



IMS newsletter

Spring 2000

The Storage Server Standard for the New Millennium . . . Shark!

Driving a data explosion, e-business is generating exponential growth in the need for immediately accessible, always available and highly functional storage capacity. The IBM Enterprise Storage Server (ESS) — also known by its code name, “Shark” — is the ultimate Storage Area Network (SAN) utility, providing the information “fuel” that runs the e-business “engine.” Shark supports rapid universal access to vast quantities of data through many advanced functions and features, making it a workhorse for support of business-critical applications. Using Shark to address any or all of your strategic and tactical business initiatives will give your organization the business advantage needed to survive and thrive in the e-business world.

Shark supports System/390 servers and inherits the S/390 functions previously provided by the 3990-6 and RAMAC families. However, Shark far surpasses those technologies in all areas such as performance, hosts supported, availability, functions, scalability and non-disruptive operation. Shark is designed specifically to support both S/390 and open systems workloads at the same time. However, for S/390 workloads that take advantage of large caches, the ESS has a large cache and sophisticated cache management algorithms.



Improving IMS Performance Using Shark

Using Shark for storing IMS data sets can greatly improve IMS response time and storage capacity.

Inside This Issue:

It's a New Year.	3	IBM Tools.	10
Java Application Performance	4	Reducing Tool Costs	12
S/390 Application Development.	6	Upcoming Events	13
Using DB2 with IMS.	7	IMS Education & IMS Redbooks	14
IBM Global Services.	8	Hot Web Sites	15
IMS Product Services.	9	Win a Jacket!.	16

The IMS performance group at Santa Teresa Laboratory has taken various IMS performance measurements in different environments using Shark. The rest of this article describes those measurements and their impressive results. Note that these performance measurements, while showing greatly improved bandwidth and the impact of the significant reductions in I/O response time, still do not fully demonstrate the potential improvements that can be realized in your specific environment. The best I/O is, ideally, no I/O, but since this is not possible, Shark provides the next best thing for your IMS environment.

The ESS Enhancements

The following ESS enhancements can benefit IMS performance.

Parallel Access Volumes (PAV)

This enhancement enables multiple active concurrent I/Os on a given device when the I/O requests originate from the same system. PAV makes it possible to place more active data sets on the same volume, and uses the available DASD space more efficiently.

Multiple Allegiance

This enhancement allows multiple active concurrent I/Os on a given device when the requests originate from different systems. This means less DASD contention — and shorter access times to shared data in an IMS data sharing configuration.

Faster Disk Rotation

Faster disk rotation reduces rotational delay and results in both improved response times and increased bandwidth. Shark's disk performance improvements also boost IMS performance; for example, improved transaction response times, shorter elapsed times for batch oriented work, and increased capacity for functions such as logging.

Increased Non-volatile Storage

There are many benefits to increasing the size of the non-volatile cache for write-intensive operations. Some IMS operations that can benefit from the larger non-volatile cache size include IMS logging, VSO buffer writes, SMQ structure checkpoints, and heavily updated databases.

Measurement Environment

The measurements in this study were taken using IMS Version 7 running on OS/390 R2.6. A few selected database tools were also used. Database data sets were restored where appropriate to provide a repeatable and consistent set of measurements. The hardware consisted of a 9672-ZZ7 (G6) processor with the data sets being allocated to RAMAC-2, RVA-X82, and Shark.

Online IMS Logging Evaluation

Over time, software improvements have been made to IMS to minimize the amount of data logged for database updates, checkpoints, etc. But the growth of IMS systems and the volume of data being processed continues to increase, especially with the increased processing power available. Logging can be a constraint to online growth, and can also be the limiting factor to processing multiple batch (BMP) jobs.

The online IMS logging evaluation was performed to show the potential benefits of using the ESS for the IMS Online Log Data Sets (OLDS). Figure 1 compares the bandwidth (logging capacity) of an IMS online transaction environment when using three different types of IBM DASD. The workload used was a Fast Path application with a large volume of logging data, such that the capacity of the IMS log was the primary inhibitor to increased transaction volume. Each transaction generated approximately 26 KB of log data. While your online transactions might not currently be constrained, the improved logging capacity can enable increased growth and Batch Message Program (BMP) concurrency. All of the measurements shown in Figure 1 were done using IMS dual logging.

BMP and UTILITY Evaluation

The measurements shown in Figure 1 compare various I/O intensive processes against a Fast Path Data Entry Data Base (DEDB), while varying the Area Datasets across the different DASD

IBM DASD Statistics from a Log-Constrained IMS Environment

	RAMAC - 2	RVA - X82	ESS
Trans / sec	103	311	550
Dev.Act. rate	13.8	38	71.8
Resp. time (ms)	68	24	14
Log data / sec	2.8 MB	8.2 MB	14.2 MB
% increased capacity over RAMAC - 2	-	193	407

Figure 1

types. The area involved contains 24 KB control intervals and consists of 362,405 root segments. The three processes observed are: an account consolidation BMP, a Data Base Tools (DBT) DEDB unload (FABCUR1+SORT), and a DBT reload (FABCUR3).

IBM DASD Statistics for I/O Intensive Processes

	RAMAC - 2	RVA - X82	ESS
BMP elapsed (seconds)	1,534	537	334
Unload elapsed	342	147	102
Reload elapsed	947	290	185
TOTAL elapsed	2,823	974	621
% of RAMAC-2 elapsed	-	35	22

Figure 2

The measurements shown in Figure 2 are some samples of I/O intensive IMS processes. There are many other I/O intensive processes in IMS that can benefit from Shark. For example, I/O intensive database data sets, Fast Path VSO data hardening, and Shared Message Queue structure checkpoints. Increased concurrency of batch and BMP processes is also possible. Any process that involves heavy I/O, even if it is only for a short burst of time, is a candidate process for using Shark.

*David Viguers, Cedric Chen, Hsiung Tang, Hiram Neal,
IBM IMS Performance Specialists*

It's a New Year . . .



It's been a year since I last shared with you an update on IMS. Here's a "progress report" on what we've been doing in IMS during the past year — and our focus in the coming year.

IMS Version 7 and the Quality Partnership Program

In August 1999, I announced IMS Version 7 and the start of the IMS Version 7 Quality Partnership Program (QPP). Some highlights of IMS Version 7 include:

- High Availability Large Data Bases (HALDB), which supports 1001 partitions to a maximum capacity of 40 gigabytes each. HALDB partitions can be processed independently and in parallel.
- The Online Recovery Service (ORS) feature, which enhances support for database recovery.
- Rapid Network Reconnect, which improves system availability by providing a faster driver reconnection utilizing the facilities of VTAM's Multinode Persistent Session Support.
- The IMS Connect feature, which enables access to IMS through TCP/IP. Within the IMS performance test environment, early IMS Connect performance data has resulted in over 2000 transactions per second on a G6 with a single IMS and two IMS Connect address spaces.

