IBM

IMS newsletter

Commonwealth of Kentucky
Takes IMS to the Web With IBM VisualAge Generator

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Developers in the Governor's Office for Technology, Transportation Systems Branch, of the Commonwealth of Kentucky were given a challenge: to deliver new IMS transactions that would communicate with users via the Internet. They wanted to continue to make use of their considerable skills in programming for IMS and OS/390 and minimize the requirement to learn new Web technologies like Java, JavaServer Pages, JavaBeans, servlets, and Web application servers.

Development Tool Requirements

The developers were looking for a development tool that would allow them to use IMS and OS/390 to leverage existing investments in proven applications and technology, and to access the large body of databases and programs that had been built up over many years. They believed they had a better chance of reaching the Web in the environment they had been using since the beginning of their careers. They did not want to learn Java in order to move to the Web because the learning curve would be too steep and too expensive.

The tool they chose to meet these goals was IBM's VisualAge Generator. A programmer programming IMS transactions in VisualAge Generator uses the same mental processes and approach to programming that he or she uses when programming IMS transactions in COBOL. The paradigm is the same; the program deals with messages that represent the information displayed on or entered from a Web browser instead of from an MFS map.

The primary goal of the developers was that a traditional COBOL IMS programmer would be able to learn to use VisualAge Generator without formal classroom training, using only the product documentation and Redbooks available through IBM. The key Redbook involved with reaching this goal is titled "Building Enterprise Web Transactions using VisualAge Generator JavaBeans and JSPs (SG24-5636-00). This book provided the developers with programming examples and the guidelines needed to develop a fully functional Web application.

Application Description

The initial project for evaluating VisualAge Generator was the creation of a new Web application for the Fleet Management Division. The application would distribute the trip record keeping of the state's fleet of vehicles to the agencies where they are used. This would eliminate the manual preparation of trip tickets by the individual agencies, postage paid delivery to the Fleet Management office, and subsequent data entry by Fleet Management personnel.

The application would give the various agencies the ability to record vehicle usage on a trip-by-trip basis, and, for vehicles permanently assigned to state employees, on a monthly basis. For the permanently assigned vehicles, to close out monthly trips, the agency would need only to enter

the ending odometer reading from the list of permanently assigned vehicles. New trips would be started automatically for the next month with the estimated return date being the last day of the next month's fiscal period.

At the close of each fiscal month, mileage would be calculated for the Equipment Management System running on IMS, which performs agency billing.

The application would also verify the validity of driver's licenses in the Kentucky Drivers License System.

Application Architecture

VisualAge Generator Web transactions can be developed using three programming approaches. The developers chose the "stateless" programming approach, which offers the greatest scalability according to the Redbook. "Stateless" means that VisualAge Generator does not automatically save the state of the conversation with the user at the browser; it is up to the developer to write code to save required state data either in visible or hidden fields on the Web message record in a database. This is equivalent to a non-conversational IMS transaction. In the other two approaches, the generated program automatically saves state in a database across any interaction with the user on the browser. In the first approach, the generated program saves the contents of every variable in the program; in the second, the program saves the contents of a designated state record. Both of these are equivalent to a conversational IMS transaction.

In choosing between the approaches, the developer must make tradeoffs. The stateless approach is more efficient at run time and allows the Web page to be cached (the user on the browser can leave the Web page and come back to it) if that is an application requirement. Automatic state saving supports a simpler program design, but does not allow the Web page to be cached (the user must complete the transaction before looking at another Web page).

The browser interface consists of a simple, single window that contains three frames. A Web site developer created JSPs from scratch for the administrative and agency menus that do not interact with the IMS system. The top frame displays the title of the system; the left frame contains the links to execute the IMS transactions; and the right frame displays the JavaServer Pages for the IMS Web transactions developed using VisualAge Generator.

Transaction Specification

The developer uses the VisualAge Generator interactive development environment (IDE), which runs on Windows NT or Windows 2000, to define Web transactions. The developer defines the message that contains the transaction information to be displayed on or entered from the browser as a "user interface record." Other types of records represent data in DL/I or relational databases. The transaction program is written in the VisualAge Generator language, which is similar to a simplified COBOL.

Transaction Testing

All testing was done using generated code in a test IMS and WebSphere environment. The developers did not have the latest version of VisualAge Generator, which contains an IBM supported facility for remote access to DL/I databases on the OS/390 host from the interactive test facility (ITF) of VisualAge Generator.

The test facility allows the developer to debug the logic of the transaction program in the development environment without ever having to generate the Web transaction and install it in IMS and the Web application server. The test facility lets you step through the program statements, displaying or modifying program variables. It supports access to local or remote DB2 databases for SQL calls or remote DL/I databases for DL/I calls. When the program puts the user interface on the message queue, the test facility interacts with your favorite browser to display a simulated JavaServer Page for the transaction.

