IMS: Leading the Marketplace in Information Integration with Management Might and System Scalability

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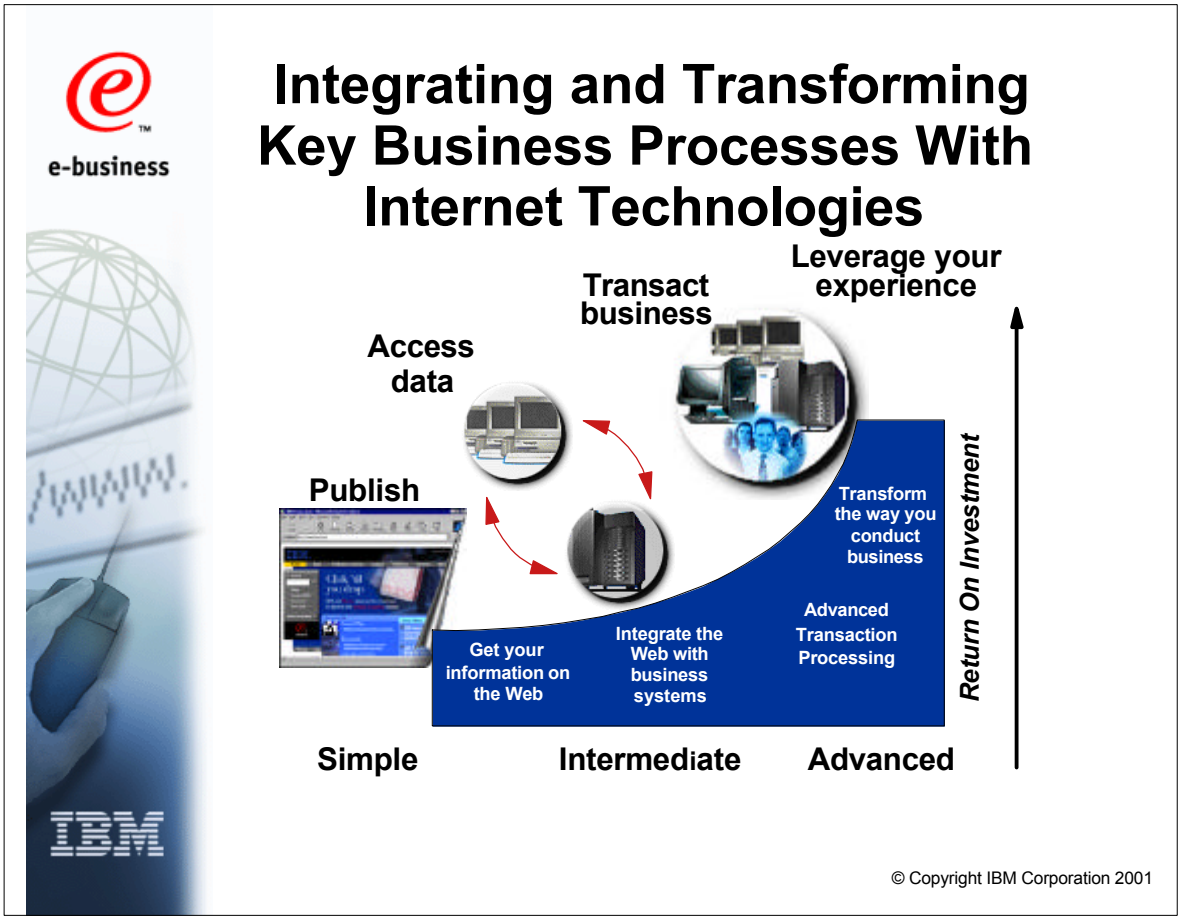
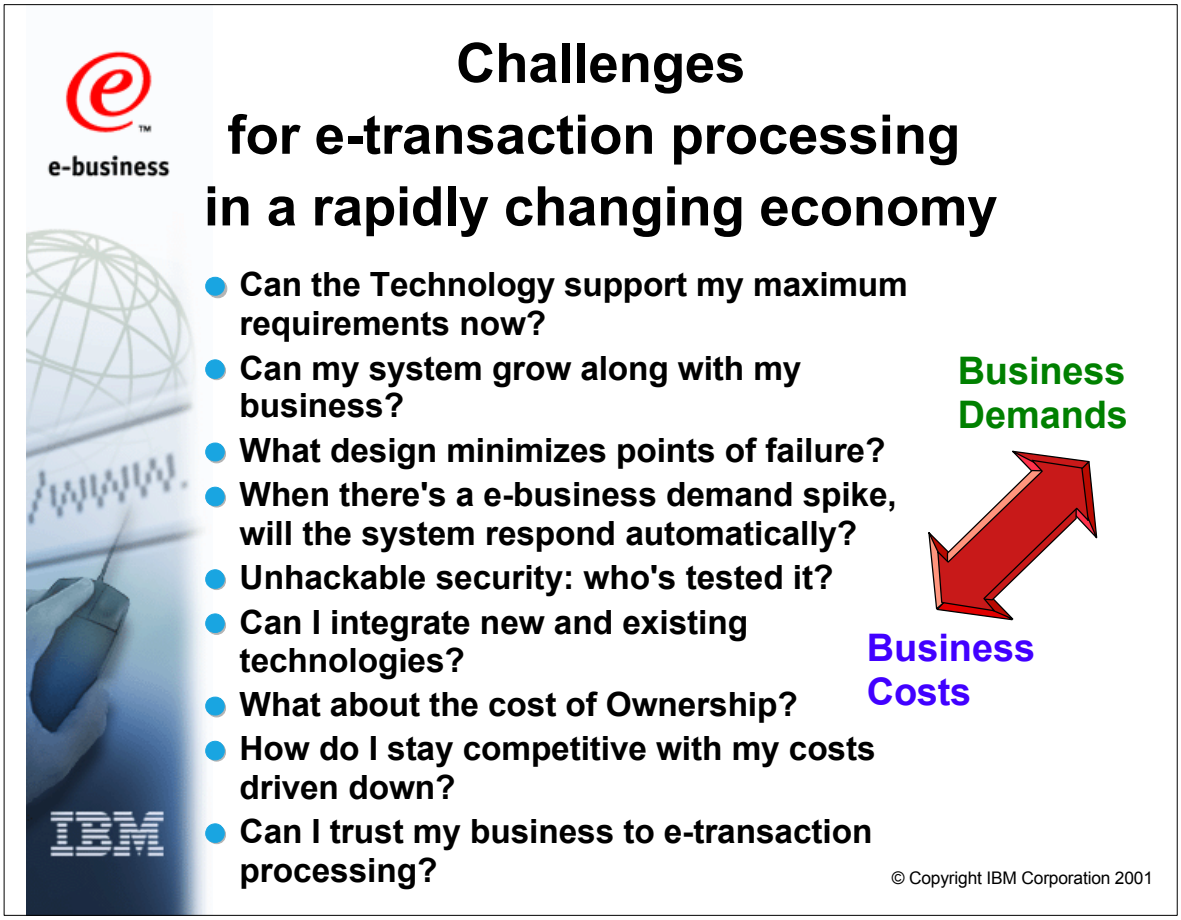
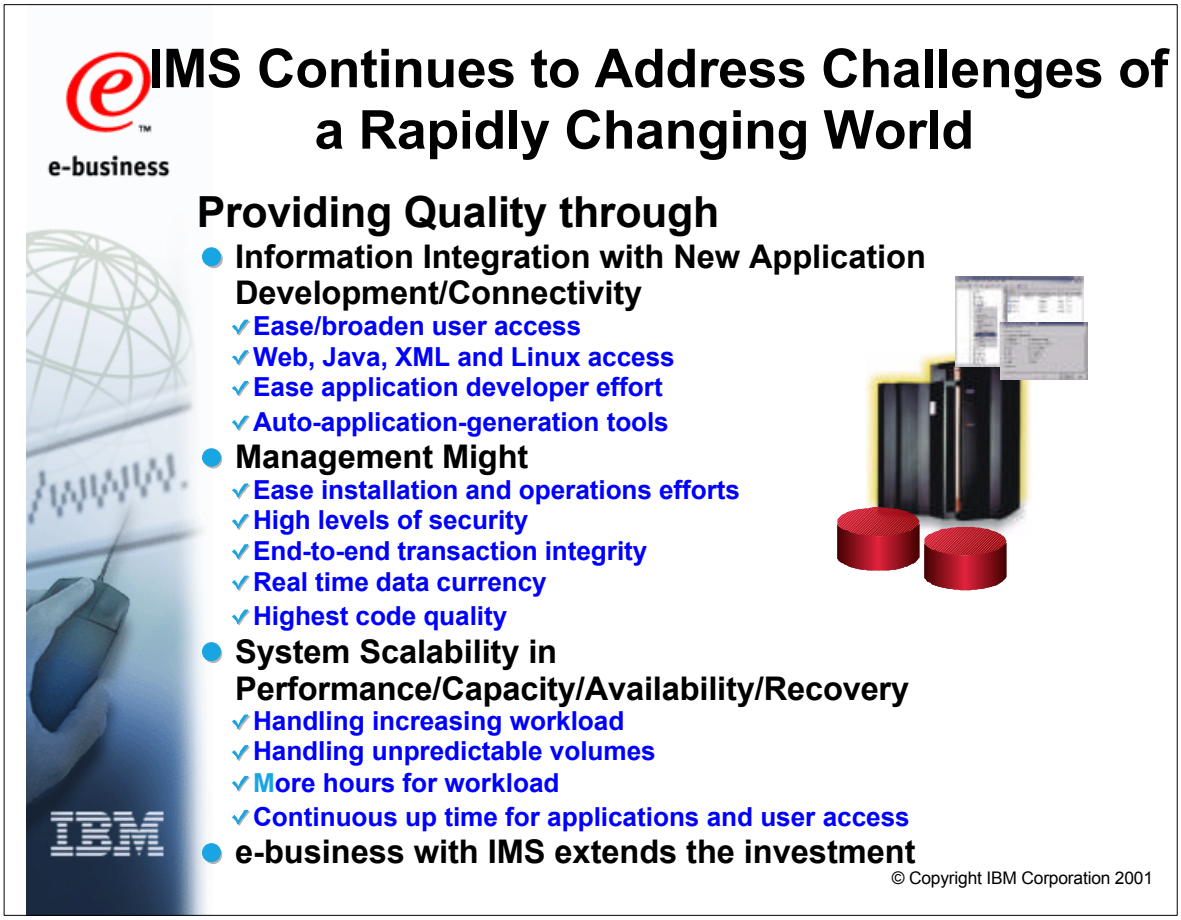
- As we move further into the new era of computing, IMS is still leading the way. More than 30 years since the first IMS-ready message for the Apollo Space program, IMS and the S/390 are breaking technology barriers, but sometimes taken for granted. Information technology has significantly changed to address the changing world of business. Market forces have been changing the way we do business. Regulation, economics, have been changing as businesses become more global. Growth of the internet, the global reach, the new commerce channels are changing the way everybody does business, like the upswing in mergers and acquisitions. Views into information are becoming as important as the information itself. Amalgamation and aggregation have become widespread in the industry. Businesses are exploiting new technologies to enable new customers with new information across the web, in a global day. Businesses are being challenged with balancing priorities and need new ways to gain and retain competitive edge to address increasing demands and sophistication of their customers. IMS customers are at the bleeding edge of this reality. Yet at its heart, business stays the same. Industry forces are making the highest demands for performance and availability, along with interoperability, flexibility, and support for new, emerging technologies. This is something IMS people have been hearing for years. And IMS continues to help efficiently provide heterogeneous access across global networks and in addressing companies' changing needs. IBM is now providing integrated solutions with IMS to help our customers further. I will cover here the IMS strategy, recent announcements, and future directions for IMS, and for the S/390 and zSeries environments in which it runs -- to provide the solutions for IMS in Leading the Marketplace in Information Integration with Management Might and System Scalability.