Participating in the Quality Partnership Program involves a significant commitment for our customers. For IMS Version 7, customers were initially involved in the design reviews in April, 1998. After receiving the code in November 1999, the QPP customers now have IMS Version 7 running in their application development systems, and expect to begin running it on their production systems early this summer. In addition to the early customer involvement, major vendors are participating in the QPP program as well, to ensure that their tools are ready for the General Availability of IMS Version 7.

IMS Means e-business

Built on the power of the S/390 platform, billions of dollars worth of IMS applications have been developed over time to run mission-critical work in a safe environment using IMS. Therefore, IMS is focused on further strengthening its support as an e-business server. With continued focus on performance, capacity, availability, systems management, usability, open access, and supporting tools for the e-business environment, IMS supports IBM's strategy for helping customers in their movement to an e-business environment.

With IMS and the surrounding systems management, database, and business intelligence tools, the elements of the e-business cycle are a reality: leveraging your existing knowledge and information, transforming your core business processes, building new applications, and running a scalable, available, and highly-safe environment. You can use existing data to sharpen decision making and responsiveness. You can prioritize which processes and applications need to be extended. You can build new reusable applications that are integrated with existing ones. And you can maximize deployment on secure platforms. We are focused on providing the IMS solutions that you need for the entire e-business cycle.

One of these solutions is **IMS Java**, which I announced as a new addition to IMS Version 7 during the recent IMS and DB2 Technical Conference held in Barcelona, Spain, in March, 2000. This application development support enhances the ability of our customers and business partners to provide integrated e-business application development with IMS. IMS Java enables you to write Java applications and run them as IMS applications using the IBM VisualAge workstation and host tools for development and testing.



In Closing...

I would like to take this opportunity to introduce new members of the IMS leadership team.

- **Jeff Horton** is focused on performance and system test with an emphasis on customer scenarios.
- **Lisa Curran** has joined the IMS management team from the DB2 for OS/390 team. Lisa is focused on the core database support for IMS, extended systems management, database and business intelligence tools.
- **Alyse Passarelli**, formerly a member of the OS/390 software development team, has also joined IMS. Alyse is focused on the rest of IMS - Systems, Fast Path and support for connectivity in IMS, including IMS Java, IMS Connect and the e-business connectors for IMS.
- **Paul Carey** has joined the team from the S/390 Application Development area. Paul is focused on the worldwide IMS Affinity Product Services.
- **Don Streicher**, a longtime member of the IMS team, is now focused on strategy and planning.
- **Don Grossweiler** continues as the IMS Technical Support Manager.

The IMS team is positioned for and committed to the key initiatives of IMS: increasing customer responsiveness and service, increasing product quality, and delivering product advancements to continue our position as the Transaction and Database Management leader in the industry.

Regards,

Enhancing Java Application Performance using IMS Connector for Java

There are many ways to enhance the performance of your web applications that use IMS Connector for Java (formerly known as IMS TOC Connector for Java) to access IMS transactions. Briefly, here's what you need to do:

1. Obtain and install (or upgrade) the latest releases of VisualAge for Java.
2. Obtain and install the IMS Version 7 IMS Connect feature.
3. Develop an efficient IMS Connector for Java application or servlet with VisualAge for Java.
4. Tune the IMS Connect (or, prior to IMS Version 7, the IMS TCP/IP OTMA Connection (IMS TOC) port).

Step 1: Obtain and install the latest release of VisualAge for Java

VisualAge for Java includes the IMS Connector for Java. Significant performance enhancements were made in the latest release of IMS Connector for Java Version 1.2.1, which is available with VisualAge for Java Version 3.02. IMS Connector for Java is one of the IBM e-business connectors that enables Java applications and servlets to access IMS transactions via IMS Connect (or prior to IMS Version 7, IMS TOC).

Many performance-related enhancements were made in the Enterprise Access Builder (EAB) and Common Connector Framework (CCF) components in the latest release of VisualAge for Java Version 3.02. You will want to take advantage of the recent updates and performance enhancements by regenerating and redeploying the input and output Java record beans and EAB Command bean which are used in your Java application or servlet.

The VisualAge for Java EAB tools enable you to create a composite Java bean for use by Java servlets or applications to access existing host applications and data. This composite Java bean, called an *EAB Command bean*, encapsulates the input and output records and the connection and interaction properties that represent an interaction of the Java application with IMS. EAB tools enable generation of input and output records for the IMS transaction from existing COBOL source code. With IMS Connector for Java's IMSConnectionSpec class, you can specify the host name and IMS Connect port. The IMSInteractionSpec class allows you to specify the IMS datastore name.

Step 2: Obtain and install the IMS Version 7 IMS Connect Feature

IMS Connector for Java uses IMS Connect on the host to provide access to IMS transactions via TCP/IP. IMS Connect provides enhanced TCP/IP access and is a separately priced SMP-installable feature of IMS Version 7. IMS Version 7 will be made generally available later this year, but the JumpStart program is available (for an education/support services fee) to get any of the IMS Version 7 features earlier than the generally available date (see "Jumpstart Program" on p. 9 for more information).

If you are using the IMS TCP/IP OTMA Connection (IMS TOC), be sure to upgrade to the latest release and fixes of IMS TOC. The list of the available fixes can be obtained from the IMS web site. If you are running IMS TOC version 2.1.3, see the e-business Connectors link in VisualAge for Java's release notes for the list of recommended fixes.

Step 3: Develop IMS Connector for Java application or servlet

The following guidelines will help you to develop an efficient IMS Connector for Java application or servlet with VisualAge for Java.

Generate Input and Output Java Record Beans

Many performance-related enhancements were made in record generation, runtime support and EAB Command runtime support in VisualAge for Java Version 3. Java record beans are generated by VisualAge for Java's EAB tools from COBOL source code to provide input and output data to the EAB Commands. The following options are recommended in the VisualAge for Java Enterprise Access Builder's "Creating Records from Record Types" SmartGuide when generating the Java record beans from COBOL source code in order to take advantage of the enhancements:

Record style - Custom records make direct references to fields based on field offsets relative to the record. The use of the custom record is recommended, if appropriate, for better performance.

Access style - Direct access of record fields is recommended for better performance as it results in the least number of objects being instantiated and faster access to values.

Generate with Notification - Your application may require notification if you make attribute-to-attribute connections to the properties of the record. Typically, this is done when you create a GUI application or Visual Servlet using VisualAge for Java's Visual Composition Editor. In many cases, your application will not require notification for the record. For example, when you generate your servlet using Websphere Studio. For better performance, it is recommended that you do not select the "Generate with Notification" option.

Inner classes - The inner class option allows you to generate all the subrecords using inner class within the record being generated. For better performance when using custom records, you should not select this option, because it prevents optimization when initializing custom records.

Shorten names - Select this option to make the inner class names of the generated record types as short as possible. This option has no effect on performance.

