Virtual IMS user group: Newsletter 32

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, “Taking IMS to new heights – what the future holds for IMS”, and was presented by IBM’s IMS Chief Architect, Betty Patterson.

Betty is an IBM Distinguished Engineer and IMS Chief Architect and is responsible for IMS architecture and design. She joined IBM as a programmer working on the development of IMS after earning her Bachelor of Science degree in computer science from California State University Sacramento. Betty was named an IBM Master Inventor in 2007 and elected to the IBM Academy of Technology in 2009. She has a long history of leadership and innovation in driving the transformation of IMS’s capabilities, especially in the areas of system management, automation, operations, parallel sysplex, and shared message queues. She led the design and development for new components and interfaces to allow multiple IMS systems running in a parallel sysplex to be managed from a single point of control.

Betty Patterson started by introducing IMS 13, and saying it was smarter than ever. IMS 13 has the highest efficiency and the lowest total cost of ownership.

In terms of reducing costs:

- Cross-platform focus on reducing mainframe software costs
- Major focus on reducing CPU usage

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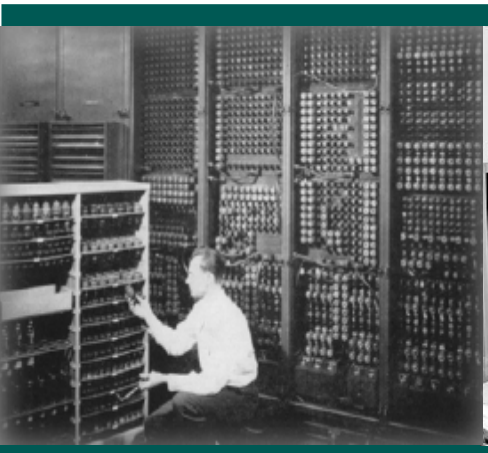

Virtual IMS USER GROUP

- Changes throughout IMS to improve performance, reduce storage usage, and reduce CPU used to run IMS:
  - Using more efficient storage services
  - Improved algorithms
  - Reducing pathlength
  - Optimizing frequently used processes
  - Latch / lock improvements
  - Storage reductions
  - Use of System z hardware functions.

Benefits include:

- Improved performance, lower cost per transaction, reduced cost of ownership.

Specific reduced TCO enhancements highlighted by Betty were:

- IMS logger LOG latch contention reduction:
  - Improves usage of log latch and log buffer management for increased logging bandwidth and more efficient processing.
- Shared Queues local first optimization now applies to program-to-program switch messages as well as ordinary input messages:
  - Avoids false scheduling on another IMS when the local IMS can process the program-to-program switch message.

- Exploitation of pageable 1M pages:
  - Based on usage of new zEC12 processors with Flash Express storage and z/OS 1.13 (Dec 2012)
  - Provides improvements in dynamic address translation and usage of translation lookaside buffer (TLB).
- DB Space Management Block Serialization Latch Improvements:
  - Split from single to multiple latches to improve heavy BMP workloads.
- Memory Data Set ENQ Management Exploitation:
  - More efficient memory-based data set ENQ management improves allocation of large number of data sets
  - Must be enabled in z/OS ALLOC*xx* SYS1. PARMLIB member

`SYSTEM MEMDSENQMGMT(ENABLE|DISABLE)`

Other reduced TCO enhancements INCLUDE:

- OTMA YTIB chain changed from a single linked list to a hash table, to improve FINDDEST performance.
- Convert OTMA and IMS Connect STORAGE calls to CPOOL
- Remove unnecessary clearing of OTMA buffers
- DFSCPY00 improved SVC directory entry search algorithm and removal of IVSK instructions.
- CQS mainline modules changed to use branch-relative branching
- Cache efficiency improvements (DPST blocks packed into a single IPAGE to keep cache references localized)
- IMS page load service algorithm optimization
- IMS dispatcher optimizations
- OSAM CML Lock Reduction
- General instruction optimization (replacing STCK with STCKF, long