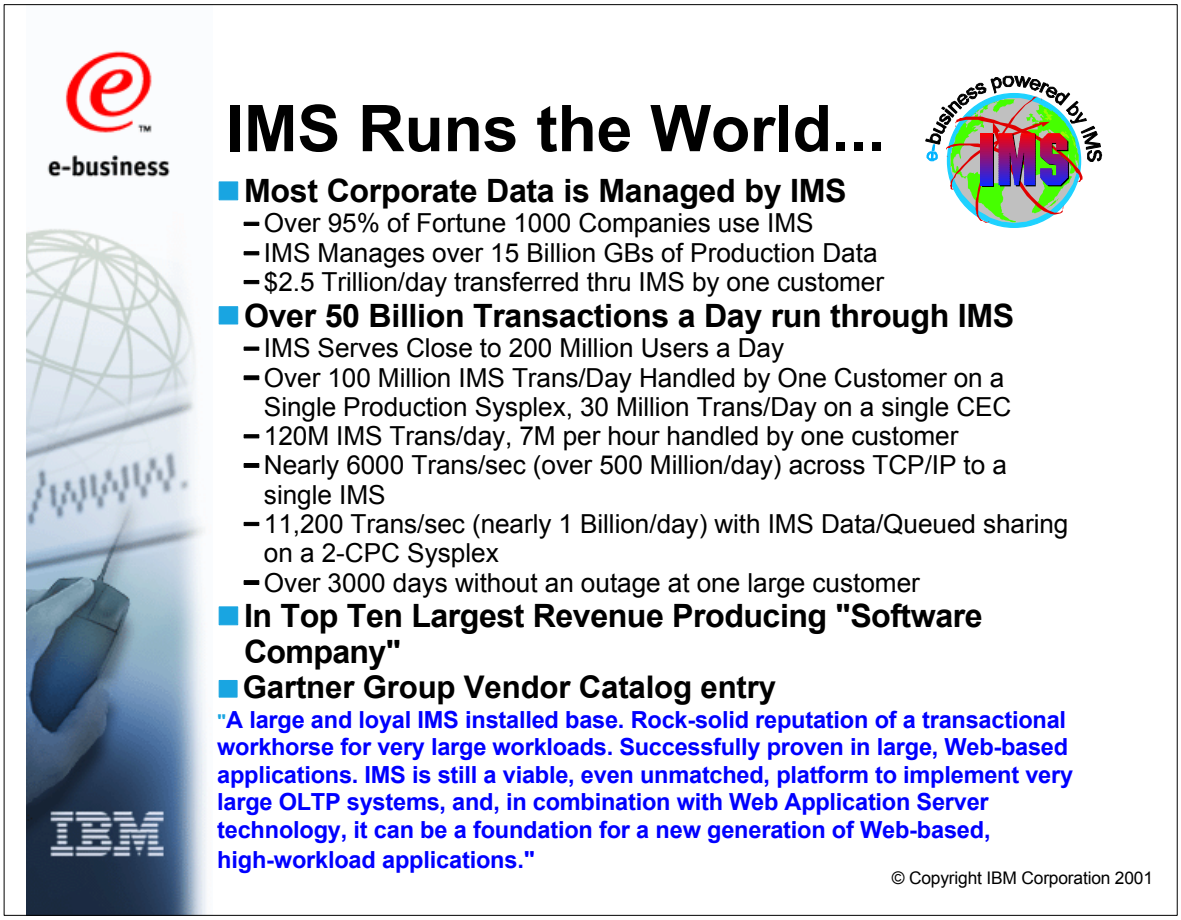
- When e-business adds e-commerce, simple becomes complex. e-business is about integration and transformation, resulting in a transaction explosion.
- The future is in creating/expanding new-existing information out to wider networks of people , economically. Customer's needs must be addressed, new technologies exploited, application concerns handled. We need to ensure simplicity, maintain security, maximize your skills, while optimizing your company's return on investment.
- e-business is no longer simply about static web pages -- it's about putting your entire business on the internet, integrating new applications with existing transaction systems to handle the explosive growth of the Internet economy. It's a place where customers, suppliers, and business can come together securely, anywhere, any time.
- e-transaction processing is about the evolution of e-business. Extreme IT needs for e-transaction processing are scalability, non-disruptive capacity upgrades, availability, security, flexibility , high bandwidth, balanced systems with ability to handle mixed workloads and system and storage management. Advanced Transaction processing calls for continuous up time for applications, high levels of security, end-to-end business transaction integrity, real time data currency, and management of unpredictable volumes.