Using Connection Pooling

Connection pooling is key to enhancing the performance of Java applications or servlets that access IMS transactions. This connection management feature is provided by the IBM Common Connector Framework (CCF). CCF is a set of Java APIs that provides infrastructure services like connection management, transaction services, security, and tracing facilities to Java applications and servlets. CCF contains a ConnectionManager class (com.ibm.connector.connectionmanager.ConnectionManager) that maintains a pool of reusable connections for each port that IMS Connect uses. If you have multiple IMS Connect components running, the ConnectionManager will maintain a separate pool for each port on each host (that is, each Hostname/Port number combination). When the ConnectionManager class is used with IMS Connector for Java, it allows the physical socket connection with IMS Connect to be persistent and to be reused by subsequent

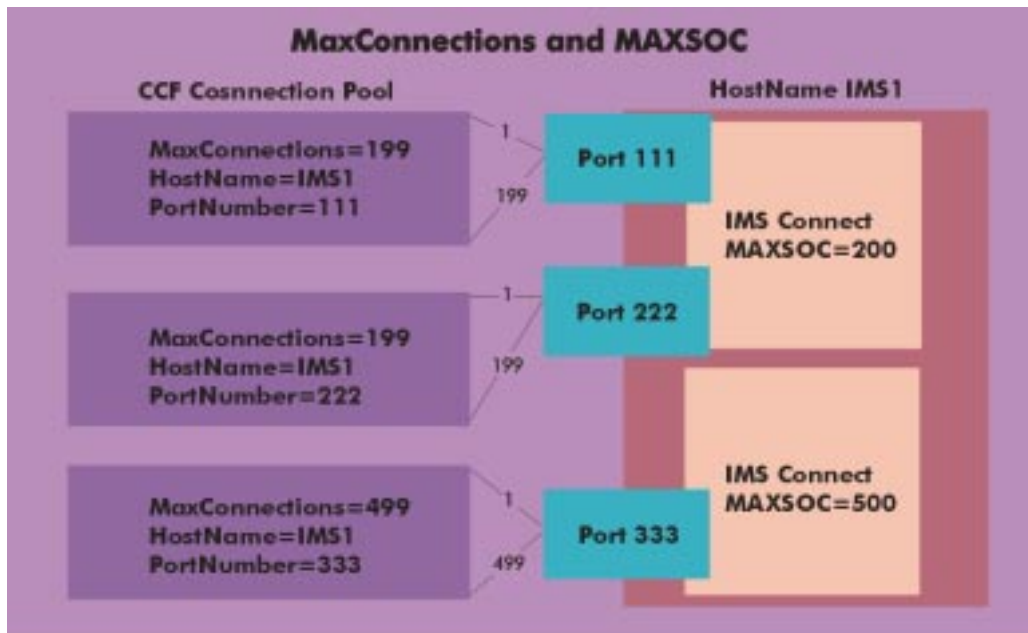


Figure 1. Maximum Value of MaxConnections

requests. Using persistent socket connections minimizes the overhead of socket initialization, and significantly enhances performance.

There should be one instance of the ConnectionManager class used within a component server (for example, Websphere Application Server). If your component server does not support the CCF infrastructure, you can use a servlet to store a single instance of the ConnectionManager class that can be accessed by any servlet, and set it on the RuntimeContext of the Java servlet. For more information and sample servlet code, see the technical article *Accessing Existing Enterprise Applications Using VisualAge for Java Enterprise Access Builder for Transactions*, which is available from the VisualAge for Java Developer Domain website at <http://www.software.ibm.com/vadd>.

Tune the ConnectionManager Properties

CCF provides a set of configurable connection management properties in the IMSConnectionSpec for each pool of connections maintained by the ConnectionManager. For example, the ReapTime property specifies the interval between runs of the garbage collector thread that cleans up idled/unused connections, and the Max/MinConnections properties specify the maximum or minimum number of connections maintained in the pool. These connection management property values can strongly influence performance.

Since IMS Connector for Java communicates with IMS Connect, the connection properties of both the ConnectionManager and IMS Connect should be synchronized to maximize the performance throughput. It is recommended that the MaxConnections property be set to a value that is less than the MAXSOC value in the IMS Connect configuration file. Figure1 shows the maximum value of MaxConnections with a given MAXSOC value on IMS Connect. MAXSOC is defined as the maximum number of sockets per port for a particular instance of IMS Connect, and it can be displayed using the IMS Connect command VIEWHWS.

Step 4: Tune the IMS Connect Port

The number of ports associated with an instance of IMS Connect and the maximum number of open sockets on a port (MAXSOC), can influence performance. To determine the value of MAXSOC and the number of ports to use, first determine the maximum number of concurrent clients (open sockets) expected at any one time (the peak load). The sum of the MAXSOC values for all of the ports used by all of the instances of IMS Connect must be greater than your peak load. The maximum value for MAXSOC is 2000. The maximum number of ports for an IMS Connect instance is 50. It is the responsibility of your Java application and servlets to balance the client requests between the ports.

Generally, selecting a high value of MAXSOC will not help throughput when the concurrent active clients per port is less than MAXSOC. However, the throughput rate is better with more ports and fewer clients per port. If adding ports does not seem to help throughput, additional IMS Connect address spaces can also help.

For more information about IMS Connect and IMS Connector for Java, see the IMS website at: <http://www.ibm.com/ims>.

Haley Fung
IMS e-business Connectors Developer



S/390 Application Development Solution: A Development Environment for Today, Tomorrow, and Beyond

What is the S/390 Application Development Solution?

The S/390 Application Development Solution (S/390 ADS) is a variety of S/390 software that is pre-packaged, pre-configured, and delivered on the S/390 Multiprise 3000, model H30. A world-class array of workstation software is also included as part of the S/390 ADS package! The entire ADS software portfolio is attractively priced and sold for "Development Use Only" purposes.

The ADS S/390 software includes these products:

- OS/390 V2R7
- IMS TM/DB V6
- WebSphere Application Server
- MQSeries V2.1
- CICS/TS V1.3
- DB2 V5.1
- QMF V3R3
- COBOL V2.1
- PL/I V1R1.1

- Application Testing Collection
- Automated Regression Testing Tool
- VA Generator Host Services 1.2
- VisualAge for JAVA OS/390 V2
- ME-10 Netview V1.2
- Host on-Demand V4

The ADS workstation software portfolio includes these components:

- VA COBOL Enterprise V2.2
- VA CICS Enterprise V3.1
- VA PL/I V2.1
- VA Java Enterprise V2.0 (V3.0)
- VA Interspace V6
- MQSeries V5.1
- WebSphere Studio V3
- Personal Communications V4.3

The S/390 ADS also includes a set of pre-defined scenarios that are designed to help you quickly create e-business applications. These scenarios use a combination of the workstation and S/390 tools, and are fully documented and available on the S/390 website.