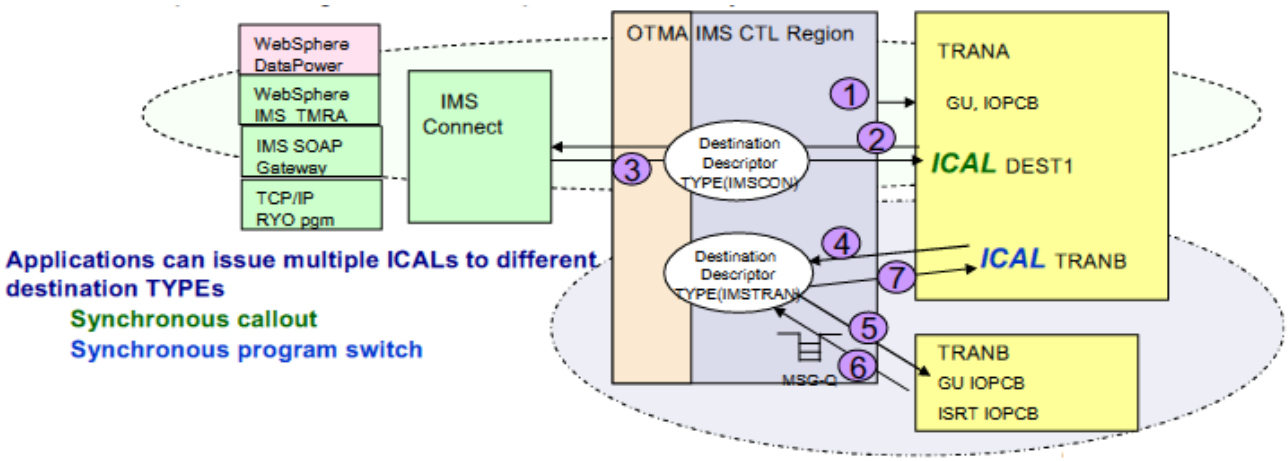

Figure 1: Synchronous Program Switch (IMS 13)

displacement facility exploitation)

- IMS cache manager spin loop elimination.

OTMA early termination notification allows Open Transaction Manager Access (OTMA) to leave the XCF group earlier in the termination processing. It notifies OTMA clients (IMS Connect, WebSphere MQ, OTMA Callable Interface) of the termination via their XCF Group Exit. Clients can then route requests to other systems, which addresses issues associated with transaction messages being accepted but not processed.

The benefits include autonomic enhancement for higher availability that allows OTMA clients to be informed of an IMS shutdown in order to choose more timely alternatives. It potentially reduces unsuccessful attempts to send in new requests and can expedite shutdown processing.

The System Definition macro SECURITY is no longer used as part of the IMS system generation process. You specify security settings through PROCLIB members' RCLASS parameter added to DFSPB*xxx*. RCLASS is also supported in DFSDC*xxx*. The DFSPB*xxx* RCLASS parameter value overrides DFSDC*xxx* if both are specified. The SECCNT parameter has been added to DFSDC*xxx*. Other security settings continue to be specified in DFSPB*xxx*, including SECLVL (parameter is replaced by RCF, TRN, and SGN in DFSPB*xxx*) and TYPE (parameter is replaced by ISIS in DFSPB*xxx*). The benefits are a simplified system generation process, and an easier method to update security-related settings.

When it comes to preconditioning IMS 11 and 12 for SECURITY change:

- New parameters were introduced to IMS 11 and IMS 12.
- Allows preconditioning by specifying new security settings prior to IMS 13 – RCLASS added to DFSPB*xxx* – SECCNT added to DFSDC*xxx* – IMS 11 - PM48203 / UK74050 ; IMS 12 - PM48204 / UK74051
- If specifying RCLASS in DFSPB*xxx*, the following APARs avoid an unnecessary error message – IMS 11 PM72199; IMS 12 PM73558.

The benefits are a simplified migration process and an easier method to update security-related settings.