Transaction Generation

The program and record definitions contain all the information needed for VisualAge Generator to create the IMS LE COBOL program with DL/I or SQL database calls that represent the transaction in the IMS region, plus the Web application JavaServer Pages and Java Session Beans used to dynamically create the HTML for displaying the transaction on the browser.

The generated JavaServer Pages are basic HTML and need to be dressed up considerably for good presentation. This required HTML and JavaScript knowledge that was somewhat beyond the novice level.

The Web developer also modified the generated JSPs using JavaScript to dynamically protect fields on the page and to automatically calculate miles traveled (ending odometer – starting odometer) during the process of closing a trip.

No modifications were required for the JavaBeans that extracted the information in the user interface record sent from IMS. The gateway servlet provided by VisualAge Generator took complete control of displaying the JSPs and communicating with IMS. No Java programming was required to run the generated Web transaction.

Deployment

The Web developer was able to try out the customized JSPs using WebSphere running on either Windows NT or AIX, with the transaction code running in either the VisualAge Generator test facility, or later, in an IMS test region. The production environment featured WebSphere running on OS/390 on the same system as the IMS production region. The servlet running on WebSphere uses IMS Connect (formerly known as IMS TCP/IP OTMA Connection (ITOC)) to communicate with the IMS production region.

Security In The Production Environment

Security is an important consideration for the production environment. VisualAge Generator provides an implementation that uses a RACF interface for user authentication from a login panel. Once the user logs in, their user ID is checked to determine if they are authorized to run the transactions selected during the session.

User authentication works well for Web applications that are accessed by state employees, but applications that support public access to IMS Web applications will need to run without requiring each user to have a personal RACF user ID and password. The solution was to have a single RACF ID and password to be used for all public transactions. VisualAge Generator supported this by allowing the public user ID and password to be specified in the properties file associated with the gateway servlet. Kentucky will have two instances of the gateway servlet on its Web Application Server: one tied to a Web URL for accessing transactions for state employees that start out with a login, and the other tied to a URL for public transactions that do not require a login.

An additional security consideration is the use of SSL (Secure Sockets Layer) for data encryption.

Production Results

The application has been in production for Kentucky employees since May 1, 2001. Feedback has been very positive. The developers are continuing to make enhancements to the application to further increase ease of use and to reduce the amount of time necessary for the users to complete their work.

Product Versions

VisualAge Generator 4.0 Fix pack 2
VisualAge Generator Server OS/390 – V1.2
(latest maintenance)
WebSphere Application Server for OS/390 – V3.0.2
HTTP Server V5.3
SSL
IMS V6
OS/390 V2.10

For more information on VisualAge Generator, contact Rusty Edmister at 919-254-1706 or Edmister@us.ibm.com, or visit the VisualAge Generator Web site:
www.ibm.com/software/ad/visgen

OTMA Security for IMS Connect and MQSeries

Traditionally, IMS™ transactions have been entered at a terminal on a SNA network, transmitted to VTAM®, and then passed to IMS by VTAM. Now, other types of networks are supported, most notably TCP/IP. The Open Transaction Manager Access (OTMA) feature of IMS allows you to use the IMS Transaction Manager as a server to many different MVS applications that participate in a client-server environment.

OTMA provides a high-performance client-server protocol for IMS to communicate very efficiently with MVS applications other than VTAM, such as TCP/IP for MVS, IMS Connect, and MQSeries® for MVS. OTMA addresses the problem of connecting a client to a server so that the client can support a large network or a large number of sessions, while maintaining a high level of performance. OTMA communicates with MVS applications (also known as OTMA clients) using MVS's cross-system coupling facility (XCF). OTMA and the MVS applications compose an XCF group, where OTMA and the MVS OTMA client applications are group members. As IMS transactions, commands, and data are opened up to access from heterogeneous networks, securing IMS resources becomes more critical.

IMS command and IMS transaction messages received through OTMA may or may not have security checking performed prior to executing the command or transaction. The OTMA security level, which is decided upon by the customer installation, determines whether or not RACF® will be called to verify the user ID and verify that the same user ID is authorized to execute the IMS command or IMS transaction code specified in the incoming message. It should be noted that the OTMA security level usually has no effect on user exit routines (used for security checking) that may have been included in the IMS system.

