Virtual IMS user group: Newsletter 22

Welcome to the Virtual IMS user group newsletter. The Virtual IMS user group at www.fundi.com/virtualims is an independently-operated vendor-neutral site run by and for the IMS user community.

Virtual IMS user group presentation

The latest webinar from the Virtual IMS user group was entitled, “IMS Database Performance – Could have, Should have, Would Have”, and was presented by Rosemary Galvan, Principal IMS Software Consultant with BMC Software.

Rosemary told the user group that she would review various performance statistics that could be monitored to determine database health. She would then focus on what statistics to look at and why. And finally, she would see what could simplify database performance monitoring.

The first thing that most sites monitor are CI/CA splits. These occur in VSAM KSDSs, not in VSAM DEDBs. Many sites use IDCAMS LISTCAT option to

```
ATTRIBUTES
KEYLEN----------19 AVGLRECL----------330... CISIZE----------2048
RKP----------0 MAXLRECL----------330... CI/CA----------315
SHROPTNS(2,3) RECOVERY SUBALLOC NOERASE EXTRALARGEINDEXED
NOWRITECHK NOIMBED NOREPLICAT UNORDERED NOREUSE NONSPANNED
STATISTICS
REC-TOTAL--------3916753SPLITS-CI----------7960   EXCPS----------163738140
REC-DELETED---------4155 SPLITS-CA----------1576  EXTENTS----------19
REC-INSERTED-----1622557 FREESPACE-%CI----------0 SYSTEM-TIMESTAMP:
REC-UPDATED--------32262 FREESPACE-%CA----------0 2007.183 02:01:48
REC-RETRIEVED--378842242 FREESPACE---------150570 X'C0D47CA4D42B836A'
ALLOCATION
SPACE-TYPE------CYLINDER
SPACE-PRI----------800  USECLASS-PRI----------0 HALRBA-OR-CI--2000370500
SPACE-SEC----------500  USECLASS-SEC----------0 HUSRBA-OR-CI--2000219930
```

About 2 gig dataset
Within 99% of that limit

*HiUse / HiAlloc * 100 = %*
*2000219930/2000270500*100=99%*

Figure 1: Example LISTCAT output

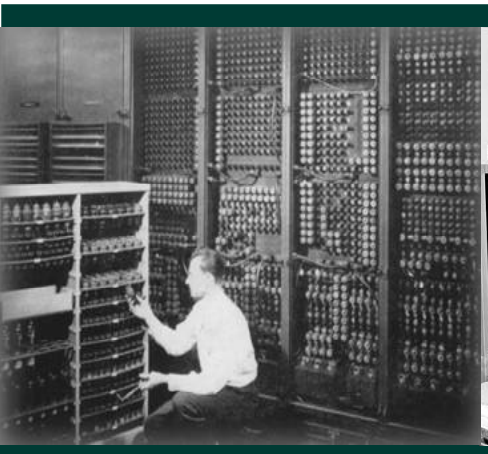
displays the number of CI/CA splits. Typically a high number of CI splits or almost any CA splits mean it’s time for a REORG.

The trouble isthat only one index may become fragmented, yet a REORG of everything is an unnecessary, lengthy outage.

The maximum number of database dataset extents for OSAM is 60, for VSAM it’s 255, and for DEDB is 0.

Rosemary went on to look at space usage and what to monitor. She suggested keeping an eye on how close

Contents:



to the 4GB VSAM limit or 8GB OSAM limit things were. She noted that for DEDB the figure is almost unlimited.

Rosemary suggested scheduling purge jobs to delete or archive off data from a database to keep it within limits. Another option is to compress the database. If a database continues to grow, other alternatives may need to be considered, such as database partitioning.

It can also be a good idea to monitor the available free space. Normal update activity reduces the free space available for new data over time. IMS tries to place new data in a convenient location, but as free space becomes scarce, data is spread across multiple locations or placed at the end. As databases become unorganized, additional I/Os are required to access data, which slows down applications trying to access this data. Regular REORGs maintains the health of a database, but mustn't occur too often because that impacts availability or wastes resources.

Bit maps keep track of free space in the database (usually shown as *s and blanks or 1s and 0s). Just by looking at it, an IMS professional can see whether there's enough space in a CI or OSAM block to hold the largest segment defined for the database.

