



Virtual CICS user group: Newsletter 61



Welcome to the Virtual CICS user group newsletter. The Virtual CICS user group at virtualcics.hostbridge.com is an independently-operated vendor-neutral site run by and for the CICS user community.

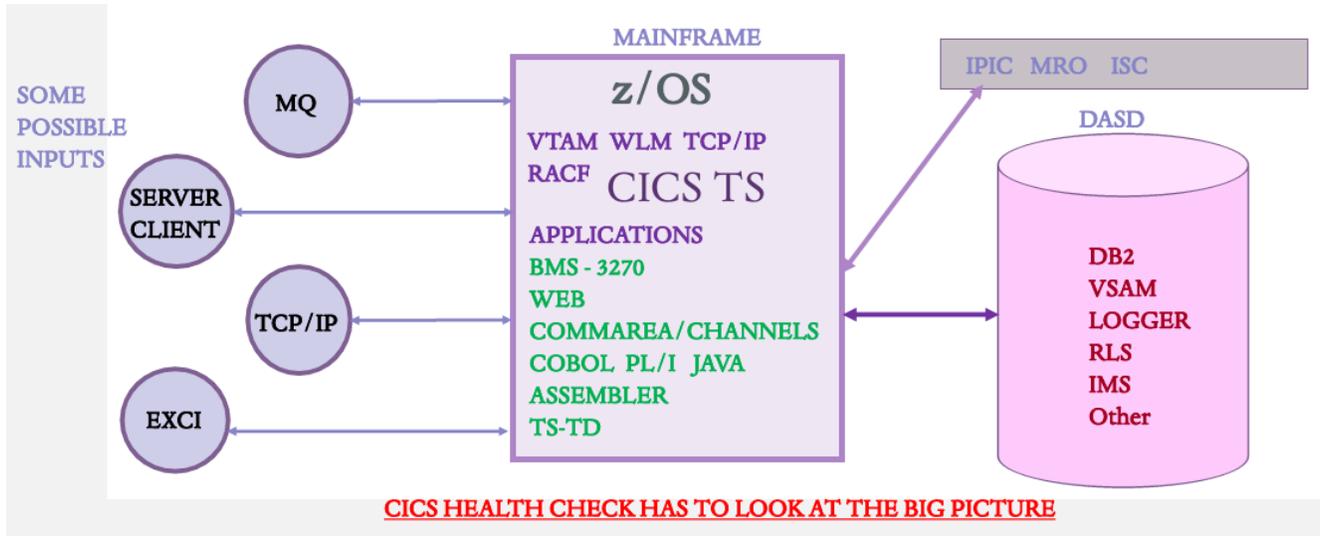


Figure 1: General CICS TS region

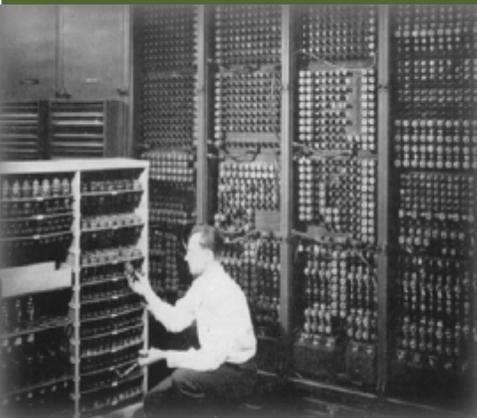
Virtual CICS user group presentation

The latest webinar from the Virtual CICS user group was entitled, "CICS Health Check – What Does It Entail?". It was presented by Eugene Hudders, president of C/TREK Corporation.