Four Levels of OTMA Security

There are four OTMA security levels, but only one OTMA security level may be in effect at a given point in time. The OTMA security levels are NONE, PROFILE, CHECK, and FULL. The levels are described below:

NONE

This is a system-wide security level, which means that RACF will not be called for messages received through OTMA. Specifically:
- RACF will not be called when IMS receives the connection request (client-bid) from MQSeries or IMS Connect.
- RACF will not be called to verify that the user ID in the incoming message is a valid user ID (one that has been defined to RACF).
- RACF will not be called to verify that the user ID in the incoming message is authorized to the IMS command or IMS transaction requested in the message.
- The user ID caching scheme is not used.

PROFILE

This is a message-by-message security level. In other words, each incoming message entered through OTMA will be checked to determine whether or not RACF will be called.
- Messages entered from IMS Connect will contain a 1-byte security flag field, and the value in the field determines whether or not RACF is called. Messages entered from the MQSeries-IMS Bridge application will contain a SecurityScope field in the MQIIH structure, and the value in the field will determine whether or not RACF is called. When the security level for OTMA is set to PROFILE, IMS checks each incoming message independently to see if the security value is set to NONE, to CHECK, or to FULL.
- A consideration for use of the PROFILE security level is that application developers set the RACF security level as N (NONE), C (CHECK), or F (FULL) in each incoming message. The security level set in each message will determine whether or not IMS calls RACF for security checking related to that message. You may not want application programmers deciding on the security for IMS commands and IMS transactions.
- RACF may be called when IMS receives the connection request (client-bid) from MQSeries or IMS Connect.

CHECK

This is a system-wide security level, which means that RACF will be called for messages received through OTMA. Specifically:
- RACF will be called for client-bid connection requests. A cache, or hash table, is built for each OTMA client if the client-bid is successful. (Use of the hash table is described below.)
- RACF will be called to verify that the user ID in the incoming message is a valid user ID (one that has been defined to RACF). If the OTMA client (IMS Connect or MQSeries for MVS) supplied a UTOKEN in the incoming message, IMS supplies the address of the UTOKEN on the VERIFY call to RACF. Use of the UTOKEN in VERIFY processing improves performance. RACF returns a security control block, called an Accessor Control Element (ACEE), to IMS for verified user IDs. A user ID caching scheme is used in IMS/OTMA environments. The caching scheme also improves authorization checking performance. A cache, or hash table, is used to store previously verified user IDs. Each OTMA client (IMS Connect, MQSeries for MVS, etc.) has a hash table created in the IMS control region after a successful client bid. Use of the hash table minimizes the number of calls to RACF to verify user IDs. This way, if the same user ID enters multiple messages destined for IMS/OTMA, IMS can check the hash table for a valid entry for the user ID and may be able to avoid the VERIFY call to RACF. The entry for the user ID in the hash table contains a pointer to the ACEE for the user ID. The ACEE that is pointed to may be used for resource (command and transaction) FASTAUTH calls to RACF.

- RACF will be called to verify that the user ID in the incoming message is authorized to the IMS command or IMS transaction requested in the message. The address of the ACEE previously built by RACF during VERIFY authorization processing is supplied (by IMS) on the FASTAUTH call to RACF.
- RACF will be called to verify that the user ID in the incoming message is authorized to the IMS transaction code set as the destination on a DL/I CHNG or AUTH call. However, an existing ACEE is not used for these calls; thus another call is made to RACF to dynamically build an ACEE for the CHNG or AUTH call. If you know the application will issue many CHNG or AUTH calls, you should consider using a different OTMA security level to overcome the performance impact.

FULL

This is a system-wide security level, which means that RACF will be called for messages received through OTMA. FULL has the same characteristics as CHECK with two exceptions:
- During VERIFY processing, RACF is called a second time to build an additional security control block (ACEE for the user ID) in the dependent region.
- If the application program (that processes the OTMA-entered transaction) issues one or more CHNG or AUTH calls with the destination set to a different transaction code, the security environment already exists in the dependent region and does not have to be dynamically built. On the other hand, if the application does not issue these calls, a security level of FULL is not needed, and you may want to consider an OTMA security level of CHECK or PROFILE.

TIPS

- As previously described, before an OTMA client application such as IMS Connect or MQSeries for MVS can connect to IMS, a client-bid connection request must be performed. If the security level for OTMA is not set to NONE, the RACF security profiles in the FACILITY Class, IMSXCF.XCFgroupname.OTMAClientMemberName, can be used to determine whether the OTMA connection (client-bid) is accepted or rejected.
- Upon receipt of messages received from OTMA, when OTMA security is activated, IMS calls RACF to verify that the user ID in the incoming message is a valid RACF user ID. IMS is not passed a password for the user ID, so the call to RACF (or an equivalent product) is to verify the user ID only. Again, it should be noted that if the user's password has not been validated prior to IMS receipt of the message, the password cannot be validated.