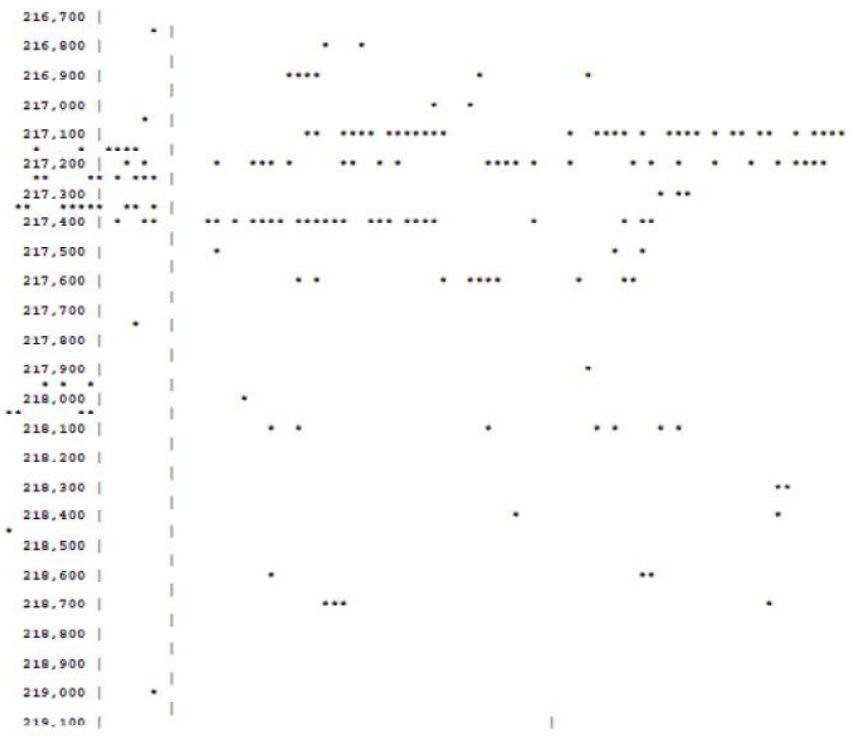


Figure 2: Example bitmap output

Rosemary went on to look at DEDB space, and asked why you'd reorganize. She suggested it might be simply to eliminate fragmented Free Space Elements (FSEs) and scraps in the Root Addressable Area (RAA). It might also be to move as many segments as possible from independent overflow (IOVF) into their respective RAA or DOVF control intervals (CIs). It can also reclaim space, re-sequence roots, and control segment placement.

When it comes to DEDB performance, useful questions to have answers to include:

- Does the UOW extend into the IOVF?
- Is UOW fragmentation over a specified threshold?
- Can reorganization of the UOW save a specified amount of IOVF?

Monitoring the health of a database is challenging. HDAM and DEDB tuning involves several parameters like:

- Block size, RAA size, RAPS parameter, CIs, UOWs

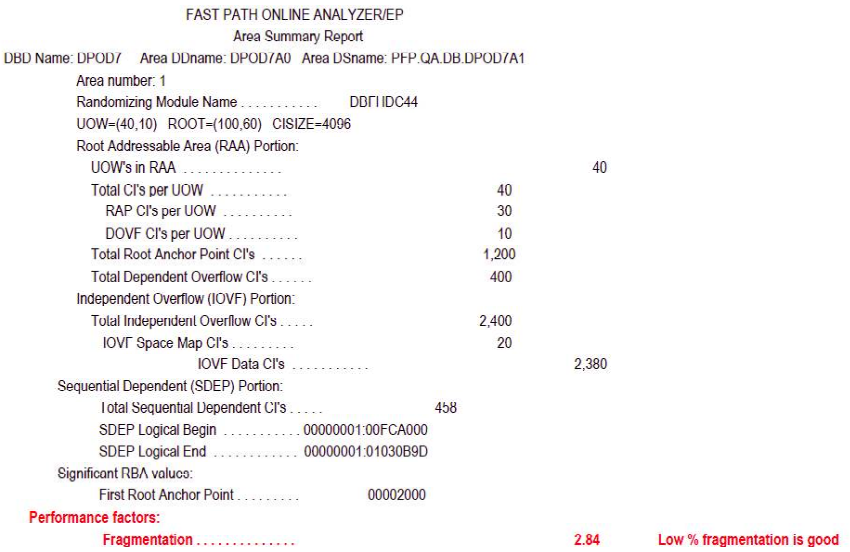
There are lots of reports available to indicate

something is wrong, but no report tells you what to change. By the time you look at a report and notice something is wrong, you may have already missed your REORG window.

Rosemary informed the user group that database performance monitoring is rarely done because it is a tedious, time-consuming, manual process, and a strain on staff resources. Lots of database statistics and performance metrics are obtained when database utilities execute, but who has time to review the data? At too many sites, groups of dedicated performance experts are reduced to one, and then none. Maintaining database performance becomes just another responsibility for the DBA, and IMS-only DBAs are rare.

