



Welcome to the Virtual CICS user group newsletter. The Virtual CICS user group at [www.fundi.com/virtualcics](http://www.fundi.com/virtualcics) is an independently-operated vendor-neutral site run by and for the CICS user community.

## Virtual CICS user group presentation

The latest webinar from the Virtual CICS user group was entitled, "CICS Transaction Debugging", and was presented by Colin Pearce.

Colin has been an MVS and CICS Systems Programmer for 30 years and has been teaching for over 20 years. He has written a number of MVS and CICS courses and has given them in many different parts of the world. Colin has spent the majority of his career working within the banking environment. He has worked in England, South Africa, Qatar, Australia, and now Singapore.

Colin started the session by explaining that he would be using IBM-supplied tools for this session because not everyone would have the same third-party software tool.

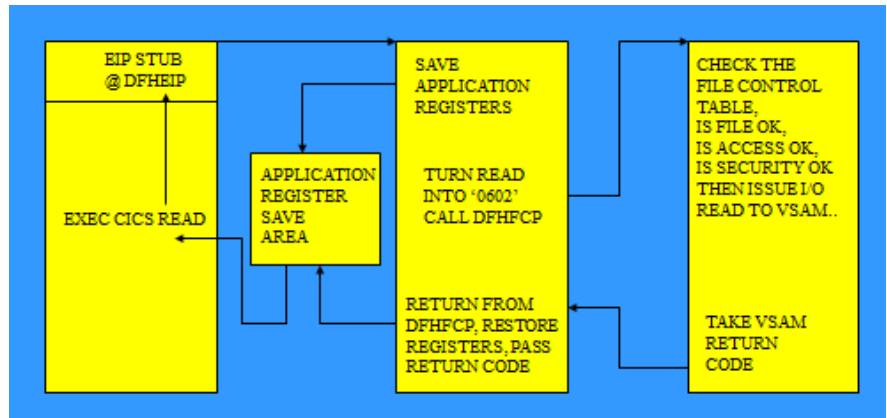


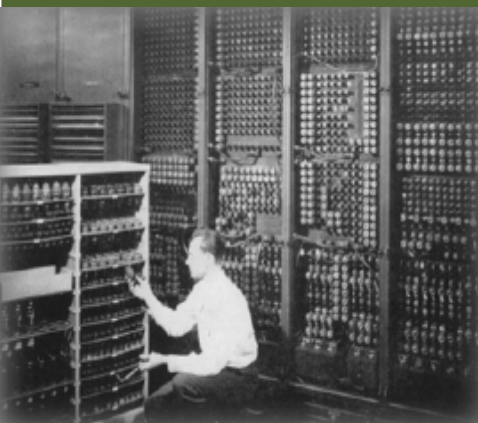
Figure 1: DFHEIP application flow

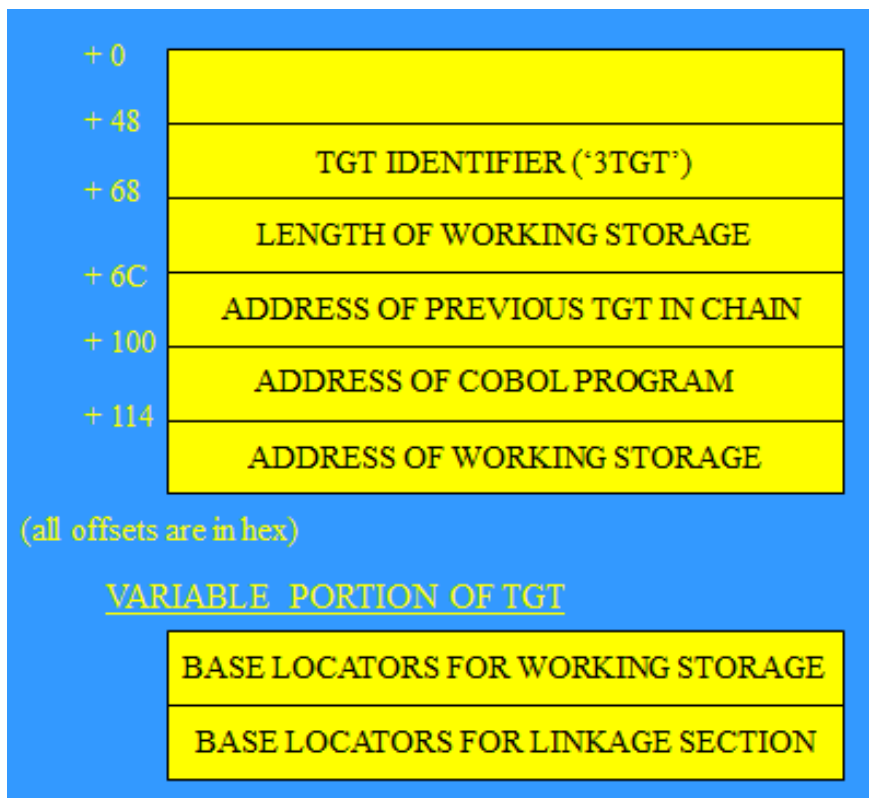
He explained that all transaction abends are accompanied by an ABEND CODE. This code is 1-4 characters and contains a two-character code identifying the module issuing the abend. For example with ASRA (Program Interrupt), SR indicates that it's issued from the System Recovery Program. With AICA (Program Loop), IC indicates that it's issued from the Interval Control Program.