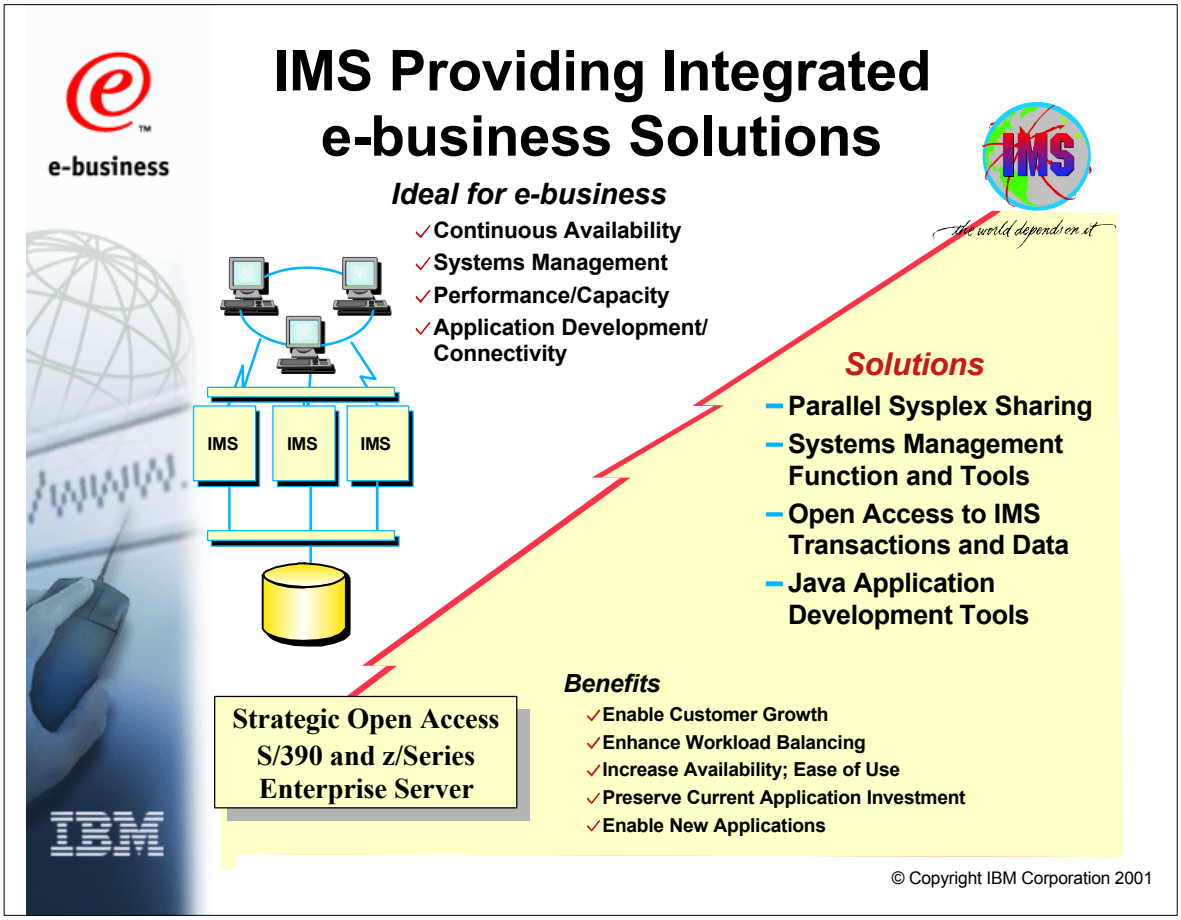
- Customers continue to be being faced with new challenges with the same old problems as they move up the scale of e-transaction processing and the changing economy.
- Customers are asking: Can the technology support my maximum requirements now? Can my system grow along with my business? How can I stay competitive with my costs coming down? Can I trust my business to e-transaction processing?
- In this new world of e-transaction processing, IMS along with the S/390 and z/series, can uniquely integrate new applications with existing data to harness the global opportunity of enterprise-critical e-business.



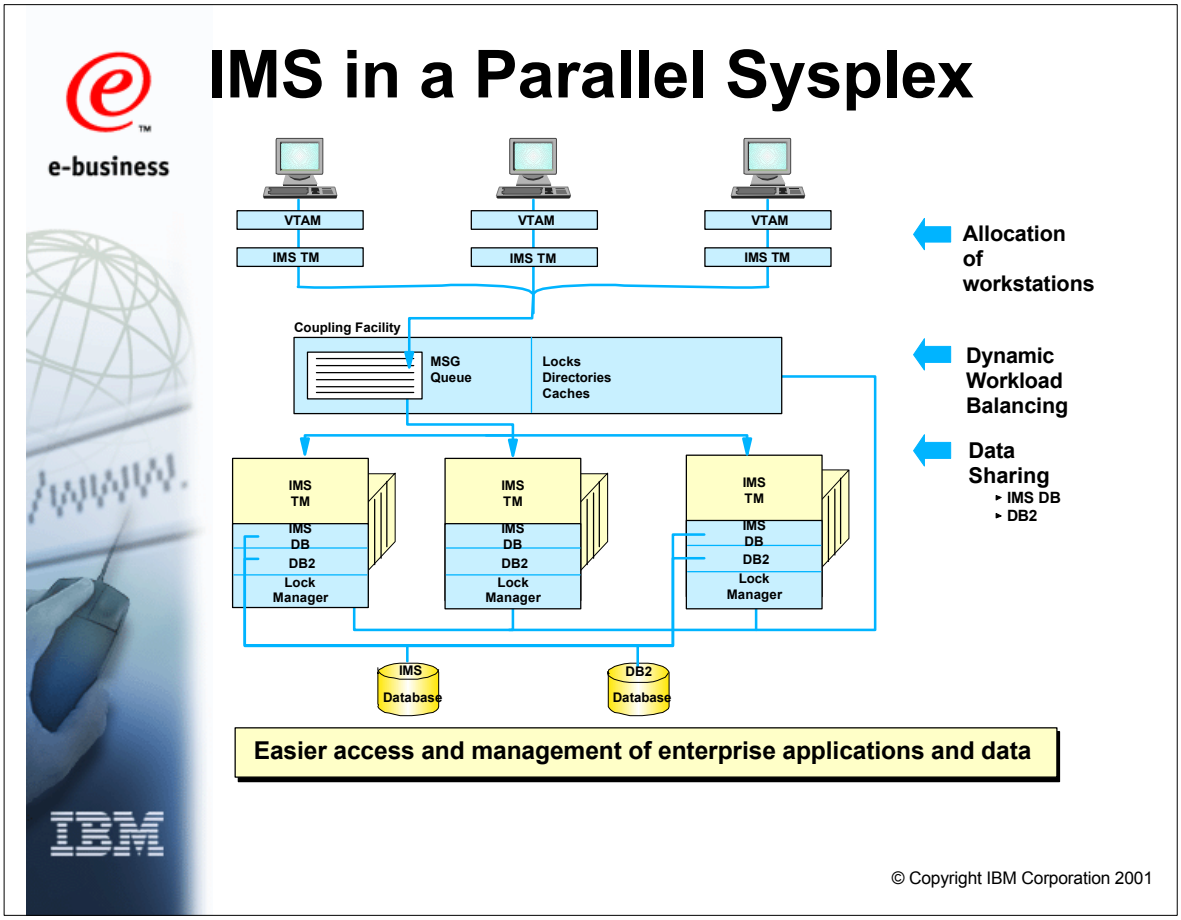
- IMS meets extreme IT needs for e-transaction processing with the ultimate in performance/capacity, availability and systems management and technological leadership in connectivity and new application development.
- IMS along with the S/390 and the zSeries have been delivering on the promise of e-business and continue to do so with new enhancements for e-transaction processing bandwidths capable of supporting the largest web sites and transaction rates through GB ethernet. Fiber connection technology and industry leading webserving with IMS and the IBM WebSphere Application Server, Security and Communications Servers. A balanced system is provided for world class solutions. IMS together with the S/390 and zSeries are delivering more comprehensive security protection, featuring centralized management and a strong suite of end-to-end products. We continue to provide and enhance our leading edge end-to-end transaction integrity and real time data currency with the sharing of data, networks, and messages, utilizing the sysplex and its coupling facility. Our technology transition from bipolar to CMOS had allowed us to deliver exponentially improving price/performance to our customers. Customers are using this power to take on new e-business related applications.