Rosemary added that there are two approaches to database performance monitoring – reactive and proactive. If they're reactive, they wait until end users complain about poor response. If they're proactive, they'll REORG as often as possible. In the past, databases were monitored to avoid unnecessary REORGs and the lengthy associated outage.

The good news is that database utilities have evolved over time and provide



```
                    FAST PATH ONLINE ANALYZER/EP
                          Area Summary Report
DBD Name: DPOD7    Area DDname: DPOD7A0   Area DSname: PFP.QA.DB.DPOD7A1
        Area number: 1
        Randomizing Module Name . . . . . .      DBFHDC44
        UOW=(40,10)  ROOT=(100,60)  CISIZE=4096
        Root Addressable Area (RAA) Portion:
          UOW's in RAA . . . . . .                                  40
          Total CI's per UOW . . . . . .              40
            RAP CI's per UOW . . . . . .              30
            DOVF CI's per UOW . . . . . .             10
          Total Root Anchor Point CI's . . . . . .    1,200
          Total Dependent Overflow CI's . . . . . .   400
        Independent Overflow (IOVF) Portion:
          Total Independent Overflow CI's . . . . .   2,400
            IOVF Space Map CI's . . . . . .           20
                  IOVF Data CI's . . . . . .                        2,380
      Sequential Dependent (SDEP) Portion:
          Total Sequential Dependent CI's . . . . .          458
          SDEP Logical Begin . . . . . 00000001:00FCA000
          SDEP Logical End . . . . . 00000001:01030B9D
      Significant RBA values:
          First Root Anchor Point . . . . . 00002000
Performance factors:
          Fragmentation . . . . . .                         2.84    Low % fragmentation is good
```

Figure 3: Example fragmentation analysis

capabilities for near online and online REORGs

Naturally, coming from BMC Software, Rosemary suggested that there were products available that encapsulated the knowledge of an IMS database expert and made that knowledge available to less experienced users.

A site would get proactive monitoring of database health. The metrics gathered would be stored in a repository for history, trending, and forecasting. DBAs would be notified of exceptions and provided with recommendations for resolution. In addition, suitable software wouldn't just tell users that the database needed to be re-sized but would also provide information on what to change – for example conditional REORGs. There would be no wasted CPU cycles on unnecessary REORGs.

A copy of Rosemary's presentation is available for download from the Virtual IMS user group Web site at `www.fundi.com/virtualims/presentations/CouldWouldShouldOct11.pdf`.

You can see and hear the whole user group meeting by downloading the WMV file from `www.fundi.com/virtualims/presentations/2011-10-11meeting.wmv`.

Meeting dates

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

- 6 December – Suzie M Wendler, IBM, will be talking about "IMS 12".
- 7 February 2012 – Neil Price, TNT Express, will be talking about "Memoirs of a HALDBA".

Recent IMS articles

Optimize IMS Performance and Availability Using OTMA and Shared Queues by Ben Johnson, Dave Cameron, and Jack Yuan in *IBM Systems Magazine* (September 2011). You can find the article at `www.ibmsystemsmag.com/mainframe/administrator/ims/Optimize-IMS-Performance-and-Availability-Using-OT/`.

Does My IMS Data Make Me Look Fat? by Nick Griffin and Kathy Klimpel in *zJournal* (October/November 2011). You can find the article at `www.mainframezone.com/it-management/does-my-ims-data-make-me-look-fat`.

The Arcati Mainframe Yearbook 2012

The Arcati Mainframe Yearbook is collecting data for its current survey of mainframe users. You can find the survey at:

`www.arcati.com/usersurvey12`

The survey results and conclusions will be published early in 2012.

IMS news

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

CONNX Solutions has announced CONNX 11 SP3, which introduces a metadata comparison tool that facilitates the migration of metadata from test, to development, to production. Additionally this release includes several enhancements for VSAM, Adabas, and IMS. An additional method to import metadata for IMS has been added that enables customers to use an Index Text Specification file rather than the IBM IMS Library Integrity Utilities for zOS. More information can be found at `http://www.connx.com/products/connx11.html`.

About the Virtual IMS user group

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

The Web site at www.fundi.com/virtualims 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 IMS practitioners. Anyone with an interest in IMS is welcome to join the Virtual IMS user group and share in the knowledge exchange.

To share ideas, and for further information, contact trevor@itech-ed.com.

The Virtual IMS user group is free to its members.