Virtual CICS user group: Newsletter 5

Welcome to the Virtual CICS user group newsletter. The Virtual CICS user group at 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 TS Performance – Tuning LSR Pools", and was presented by Eugene S Hudders, president of C\TREK Corp.

Eugene developed C\TREK, a CICS performance tuning and problem determination tool that facilitates and simplifies the job of the systems programmer.

He joined the MIS industry in 1965, and has been working with mainframes ever since. In spite of his many duties, he's found the time to write several books and many articles on CICS and VSAM tuning. Many technical conference sponsors have invited him to give presentations on these and other topics..

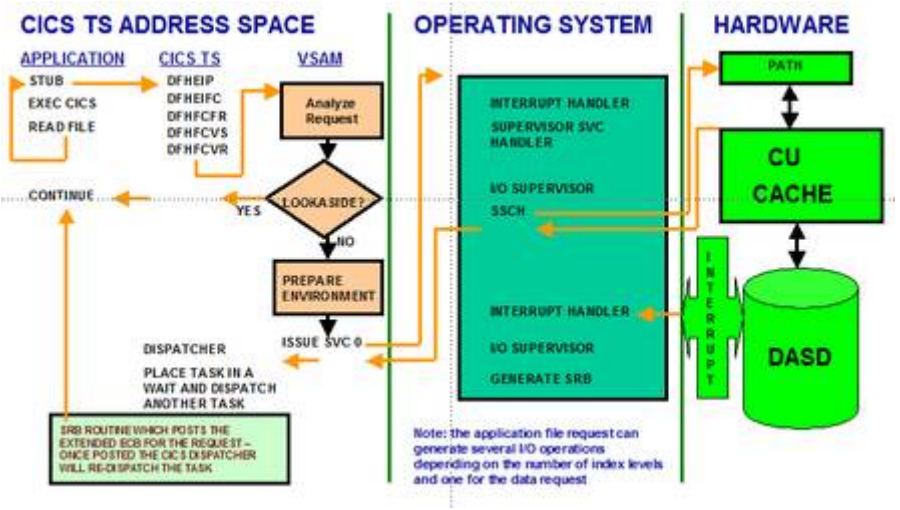

Figure 1: The very big I/O picture

Gene told the user group that CICS uses two techniques to handle VSAM files within CICS TS – Non-Shared Resources (NSR) and Local Shared Resources (LSR). In recent years, new VSAM features announced for CICS have been LSR oriented

Gene informed us that the major difference between the

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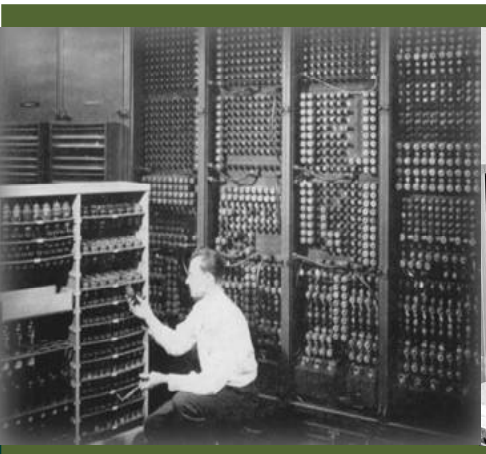

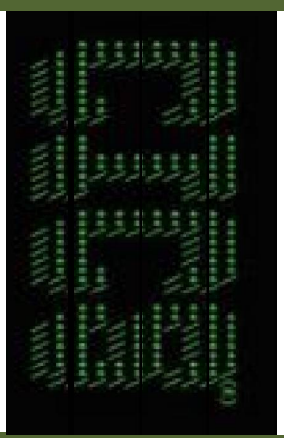

two techniques lies in the "ownership" of the resources – NSR resources are used exclusively by the file, whereas LSR resources are shared between participating files.

Gene explained that I/O generates CPU usage. It goes from CICS to VSAM to the SVC Handler to IOS, which will start the I/O and eventually back to CICS to have task wait, then process I/O interrupt, create SRB, dispatch the SRB to Post Completion. Finally to the CICS Dispatcher that dispatches the task when its turn occurs. This is illustrated in Figure 1.

To improve response time and reduce CPU overhead, you need to eliminate I/O. Finding the data/index in a buffer is called a Look-Aside Hit. The CPU requirements for a Look-Aside Hit is much lower than for a full I/O operation.