- Industries world-wide rely on IMS to run their businesses. IMS is part of everyday life. Chances are you are using IMS when you turn on a light, make a telephone call, get a business loan, process accounting records, use your ATM card, put money in a bank, rent a car, purchase insurance, travel, send a package, track in-transit packages, trade stocks, control inventories, process payroll, update personnel records, control an assembly line, control a railroad, use corporate database, run a government agency, conduct international business/banking, and many more.
- More than ninety-percent of the Fortune 1000 companies use IMS. IMS serves 200 million end users, managing over 15 billion Gigabytes of production data and processing over 50 billion transactions every day. IMS still owns the high-volume on-line transaction and database management environment.
- IMS customers have been driving their own growth and the world's business with IMS
- One customer had transferred over $2.5 Trillion through IMS in a single day.
- Over 100 million transactions were handled by one customer in a single day on a single sysplex system
- 7 million Transactions/ hour and 120 million transactions/day were handled by another customer.
- IMS in-house testing has reached nearly 6000 transactions/sec across TCP/IP to a single IMS on a single machine. That equates to over 500 Million per day.
- And we have reached 11,246 trans/sec (nearly 1 Billion trans/day) with IMS Data/Queued Sharing on a 2-CPC Sysplex..
- One large customer has also indicated they have reached over 3000 days without an outage and still going strong.
- IMS, IBM's premier hierarchical transaction and database management system, is the product of choice for critical on-line operational applications and data where support for high availability, performance, capacity and integrity, and low cost are key factors. Today, IMS manages the world's mission-critical data and has been at the forefront of the swing back to mainframe usage.
- A recent Gartner Group Vendor Catalog entry stated "A large and loyal IMS installed base. Rock-solid reputation of a transactional workhorse for very large workloads. Successfully proven in large, Web-based applications. IMS is still a viable, even unmatched, platform to implement very large OLTP systems, and, in combination with Web Application Server technology, it can be a foundation for a new generation of Web-based, high-workload applications."



- The IMS Transaction and Database Server has been evolving to further strengthen its support for Enterprise Transaction processing environments. IMS has been providing increased capacity and incremental horizontal growth and offering improved availability with network, message and data sharing, utilizing the Sysplex facilities of the S/390 and zSeries and the latest technological advancements for security and integrity of OS/390 and z/OS.
- IMS has also been providing improved systems management in automated operations, workload balancing, dynamic routing, dump analysis and packaging enhancements. Building on a tradition of success, IBM has been offering additional product and tools for IMS which enhance enterprise computing systems management, availability, and capacity (for example, with the new Sysplex Recovery coordination, and High Performance DB tools).
- IBM is also offering additional product and tools enhancements for network computing to simplify access to both existing and new IMS applications and data. IMS had introduced new interfaces for Open access to IMS applications and data and continues to provide for better integration and efficient access of IMS by other subsystems.
- IBM has also been providing common cross-product solutions, utilizing the latest technology offered for the Web, Java, and XML. IMS has been enabled for the new world and as a result continues to grow.



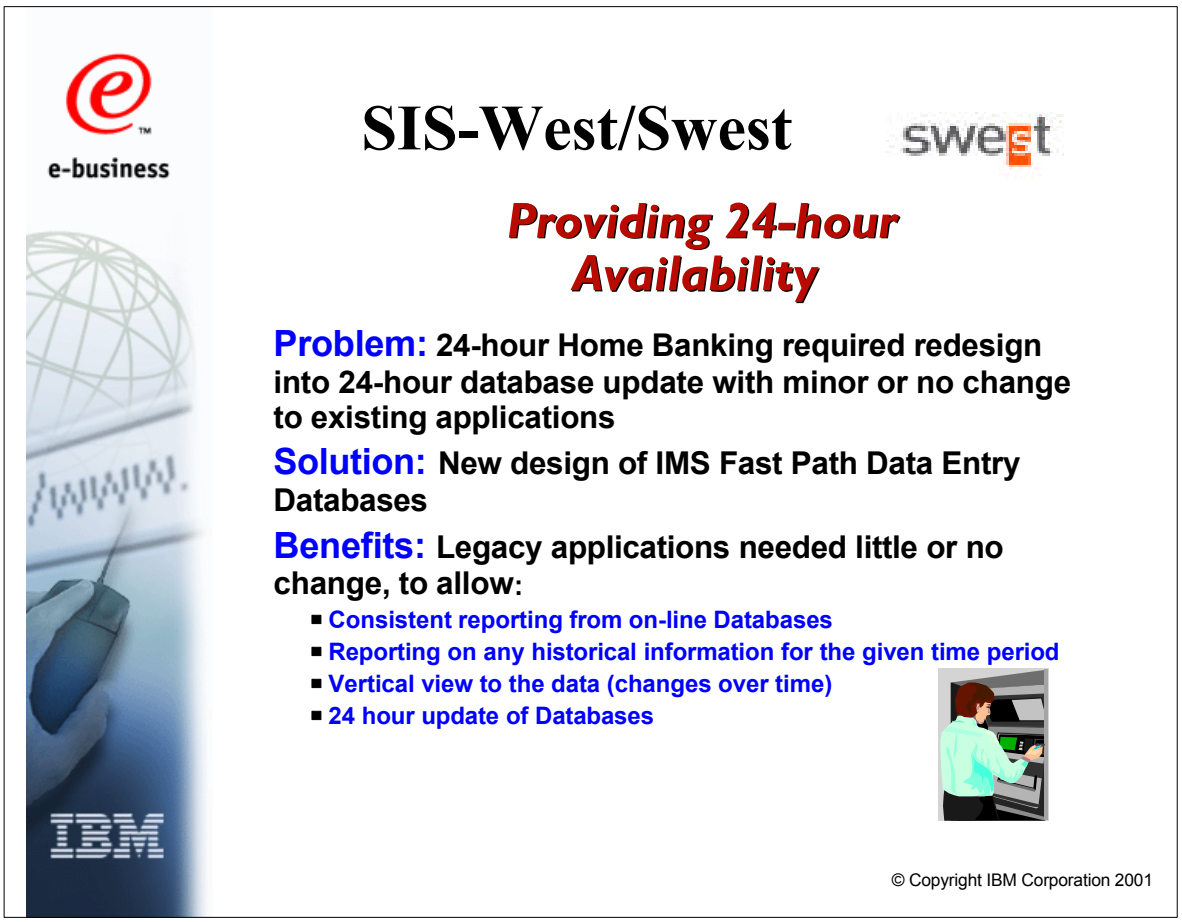
- IMS continues to strengthen its support of the Enterprise by providing the highest in performance, availability, security, integrity, at the least cost per transaction. In doing this it has been exploiting the hardware/software environments that it has grown up along side of. IMS fully exploits for customer advantage the new technology and power of OS/390 and the Parallel Sysplex. Existing IMS data sharing capability was enhanced with IMS Version 5 to take advantage of the coupling facility for storing lock information and for easy availability of that information by all systems in the Sysplex environment. The lock manager in each system could access the locks as they needed to. In addition to data sharing, IMS V5 provided necessary information to the MVS workload manager to assist with workload balancing of resources across the Sysplex. IMS also enhanced message routing between systems to take advantage of workload balancing information, and IBM provided the IMS Workload Router to use these facilities to push the work to the available system. Significant enhancements for IMS V6 were added to those provided in IMS V5 to complement the Parallel Sysplex hardware and operating systems facilities. IMS V5 also provided Remote Site Recovery, which allowed backing up an IMS system with another at a different location. A database at another system is maintained to match the primary database and/or a log is maintained that can dynamically and quickly update that remote data base to allow takeover in the event of failure.
- IMS V6 improved the IMS V5 Data Sharing and Workload manager enhancements with additional data sharing (storing changes and unaltered data on the coupling facility for Sysplex access, and providing additional Fast Path sharing), message sharing (providing message queues and fast path messages on the coupling facility for Sysplex access), and message routing enhancements (utilizing VTAM Generic resource support). As customer workload grows, the power that distributing data and applications across the Sysplex provides is needed. End users want to be able to access applications and data transparently, regardless where the work is processing. This enhanced support provides improved end user interaction, improved IMS availability, improved workload balancing, and offers increased capacity and growth in moving into Parallel Sysplex environments.
- IMS's Fast Path capabilities continue to be enhanced to provide the fastest access through the system, continuing to lead database products. Against industry standard benchmarks it continues to show as the best price performance at the lowest cost, confirming that nothing in the transaction market matched the speed and power of the IBM S/390 with IMS.
- IMS V7 and V8 continue to enhance this environment.

