limit so that there is very sufficient 31-bit partition GETVIS available.

Since our customer changed the values they have not had any more ABEND2C5 Errors of this type.

---

---

# CICS Problem Determination

## ABENDS ---- NOTES

CICS always performs exception tracing when it detects an exception condition (for example, bad parameters on a domain call, or an abnormal response from a called routine). The aim is "first failure data capture", to record data that might be relevant to the exception as soon as possible after it has been detected.

CICS uses a similar mechanism for both exception tracing and "normal" tracing. Exception trace entries are made from specific points in CICS code, and data is taken from areas that might provide information about the cause of the exception. The first data field in the trace entry is usually the parameter list from the last domain call, because this can indicate the reason for the exception.

Exception trace entries are always written to the internal trace table, even if no trace destinations are currently STARTED. That is why there is always an internal trace table in every CICS partition, to make sure there is always somewhere to write exception trace entries. If the other trace destinations are STARTED, the exception trace entries are written there, as well.

---

---

# CICS Problem Determination

## ABENDS ---- NOTES

You can select tracing options so that exception traces only are made to an auxiliary trace data set. This is likely to be useful for production regions, because it enables you to preserve exception traces in auxiliary storage without incurring any general tracing overhead. You need to disable all standard and special task tracing, and enable auxiliary trace:

1. Ensure that special tracing has not been specified for any task.
2. Set the master system trace flag off.
3. Set the auxiliary trace status to `STARTED`, and the auxiliary trace data set and the auxiliary switch status to whatever values you want.

Exception traces are now made to an auxiliary trace data set, but there is no other tracing overhead.

The format of an exception trace entry is almost identical to that of a normal trace entry. However, you can identify it by the eye-catcher `*EXC*` in the header.

---

---

# CICS Problem Determination

## HANGS

### SCENARIO

Our CICS customer hangs with all tasks waiting.

After taking the SNAP dump, our customer purged one task and all the other tasks were relieved from the hang situation. Everything was back to a normal condition.

Customer would like to know the status at the time of hang to know the reason for the hang and how to prevent it from happening in the future.

---

---

# CICS Problem Determination

## HANGS

There were **NO MESSAGES**

The DS domain shows that many tasks were suspended on file activity because someone held the lock and has not released it yet.

KC_ENQ	SUSPEND	S 06:11:21.417	031745C
KC_ENQ	SUSPEND	S 06:11:28.235	031922C
KC_ENQ	SUSPEND	S 06:13:35.551	034674C
KC_ENQ	SUSPEND	S 06:11:26.108	031874C
KC_ENQ	SUSPEND	S 06:11:21.180	031764C
FCXCWAIT	APBBIFM	C 06:11:55.239	032534C
KC_ENQ	SUSPEND	S 06:13:00.364	033927C
KC_ENQ	SUSPEND	S 06:12:08.342	032816C
KC_ENQ	SUSPEND	S 06:13:55.250	035073C
KC_ENQ	SUSPEND	S 06:15:01.859	035259C
KC_ENQ	SUSPEND	S 06:12:14.845	032959C

---

---

# CICS Problem Determination

## Hangs

### **ANALYSIS:**

The dump revealed there were over 20 tasks waiting in a KC\_ENQ type wait.

We pick as close to the oldest task and run the TCA->QEA->TQE chain.

This process is to go to x'28' off the TCA to get to the QEA. If the high order bit is on, this is the TQE. At x'14' is the TCA of the owner of the resource the resource in question.

The tasks in question were 31745 (TCA x'00A0B080') and 31764 (TCA x'00A0B680').

We then looked at those tasks they were in KC\_ENQ waits as well.

We ran the chain for TASK-31745 the owner of the resource it required is task 31764. We ran the chain for TASK-31764 the owner of the resource it required is 31745, so this leads to a deadlock situation and the stall the customer is seeing.

The transaction ID for the task in question is AAA1 (31745) and AAA2 (31764).