For read operations the VSAM I/O cost is not included because the necessity to access DASD is workload dependent. For the read operation to complete, both the index and data must be accessed. If neither the index nor the data is in a buffer, an I/O must be done for each level of index and one for the data. The relative number of instructions, in 1K instruction counts, for the I/O for each file type is 9.5 for a KSDS and an ESDS, and 8.2 for an RRDS – according to the IBM CICS Performance Guide CICS TS V4.R2.

Tuning LSR files is based on simply applying the Robin Hood theory in reverse – Gene said. In Sherwood Forest, Robin stole from the rich and gave to the poor. With LSR you steal from the poor to give to the rich! In this case the 'poor' are low to medium activity files, and the 'rich' are the most active files. In other words, the major contribution that low-activity files provide to LSR are their resources, so that higher activity files can use them – the cruel reality.

The advantages associated with LSR include:

- More efficient VS use because resources are shared.
- Better look-aside because buffers can maintain the Sequence Set Index records.
- Tends to be more self-tuning because buffers are allocated on an LRU basis, keeping information of the more active files in the buffers at the expense of less active files.
- Only one copy of a CI allowed (better read integrity).
- Can allocate up to 255 pools to segregate files (V4.R2 – prior releases 8).
- Supports Transaction Isolation (TI).
- Supports VSAM Threadsafe (local VSAM).

Gene provided the group with a number of recommendations for Pool definitions:

- Define LSR Pools explicitly.
- Determine individual file requirements – data and index (if applicable) CISZ required; specify maximum length key, and strings.
- Get "big picture" of requirements – using CICS Performance Tool/Monitor, CICS Statistics (EOD), and Dynamic Definition (once).

Gene highlighted some overlooked LSR tuning areas, particularly buffer fragmentation. He reminded us that VSAM has 28 different CI sizes available, but there are only 11 valid CISZ for LSR buffers (K) (0.5, 1.0, 2.0, 4.0, 8.0, 12.0, 16.0, 20.0, 24.0, 28.0, and 32.0). Therefore, a 2.5KB CISZ would use a 4K LSR buffer. If a 4K buffer was not available, the next largest available buffer Is used. Gene noted that some fragmentation may be desired for certain CISZ (eg non-VSAM/E – 18.0K).

Gene went on to say that we should avoid unnecessary fragmentation (eg a 6K CISZ using a 12K buffer instead of an 8K buffer). Certain default Index CISZ should be forced to an LSR CISZ (eg 1536 to 2048 or 2560 to 4096). Virtual fragmentation results in real storage fragmentation.

Next Eugene Hudders looked at LSR buffer versus file CISZ reconciliation, suggesting it was the best alternative to reducing fragmentation. He suggested determining file CI sizes required and assigning LSR Pool buffers to match (looking at the number and size of the buffers, and the number of strings overall). He suggested setting CISZ standards (where possible) for LSR Pool files – a complex task, if done manually. Gene informed us that some installations simply define a certain number of buffers for every possible buffer size (all 11). This is a mistake.

Suppose you don't have any 16K buffer users (CISZ range Is 14K and 16K files). You determine that you want to have 20 16K buffers defined (320K) just in case one day you get a 14K or 16K file. This allocated storage will not be used – it's wasted storage every day of the year. Instead, simply define 16 20K buffers (320K) (or next useable size) that will be used every day!

Another overlooked area is multiple pool considerations. With data tables, the output operations go against the VSAM file. The LSR pool used for Look-aside for records before going to disk is 90%+ read operations – as a rule of thumb.

As the objective is to have 90%+ of the requests found in the table, the probabilities that the record would be found in an LSR buffer is low because of the low activity to the LSR pool.

So, a separate pool for data table files is recommended so that the competition for the buffers is from other low activity files

When it comes to LSR VSAM threadsafe files, which became available in CICS TS V3.2, only one pool can be accessed at a time without VSAM Threadsafe – operations occur on the QR TCB and are single threaded.

Having multiple pools does not represent parallel access to pools. VSAM threadsafe uses a lock mechanism to protect the file and pool integrity. Because file requests may be coming from different tasks on different TCBs, the use of a single pool may cause tasks to wait.

The lock mechanism may require more distribution of files to different pools to allow for simultaneous requests – Parallel Access.

Where you have an FOR, a single pool is better because no VSAM threadsafe is available (FCQROLY=YES). Note: IPIC connections are threadsafe.

Gene explained that LSR provides the best Look-aside algorithm within CICS. Generally, files (high, intermediate, and low activity) should be assigned to LSR except Shareoption 4 files; files that do not follow command-level guidelines (Start Browse, Read Next …Read for Update – Non-RLS); high CA split activity files (tune these independently).