PMU - French Horse Racing

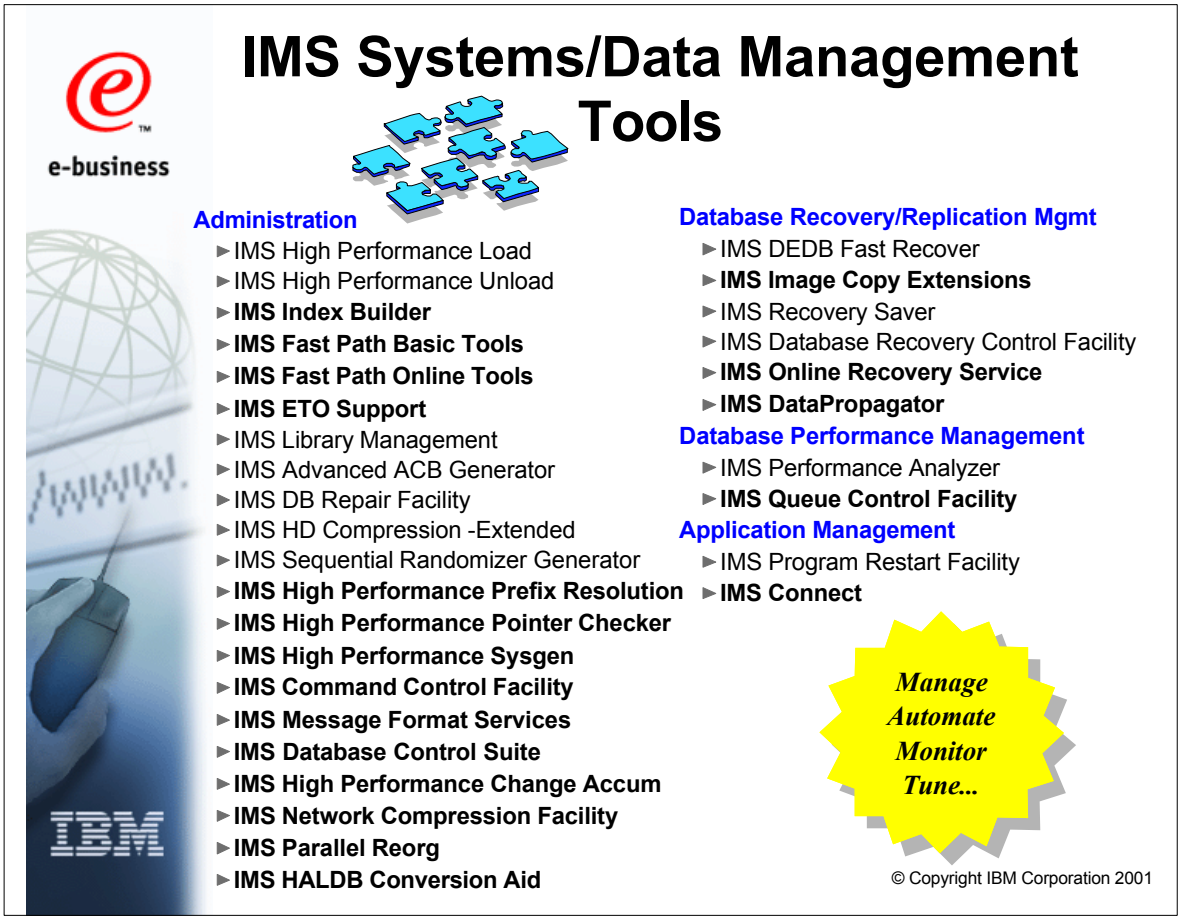
e-business

- PRIX D'AMERIQUE 2001
  - This 80th edition has seen the victory of Varenne driven by G.P. Minnucci
  - This 80th edition has seen the victory of the IMS Betting Application which reached 1100 transaction per second during half an hour!
- IMS Betting Application Design
  - 2 IMS subsystems with data sharing
    - designed for 1400 tr/s
  - Using IMS Fast Path TM
    - Expedited Message Handler
  - Using IMS Fast Path DB
    - 3 VSO DEDBs with SDEPs
    - 1 shared VSO DEDB

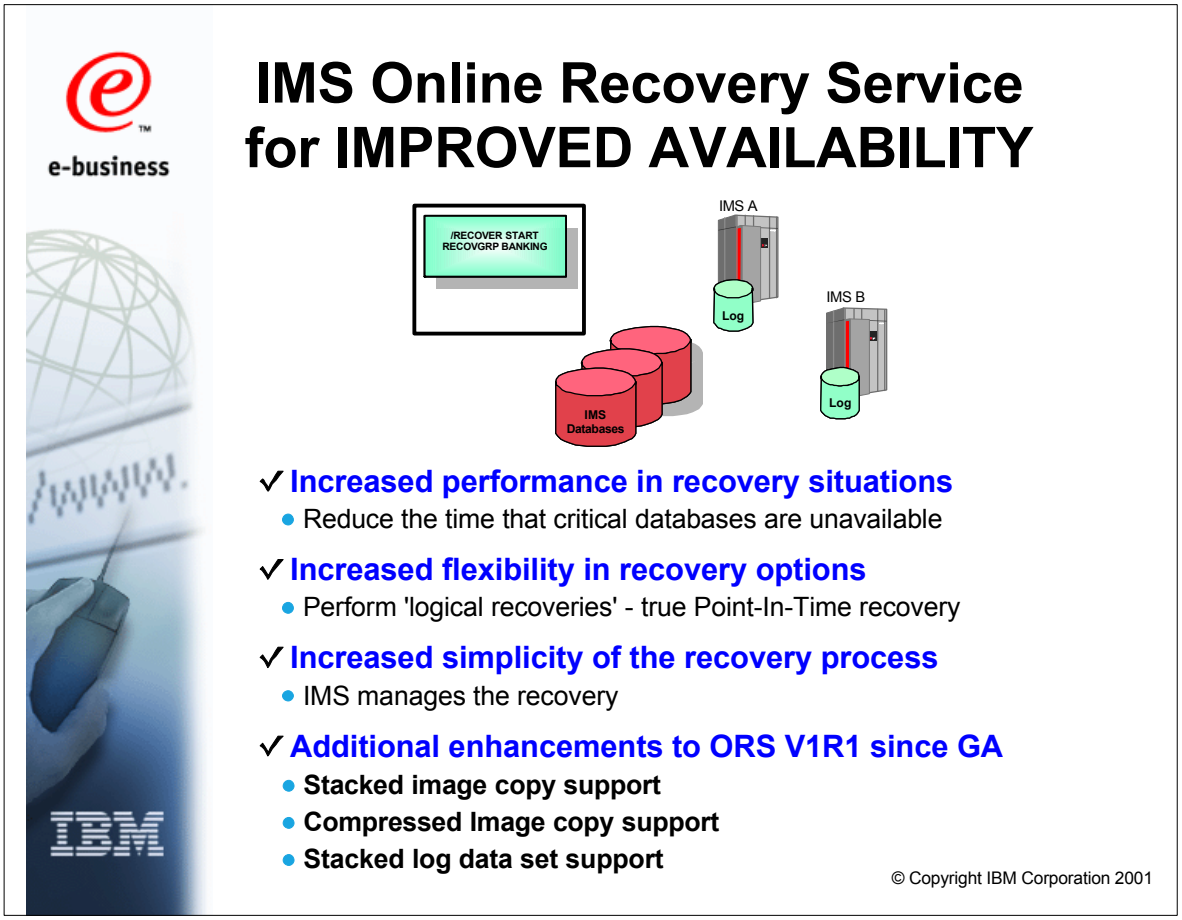
- One of our customers, PMU, chose IMS 5 years ago and now has 2 years of intensive production on IMS.
- After some CICS/DB2 prototyping, they choose IMS in order to reach their transaction throughput goal at 1400 transactions/second.
- The reputation for excellence of breeding and for French horse racing are a great asset for PMU in the exporting of its know-how to other markets. PMU often acts as a technical expert for foreign partners wanting to set up a pari mutual betting network on horse races or on their own events or for operators already present and wanting to increase their betting facilities.
- Since 1986, PMU's activities have been developing in three main directions using IMS to achieve high transaction rates:
- Common Pool betting
- Betting terminals located abroad are connected directly to the PMU network.
- Technical assistance and the creation of networks
- PMU also places expertise at the service of countries wanting to set up a betting network on French horse races.
- Sales of programs, results and pictures
- This service enables foreign operators to organize in their own countries, as individuals, betting on French horse racing.