---

---

# CICS Problem Determination TASK Hang --- SOLUTION

This problem is still active in our pmr system..

However, we have relayed the information to our customer and asked the big question – WHAT HAS CHANGED IN THE APPLICATION which would lead to the deadlock condition.

At this point, our customer needs to get with the application people and figure what needs to be changed to stop this deadlock.

---

---

# CICS Problem Determination

## CICS Hangs

- Steps to debug a HANG in a CICS partition
    - Inspect the MSG log for signs of abends
    - If there are no abends dump the CICS partition
    - Run Infoana against the CICS partition dump
    - Issue “CALL DFHPD410 DATA  
KE=3,TR=3,LD=3”
    - If you have questions/problems, call the IBM Support Center
-

---

# CICS Problem Determination

## VSE SUB-TASK Hangs

- Steps to debug a HANG
    - Issue the STATUS command (more than once if you suspect a Loop condition)
    - Issue MSG xx,dump 0-7FFFFFFF,uuu or
    - Create a Standalone dump or
    - Dump the Partition(s) in question, SVA and Supervisor
    - If you have questions/problems, call the IBM Support Center
-

---

# CICS Problem Determination LOOPS

**A loop is the repeated execution of some code. If you have not planned the loop, or if you have designed it into your application but for some reason it fails to terminate, you get a set of symptoms that vary depending on what the code is doing.**

**In some cases, a loop may at first be diagnosed as a wait or a performance problem, because the looping task competes for system resources with other tasks that are not involved in the loop.**

---

---

# CICS Problem Determination LOOPS

- The following are some characteristic symptoms of loops:
    - The 'system busy' symbol is permanently displayed in the operator information area of a display unit, or stays displayed for long periods.
    - The transaction abends with abend code AICA.
    - CPU usage is very high, perhaps approaching 100%, yet some tasks stay suspended or ready, but not running, for a long time. CPU usage is very high, perhaps approaching 100%, yet some tasks stay suspended or ready, but not running, for a long time. You can check what the CPU usage is for any VSE job by using the DISPLAY SYSTEM ACTIVITY screen of the VSE/ESA Interactive Interface. See the VSE/ESA Operation manual for more information.
    - There is reduced activity at terminals, or possibly no activity at all.
    - One or more CICS partitions appear to be stalled, or to be continuing only slowly.
-

---

# CICS Problem Determination **LOOP**

Our customer reported that an application appeared to go into a Program Check loop on the start of the program.

They were not able to communicate with the CICS region to attempt to purge the transaction.

Eventually they had to cancel the partition with a Dump .

Further examination of the Trace table showed many program checks consistent with the looping condition.

---

---

# CICS Problem Determination

## LOOPS

Trace shows the following 3 entries repeated over and over for a TASK-1815

```
.
66367 1 AP 1942 APLI *EXC* Program-Check      START_PROGRAM,BML150P
66367 1 AP 1948 APLI EVENT CALL-TO-LE/VSE    Program_Check_Recovery
66367 1 AP 1949 APLI EVENT RETURN-FROM-LE/VSE Program_Check_Recovery
.
```

Then the program check occurs again. Kernel error table shows abend0C2's and abend0C1's interspersed with abend999's:

```
.
ERR_NUM  ERR_TIME  KE_NUM  ERROR TYPE    ERR_CODE  MODULE  OFFSET
=====  =====  =====  =====      =====  =====  =====
006BB169 10:45:15  0055  PROGRAM_CHECK 0C2/AKEA UNKNOWN UNKNOWN
006BB16A 10:45:15  0055  ABEND          ---/0999 DFHKERET 00000068
.
006BB16B 10:45:15  0055  PROGRAM_CHECK 0C1/AKEA UNKNOWN UNKNOWN
006BB16C 10:45:15  0055  ABEND          ---/0999 DFHKERET 00000068
.
```