LSR Is the gate to new file features within CICS. LSR is preferred over NSR buffering. And it provides a superior Look-aside hit ratio

Tuning LSR Involves:

- Ensuring the proper number of buffers are defined (achieving installation Look-aside hit ratio goals)
- Eliminating fragmentation
- The static definition of the pool(s).

Gene told us that there needs to be continuous review – especially when major application changes occur; and VSAM tuning is vital.

In conclusion, Gene's advice was to:

- Use LSR over NSR
- Tune to eliminate I/O – Look-aside hits
- Monitor file statistics periodically to ensure that Look-aside hit ratio objectives are being met
- When tuning LSR remember Robin Hood!

A copy of Gene's presentation is available for download from the Virtual CICS user group Web site at www.fundi.com/virtualcics/presentations/TuningLSRFilesNov11.pdf.

You can see and hear the whole user group meeting by downloading the WMV file from www.fundi.com/virtualims/presentations/2011-11-08meeting.wmv.

Meeting dates

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

- 17 January 2012 – Eugene Andrew Smithson, CICS Transaction Gateway Development Software Engineer, IBM Hursley. "*CICS Transaction Gateway V8.1*".

  CICS Transaction Gateway is IBM's market-leading connector, production proven in over a thousand customers for enterprise modernization of CICS assets. In this presentation we will look at the new features introduced with the recently released Version 8.1 and how the CICS Explorer can be used to manage your CICS Transaction Gateway instances.

  To register for this meeting you need to go to https://www1.gotomeeting.com/register/153618953.

- The next meeting is on 13 March 2012. The details are still to be confirmed.

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

All meetings start at 10:30 Central Time (4:30 GMT in the winter and 3:30 GMT during daylight saving time).

Recordings of meetings are available for download from our Web site for people who were unable to attend the meeting.

Recent CICS articles

Rational Team Concert Breathes New Life into the CICS Transaction Server by Kevin Bowkett, Nigel Hopper, and Phil Anselm in *IBM Systems Magazine* (November 2011). You can find the article at www.ibmsystemsmag.com/mainframe/administrator/cics/CICS_RTC/.

CICS Event Processing: Meeting the Needs of Your Business by Anthony Papageorgiou in *z/Journal* (October/November 2011). You can find the article at www.mainframezone.com/it-management/cics-event-processing-meeting-the-needs-of-your-business.

CICS Nostalgia: The Way Things Were by Phyllis Donofrio in *z/Journal* (October/November 2011). You can find the article at www.mainframezone.com/it-management/cics-nostalgia-the-way-things-were.

CICS news

DSI Document Systems (DSI) has announced SysQManager, which dynamically creates and manages CICS extra-partition Sysout Transient Data Queues (TDQs).

SysQManager automatically manages CICS TDQ output, thereby eliminating the risk of non-stop CICS processing generating Sysout TDQs that could interfere with 24x7 CICS operation. SysQManager includes Critical Message Alert Detection, which can be set to e-mail notify designated users. DSI has also refreshed BatchCICS-Connect for real-time interfacing to CICS via batch. More information can be found at www.dsisolutions.com/products/sysqmanager/.

Progress Software has announced Version 2.0 of its Progress Responsive Process Management (RPM) suite. The Progress Control Tower interface is a browser-based interactive interface that can be accessed on an Apple iPad anywhere with Internet connectivity. Users can monitor, manage, analyse, and also act on information stored across a variety of data sources, including IBM mainframe CICS, Tibco, Oracle, FUSEsource, and SAP environments. Progress RPM suite uses Progress Actional interceptors to gain access into IBM CICS/MQ mainframes, Tibco Activematrix BusinessWorks, SAP ABAP, and Lombardi TeamWorks facilitating real-time cross platform visibility without additional mainframe costs. Full details can be found at www.progress.com/en-gb/inthenews/progress-software-un-49682.html.

New Era Software has a free download for auditors called "Auditing CICS - A Beginner's Guide". Full details can be found at www.newera-help.com/CICS-Essentials.html.

Voltage Security has announced Voltage SecureData z/Protect, which makes encryption easier. Mainframes running CICS, IMS, DB2, and batch can now add native encryption. Full details can be found at www.voltage.com/pressreleases/PR111011-Voltage-Security-Simplifies-Modern-Encryption-for-zOS.htm.

Don't forget that you can stay up-to-date with all that's happening in the CICS world and with what's happening with the Virtual CICS user group by following us on Twitter or finding us on Facebook or joining our group on LinkedIn.

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 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.