Eugene Hudders is president of C/TREK Corporation, a company that developed C/TREK, a performance and problem determination tool for CICS. He has worked on IBM mainframe computers for over 50 years. He has made presentations related to CICS and VSAM

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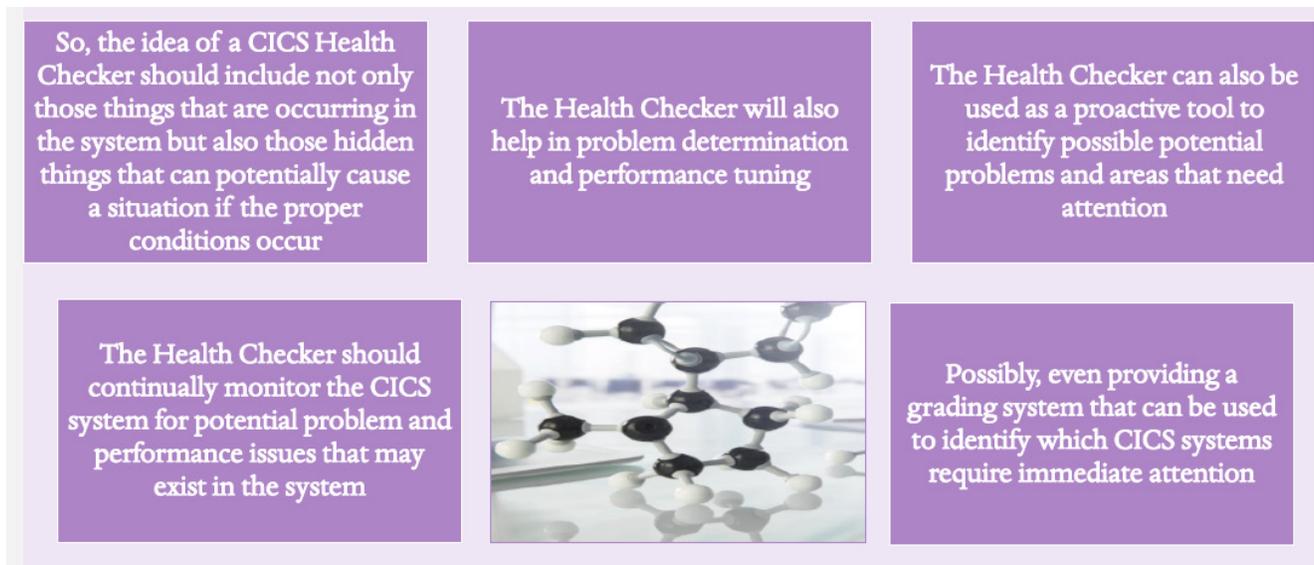


Figure 2: CICS Health Check

at technical conferences such as SHARE, CMG, and WAVV. In addition, Gene has written several books on CICS and VSAM in the areas of problem determination and tuning, as well as many articles for technical magazines on the same topics. In his current position, Gene continues to develop new performance functions for C/TREK software, and provides consulting and educational services for clients in the USA and Latin America.

Eugene Hudders started the session by defining what was meant by a health check, explaining that for CICS it was an examination of the entire address space to determine how well a CICS TS system is executing and whether it is efficiently using the resources assigned,

and providing sub-second response times. A health check should look at CPU, Virtual/Real Storage, and I/O to provide an overall assessment that accurately determines how a CICS TS system is performing.

Gene suggested that most installations today rely on some type of software products to help them identify potential situations that could affect the performance of their CICS system. This leads to a dependence mainly on performance monitors. The major issue is the number of CICS systems that need to be monitored and the number of system programmers needed to accurately assess and maintain the CICS systems. In many installations performance tuning and

problem determination are only done when a problem occurs. There's limited availability of experienced system programmers. And, at many sites, educational expenditure is limited or non-existent.