With ABM0 (BMS unable to locate the Map), BM indicates that it's issued from the Basic Mapping Support

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**Figure 2: Task Global Table**

Program. With AEIM (Not found condition), EI indicates that it's issued from the Exec Interface Program. The meaning of all abend codes can be found in Chapter 3 of the CICS/TS MESSAGES AND CODES manual.

The first thing to do is identify what is the problem. A Program Check or Interrupt in an application causes CICS to issue an abend code 'ASRA'. A Program Check can take various forms:

- Arithmetic Operation of undefined fields.
- Executing outside of the Address Space/Region.

- Executing invalid instructions.

The Program Status Word (PSW) shows the type of Program Check in the third Word.

We next need to find where the problem is. A Program Check is the result of user code being interrupted. In order to answer the questions, we need to know three things:

- At what address is the program loaded?
- Are the program load address and the program entry address the same?

- At what offset in the program did the interrupt occur?

The Program Status Word contains the address of the NEXT instruction that would have executed. However, if the interrupt code is 0010 or 0011, then the PSW will contain the address of the failing instruction.

The Transaction Dump module index, located at the end of the dump, will show both the Load address and the Entry address.

The Linkedit Map from the Compile and Link output will also show the Load module structure, all the modules that combine to create the Load module that is in error.

The AMBLIST utility can be run to list the structure of the Load module.

The Program Status Word is 8 bytes long in 24 and 31-bit addressing mode. It can be found on the first page of the transaction dump.

The 8 bytes are divided into 2 words, however an additional 8 bytes are included in the dump. Each word is 4 bytes in length. WORD 1 contains the System Control information, such data as the status of the Condition Code, Protection Key, Wait State, and execution state (Problem or Supervisor).

WORD 2 contains the address of the NEXT instruction that would be executed either 24-bit or 31-bit mode. 31-bit mode is more likely.

In WORD 3, the first two bytes contain the length of the instruction that failed. The remaining two bytes contain the type of exception that occurred, referred to as Program Interrupt codes.

WORD 4 is unused for our purposes.

We next need to find what program is affected. The first page of the Transaction Dump displays the name

of the program CICS considered to be currently executing. The storage occupied by this program will be printed in the dump.

External areas that can be interrogated include:

- Any messages on the affected terminal.
- Any messages on the System Log/Console.
- Any messages on the CICS Log.
- Any unusual circumstances surrounding the execution of the program.

The following can be used for diagnostic purposes:

- The Compiler output.
- The CEEMSG output
- The AMBLIST output
- The Transaction Dump.
- The Dump utility:
  - DFHDU660 (CICS/TS 4.1)
  - DFHDU670(CICS/TS 4.2).

Colin then started on a detailed look at how to identify what the problem was that caused the ABEND.