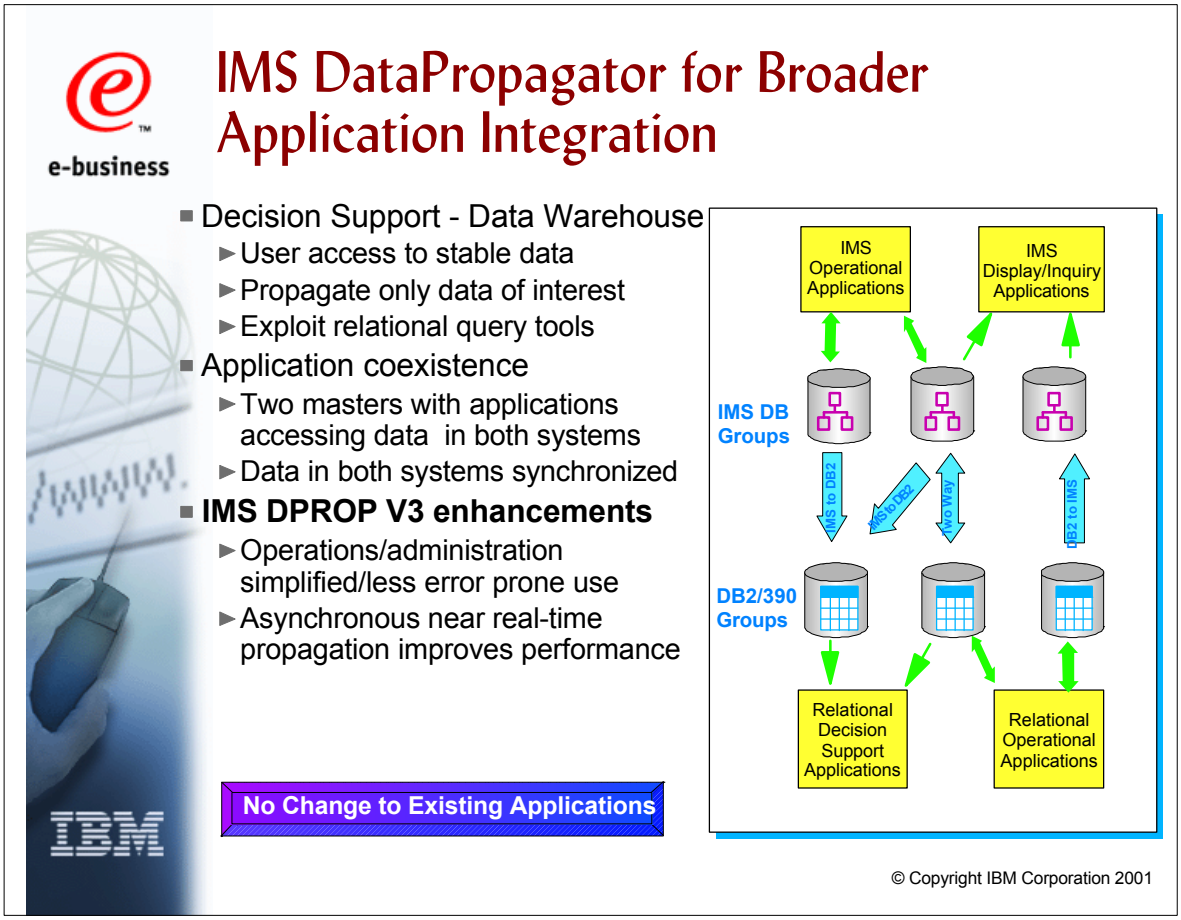
- SIS West / Swest provides Savings bank services across Germany, handling 1500 transactions per second on 5 IMS systems. SIS West redesigned their customer information system (KIS) to run in production since 1997 without interruption. The database is about .4 Terabytes of data, spread over 5 IMS systems. On-line updates are applied at any time. Several hundred reports are taken per day, some of them are based on final processing of the last day, others on last ultimo, or the 10th or the 20th of the month. Until June the customer allowed reporting on the last year-end. Some reports are taken on the last position. New applications are on development to deal with changes over time.
- Several other databases are redesigned as well to provide same functionality. These are the savings account database, the standing orders database and the cards management databases.
- Due to the new technique, gradually, manageable, changing to truly 24-hour operation is possible without losing pace in a rapidly changing world. Hundreds (600-800) of legacy programs would have been affected in a regular redesign.
- Today, banks around the world are providing home banking to their users. Credit Mutuel, in France, was one of the early users of home banking. They had provided access for their customers to their IMS applications and data with MQSeries Web solutions.



- IBM has been providing a wide range of price/performance, competitive Systems Management tools for IMS. This shows a summary of the IBM IMS tools available to you. The tools provided support for speeding up and reporting on performance, extend the functions of and assist with testing of IMS, and provide system tools for querying, validating, managing, and tuning the IMS Database, These include for example tools necessary to maintain and repair databases Many tools serve multiple purposes. IBM offers tool functionality that is not available from any other vendor. IBM offers high performance tools that are competitive within the industry at an affordable price. In fact when taken together "price/performance and functionality", IBMs IMS tool can be considered the best in the industry. This past year we have continued to announce and ship a number of new/enhanced Tools (highlighted in bold print here).



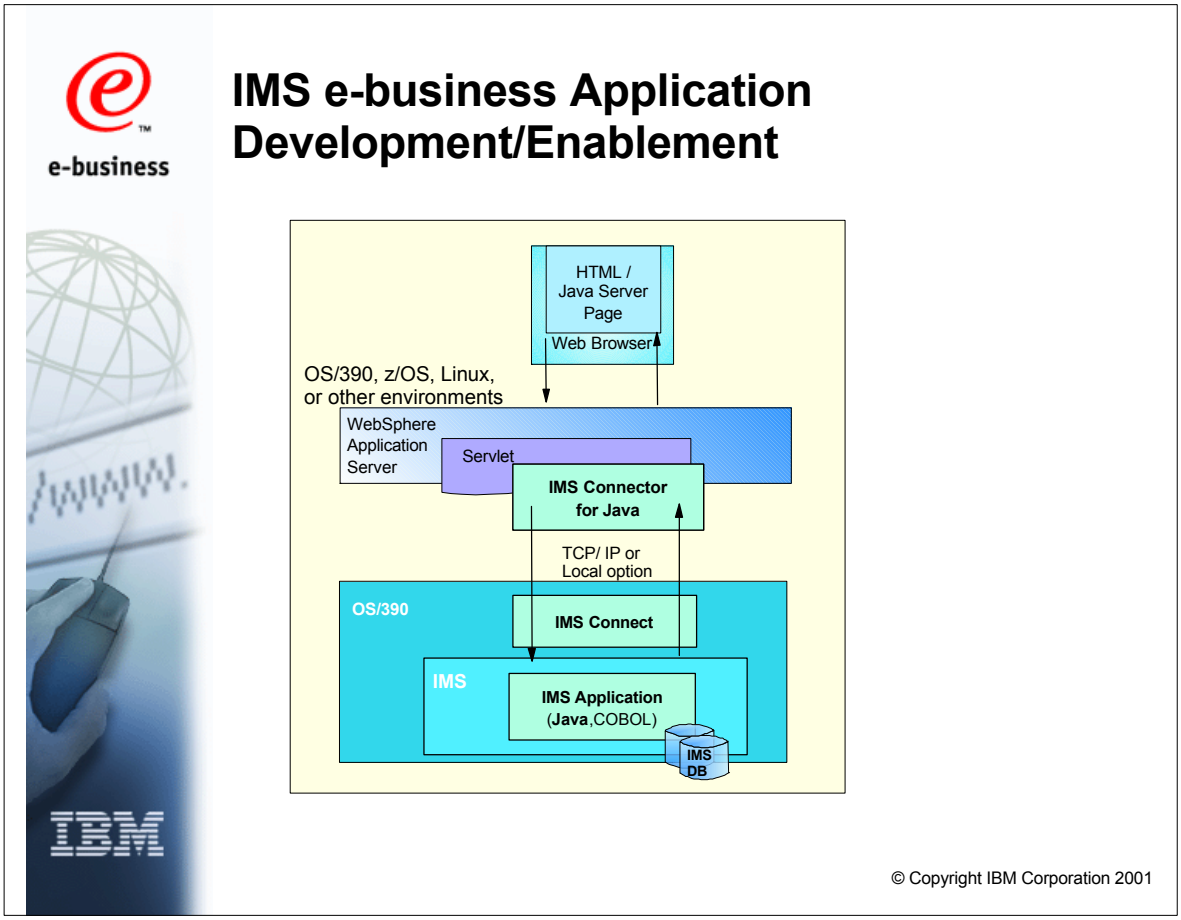
- The Online Recovery Service (ORS) is a separately orderable/priced facility for use with IMS V7 that also provides for availability. This facility gives a customer the ability to recover multiple database datasets by reading log volumes in parallel and applying the database changes to multiple database datasets simultaneously. Recovery-related processing takes place only when recovery is required. In addition, I/O overhead for recovery is reduced. This feature also gives a customer the ability to recover data bases to a 'point in time' which is earlier than the last committed updates.
- Enhancements have also been provided for this for performance and ease of use.