Using IMS with the S/390 ADS

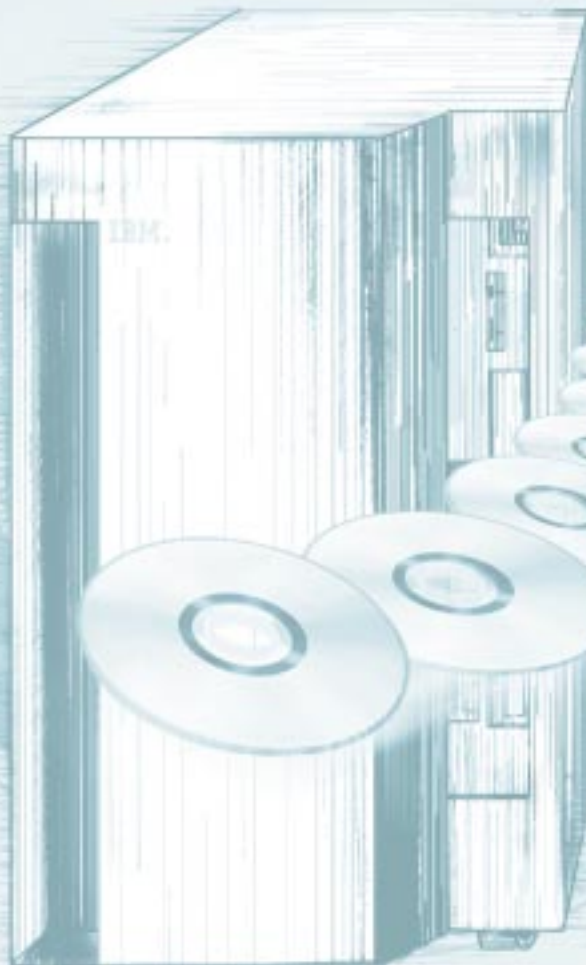
The S/390 Application Development Solution assists in eliminating some of the contentions that arise when development and production take place on a common system. By eliminating these contentions, not only will you be able to take care of the everyday maintenance activities in a safe and efficient environment, but you also will be able to fully exploit the later levels of software that will enable you to quickly delve into e-business.

From an IMS perspective, the S/390 ADS portfolio allows you to better harness the power of IMS, and to quickly utilize Visual Age for Java and the Common Connector Framework to tap into your IMS applications for e-business exploitation.

The S/390 ADS is also invaluable in leveraging the power of other IBM subsystems such as DB2, CICS and MQ Series.

To learn more about the S/390 Application Development Solution and what it can do for you, please visit our website at:
<http://www.s390.ibm.com/ads>.

*Marty Shelton
Manager, S/390 ADS Development*



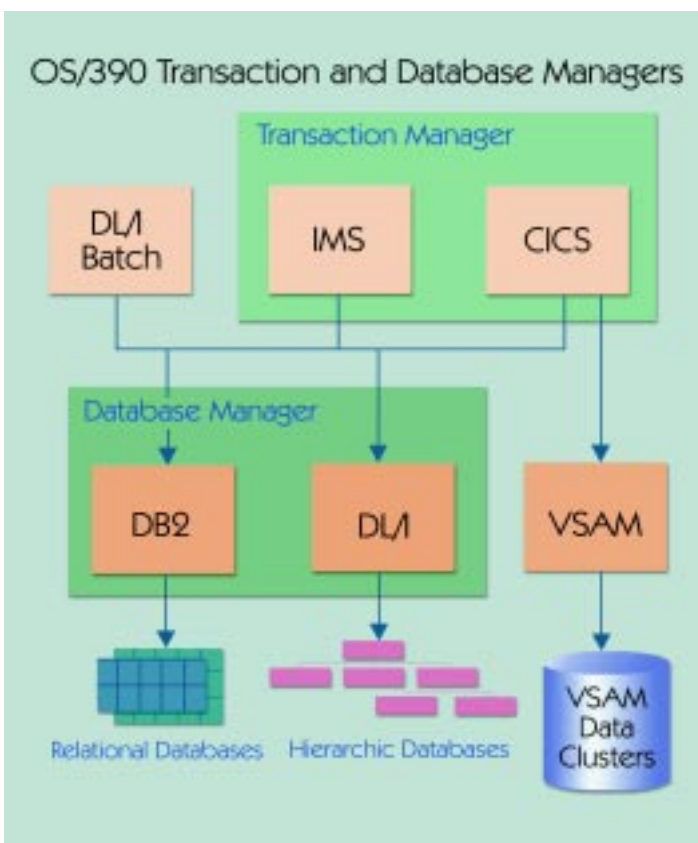
MQSeries
VA Interspace
WebSphere
VA COBOL
VA Java
VA PL/I

IMS as a Transaction Manager for DB2 UDB for OS/390

DB2 UDB for OS/390 is a database manager with the ability to do application processing through the use of DB2 Stored Procedures. DB2 UDB supports a number of "attachments" from a variety of application programming environments including:

- IMS Transaction Manager or IMS DBCTL
- IMS Batch
- CICS Transaction Server

For DB2 UDB, IMS provides all of the functionality required of a world-class transaction management system. For customers using the CICS Transaction Server as a transaction manager, IMS DBCTL provides DB2 UDB with an excellent syncpoint manager for Batch Message Processing (BMP) regions accessing DB2 UDB resources. See Figure 1 for IBM's OS/390 Transaction and Database Managers.



In this article, the architectural strengths of the IMS product as used by DB2 UDB are highlighted.

IMS External Subsystem Attach Facility (ESAF)

Both DB2 UDB and the MQSeries for MVS/ESA use the IMS ESAF to enable IMS applications to use the SQL or MQI application program interface.

The IMS ESAF provides external subsystems with a very simple and efficient way of connecting to an IMS control region (DBDC, DCCTL or DBCTL). These are the key functions that IMS ESAF provides to the external subsystem, DB2 UDB:

- Establishment of a connection between an IMS subsystem and one or more DB2 UDB subsystems using the MVS Subsystem Interface.
- Creation of command and transaction threads, which allow users in the IMS environment to communicate with the DB2 UDB resource manager.
- An application programming interface (API). This API includes a DB2 Precompiler, which converts SQL source statements to a form acceptable to the language compiler (for example, COBOL), and an IMS Language Interface function, which routes a program's request to the appropriate DB2 resource manager, and then returns the result to the application program. All SQL statements are allowed except COMMIT and ROLLBACK. IMS issues COMMIT and ROLLBACK functions on behalf of the program during commit and abort processing.
- Coordinated data synchronization, which guarantees the two subsystems, IMS and DB2 UDB, can be kept synchronized in the event of a failure.

GSAM Support

GSAM is an IMS interface to MVS sequential input and output files. The IMS calls (GN and ISRT) are used to access these files. GSAM is available in the BMP region in an online environment, and in the IMS batch environment.

GSAM is supported by the two-phase commit processing. Two-phase commit processing allows the IMS checkpoint/restart logic to automatically reposition the GSAM files by using information that is saved on the IMS log during commit processing.

In an IMS/DB2 environment, the commit scope can include sequential GSAM files, IMS databases and DB2 UDB tables.