Gene listed the top six benefits of a periodic health check as:

- Keeps expenses and outages at a minimum
- Potential to defer system upgrades
- Correct anomalies before they cause outages
- Maintain CICS overall performance at peak performance
- Spot abnormalities that directly impact Transactions Per Second

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• +DFHHC0101I CICSTS56 CICS has registered successfully to the z/OS Health Checker.
• D T
• IEE136I LOCAL: TIME=17.57.55 DATE=2020.180 UTC: TIME=21.57.55 DATE=2020.180
• D A,L
• CNZ4105I 17.57.55 DISPLAY ACTIVITY 489 (Console Messages)
• JOBS M/S TS USERS SYSAS INITS ACTIVE/MAX VTAM OAS
• 00007 00027 00001 00036 00016 00001/00100 00026
• LLA LLA LLA NSW S HZR HZR IEFPROC NSW S

- 33 2A CHCK QR 36 DFHCHK SUSP SUSP NOT RUNNING SY NO (System Task)

1CAD4710 1CAD4030 CHCK TASKWAIT 05 08 07072020 11:07:01 11:37:01 DF0466AA (ICE)

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Figure 3: Health Checker registered message

- (TPS) response like CPU, storage, and I/O
- Gives the system programmer(s) the ability to see a problem before it becomes fatal and tells them the root cause of the problem.

Figure 1 illustrates a general CICS TS region. Some sources of information include: SMF, RMF, third-party monitors, internal CICS transactions (eg CEMT, etc), STAT transaction, z/OS Health Checker, EOD statistics, third-party tools, and dumps.

Traditionally, the most common areas monitored are: overall CPU and CICS CPU utilization, long-running tasks (First In Still Here!), heavy CPU-consuming tasks, CPU to dispatch ratio, MXT and TCLASS

limits, DSA/EDSA/GDSA usage (SOS, cushion, etc), storage violations, Logger, overall paging and CICS paging, LSR pool look-aside percent (data and index), TCB usage (eg QR, L8/L9, MAXOPENTCBS etc), waits (string, buffer, enqueue, etc), Temporary Storage and Transient Data, communications session usage, and SIT parameter settings (ICV, ICVR, ICVTSD, etc). In general, less than 50 conditions are monitored and produce messages. And some require that you research the information. Gene then looked at some traditional messages.

Most monitors will present the traditional messages, and these are an important part of identifying how efficiently the resources are being used by CICS. They provide good information regarding

exception conditions such as SOS, wait on resources such as strings, MXT etc. However, there are many things that are hidden that degrade resources. For example, you get an SOS condition below the line. You may see many tasks running with storage allocated below the line. Do you raise the DSALIM (if storage is available) or find out why there are so many tasks using storage below the line? Further investigation may show that programs are running above the line but hidden to you are programs compiled with a COBOL CBL that had DATA(24) specified. A full CICS Health Check is shown in Figure 2.

Gene told the user group that in addition to the traditional messages, there are over 300 other things that can affect the overall health

of the CICS system. This includes not only resources that are reaching limits such as MXT, but also poor use of CICS resources that could be allocated for other purposes (eg more LSR buffers to reduce physical I/O). These areas include but are not limited to:

- Over-allocated resources such as MXT or TCLASS definitions
- Over-allocated VSAM resources such as DASD space
- Under-allocated VSAM resources such as free space
- Incorrect VSAM CISZ for data and index
- Unused resources such as disabled or never used resources
- Potentially dangerous settings such as SHUTDOWN in transaction/system dumps
- Low thread REUSE in Db2
- Low look-aside hit ratio in LSR.

Gene then looked at some CICS-related issues, some VSAM files/LSR related issues, and some z/OS-related issues that can impact CICS performance.

To get a proper perspective

about the health of your CICS system, Gene said, you need to analyse not only the traditional areas, but also those areas not generally covered by system monitors. He suggested CICS users:

- Develop different checks that apply to their installation
- Separate the conditions found by category
- Too many potentially severe messages may be an indication that the system is severely underperforming
- Some of these situations are another department's responsibility to fix (eg VSAM file definitions)
- Determine how often they should run the Health Checker. Recognize that some conditions don't change and others can appear suddenly.