Security User Exits removed

Figure 2: Asynchronous Callout to WebSphere MQ via MQ Bridge

from nucleus include:

- User exits DFSCSGN0, DFSCTRN0, and DFSCTSE0 are now linked separately, loaded from STEPLIB (if present) into 31-bit storage.
- New DFS1937I message indicates which user exits have been loaded – can be used in automation to ensure that exits are being used
- DFSCSGN0 now called at IMS initialization – storage can be obtained and shared with the other exits.

The benefits are that it simplifies the process of customizing IMS with user exits (simplifies writing of user exit DFSCSGN0) and reduces 24-bit private virtual storage usage.

/DIAGNOSE command enhancements mean:

- Users can now send formatted /DIAG SNAP command output to a SYSOUT data set, enabling easy submission to IBM support
- SYSOUT data set will contain documentation that is:
  - Formatted and readable
  - Easy to retrieve
- SHOW() support added for LTERM, NODE, USER
- BLOCK – can now specify multiple single instance blocks and more block types can be snapped
- More blocks can be snapped for DB, LINE, LINK
- Support added for MSNAME.

The benefits are improved time to effort to capture diagnostic information and reduced time needed to resolve problems.

In terms of IMS 13 integration, there is a new option that supports TCP/IP network connectivity for Intersystem Communication (ISC) connections:

- IMS TM – CICS
- Supports both static and dynamic terminals
- Leverages IMS Connect
- Uses Structured Call Interface (SCI) to communicate between IMS and IMS Connect
- Requires CICS Transaction Server for z/OS 5.1.

The benefits are that it provides a strategic protocol alternative to SNA/VTAM, allowing an all-inclusive TCP/IP solution for networks.

Synchronous Program Switch extends IMS Synchronous Callout to invoke another IMS application. Synchronous flows use DL/I ICAL, asynchronous flows still use DL/I ISRT. The OTMA Descriptor defines the destination.

This provides a single DL/I call to request a synchronous service regardless of where that service resides, and it simplifies integration and improves usability – see Figure 1.

Asynchronous Callout to WebSphere MQ via MQ Bridge uses OTMA Descriptor enhancements. The new TYPE=MQSERIES defines a WebSphere MQ destination. It provides asynchronous callout and messaging support (DL/I ISRT ALTPCB) – a new option allows exits to be called to override the descriptor. It applies to all destination descriptors.

This eliminates the need to write an OTMA user exit to recognize an MQ destination, and simplifies integration and improves usability – see Figure 2.

IMS 13 allows Java Dependent regions to use the External Subsystem Attach Facility (ESAF). It allows connections for DB2 to be consistent across all region types. It allows access to other subsystems such as WebSphere MQ. It eliminates the need to use z/OS Resource Recovery Services (RRS) Attach for DB2. See Figure 3.

The benefits are that it allows JMS access to MQ from Java. It allows MQ access from COBOL and PL/I. It simplifies external subsystem definitions. And there's improved performance for DB2 due to eliminating extra signon processing.

Among IMS 13's core capabilities is High Availability Large Database Alter. This allows users to change the structure of an IMS High Availability Large Database (HALDB) without a DB outage. Users can add a new field to space at the end of an existing segment, increase the length of an existing segment, and define new fields that redefine (overlay) existing fields and space in an existing segment

It's built on HALDB Online Reorganization, so no unload/reload required:

```
- INIT OLREORG NAME(mas-
terdb) OPTION(ALTER)
- TERM OLREORG Benefits
```

It improves IMS HALDB availability by providing structure changes without taking the database offline, and provides flexibility in rolling database changes into the system.

The Fast Path Data Entry Database (DEDB) Alter allows DEDB Area changes without an unload/reload of the area. It allows dynamic change for UOW and ROOT parameters of an existing Area. It replaces the randomizer

It provides new DEDB dynamic change utility that runs as a standard Fast Path utility, and the area remains online

It requires the use of a two-stage randomizer allowing Areas to be processed individually. It supports Virtual Storage Option (VSO) Areas if /VUNLOAD is done before DEDB Alter is executed

The benefits are that it improves DEDB Area availability by providing definitional changes without taking the Area offline, and it provides flexibility in rolling Area changes into the system.