System Availability

The IMS system consists of multiple MVS address spaces. Applications run independently in application address spaces under their own MVS TCB. The use of a multiple address space architecture means that applications are isolated from IMS code and other application programs. Therefore, an application defect does not impact the availability of the IMS system itself or other application programs.

IMS is a queued system, so the communication protocol used to enter an input transaction does not affect the execution of the transaction. The IMS control region is responsible for ensuring the communication with the components that are outside of IMS. When IMS places the input message in the IMS message queue, that message becomes available to be processed at any time, whenever a dependent region becomes available to process it. In this way, the application is completely isolated from the network: application errors do not impact the network, and network problems do not impact application processing.

IMS Scheduling Mechanisms

IMS has very efficient scheduling mechanisms using IMS transaction priority and program class. An MPP is started for scheduling specific program classes.

By dedicating a transaction to one MPP region, Wait For Input (WFI) processing enables high volume transaction processing in a single region without having to perform multiple initialization and termination tasks.

(continued on p. 8)

IBM Global Services

IMS Global Services from IBM Global Services provides fee-based technical consulting for deployment of IMS-based technology. Specializing in hands-on technical services, the IMS team from Global Services has skills available for IMS product installation, version migration, and feature function enabling. IMS services can help out with your specialized needs by delivering IMS skills with practical product experience.

Capabilities delivered from IBM Global Services for IMS include:

IMS e-business Services — We provide support to help you both exploit the World Wide Web and preserve your valuable investments in IMS, legacy applications, and data. Our experienced IMS specialists will recommend, install and configure an IMS-to-web connectivity solution for you, enabling you to access enterprise applications and data over the Internet and an intranet using a web browser.

IMS System Programmer Coverage — We provide highly skilled IMS systems programmers to augment your staff's coverage and experience base. IMS consultants can provide skills instruction — in addition to documented procedures — to accommodate your in-house staff needs.

IMS Tools Consulting and Conversion Planning — We provide tool use reviews, as well as assessments for migrating existing tool utilities to IBM IMS Tools. We have experience with the newest tools available from IBM, and can help with tool planning, installation, setup and customization.

Disaster Recovery Services — We provide assistance in developing and reviewing IMS disaster recovery plans. We can also help test your plans by providing a tactical services role.

Migration Services — We provide complete version migration services for moving to new versions of IMS. Services provided range from straight migrations, to migrations including new feature function implementation. Migration services also include research for IMS and associated product maintenance levels necessary for IMS migrations. Service for planning migrations and reviewing established plans are available within this service set. We presently have services in progress for version migrations from IMS V5 to IMS V6 where we are providing comprehensive project needs, including building the



SMP/E environment, planning the migration process, proving the migration steps in a development process, and leading the production implementation. Our migration projects also include the reworking of user exits, and management of transition issues encountered — ranging from security product interaction to performance tuning considerations. Other services in progress include problem management services specific to IMS-based applications and their administration tools.

The IBM Global Services IMS team can compliment your IMS needs with custom services, too. If you need assistance with a service that isn't listed here, please let us know. Our services can be as general or as specific as you require them to be from a short one day engagement to remote technical assistance. Consider your needs and contact us to help.

For information on these or other IMS IBM Global services, call Winston Tobias at (216) 664-7271, or e-mail him at: wtobias@us.ibm.com. You can also visit the IBM Global Services web site at: <http://www.ibm.com/services/>.

To speak with an IMS sales specialist in North America, please call toll-free: 1-888-426-4343.

*Winston Tobias
Principal, IBM Global Services*

(continued from p. 7)

Pseudo-Wait For Input (PWFI) processing also reduces the number of initialization and termination tasks when the same transactions are scheduled one after the other in the same region.

The IMS ESAF supports both WFI and PWFI algorithms. As a result, the cost of communication link creation and deletion between IMS and DB2 UDB is significantly reduced.

IMS Application Coding Flexibility

Coding IMS online applications is simple, and preserves your programming investment across communication requirements due to customer or technology changes. An IMS application can remain unchanged regardless of whether it is accessed through 3270 terminals, SLUTYPEP (ATM or finance) terminals, the SNA LU6.2 program-to-program communication, or by TCP/IP direct communication from a web server.

Adding DB2 UDB access to an application program does not require changing the data communication portion; only the database portion has to be updated (and those changes are transparent to the end-user). The same synchronization calls are used.

For more information about using DB2 as a Database Manager with the IMS Transaction Manager, please refer to the DB2 UDB for OS/390 publication library.

*Hélène Lyon
IMS Specialist, Paris, France*

Worldwide IMS Product Affinity Services

The Worldwide IMS Product Affinity Services group is made up of highly experienced technicians from the worldwide IMS advocate team, the IMS development team and the IMS technical support team. As part of the Santa Teresa Lab's IMS product organization, our mission is to help you be successful with IMS. We have just added two exciting new services to our product offerings:

- The IMS Performance Evaluation
- The IMS JumpStart Program

IMS Performance Evaluation

Give your IMS system a "checkup!" The IMS Performance Evaluation service is available to IMS DB/DC and DBCTL customers, and is designed to serve as an initial "health check" review of your IMS systems. Skilled IMS practitioners review your systems to identify whether IMS is performing up to its potential, or whether there are IMS tuning issues that require further attention.

The IMS Performance Evaluation is conducted remotely, using information that IBM helps you collect from your IMS system. Because this analysis is done remotely, the cost for this offering is significantly less than for a comparable on-site analysis.

The following information from your IMS system configuration is used in the analysis:

- An IMS Monitor Report created as an output file.
- The IMS (IMS DB/DC or DBCTL) Startup Procedure.
- The active IMS.PROCLIB members for DFSVSMxx and DFSPBxxx.
- Records extracted from the IMS Log. IBM will assist you with running utility DFSERA10 to extract the appropriate log records required by this analysis.
- The RMF Report as an output file.
- The CF Structure Activity Report (for users with an active Coupling Facility).
- The DFSPZPxx ("DRA Parns") member for CICS/DBCTL users.

You can send these system configuration files to IBM either on floppy diskettes, or by e-mail.

IBM uses the files to analyze your existing system configuration to assess how well the configuration matches the executing IMS workload. Special focus is placed on analyzing the size and use of database buffer pools, the size of IMS system pools, and the number of MPP regions. This analysis will also identify whether IMS is being negatively impacted by other work in the system or by unreasonable I/O delays.

When the analysis is finished, you will receive a written report that documents the findings of the IMS analysis. The report includes:

- A "report card" that provides an indication of how well the IMS system matches its workload.
- Recommendations for changes, and an indication of whether a more detailed analysis is advised.



- You will also have the opportunity to conduct a conference call that further explains the report, and the results of the review.

Please note that the focus of this service is the review of a single IMS system. Complex MSC configurations or Parallel Sysplex Data Sharing configurations are beyond the scope of this offering.