IBM's z/OS Health Checker is a software package that gathers information about the system environment and parameters to help identify potential configuration problems that could affect the availability and reliability of the system and may possibly result in system outages. It is a z/OS component that helps simplify and automate the identification of potential configuration problems

before they impact system availability or cause outages. CICS Transaction Server supports Health Checker rules that define the best practices for CICS system configuration.

Each CICS TS region runs a system transaction CHCK every 30 minutes to check and report on compliance to the best practices. Every 30 minutes the IBM Health Checker for z/OS provides address space reports on the previous 30-minutes activity. If any region is non-compliant with the best practices, a warning is issued with the details of the non-compliance. There are three CICS health checks supplied for the Health Checker. The Health Checker registered message is shown in Figure 3.

Gene concluded that installations that have expanded the coverage of traditional checks to include additional checks have seen improvements such as: a reduction in the CICS CPU utilization, improvement in the overall CPU utilization, recovery of wasted disk space, reduced physical I/O, recovery of virtual/real storage that can be used for I/O buffers, and improved response times. As a result, some installations have been able to defer upgrades. CICS sites need to identify

which areas they would like to analyse, and develop the codes/actions to check for the conditions identified.

A copy of Gene Hudders' presentation is available for download from the Virtual CICS user group website at virtualcics.hostbridge.com/presentations/CICSHealthCheckMar21.pdf.

You can see and hear the whole user group meeting at <https://youtu.be/mCCMMfLQIQ8>.

Meeting dates

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

- On 11 May, we have James Alexander, Director of Technical Services for HostBridge building a CICS API live! He says: "These APIs are ideal for making CICS applications available as callable web services".
- The following meeting is on 13 July when Colin Penfold, Technical Leader for IBM CICS Transaction Server Security will be discussing, "What's New in CICS Security".

We are using Zoom for the user group discussing "What's New in CICS Security".

CICS news

Infotel has announced Version 2.0 of its Eccox Application Parallel Testing (Eccox APT®) solution, which was designed to quickly spin up developer testing 'containers' on the mainframe. Built for Agile and DevOps methods, Eccox APT accelerates application production on z/OS by running tests in parallel, allowing a team of developers their own 'sandbox' to test and release iterations of their code. Eccox APT can find all the components of a CICS or IMS transaction with a click, and all programs and tables that the transaction uses are cloned in a test container. Mobile application and Internet development teams can create their test tracks of all the CICS or IMS transactions required and work completely independently of the mainframe developer teams.

More information can be found at <https://blog.infotelcorp.com/press-releases/articles/infotel-corp-announces-latest-release-of-its-container-based-eccox-application-parallel-testing-product-for-ibm-z-os-is-generally-available>

Recent CICS articles

Which version of JCICS should I use? by Ben Cox in the CICS part of the IBM Z and LinuxONE Community (4 March 2021). You can find the article at: <https://community.ibm.com/community/user/ibmz-and-linuxone/blogs/ben-cox1/2021/03/04/which-version-of-jcics-should-i-use>

Optimizing Legacy-to-Cloud Integrations.

A recent blog at <https://www.hostbridge.com/optimizing-legacy-to-cloud-integrations/> included a discussion between Russ Teubner, co-founder and CEO of HostBridge Technology and IBM executive Phil Weintraub during a webinar about optimizing legacy-to-cloud integrations. Phil is now the president and lead consultant at Weintraub Systems IT Consulting.

Every enterprise customer HostBridge works with is in the process of integrating legacy applications, most of them running in CICS, with something outside the mainframe. HostBridge provides integration software that makes CICS apps available as services via RESTful APIs. HostBridge understand the spectrum of legacy integration solutions

HostBridge is now offering services, support, expertise, and even free pilot software to help organizations rapidly make CICS applications available.

very well, their pros and cons, costs and benefits.