---

---

# CICS Problem Determination

## LOOPS

Looked further at the dump. The program checks are caused by a branch to low core from LE module CEEHTRAV. CEEHTRAV is loading an address of zeroes from within itself +x'5D4', and then branching there. Here is what CEEHTRAV looks like in storage:

```
.
Address Offset ----- Hex ----- ----- Char -----
C0A2C10     0 47F0F014 00C3C5C5 00000138 00000604 e .00..CEE..... e
...
C0A2D20   110 92E8D126 58F0B5D4 5400B5C4 05EF5840 e kYJ..0.M...D... e
C0A2D20   110 92E8D126 58F0B5D4 5400B5C4 05EF5840 e kYJ..0.M...D... e
                *****                ****
                Load R15                branch to low core
```

---

---

# CICS Problem Determination

## LOOPS

C0A3160 550 D7C1E3C3 C840C1D9 C5C14060 40C3C5C5 e PATCH  
AREA - CEE e  
C0A3170 560 C8E3D9C1 E540F2F0 F0F84BF1 F9F2B56E e HTRAV 2008.192.. e  
C0A3180 570 B570B572 B574B576 B578B57A B57CB57E e .....:....= e  
C0A3190 580 B580B582 B584B586 B588B58A B58CB58E e ...b.d.f.h..... e  
C0A31A0 590 B590B592 B594B596 B598B59A B59CB59E e ...k.m.o.q..... e  
C0A31B0 5A0 B5A0B5A2 B5A4B5A6 B5A8B5AA B5ACB5AE e ...s.u.w.y..... e  
C0A31C0 5B0 B5B0B5B2 00000138 00000000 00000000 e ..... e  
C0A31D0 5C0 00001000 7FFFFFFF 80000000 0000FFFF e ...."..... e  
C0A31E0 5D0 0C0C4940 00000000 00000005 00000007 e ... ..... e

\*\*\*\*\*

**should be address of LE abend routine**

---

---

# CICS Problem Determination

## LOOPS

```
C0A31F0 5E0 0000000A 0000000B 00000000 00000000 e ..... e
C0A3200 5F0 7FFFFFFF 00108001 00300000 00400030 e " ..... .. e
C0A3210 600 C4C20000 20CEB000 0C0A3240 00000000 e DB..... .... e
C0A3220 610 00000000 00000000 00000000 00000000 e ..... e
C0A3230 620 00200000 0008C3C5 C5C8E3D9 C1E50000 e .....CEEHTRAV.. e
C0A3230 620 00200000 0008C3C5 C5C8E3D9 C1E50000 e .....CEEHTRAV.. e
C0A3240 630 01000001 00000000 00000000 00000014 e ..... e
C0A3250 640 0C0A2C10 F2F0F0F8 F0F7F1F0 F1F3F0F3 e ....200807101303 e
C0A3260 650 F0F0F0F1 F0F4F0F6 0007D3C5 F1F4F6C7 e 00010406..LE146G e
```

CICS gets control for the program check, and DFHAPLI1 then calls LE for Program\_Check\_Recovery. LE returns RC0 from the Program\_Check\_Recovery call. Based on the RC0 and contcode\_bit2 set on, CICS will branch to a retry address given to us by LE and then the whole process occurs again.

---

---

# CICS Problem Determination

## LOOPS -- SOLUTION

APAR= PK85826 SER= AB ABEND  
PROGRAM-CHECK LOOP BETWEEN CICS TS AND CEEHTRAV

STAT= CLOSED PER FESN0600006- CTID= BB7044 ISEV= 3  
SB09/05/04 RC09/05/07 CL09/05/18 PD SEV= 3

PE= TYPE= F

RCOMP= 5686CF832 LE BASE + JAP RREL= R01K  
FCOMP= 5686CF832 LE BASE + JAP PFREL= F999 TREL= T  
ACTION= SEC/INT= DUP/  
USPTF= UK46716 PDPTF= UK46716 DUPS 0