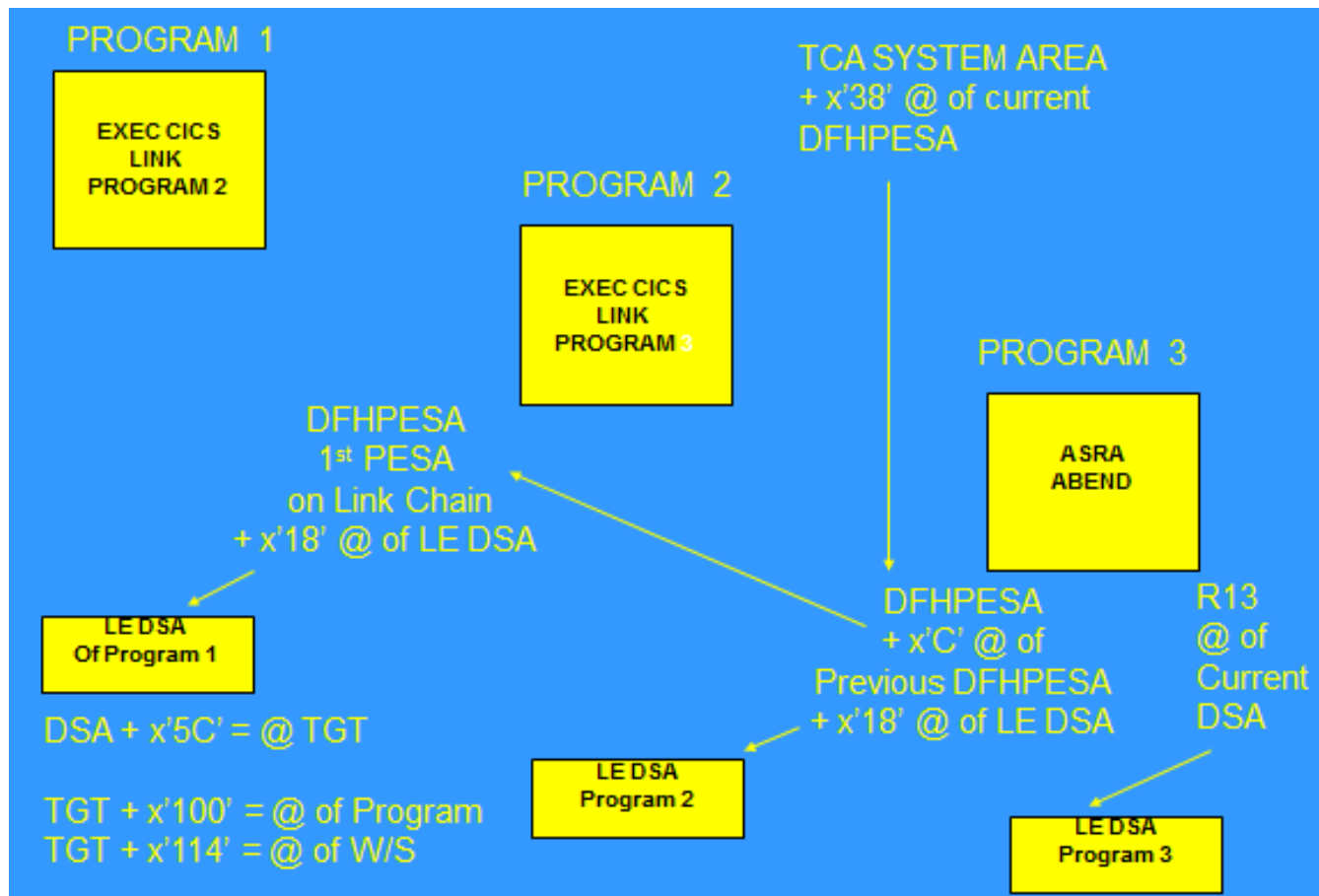


Figure 3: EXEC CICS LINK

The Exec Interface Program handles Calls and provides the handshake between the Program and the CICS function. The main function of the EIP is to interpret the Call for CICS services issued from the application and hand control over to the relevant management module invoked to deal with the request. The Call is turned into a 2-bytes Function code. This is illustrated in Figure 1.

The Task Global Table (TGT) is printed in the Compiler output, provided OFFSET or LIST is specified as a compiler option.

The TGT (see Figure 2) has the eyecatcher in the transaction dump '3TGT' at offset x'48' from the beginning.

The TGT was used for saving the registers in the Application Register Save area. However, now this Register Save area is handled by the Language Environment DSA (DYNAMIC SAVE AREAS). The TGT holds the Entry point address of the program, the Working Storage address, as well as the BLWs and BLLs.

The Program Environment Save Area (PESA) is created whenever a Program issues an EXEC CICS LINK. It is created by the Program Manager Domain. This is illustrated in Figure 3.

A copy of Colin Pearce's presentation – with far more detail than we can begin to cover here – can be found at <http://fundi.com/virtualcics/presentations/DebugMay14.pdf>.

You can see and hear the whole user group meeting by downloading the WMV file from [www.fundi.com/virtualcics/presentations/2014-05-13meeting.wmv](http://www.fundi.com/virtualcics/presentations/2014-05-13meeting.wmv).