In recent years, and with increasing frequency, HostBridge is seeing enterprises experience sub-optimal performance on the mainframe that is a direct result of integration technology choices. As businesses race to include mainframe applications in their hybrid cloud strategies, optimizing legacy-to-cloud integrations is imperative. Integration using APIs offers lower costs and greater performance because of the loose coupling they create.

Phil and Russ agreed that the recipe for success in optimizing legacy-to-cloud integrations begins with analysis. Weintraub Systems starts at the top by looking at IT strategy. HostBridge starts at the bottom by using SMF 110 data to look at cloud-mainframe interactions. They bring their analyses together to present clients with a report and plan for optimization.

Q: Does the analysis of SMF 110 records cover the whole

trip from end-user to CICS transaction?

Russ: SMF records by default don't contain this information. However, what we provide with our analytics offering is software that runs inside CICS. It looks at the requests that come in and extracts bits of metadata about them, saving it in the SMF 110 records.

Imagine that you have a lot of HTTP traffic coming in and one of the headers, perhaps, on that HTTP request is a correlation ID. There's nothing in CICS that automatically extracts that and then includes it in the SMF data. That's part of what we're doing. So, while the SMF 110 record only covers the transaction that ran inside CICS, we enrich that SMF 110 record with correlation or requests-specific data. We can then use Splunk to match it up with other log data from the distributed system. In this way, we create a complete end-to-end picture of what's going on.

Q: How do we measure distributed parts of hybrid transactions? We are currently flying blind in this area.

Russ: What we see in most large organizations is something like this: a request comes in from the hybrid cloud. That

request will cause CICS transaction A to run, then it's going to run CICS transaction B, so you have this long chain of events occurring. Remember that metadata I said we extract from incoming or outgoing requests? In our approach, CICS automatically includes it as part of the origin data or transaction tracking data. Thus, the correlation information follows each of the dependent transactions.

As a result, when we ingest this data into Splunk, we can literally stitch all the transactions together and see where requests are coming from. Let's say it's a WebSphere server request, or maybe it came in through MQ, HTTP, or even a 3270 data stream. Whatever its source, we're able to show you an end-to-end picture of the hybrid transaction by virtue of having annotated the SMF records with origin data and metadata.

Q: What are the main reasons that drive an application to be targeted for API enablement?

Russ: From the top down, it's an issue of strategic intent. If an application is part of your demand chain or supply chain interactions, it probably falls into the category of critical application infrastructure. Such applications run

the business, have high-availability requirements, and therefore need high-performing, reliable integration solutions. These are the kinds of applications that most benefit from making them available via an API.

In our work with customers, we usually see repetitive interaction patterns with these applications. With one customer, we observed that every morning, every sales rep clicked a “Refresh” button in a particular spreadsheet. They then went for coffee because when they clicked the button, a macro ran about four to five thousand CICS transactions. This volume of interaction between a client spreadsheet and your mainframe is a good indicator of need to wrap an API around that process. This interaction pattern – a flurry of interactions back and forth – is highly inefficient and generates latency like crazy. I might just add one more thing. We’ve done so much work. I’ve mentioned 3270 terminal emulation and screen scraping as an integration technique. There’s just so much of that still out there. So much so that we’ve actually built particular technology, based around Splunk, to be able

to deduce what we call the DNA, of these robotic or automated processes. When we run your SMF 110 data through our process, we’re able to see the sequence of the flow of the automation. Our objective is to show the DNA at such a level so that an application subject matter expert can look at it and have an “Aha!” moment.

A lot of these RPA bots or Excel macros were developed for a good reason. Someone thought that was easier to write an Excel macro or a bot than call up the IT department and say, “Gee, I’d really like this functionality.” A decade later, we’re still running those macros. Our dashboards will show you the DNA of these automated processes. From there, it’s almost child’s play to make decisions about where the top optimization priorities are.

Read the full transcript on the HostBridge Technology website.

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 virtualcics.hostbridge.com 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.

The Virtual CICS user group is free to its members.