IMS JumpStart Program

Get a jump start on learning, understanding, and implementing the new functions of IMS Version 7 — in your test environment, and before it becomes generally available — by enrolling in the IMS JumpStart Program! When you join the IMS JumpStart program, you receive:

- One pre-release copy of IMS Version 7 for use in a testing environment.
- Defect support for problems found during the use of the pre-release code.
- IBM IMS Advocate support for non-defect related issues and regular conference calls.
- Three seats in an IMS Version 7 class.
- A two day on-site planning session with an IBM IMS Advocate to assist in the preparation, installation, migration, and use of IMS Version 7.

IMS JumpStart program openings are limited, and are sure to fill up quickly. Sign up now to reserve your space!

To schedule an IMS Performance Evaluation, sign up for the IMS JumpStart program, or for more information about these or the many other Worldwide IMS Product Affinity Services offerings, please contact Paul Carey, IMS Product Affinity Services Manager, at (914) 435-6940. or e-mail: dmservices@us.ibm.com.

*Paul Carey
Manager, IMS Product Affinity Services*

What's New in IMS Tools?

The IMS Tools group is pleased to introduce two new products: the Dynamic Resource Control Facility (DRCF) and the Program Restart Facility (PRF).

Introducing the Dynamic Resource Control Facility

The Dynamic Resource Control Facility (DRCF) is a real-time IMS productivity tool designed to assist you in troubleshooting and correcting IMS TM/DB system and application related problems. The DRCF boasts over 40 functions that operate under IMS TM to assist you in managing your IMS TM/DB environment. The DRCF includes these powerful features:

- Provides IMS resource information that is usually difficult to obtain from other sources.
- Ability to quickly deque IMS input transactions without the need to execute a Batch Message Program (BMP). This functionality enables you to avoid IMS "message queue full" conditions caused by runaway program-to-program message switches.

The DRCF functions provide enhanced IMS-like command output. Each DRCF function is designed to interrogate specific IMS resources and to provide information on how the resources have been defined to IMS, the relationships between resources, and the current status of these resources. Here is an overview of some of DRCF's many powerful functions:

- The TRANSACTION RESOURCE function provides detailed information about a given transaction code, the related PSB, application program, and all related IMS databases.
- The DATA BASE STATUS function extends this capability by offering a list of the database data sets related to a particular database.
- DATA BASE CROSS REFERENCE function is especially useful in determining the impact of removing a database from the online system by providing a list of PSBs and transaction codes that reference a given IMS database.
- The DRCF DATA BASE ALLOCATION function dynamically adds or modifies the IMS database data sets that are allocated to the IMS online system through a real-time interface to IMS dynamic allocation.
- The DRCF RESOURCE QUERY function enables you to query IMS-defined resources by naming convention, IMS defined attributes, or IMS status. For instance, you might want to display all transactions defined as IMS scheduler class 1, or all PSBs defined as DOPT.
- The DRCF IMS COMMAND PROCESSOR function provides the ability to enter one or more IMS commands simultaneously and page back and forth through the command output. DRCF-enhanced versions of IMS commands also facilitate the use of generic resource names for IMS transactions, databases, PSBs, and LTERMS.

- The DRCF MSC INTEGRATED DISPLAY and ISC NODE REPORT functions make quick work of displaying extended information about IMS Multiple Systems Coupling (MSC) and InterSystem Communications (ISC) network resources.
- The DRCF KILL function provides support for terminating IMS dependent regions that ordinarily do not respond to the IMS stop region command.

This article provides just a sampling of the DRCF's many powerful features. For more information about the Dynamic Resource Control Facility (5697-D14), please call Elmer Rohde, IMS Tools Marketing Consultant, at 408-463-4548 or e-mail: ecrohde@us.ibm.com. Please see the IBM IMS Tools website at: <http://www.software.ibm.com/data/ims/about/imstools>.

Introducing the Program Restart Facility

The IMS Program Restart Facility (PRF) is designed to help you correctly restart abended IMS Batch Message Programs (BMPs) that take advantage of the IMS Extended Restart Facility. You can restart the abended BMP on any IMS in the Sysplex that has access to the databases — without making JCL changes or having to process the logs from the original IMS system.

Using the IMS PRF helps prevent data from becoming corrupted as a result of restarting an abended job — without specifying a restart checkpoint ID. Restarting an abended job correctly can help save you from costly and time-consuming database recoveries that could leave your data unavailable for extended periods of time.

The IMS PRF works by automatically supplying the most recent checkpoint ID to any jobs that are being restarted because of an earlier abnormal termination. This task may seem simple enough to perform manually, without using the IMS PRF. But if the job that is being restarted is supplied with a valid, but incorrect checkpoint ID, or worse, if a job is restarted without any supplied restart checkpoint ID, data can easily become corrupted. Checkpoint restart ID errors can require costly and time-consuming database recoveries — and, if the manual restart error is not detected right away, the database recovery process can take much longer — causing even more delays and longer periods of database unavailability.

The IMS PRF writes a copy of the IMS log records required for a checkpoint restart in a pair of Checkpoint ID Tracking Data Sets (CTDS). It also automatically makes the CTDS available to the job requiring a restart without requiring manual JCL changes to provide the correct log data set names. If the BMP runs to normal completion, the CTDS is automatically deleted.

Using the IMS PRF requires no changes to application code or JCL.

For more information about the IMS PRF (5697-F18), please call Elmer Rohde, IMS Tools Marketing Consultant, at (408)-463-4548 or e-mail: ecrohde@us.ibm.com. Please see our the IBM IMS Tools website at: <http://www.software.ibm.com/data/ims/about/imstools>.

Enhancements to the Existing Tools

The existing IMS Tools are always being enhanced. We have recently made significant updates to the following six IMS Tools:

- Data Base Tools (5685-093)
- IMS Parallel Reorganization (5697-D13)
- IMS Database Control Suite (5697-D15)
- Data Stream Tuner for IMS/ESA (5697-D69)
- Batch Terminal Simulator (5697-A14)
- Fast DEDB Recovery (5655-109)

Data Base Tools (5685-093)

The Data Base Tools have been enhanced through the following APARs and PTFs:

- PQ30648/UQ34927 (PDO 9909)
- PQ31673/UQ37270 (PDO 9911)

IMS/ESA Parallel Reorganization (5697-D13)

Parallel Reorganization has been enhanced through the following APARs and PTFs:

- PQ31678/UQ37115 (PDO 9911)
- PQ32175/UQ37757 (PDO 9911)

IMS Database Control Suite (5697-D15)

The Database Control Suite has been enhanced through the following APAR and PTF:

- PQ33876/UQ38575 (PDO 9912)

Data Stream Tuner for MVS/ESA (5697-D69)

The Data Stream Tuner has been enhanced through the following APAR and PTF:

- PQ30387/UQ35639 (PDO 9910)

Batch Terminal Simulator (5697-A14)

The Batch Terminal Simulator has been enhanced through the following APARs and PTFs:

- PQ30068/UQ34087 (PDO 9908)
- PQ31666/UQ36103 (PDO 9910)
- PQ33116/UQ37769 (PDO 9912)
- PQ33522/UQ38282 (PDO 9912)
- Fast DEDB Recovery (5655-109)

Fast DEDB Recovery (5655-109)

The Fast DEDB Recovery has been enhanced through the following APAR and PTF:

- PQ30765/UQ35048 (PDO 9909)

For more information on the IBM Tools, please call Elmer Rohde, IMS Tools Marketing Consultant, at (408)-463-4548 or e-mail: ecrohde@us.ibm.com. Please see our the IBM IMS Tools website at: <http://www.software.ibm.com/data/ims/about/imstools>.