---

---

# CICS Problem Determination LOOPS

- Steps to debug LOOPS
    - Issue the STATUS command several times (this to see if the PSW is constantly changing)
    - Issue "CEMT P SNAP" to get a dump of the partition
    - Dump the SVA and SUPERVISOR
    - Using the DFHPD410 dump formatter, format KE=3, TR=3, AP=3
    - Gather all the CICS and message logs
    - Contact the IBM Support Center for assistance
-

# CICS Problem Determination

## WAITS

Table 20. Resources that a suspended task might be waiting on

Resource type	Resource name	Suspending module	DSSR call	Task
(none)	DMWTQUEU	DFHDMWQ	SUSPEND	System
(none)	LMQUEUE	DFHMLM	SUSPEND	User
AP_QUIES	CSASSI2	DFHSTP	WAIT_OLDC	System
AP_TERM	STP_DONE	DFHAPDM	WAIT_	System
			EXTERNAL	only
EKCWAIT	Value of NAME argument	DFHEKC	WAIT_OLDW	User
FCIOWAIT	file ID	DFHFCBD or DFHFCVR	WAIT_OLDW	User
FCPSWAIT	file ID	DFHFCVR	WAIT_OLDC	User
FOREVER	DFHXMTA	DFHXMTA	WAIT_	User
			EXTERNAL	
TCP_NORM	DFHZDSP	DFHZDSP	WAIT_OLDW	System
ZCIOWAIT	DFHZARQ1	DFHZARQ	SUSPEND	User

---

# CICS Problem Determination WAITS

## **DMWTQUEU**

A system wait typically when domains are shutting down.

## **LMQUEUE**

It means that the suspended task cannot acquire the lock on a resource it has requested, probably because another task has not released it.

## **CSASSI2**

It means the AP domain is trying to shutdown and it has not finished. Typically it waits on the Terminals to finish their shutdown process.

## **STP\_DONE**

This wait is done to wait for DFHSTP to complete its processing before returning to Domain Manager, as DM will assume we have completed QUIESCE when we return and set the phase point etc, allowing other domains to complete their QUIESCE processing.

## **EKCWAIT**

EKCWAIT indicates that a task has issued an EXEC CICS WAIT EVENT command. USERWAIT indicates that a task has issued an EXEC CICS WAITCICS or EXEC CICS WAIT EXTERNAL command. If the wait is prolonged, you should identify the event being waited on.

---

---

# CICS Problem Determination

## WAITS

### **FCIOWAIT**

A wait on resource type FCIOWAIT occurs when the exclusive control conflict is deferred internally by VSAM and not returned as an error condition to CICS. An example of this is when a request against an LSR file is made for exclusive control of a control interval (for example, by EXEC CICS WRITE or READ UPDATE) and either this task or another task already holds shared control of this control interval (for example, by STARTBR).

### **FCPSWAIT**

If your task is waiting on either of resource types FCPSWAIT or FCSRSUSP, it means that it cannot get a VSAM string. FCPSWAIT shows that the wait is for a private string, and FCSRSUSP shows that the wait is for a shared resource string.

### **FOREVER**

If you have found that a user task is waiting on a resource type of FOREVER, and resource name DFHXMTA, transaction manager has detected a severe error during task initialization or task termination. Transaction manager has suspended the task.

### **ZCIOWAIT**

Suspends on resource type ZCIOWAIT occur when the task is waiting for some terminal I/O. Once the expected I/O event occurs, the task is resumed.

DFHZARQ1 - resource type and name for all application requested waits involving NON-LU 6.2 devices.

DFHZARR1 - waiting for a receive issued to a LU6.2 ISC connection.

DFHZARL1 - waiting for a send issued to a LU6.2 device.

---

---

# CICS Problem Determination WAITS

## **SCENARIO**

Our customer found CICS was in a “hang”, customer has to cancel CICS partition and dump was generated at 11:09:08. Last trace entry time is 10:50:59 which means CICS was “hung” after this time.