- IMS uses the UTOKEN in the input message in the call to RACF to not only to verify the user ID, but to also create a security control block in the IMS control region to represent each verified user IDs. The security control blocks built in the IMS control region, representing verified RACF user IDs, are called Accessor Control Elements or ACEEs.
- Once RACF has returned IMS an ACEE address for a verified user ID, the ACEE is used in a subsequent (or second) call to RACF to determine the user ID's authorization to the IMS command or IMS transaction requested in the input message.
- The ACEE for each user ID and the ACEE expiration value are saved in an OTMA table. The ACEE expiration value is specified during the client-bid time. If a user ID is revoked and the ACEE is not expired, it is necessary to issue /STOP and /START OTMA to rebuild the ACEE table. Enhancing the /SECURE OTMA command to refresh the ACEE for a specific user ID is currently an OTMA requirement.
- Use the IMS startup/execution parameter of OTMASE to globally specify the OTMA security level for all the OTMA clients, or issue the /SEC OTMA command to specify the security after IMS has been started. However, setting the OTMA security level for an individual OTMA client is another OTMA requirement.
- The OTMA security described above also applies to roll-your-own OTMA clients and OTMA C/I users.

SUMMARY

OTMA uses XCF to connect OTMA client applications to IMS, thereby allowing access to IMS commands and transactions from other environments such as TCP/IP networks. The installation has a number of security options and considerations for using each type of security checking. Two IBM® program products, IMS Connect and MQSeries for MVS, are widely used to provide access to IMS resources from heterogeneous networks. Both products provide a number of robust security options.

For more information on IMS Connect, MQSeries for MVS and the MQSeries-IMS Bridge application, or OTMA, contact your IBM marketing representative.

Jack Yuan
IMS Developer

IMS Disaster Recovery Solutions

In the Spring, 2001, issue of the IMS newsletter we introduced the overall concepts of disaster recovery and covered the IMS solution — the features that are implemented in Remote Site Recovery (RSR). In this article we discuss the hardware solutions and available service offerings. We conclude with a summary and recommendations.

Extended Remote Copy (XRC)

XRC allows timestamp-consistent copying of multiple DASD volumes to a remote site in real time. It works by copying data from the local controller to a staging system and from there applying it to the remote site. The staging site can be different from the local and remote sites. This choice improves data availability and

Fig. 1. XRC Configuration

the ability to configure the environment for the solution when the roles are reversed, and it also extends the support to two ESCON® distances.
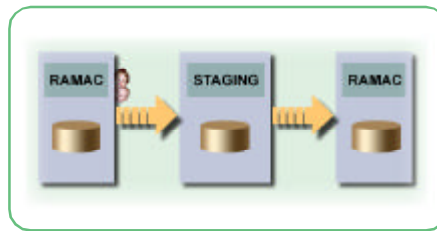
IMS Development recommends that you copy OLDS, WADS, DBs, and RECONs completely — all or nothing — and that ERRORLEVEL SESSION be chosen to ensure that both logical and physical views are consistent at the remote site. Use of multiple redundant ESCON is recommended. XRC works for DASD but not tape, so log archiving to tape can be a problem. Ensure that archived logs are not needed for recovery after a disaster switch to the remote site. To do this, consider enlarging the OLDS/SLDS DASD capacity.

Ensure that image copies (ICs) are taken at the "new" site after a disaster switch because you might not have enough log data to go back to the oldest valid IC without using archived log data.

You can do staging at a third site. Ensure that the staging is not on the primary site, otherwise more data may be marooned at the primary site. Also consider the configuration after site roles have been switched.

The advantages of XRC:
- It is a hardware-only solution and works on any type of DASD content.
- It is application independent. It is asynchronous and has no impact on the IMS service.
- It is easier to operate than a software approach.

The disadvantages of XRC:
- It is limited to ESCON distances only (a channel extender might be helpful).
- It needs a substantially larger bandwith than RSR because XRC transmits entire altered blocks (not just the altered data within the blocks). This may be a non-issue over ESCON.

Archived logs that are on tape are a problem for both IMS and DB2®. The IBM 3494 Magstar Virtual Tape Server duplexing function might help. It requires enough log data on DASD to enable recoveries from ICs at the remote site.

Peer-to-Peer Remote Copy (PPRC)

PPRC also works from DASD controller to DASD controller across ESCON, but does it synchronously. A write to the local controller is mirrored to the remote site controller. The local write requester — IMS in our case — does not see the write operation complete until the change is stored in the remote controller's nonvolatile cache. All write service times are extended by the remote write — the further the distance, the longer the write. Updating transactions and updating batch jobs can all take longer.