Elmer Rohde
IMS Tools Marketing Consultant



Impact of ISV Software on S/390 Budgets



Reduce Your Software Costs and Maintain Critical Functionality with IBM Tools

IBM strives to give you the best value for the money spent on both hardware and software. Two examples are the introduction of PSLC pricing groups C and D, and measured software usage. These enable you to reduce software costs in new environments and pay less money per MSU as the S/390 environment grows. Trends, however, show third-party software costs consume an increasingly larger percentage of the total cost of IBM S/390 ownership. The average S/390 customer now spends more money on third-party software than is paid to IBM for hardware and software. And if trends continue, the situation will get worse as third-party software costs continue to grow.

IBM has a solution to help you control the growth of your database tools and utilities budget: IMS products that offer attractive alternatives to third-party software. As customers like SBC have found, IBM products can meet the needs of the most dynamic environment. And they are continually being enhanced — providing you with more value.

For product information, education, evaluation, or migration assistance, please contact Rick Morey (morerich@us.ibm) or Ben DeVivo (bdevivo@us.ibm.com).

*Rick Morey
Software Migration Project Office*

IMS Technical Conference



Come join us in Southern California for the 2000 IMS Technical Conference and in Hamburg, Germany, for the 2001 IMS and DB2 Technical Conference.

These events offer everything you need to get up to speed on what's new with IMS Version 7,

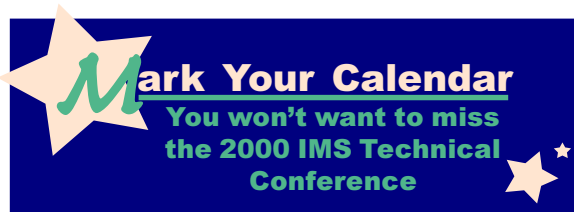
the latest tools for application development, and what's next for this powerful transaction and database solution. The agenda is jam-packed with IMS topics, including web-enabling, backup and recovery, Parallel Sysplex, IMS Performance and more.

Count on 3 1/2 days of full IMS exploration. Enhance your IMS skills through dozens of informative elective sessions, an eye-opening keynote address, one-on-one interaction with product developers, demonstrations of new technologies at the Product EXPO, networking opportunities at every turn, a special evening social event, and cost-effective post-conference workshops.

Mark your calendar today - you won't want to miss the 2000 IMS Technical Conference!

For more information or to enroll, visit the IMS Technical Conference web site at: <http://www.ibm.com/services/learning/conf/ims/> or call (800)-IBM-TEACH (426-8322). If you are calling from outside North America, please call our international number, 001.770.858.5902

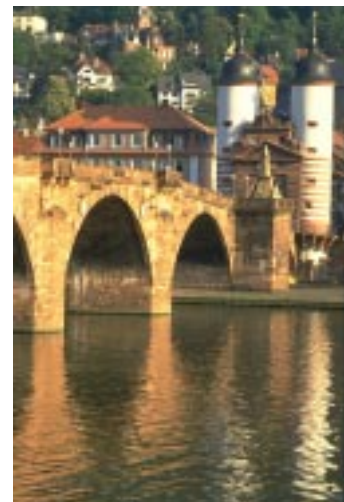
*Tracy Johnston
IBM Marketing Specialist*



IMS Technical Conference October 23-26, 2000 Anaheim, California



IMS & DB2 Technical Conference March 6-9, 2001 Hamburg, Germany



The Latest IMS Redbooks (Available Now!)

IMS Using VTAM Generic Resources with IMS (SG24-5487-00)

This redbook provides a discussion of the use of VTAM Generic Resources (VGR) in an IMS environment and it will help you install, tailor, and configure the use of VGR in IMS.

IMS/ESA Database Tools Volume II: System Extension and Other Tools (SG24-5242)

This redbook is designed to provide the managers of IMS customers, database administrators, system programmers, application programmers, and IBM representatives with a brief overview about how all of the IBM IMS database management tools work. This is the second book on this topic. The first book is called *IMS/ESA Database Tools Volume I: Database Manager Tools* (SG24-5166-00).

IMS Primer (SG24-5352-00)

This redbook is called a "primer" because it is intended to be an introductory book to help familiarize the reader with the basics of IMS. Much of the original content of this book was in an early IMS manual called the IMS Primer, which was discontinued a number of years ago. This redbook will help you to understand some of the basic functions of IMS. It also positions IMS with some of the other IBM products, and it gives a broad outline of the IMS architecture. The book is meant as an overview of the IMS product, and it contains the following parts:

- The first part of the book contains an overview of the IMS Transaction and Database Manager. It also includes an overview of how IMS interfaces with other products like the OS/390 operating system.
- The second part of the book provides a more detailed explanation of the IMS Transaction Manager. It covers a detailed explanation of message processing, and also contains an introduction to the application programming interface to the IMS system.
- The third part of the book provides a more detailed explanation of the IMS Database Manager. It starts out with some basic database concepts, including the hierarchical model and how it is implemented in IMS. This part of the book provides some information on database design and choosing the right database types, and also includes an explanation of the database backup, recovery, and reorganization utilities.
- The fourth part of the book explains application programming within the IMS environment, including the transaction and database programming interfaces, as well as the Message Format Service (MFS).
- The fifth part of the book explains some basic IMS administration functions. These functions include database recovery (DBRC), RECON record information, IMS logging and the IMS system generation procedure.

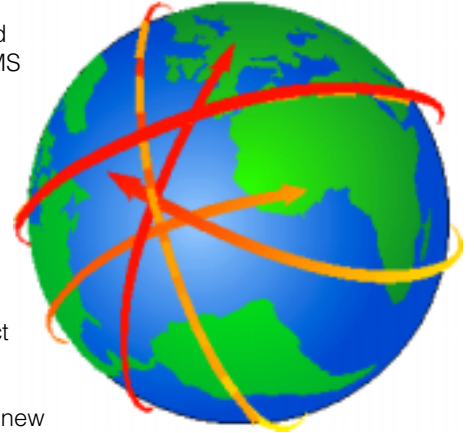
Rick Long
ITSO IMS Specialist



The Latest in IMS Education

New Curriculum Spotlight to Help you Plan your Skill Building

Want to find out what's new and hot in IMS education? Looking for an easy way to access all the IMS training resources from one place? Then look no further than the IBM Learning Services curriculum spotlight for IMS web site! You can find listings of all our course offerings clearly organized by job function, skills and product features. There are links to course roadmaps, conferences, Redbooks, custom education, and the IMS product website. There's also a Frequently Asked Questions (FAQ) section. If you ever need help in mapping your IMS skill building plan make it one-stop shopping at the IMS curriculum spotlight website.