Database Versioning allows programs to use different versions of the same physical database, providing multiple views of the physical data maintained in the IMS Catalog. Existing applications can remain unchanged when the physical structure of the database changes. Users can recompile just those programs referencing changed fields/segment. This applies to Full Function DB, HALDB, Fast Path DEDB. It supports HDAM, HIDAM, PHDAM, PHIDAM, and DEDB databases.

Figure 3: IMS Java Dependent Region use of ESAF

Database Versioning supports the following database structure changes for all supported database types:

- Increasing the length of a segment
- Adding a new field to space at the end of a segment – For Full-Function and HALDB database types
- Adding new field(s) that remap existing field(s) and space at the end of a segment.

It provides greater flexibility in rolling out new versions of programs and databases, and allows new programs to get out faster without waiting for all programs to be updated to the new database structure.

The limit of concurrent application threads has been increased to 4095. The limit applies to the total number of combined Dependent Regions, CICS/DBCTL threads, and Open Database Access (ODBA) threads. It follows a change to the MAXPST parameter on IMS control region

It provides increased capacity and scalability for IMS systems, allows vertical growth, and provides more dependent regions for use with synchronous callout and program switch.

Refreshable User Exits mean that users can refresh user exits without an IMS system outage, and defines exit "types" to support a list of exit names. This improves availability and simplifies user exit management.

IMS Connect Enhancements mean users can dynamically CREATE IMS Connect resources through commands for PORT and DATASTORE.

Benefits include reporting of overall health to Workload Manager (WLM), configurable TCP/IP backlog (queue) size, automatically refresh cached userids by listening to RACF events (ENF signals), and expanded Recorder Trace Records for external trace. It provide better resiliency, and make IMS Connect easier to use and manage.

Enhancements specifically for IMS SOAP Gateway users include:

- Query support for XML Converters
- Ability to increase the number of Converters that can be loaded
- Automatic restart of the Language Environment when an XML converter ABENDs
- Automatic refresh of the BPE User Exit for the XML Adapters after the ABEND limit (ABLIM) has been reached.

The benefits include providing better resiliency, and improved efficiencies during error conditions. It eliminates IMS Connect restart and user interactions.

In conclusion, Betty said the IMS Strategic Objectives were to reduce Total Cost of Ownership, reduce MIPS usage, and use advanced autonomics, so IMS is self-managing and self-tuning

IBM wants to extend IMS's lead in availability, scalability, and performance. To consistently deliver IMS capacity limits that are well beyond customer needs. To provide IMS performance metrics that help users grow their business securely. To extend the life-cycle of IMS applications and transactions, and enable high-volume transaction processing for the next wave of applications (Big Data, next gen Web Services, Cloud, Mobile, and more).

A copy of this presentation is available for download from the Virtual IMS user group Web site at www.fundi.com/virtualims/presentations/IMS13Jun13.pdf.

You can see and hear the brief user group meeting by downloading the WMV file from www.fundi.com/virtualims/presentations/2013-06-11meeting.wmv.

Meeting dates

- 6 August 2013, Wayne Morton, Rocket Software will be discussing "Putting IMS/DB in Business Analytics / Intelligence".

IMS news

IBM has announced the IBM Enterprise COBOL for z/OS V5.1 compiler, which works with the latest versions of IMS, CICS, and DB2. It's expected to be available later this quarter. The new software: provides support for Java 7, new UTF-8 built-ins, debugging enhancements, and support for unbounded tables and groups; supports a new level of z/OS System Management Facilities (SMF) tracking, which allows users who implement sub-capacity tracking to reduce their administrative overhead; Improves control over XML documents with the z/OS XML parser, allowing parsing workload to be off loaded to specialty engines to reduce operating costs More information can be found at www-01.ibm.com/support/docview.wss?uid=swg21633234&aid=1.

Recent IMS articles

Using IMS Application Interface Block in COBOL for Synchronous Callout by Jack Yuan, Mei Xiu Li, and Yee-Rong Lai in *IBM Systems Magazine* (June 2013). You can find the article at http://ibmsystemsmag.com/mainframe/administrator/ims/ims_aib_cobol/.

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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.