IMS has also been providing Business Intelligence solutions with data replication/propagation tools, such as the IMS DataPropagator.
The IMS DataPropagator provides synchronous and asynchronous updates passed between IMS DB and DB2 databases to enable consistency and use in a mixed database environment.
The IMS Data Propagator can provide IMS customers with advanced data integration and analysis capabilities, while leveraging their existing IMS data assets.
IMS DPROP

- Propagates updates from IMS to DB2, DB2 to IMS, and both
- Two modes of operation are Asynchronous (user controlled) and Synchronous (automated)
- Allows users to subset operational data for informational use, create consistent copies, and maintain historical data
- Can use a local/remote DB2 target with asynchronous propagation of updates to a remote DB2 target copy.
- Interfaces to Data Refresher for initial synchronization of source and target, and source/target mapping used both for initial load and for propagating changes
- Provides data staging where IMS updates propagated to DB2 DPROP staging table and applied to DB2 and DataJoiner targets.

IMS Data Propagator V2 has been enhanced to run with IMS V7. And the new DPROP V3 adds near real time asynchronous update capability through MQSeries support. Additional requirements could also address an improved user interface, and support for additional environments.



- IMS is exploiting the latest programming technologies for the Internet and Java. This includes enablement of interactive and multimedia applications in a simplified fashion. With Java, users can transparently download and seamlessly run applications. It is becoming widely used and is platform independent.
- IBM is also providing a common connector framework with a set of common, consistent Java interfaces that connectors for any subsystem can and are implementing, making it easier for programmers not to worry about the differences between those subsystems. For such, IMS has provided an IMS Connector for Java in VA Java Enterprise Edition Version. By being compliant with the Common Connector Framework, IMS Connector for Java can be used in any component server environment that supports the Common Connector Framework. And we are now extending that to the J2EE environment, also known as the Java Connector Architecture (JCA).
- This shows the runtime environment of a Java Servlet Application (running under OS/390, z/OS, Linux or another environment). When a user executes the application and provides the appropriate input data, IMS Connector for Java within the Java Application establishes a connection with IMS Connect through a TCP/IP (or Local Option, if in the same LPAR as Connect) connection. IMS Connect, running under OS/390 or z/OS can run in the same or separate LPAR from IMS. It will forward the transaction request to the IMS application through the IMS OTMA (Open Transaction Manager Access) interface, using MVS XCF (Cross-system Coupling Facility). The IMS application could be written in Java or another language. IMS Connect would also send the output back to the IMS Connector for Java application in a similar manner.
- In the servlet runtime environment, the user can invoke the HTML page using the web browser and put in the input data. The request will be sent to webserver and the corresponding servlet will be invoked by the WebSphere application server. The servlet will then use the IMS Connector for Java to establish and connection with IMS and invoke the requested transaction with the input data through IMS Connect.
- The output result will be handed back to the IMS Connector for Java in the servlet via IMS Connect and send to the output HTML page by the web server.
- Development on NT can be deployed in any WebSphere environment.

IMS Connect for Broader e-business Connectivity

e-business

IMS Connect V1R1

- **Separately priced tool providing enhanced TCP/IP access to IMS**
- Improved Performance with Persistent Sockets
- Enhanced Usability with user exit, command improvement, and asynchronous output support
- Ease Serviceability with Dump formatting enhancements
- Enhance Manageability with SMP/E Install/Maintenance
- **Much of the base function runs with IMS V5, V6 TM**
- **Asynch output and future enhancements require IMS V7**

IMS Connect V1R1 Enhancements

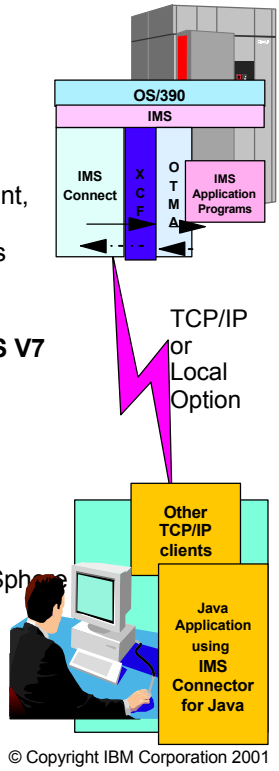
- Local/390 support
- Unicode
- ACK/NAK required notification support
- Output message structure change

IMS Connect V1R2 Enhancements

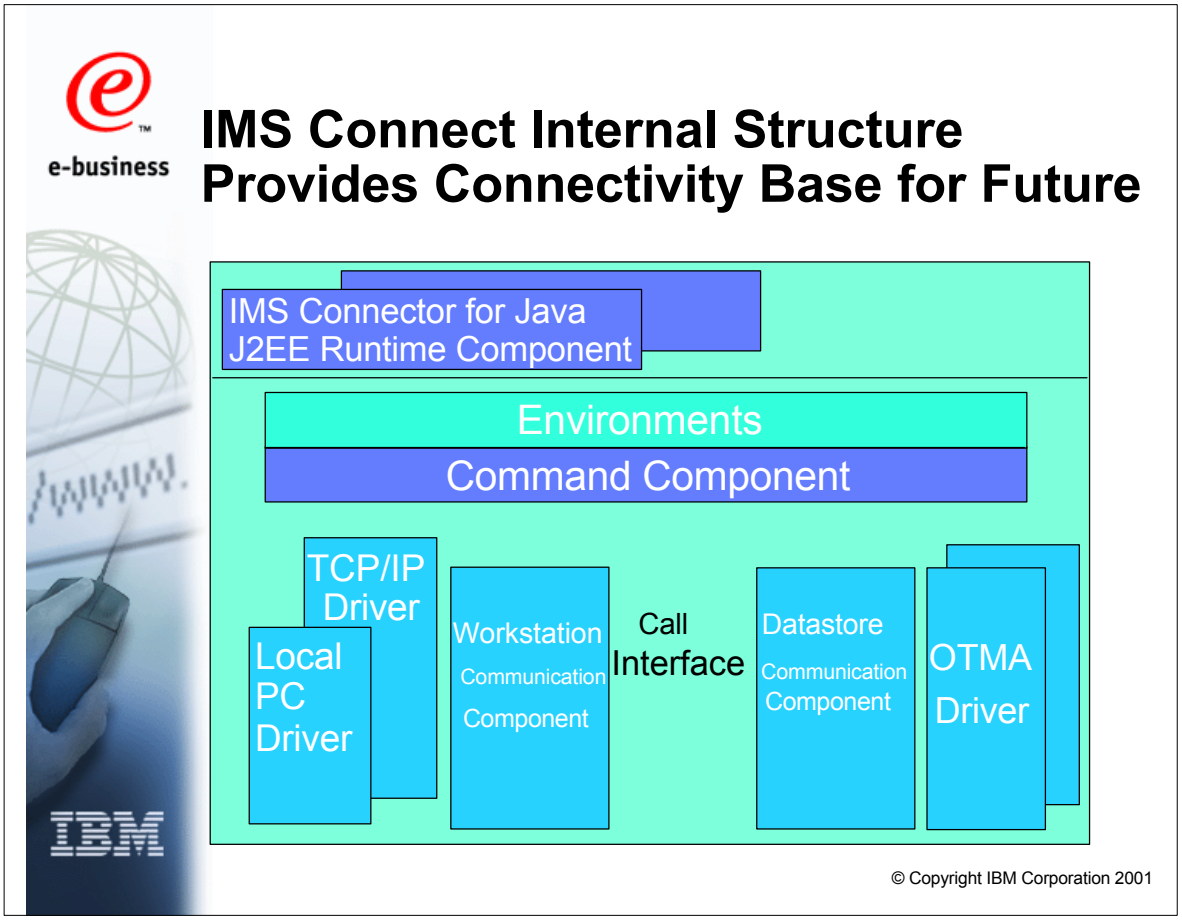
- IMS Connector for Java J2EE Runtime support for WebSphere access
- Used with VAJava's IMS Connector for Java J2EE Development support