Synchronous writing means that no data is lost in the case of a disaster because all writes will have been mirrored to the remote site.

Where DASD is behind multiple controllers, the controllers must form part of the same transmission group to ensure
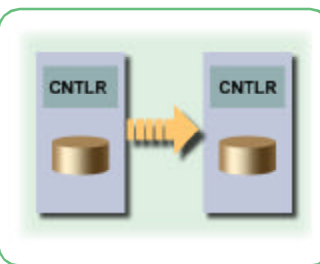

that there are no uneven writes to the remote controllers in failure situations; such "ragged writes" could cause inconsistencies between WADS, OLDS, RECONs, and DBs. Use CRIT=YES to ensure that remote writes take place before the local write is considered complete.

Fig. 2. PPRC Configuration

The gross effect of a failed write depends on the data set that is affected. If it is a database, normal IMS handling occurs (for example, EEQE creation). If the affected data set is a RECON, IMS again tries to use the spare, as normal. If the affected data set is an OLDS or WADS, IMS tries to switch data sets. If no more OLDS or WADS data sets are available for the switch, the effects are more dramatic — a stalled IMS or severely degraded performance.

As with XRC, you need to ensure that you have image copies at the remote site immediately after a disaster and prior to restoring service.

The advantages of PPRC:
- It is the only synchronous method and the only method to ensure that no data is lost in a disaster.
- It uses hardware only and therefore covers all DASD data.
- It employs minimal interaction with operators.

The disadvantages of PPRC:
- It impacts IMS throughput and turnaround time. If the link between sites goes down, the active site service is unavailable. This solution is only viable when protection of the data is of the highest priority. An example might be high-value interbank transactions.
- It is limited to ESCON distances only (perhaps with channel extender).

It needs a substantially larger bandwidth than RSR because PPRC transmits entire altered blocks (not just the altered data within the blocks). This may be a non-issue over ESCON. Archived logs on tape are a problem for both IMS and DB2. The IBM 3494 Magstar Virtual Tape Server duplexing function might help. It requires enough log data on DASD to enable recoveries from ICs at the remote site.

Geographically Dispersed Parallel Sysplex®

Geographically Dispersed Parallel Sysplex (GDPS) recognizes some of the availability issues with PPRC and XRC. It is a service offering to provide some automation to handle write-failure cases. See Figure 3 for an illustration.
The automation, which is provided as part of the offering, detects write failures and offers choices for the installation. The installation choices for GDPS/PPRC are:
- FREEZE & GO: This stops all secondary-site writes but continues providing unaffected primary service. This choice preserves the data consistency status at the secondary site for a later switch, but that switch is with back-level data unless PPRC is resynchronized prior to the switch. The effect is that, at the first write failure, offsite recording of data changes ceases, but restart time may be faster because no database recovery is needed. Delaying the switch but continuing service causes data loss if the switch eventually occurs.
- FREEZE & STOP UNCONDITIONAL: At the first write failure, this choice stops all writes (primary and second-

Fig. 3. GDPS Configuration

ary) and switches to the remote site. This causes a service interruption until the switch is completed, but the result will be no missing data. A transient write error might cause a disruptive service switch.
- FREEZE & STOP CONDITIONAL: This choice stops all secondary writes if it is a secondary-site write error; otherwise it switches service. Because the problem is with writes into a secondary control unit, this choice preserves data consistency status at the secondary site. However, if the problem is with writes to the secondary site, and service continues, the secondary site will have back-level data until PPRC is resynchronized.

As with XRC/PPRC, you need to ensure that you have image copies at the remote site immediately after a disaster and prior to providing service.

The advantages of GDPS are derived from PPRC or XRC. In addition:
- It is based on PPRC or XRC but tolerates rolling failures.
- There are installation choices for failure management.

The disadvantages of GDPS are also derived from PPRC and XRC.
- It can impact IMS throughput and turnaround as marooned data might result from the GO and STOP CONDITIONAL options.
- It must restart on a Parallel Sysplex.

Other vendors provide hardware data-mirroring solutions; but, the same arguments about scope and consistency apply.

Summary and Recommendations
Both synchronous and asynchronous offerings are available. Whichever you choose, the IMS recommendation is: copy all or nothing. Mixing approaches and techniques is very risky and likely to induce operator errors in a time of stress.

The IMS recommendation is to use asynchronous techniques for capacity and performance factors unless zero data loss is mandatory.