---

---

# CICS Problem Determination

## WAITS

**Here is the CICS KERNAL entries showing the running task and what it is doing at the time of the "hang":**

10 078EEB00 \*\*\*Running\*\* 07897680 58065 XXXX 1785AD80 1832D020

KE\_NUM @STACK LEN TYPE ADDRESS LINK REG OFFS ERROR NAME

0010 078F8020 0120 Bot 98366BE8 98366EB8 02D0 DFHKETA

0010 078F8720 03E0 Dom 879400C8 87940A5C 0994 DFHPGPG

Int +00D4 87940156 008E INITIAL\_LINK

0010 078F8B00 0510 Dom 87AEA410 89982D3E 0000 DFHAPLI1

Int +223E 87AEA9AE 059E LE370\_INTERFACE

Int +2022 87AECC5C 284C

INVOKE\_FOR\_RECURSION

10 078F9010 06A0 Lifo 006EB358 879CD894 0000 DFHERM

---

---

# CICS Problem Determination

## WAITS

**We now know that there was a call to an external resource manager to do some work. We need to see what the last trace entry shows as this will give us the request information:**

```
AP 00E7 ERM ENTRY APPLICATION-EXEC-DLI          REQ(0004) FIELD-  
A(C22D71F4 B..4) FIELD-B(D5075904 N...) RESOURCE(DLI  
TASK-58065 KE_NUM-0010 TCB-0041F000 RET-89982D3E  
TIME-10:50:59.0021395947 INTERVAL-00.0000005312  =116992=
```

---

---

# CICS Problem Determination

## WAITS

**We then go to the RETurn address listed in the previous trace entry to see who is making the call to the external resource manager.**

This call is made at offset x'1BFC' in the application:

```
| .....00..CEE.... | *
| .....00.ϕ....q.. | *
| ..... | *
| ..0.q.0<.....q. | *
| .q...q...q...q. | *
| .q...q...q..... | *
| ....XXXXXXXXX02008 | *
| 0327161010010100 | *
| .....-...h... | *
| ..... | *
*****
```

---

---

# CICS Problem Determination

## WAITS -- SOLUTION

- We know CICS was last dispatched at the call to the External Resource Manager DL/I.
  - We know that control was never returned from this DL/I call.
  - There was CPU activity going on in the DL/I partition.
  - Our customer needed to find out what is going on with the DL/I activity and see why it never returned to CICS.
-

---

# CICS Problem Determination WAITS

- Steps to DEBUG WAITS
    - DUMP the CICS Partition --- CEMT P SNAP
    - Run the "Analyze CICS Dumps" format the following domains: KE=3, TR=3, DS=1
    - Contact the IBM CICS Support Center
-

# CICS dump formatter

```
* $$ JOB JNM=DMPACD1,DISP=D,PRI=8,  
* $$ NTFY=YES,  
* $$ CLASS=0  
* $$ LST DISP=H,RBS=1000  
// JOB DMPACD1 ANALYZE CICS/TS DUMP  
// EXEC PROC=DTRINFOA  
// EXEC INFOANA,SIZE=INFOANA,OS390  
    SELECT DUMP MANAGEMENT  
    DUMP NAME SYSDUMP.BG.DBG00002  
    RETURN  
  
    SELECT DUMP VIEWING  
    CALL DFHPD410 DATA AP=0,KE=3,DS=1,TR=2,LD=3  
    RETURN  
        DUMP NAME SYSDUMP.BG.DBG00002  
    RETURN  
    SELECT END  
  
/*  
/&  
* $$ EOJ
```

```
C /===/  
C *====*  
  *====*  
  *====*  
  *====*  
  *====*  
  *====*  
    *====*  
    *====*  
    *====*  
      *====*  
      *====*  
      *====*  
        *====*  
        *====*  
        *====*  
          *====*  
          *====*  
          *====*  
            *====*  
            *====*  
            *====*
```

---

# SUMMARY

---