## Meeting dates

The following meeting dates have been arranged for the Virtual CICS user group:

- On 8 July, we welcome back Circle Software's Ezriel Gross, who will be talking about, "CICS Web Services as a Provider and Requestor". That starts at 10:30 CDT or 16:30 BST.
- On 9 September we have Fundi Software's Jim Martin who will be talking about, "Finding problems in a mixed environment – Transaction Analysis Workbench". That starts at 10:30 CDT or 16:30 BST.

We will be using Citrix GoToMeeting for the user group meetings.

## Recent CICS articles

*Going Mobile: CICS Makes Light Work of Mobile Integration* by Geoff Pirie and Inderpal Singh in the May 2014 edition of *Enterprise Tech Journal*. You can find the article at <http://enterprisesystemsmedia.com/article/going-mobile-cics-makes-light-work-of-mobile-integration#&ts=1355523244>.

*Develop Cloud Applications and Meet Consumer Expectations with the IBM CICS V5.2 Application Server* by Matthew Webster in the May 2014 edition of *IBM Systems Magazine*. You can find the article at [http://www.ibmssystemsmag.com/mainframe/administrator/cics/CICS\\_V5-2/](http://www.ibmssystemsmag.com/mainframe/administrator/cics/CICS_V5-2/).

## CICS news

Critical Path Software has announced Turbo CICS, which analyses and identifies improvements to CICS online response times and reduces R4HA and MLC. It is completely compatible with Striping and Record Level Sharing (RLS). The analysis is fast, non-invasive, and free of charge upfront to determine the impact of discoveries. Full details can be found at <http://www.briefingwire.com/pr/cpsi-has-a-new-turbotune-tool>



IBM has announced CICS Tools V5.2, which support the new features, resources, options, and metrics in CICS TS V5.2.

CICS IA V5.2 collects more information about applications and platforms, to help clients create a more dynamic CICS cloud environment. The new Command Flow visualization provides yet more insight into program behaviour. A new variable sampling technique is introduced to help reduce the CPU overhead by up to 75% while collecting data. This technique can be applied to production regions to balance the impact of collection, the fidelity of the data collected, and production throughput.

CICS DA V5.2 introduces a new RESTful API that allows the deep insight captured in the discovered model to be shared with other management tools, or viewed from mobile devices and browsers. New cloning options deliver value to a wider range of client environments. A new compare option highlights key differences in region configuration and helps to ensure standards conformance and system reliability.

CICS PA V5.2 supports the CICS cloud with new Performance Summary

reports for platforms and applications, while multi-version application support enables fine-grained analysis of ever-changing mobile applications. New, simply configured, batch reporting of CICS TS and CICS TG statistics provides a wealth of valuable diagnostic and planning information. Plug-in enhancements, which include new Performance Alerts, and more advanced visualization and analysis, help development and systems staff to identify and resolve performance issues quickly.

CICS CM V5.2 improves DevOps collaboration with new plug-in support for Migration Schemes and Deployment Analysis. New support to manage CICSplex SM Topology and Workload Management definitions allows dynamic mobile workloads to be quickly reconfigured.

CICS VR V5.2 adds new support for extended address volumes (EAVs), and delivers usability, installation, coexistence, and customization enhancements. CICS VR provides Disaster Recovery support for online data and operation support for batch to minimize the batch window. CICS also supports the replication of VSAM data for IBM GDPS Active-Active continuous availability,

enabling cross-site workload balancing, continuous availability, and disaster recovery.

CICS Optimization Solution Pack for z/OS, V5.2 is updated to include the new releases of CICS IA, CICS DA, CICS PA, and CICS CM. Full details can be found at <http://www-01.ibm.com/common/ssi/cgi-bin/>.

### About the Virtual CICS user group

The Virtual CICS user group was established as a way for individuals using IBM's CICS TS systems to exchange information, learn new techniques, and advance their skills with the product.

The Web site at [www.fundi.com/virtualcics](http://www.fundi.com/virtualcics) provides a central point for coordinating periodic meetings (which contain technically-oriented topics presented in a webinar format), and provides articles, discussions, links, and other resources of interest to IBM CICS practitioners. Anyone with an interest in CICS is welcome to join the Virtual CICS user group and share in the knowledge exchange.

To share ideas, and for further information, contact [trevor@itech-ed.com](mailto:trevor@itech-ed.com).

The Virtual CICS user group is free to its members.