To minimize delays at switch time, perform electronic copying of the first image copy after any DB reorganization or DB load. You cannot use log data later than the time of the reorganization without the appropriate image copy.
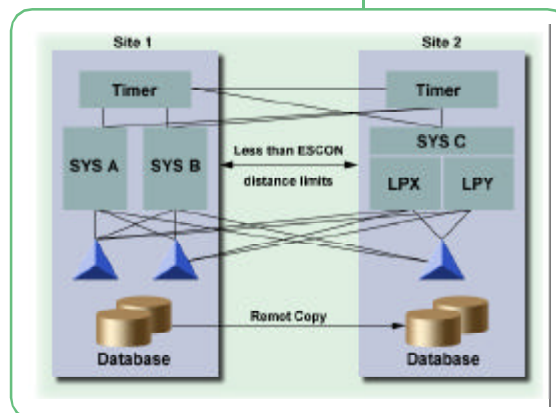
The Latest in IMS Education

The following courses have recently been updated to provide you with the latest product information:

- CM201 - IMS Database Recovery and Control (DBRC) - 5 Days
  This course replaces CM200. Learn all aspects, including installation, implementation, and management, of the IMS DBRC — a facility that provides database recovery in all IMS environments. System programming and technical support individuals who need to understand DBRC installation, customization, administration, and maintenance in an IMS system will find this offering to be most valuable.

- CM611 - IMS Shared Queues - 2.5 Days
  Learn about the key enhancement to IMS Version 6 - the Shared Queues facility, which offers the ability to share full function message queues within a Parallel Sysplex environment. Also, learn about sharing Fast Path Expedited Message Handler (EMH) queues within a Parallel Sysplex environment.
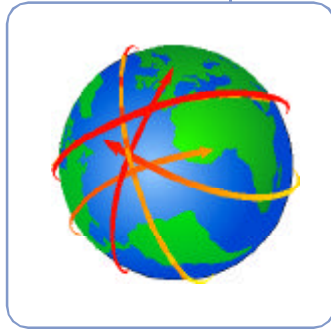
The following two courses are being offered on a special limited basis in 4th Quarter 2001 U3724 - IMS Logical Relationships: Implementation & Performance - 4 Days Learn to implement IMS logical relationships and to improve their performance. Intensive machine labs allow you to practice these skills. Individuals responsible for designing, implementing, maintaining, or tuning IMS databases using logical relationships will find this offering to be most valuable. You'll discover how to:

- Code DBDs and PSBs for databases involved in logical relationships, including those with recursive data structures
- Use IMS utilities to load and reorganize logically related databases
- Choose logical update rules based on application processing requirements
- Work with DBD coding parameters that are crucial to logically related database performance
- Use the IMS database monitor reports to interpret the results of logical relationship implementations

- U3720 - IMS Database Performance & Tuning - 5 Days
  Learn how to tune IMS databases for use in IMS/Batch, IMS/DC, CICS®-Local-DL/I, and DBCTL environments. Explore the IMS database features that affect performance such as data set considerations and buffers for VSAM and OSAM. You will also practice a method for estimating performance before implementation. Plus, you will reinforce the skills you have learned with seven machine labs.

For the most up-to-date information and further details on all the above courses, check our IMS curriculum spotlight in the U.S. at http://www.ibm.com/training/spotlight/ims/

New IMS Course Advisor

Need an easy way to develop your IMS education plan? Check out our new IMS Course Advisor on our Learning Services Web site. It contains questions to help you determine which courses best meet your particular skill needs. Each question is followed by a list of highly recommended and useful courses. You can easily click on the course number and go directly to its detailed course description. The course descriptions contain course outlines, skills taught, pricing, and schedule information. If the course is the one you need, you can then proceed to enroll on-line.

To access the IMS Course Advisor, please visit http://www.ibm.com/training/spotlight/ims/advise.html

Amiet Goldman
Senior Direct Marketing Strategist

However, lower cost transport of regular, routine image copies is possible because IMS can easily use an earlier image copy plus additional logs for recoveries.

Do not be too frugal with VTAM data transmission bandwidth or ESCON channels. The greater the transmission bandwidth available, the quicker the catch-up from transmission gaps. At a minimum, allow bandwidth for twice the normal heavy-transmittal volumes.

Do not forget any other required data, such as control files or batch input.

Understand that money is an unavoidable part of your decision, just like an insurance policy. Everyone would like to have the impossible zero data loss and zero availability loss, but the actual solution depends on a combination of the installation's requirements and resources.

The IBM Global Services group, IBM Business Continuity and Recovery Services, is happy to discuss a disaster-recovery strategy and to provide the "remote" site for your installation. For more information, visit them at: www.ibm.com/services/brs

Pete Sadler
IMS World Wide Technical Service Specialist, United Kingdom

What's New in IMS Tools?

The Data Management Team announced a multitude of tools in September 2001 for both IMS and DB2. There were seven tools announced for IMS: two new IMS tools, two new version levels of existing IMS tools, and three new releases of existing IMS tools.