New Courses Coming in Early 2nd Quarter 2000

- IMS Security
- IMS Version 7 Product Enhancements

Please check on these new courses and take a curriculum tour at:

<http://www.ibm.com/services/learning/spotlight/ims.html>

Amiet Goldman
Senior Direct Marketing Strategist

IMS Library: Updated Product Kits

New editions of the IMS Version 5 and IMS Version 6 product CD-ROMs (PKITs) are here! This is the first update of the PKITs since they became Generally Available. And, both version of the PKITs include the licensed books (the *Diagnosis Guide* and *Reference and the Failure Analysis Structure Tables* manuals)! Each of the libraries on the PKITs is in both Adobe PDF (Portable Document Format) and BookManager.

The IMS Version 5 PKIT (LK3T-3489-01) is estimated to be available in June, 2000. The IMS Version 6 PKIT (LK3T-2326-02) is estimated to be available in July, 2000.

The IMS Newsletter is Now in PDF Format!

The IMS Newsletter is now available on the IMS website in Portable Document Format (PDF), and can be downloaded or printed as often and whenever you like. You can find the IMS Newsletter at: <http://www.software/data/ims>.

The Adobe Acrobat Reader is required to view PDF files. Download it for free at: <http://www.adobe.com>

Sherry R. Gordon
Software Engineer, IMS User Technology



IMS Home Page

<http://www.ibm.com/ims>
<http://www.ibm.com/software/data/ims>

IMS PDF and Adobe Acrobat Reader

<http://www.ibm.com/ims/shelf/v6pdf>
<http://www.adobe.com>

IBM Redbooks

<http://www.redbooks.ibm.com>

IBM Enterprise Storage Server (Shark ESS)

<http://www.storage.ibm.com/hardsoft/products/ess/ess.htm>

IMS Connector for Java

<http://www.ibm.com/software/data/ims/jitoc.html>

IMS TCP/IP OTMA Connection (IMS TOC)

<http://www.ibm.com/software/data/ims/imstoc.html>

VisualAge for Java

<http://www.ibm.com/software/ad/vajava/>

WebSphere Application Server

<http://www.ibm.com/software/webservers/appserv/>

WebSphere Studio

<http://www.ibm.com/software/webservers/studio/index.html>

Customer Success Stories

<http://www.s390.ibm.com/customer/>

Year 2000 Technical Support

<http://www.ibm.com/software/year2000>
<http://www.s390.ibm.com/stories/tran2000.html>
<http://www.ibm.com/software/data/ims/y2k/index.html>
<http://www.ibm.com/ibm/year2000/content/solweb.html>

IBM Global Services

<http://www.ibm.com/services/>

IBM Learning Services

<http://www.ibm.com/services/learning>
<http://www.ibm.com/services/learning/roadmaps/imsidx.html>
<http://www.ibm.com/services/learning/spotlight/ims.html>

Enterprise Connection Conference Call Series

<http://www.s390.ibm.com/events>

S/390 Application Development Solution (ADS)

<http://www.s390.ibm.com/ads>

Share Proceedings

<http://www.share.org>

IBM Application Testing Collection

<http://www.ibm.com/software/year2000/test0.html>

IMS Technical Conferences

<http://www.ibm.com/services/learning/conf/ims>
<http://www.storage.ibm.com>
<http://www.storage.ibm.com/hardsoft/products/ess/ess.htm>
<http://www.ibm.com/support/techdocs>

Your Award-Winning IMS Newsletter!



The IMS Newsletter has won an Achievement Award at the 1999 Northern California Touchstone Competition, sponsored by the Society for Technical Communication, which is an international professional association that advances the arts and sciences of technical communication.

Editor-In-Chief: Glenn N. Galler
 Executive Editor: Sherry R. Gordon
 Art Director: Debbie Slayton
 Graphic Designer: Stacy A. Newman

We welcome your feedback on any of the material contained in this issue.

To receive a free subscription to the *IMS Newsletter* please complete the form on our web page at:

<http://www.software.ibm.com/data/ims/shelf/quarterly>

or write to us in any of the following ways:

e-mail: imsmt@us.ibm.com
 FAX: 1-(408)-463-4101
 IMS Newsletter, IBM Corporation
 DQY/A2
 P.O. 49023
 San Jose, CA 95161-9945

Win an IMS Jacket!

In the past few issues of the IMS Newsletter, we have discussed how IMS is participating in IBM's strategic e-business solution. Through the use of VisualAge for Java and the Websphere family of products, it is now easy to develop new applications to access IMS and DB2 databases, and the IMS Transaction and Database Manager is a powerful engine for practically any type of e-business workload.

We want to hear from you.

Please tell us how IMS will (or already does) help you compete in the e-business world. The best entry will win this black IMS nylon jacket.



Please e-mail or write to:

Editor-In-Chief,
IMS Newsletter
555 Bailey Avenue
San Jose, CA 95141

Glenn N. Galler
Editor-In-Chief



© International Business Machines Corporation
Printed in the U.S.A. 4/00
All Rights Reserved

Business Intelligence, Classic Connect, Client Application Enabler, CICS, COBOL, DataJoiner Classic Connect, DataPropagator Non-Relational, DB2, DB2 Universal Database, DBCTL, Dynamic Resource Control Facility, e-business, eNetwork Host On-Demand, Enterprise Access Builder, Enterprise Storage Server, Expedited Message Handler, Extended Terminal Option, Fastpath, IBM, IBM CMOS R65/R85, IMS, IMS Connect, IMS Connector for Java, IMS/ESA, IMS Java, IMS TCP/IP OTMA Connector, IMS TOC Connection for Java, IMS Message Requeuer, IMS Data Base Tools, IMS Application Development Facility, Informix, Java's Visual Composition Editor, LAGON, MQSeries, MVS, OS/390, OS/390 Debug Tool, OTMA, Parallel Sysplex, PL/I, Program Restart Facility, ResQ!Net, S/390, SQL, VisualAge for Java, VM, VSAM, WebSphere Application Server, WebSphere Studio are trademarks or registered trademarks of International Business Machines Corporation.

Windows, Windows NT, Windows 95 and Windows 98 logo are trademarks of Microsoft Corporation.

All other products and company names are trademarks and/or registered trademarks of their respective holders.

The information in this document concerning non-IBM products was obtained from the suppliers of those products or from their published announcements. IBM has not tested those products and cannot confirm the accuracy of the performance, compatibility, or any other claims related to non-IBM products.

Questions on the capabilities of non-IBM products should be addressed to the suppliers of those products.

GC26-9655-03



IMS Newsletter
IBM Corporation
DQY/A2
P.O. 49023
San Jose, CA 95161-9945

PRESORT
FIRST CLASS
US POSTAGE
PAID
SAN JOSE, CA
PERMIT NO. 1