The IMS Network Compression Facility (NCF) is a new tool that replaces the Data Stream Tuner product. NCF reduces the size of data streams sent to 3270 terminals logged on to IMS, without any changes to IMS application programs or MFS. NCF also includes an ISPF facility to display statistics and options, update options currently in use, and trace data streams. The data stream compression engine examines each outbound 3270 data stream and uses standard 3270 data stream commands to reduce the size of outbound data streams. There are a number of separately controlled options used in the data stream compression process. These options are initially defined in an IMS PROCLIB member and can be dynamically updated through the ISPF interface. Compression options can be excluded by node name, LTERM name, user ID, IMS user name, transaction code, or MFS format name. The trace facility included in the ISPF interface allows the user to display both before and after compression images of the data streams sent to a given node name. The trace feature can be used to help diagnose problems not only with NCF, but also with remote screen scraper applications, as well as with IMS application programs.

The IMS High Performance Change Accumulation Utility (HPCA) is a new tool that replaces the Parallel Change Accumulation tool. HPCA will trigger a single job through the internal reader, without the need to submit the JCL manually. The job will function as a multitask address space, ensuring parallel streaming of both input and output data. Parallel input/output ensures an elapsed execution time as short as possible. Input data (from logs or RLDSs) and output data (new CAs) are processed in parallel. The user can control the number of parallel processes. If the number of parallel processes are user-throttled, the excess processes will be processed in series after the first maximum number of tasks have completed. Inevitably, this will result in elongated execution time, but the option is provided and is up to the user to exploit. The product has DBRC notification support and provides both ISPF and Batch interface for operations. The ISPF interfaces allow for customization, setup, and execution.

The IMS Parallel Reorganization Version 2 (IPR) provides new features and functional improvements. The execution of Unload, Reload, and Index Builder tasks are subtasks of the main IPR V2 address space. Data is passed via a "pipes-like" process. IPR V2 dynamically allocates input and output database data sets and has full DBRC support, including DBRC notification processing. IPR V2 can perform automated name swapping for input and output database data sets. IPR V2 provides the infrastructure to operate IMS High Performance Unload, IMS High Performance Load, and IMS Index Builder Version 2 products in parallel as a single Job step. The advantage of such operation is a significantly reduced batch window for Full Function databases. Since the reorganization components are operated in parallel rather than sequentially, the reorganization operation takes only slightly longer than the longest component operation.

The IMS DataPropagator™ Version 3 (DProp V3) supports an additional method of propagation of IMS DB changes: an MQSeries-based, asynchronous, near real-time propagation. With this method, a new IMS-DPROP Capture Component captures the IMS database changes (the source DBs) performed by IMS Batch, IMS BMP, and IMS TM application programs. Then a new IMS-DPROP Apply Component transforms the IMS DB changes into relational format and applies the changes to DB2 tables (the target tables). As in previous IMS DPROP releases, the transformation of the IMS data into relational format is based on mapping definitions provided by the database administrators. The DB2 target tables can be on the same or on different systems from the IMS DBs. The transmission of the DB changes from the Capture to the Target Component is via the recoverable, buffered, and queued asynchronous messaging services of MQSeries. In addition to a near real-time propagation, the new MQSeries-based asynchronous propagation also supports a point-in-time propagation. With point-in-time propagation, the content of the DB2 target tables reflects some clearly identified logical point-in-times of the IMS source databases, for example: the logical end of a business day, the logical end of a business month, or the end of a specific IMS batch/BMP job stream. Point-in-time propagation is typically used to propagate the subset of data that does not need to be propagated within seconds to data warehouses or decision support systems.

Three products announced new releases to incorporate new functions and enhancements. They are: IMS Fast Path Basic Tools V1 R2, IMS Extended Terminal Option Support V2 R2, and IMS Connect V1 R2. I encourage you to look at the announcement summary and the associated documentation on our Web site at www.software.ibm.com/data/db2imstools

Elmer Rohde
IMS Database Tools Marketing Specialist

IMS Technical Conferences

DB2 and IMS Technical Conference
Nice France
March 18-22, 2002

IMS Technical Conference
St. Louis, Missouri
Adam's Mark Hotel
September 30 - October 3, 2002

The dates for the 2002 IMS Technical Conferences are already set, so please mark your calendars. They promise to be great events that we're sure you won't want to miss.

In 2002, we'll be traveling to the beautiful cities of Nice, France and, St. Louis, Missouri for a very special experience. Whether you're looking for thrilling adventure at the Six Flags theme park or a cultural escape in world-class Forest Park, St. Louis has it all! From the nation's tallest monument - the Gateway Arch - to the Anheuser-Busch Brewery, to riverboat gaming, to the St. Louis Zoo, and an incredibly varied nightlife - this unique city on the Mississippi River will help make this IMS Technical Conference an event you will long remember.

For more details and to enroll, visit the conference Web site at: www.ibm.com/training/conf/

Amiet Goldman
Senior Direct Marketing Strategist

The Latest IMS Redbooks

Two new IMS Redbooks™ will be available by the end of the year:

- IMS Version 7 Performance Monitoring and Tuning Update (SG24-6404) provides practical advice on how to monitor and tune IMS Version 7 systems and includes many details and examples. It also describes the tools used to capture and report performance data and provides recommendations maximizing the performance of an IMS system.

- IMS e-business Connectors Update (SG24-6514) describes the changes in the IMS e-business connectors that have been implemented over the last 2 years. This book documents the changes to IMS Connect, the Java™ support added to VisualAge® for Java, an ODBA example, and changes to IMS support in WebSphere® Application Server. The book is full of examples and detailed descriptions of the processes needed to access IMS from the World Wide Web and other e-business clients.

The most recent Redbooks are available at the ITSO Web page (www.redbooks.ibm.com) and include the following titles:

Title	Order Number
IMS Version 7 Release Guide	SG24-5753
IMS Version 7 High Availability Large Database Guide	SG24-5751
IMS Version 7 and Java Application Programming	SG24-6123
A DBA's View of IMS Online Recovery Service	SG24-6112
IMS Primer	SG24-5352
IMS V6 Security Guide	SG24-5363
e-business Enablement Cookbook for OS/390® Volume II: Infrastructure for Java-based Solutions	SG24-5981
Cross-Platform DB2 Stored Procedures: Building and Debugging	G24-5485-01
Using VTAM Generic Resources with IMS	SG24-5487

For more information about Redbooks, joining a Redbook residency project, or to download any Redbook, visit the IBM Redbooks Web site at: www.redbooks.ibm.com

Rick Long
IMS Development

HOT Web Sites

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IBM Database Tools for OS/390 and z/OS
http://www.ibm.com/software/data/db2imstools

Enterprise Connection Teleconference Series
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Customer Success Stories
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SHARE Proceedings
http://www.share.org

VisualAge for Java
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shopIBM Provides One More Great Reason to Upgrade to IMS Version 7!

If you use shopIBM to place your upgrade order for IMS Version 7 between now and year-end, you can receive a valuable service to assist your IMS Version 7 installation efforts at no additional charge.

If you are in France, Germany, Italy, the Nordics, Spain, or the UK, you can receive the IMS Version 7 Migration Assistance Package, which is comprised of the following elements: a one-day on-site installation planning workshop, installation assistance, ongoing technical support, performance tuning assistance, and problem resolution. An IMS expert will visit your site to give the workshop! The workshop can be provided in English, French, or German and is provided on a first-come, first-served basis.

If you are in North America, you can receive the IMS Version 7 Silicon Valley Workshop Offering, which is a three-day hands-on migration, installation, and systems management workshop for IMS Version 7, conducted by IMS developers on-site at the Silicon Valley Laboratory facility for up to two customer participants. Customers are responsible for travel and living expenses.

If you are in any of the above countries, go to the IBM home page (www.ibm.com), click or search for shopIBM, locate the IMS promotion, and then click the "call me now" button. An IMS representative will explain the values of IMS Version 7 and arrange for you to receive your special Migration Assistance Package if you are in Europe, or the Silicon Valley Workshop package if you are in North America.

Joe Kreitz
IMS Worldwide Marketing Manager

They Must Be In Here Somewhere

My son and daughter continue their stroll through the IMS newsletters, and this issue is no exception. We still have an ample supply of IBM IMS pins, and we are anxious to send one to each of you who can identify the location of my children in this issue. The number of winners of the IBM IMS pin contest continues to grow with each issue.

We want to hear from you.

We will send an IBM IMS pin to every person who can find my children's pictures correctly in this issue.

You can download a copy of the IMS newsletter in PDF format, or you can view the IMS newsletter on the IMS Web page at: www.ibm.com/ims

If you would like to receive an IBM IMS pin, please e-mail your external postal address and the picture locations in this issue to: imsmkt@us.ibm.com

Or write to:

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DQY/A2
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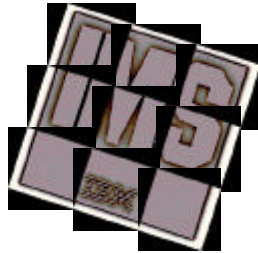
While you're at it, tell us what you think of the IMS newsletter!

Glenn N. Galler
Editor-in-Chief

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