IMS Connect Additional Requirements

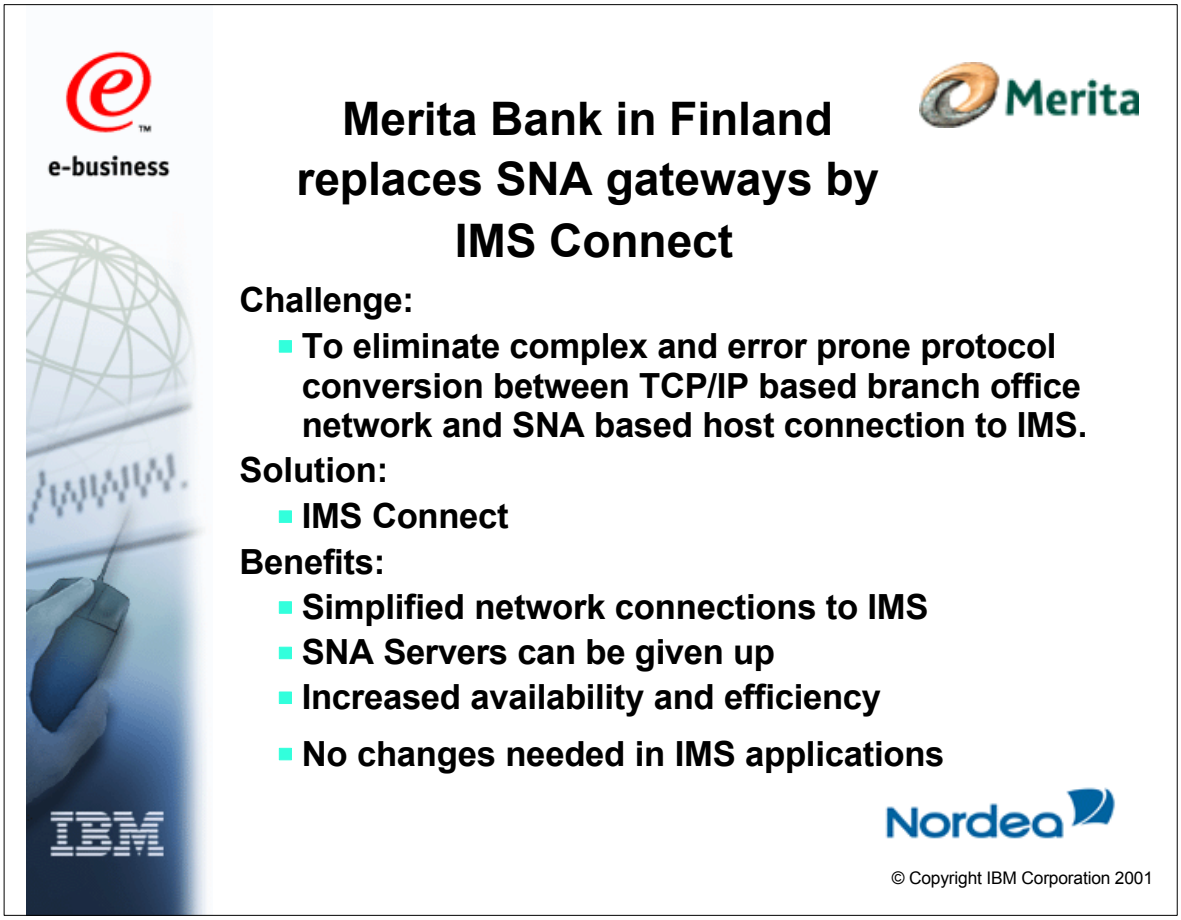
- Two phase Commit Support



- IMS Connect V1R1 was provided last year as a new separately priced facility for IMS. It provides enhanced IMS TCP/IP support. New enhancements this year being provided through the service process include:
- Local support, available via APAR PQ45057 4/01, for communication using Program Calls without requiring TCP/IP from a webserving application to IMS in a z/OS or OS/390 environment, easing the management in this environment. This support is used by the VisualAge for Java (VAJava) IMS Connector for Java for creating Java applications that can access IMS transactions from WebSphere Application Servers for zOS and OS/390.
- Unicode support, available via APAR PQ47906 5/01, for sending Unicode application data to an IMS host application capable of dealing with Unicode, such as a Java application running in IMS.
- ACK/NAK required notification support, available via APAR PQ46195 4/01, provides client notification that an ACK or NAK response is required by the client without additional testing of data received. This notification will be sent to the Client in the CSM and RSM.
- Output message structure change, available via APAR PQ48182 5/01, to include the full message length preceding the output message to the client, reducing the design and coding effort of a client application.
- In web computing the system must match capacity to business requirements on an as-needed basis and provide an easy growth path, minimize downtime and provide quick return on investment. These are available with IMS and IMS Connect along with and the S/390. Recent enhancements have included improvements to the processing of requests, yielding overall increases in throughput. Performance improvements, higher bandwidth networking, and numerous other enhancements continue to make IMS and the S/390 a powerful, flexible system for growth in web serving as well as the rest of mission critical work.
- IMS solutions exploit the security, performance, and other facilities of the S/390 to optimize performance. Testing with IMS Connect has demonstrated very high transactions rates.
- Early IMS Connect performance data resulted in over 4000 trans/second on a G6 with a single IMS. Early performance work on IMS Connect shows potential for even more growth in this transaction rate as well.
- With IMS Connect V1R2 we are providing IMS Connector for Java J2EE runtime support for these new applications accessing IMS transactions.
- Additional requirements to be provided shortly are those for two phase commit support, initially for the OS/390 and z/OS environment through the Local option.



- IMS Connect uses the IMS Base Primitive Environment (BPE) services. Much of the function of the IMS Connect can also be used with IMS V5 and IMS V6 so you can migrate to this and take advantage of the IMS Connect function without having migrated your networks/applications/databases to IMS V7. The structure of IMS Connect is designed such that drivers can be interchangeable. That is, TCP/IP or OTMA could be replaced with other protocols and/or interfaces.



- One customer that is realizing the benefits of IMS Connect is Merita Bank in Finland. Merita Bank is the Finnish part of the Nordea, the largest financial services group in the Nordic and Baltic region
- Merita Bank is running over 3 million IMS-transactions during a normal banking day, approx. 190 tx's per second during the peak hour, and most of the transaction are coming from the bank's branch office network that has been TCP/IP based for several years already
- The connection from the bank office's workstation has been through SNA gateways that convert the protocol between TCP/IP and IMS SNA SLUTYPEP (WS -> bank office server -> banking net -> SNA server -> 3745/2216 -> IBM host)
- 13 500 defined SNA sessions (from which up to 5 000 concurrently active) requires several SNA servers and the servers have not been working as reliably as desired and the error in SNA server has wide affects in IMS transaction processing
- A project was established to replace SNA gateways by IMS Connect that enables the straight connection from workstation to IMS by using TCP/IP (WS -> banking net - IBM host (OSA Express)).
- Merita Bank was a Jump Start customer for IMS Connect and the project started a limited pilot production last autumn and now they are expanding the production deployment in phases. They began their IMS Connect usage with IMS version 6.
- In the tests the IMS Connect has been proved to be very stable, reliable and efficient
- And all this was done without touching the IMS Applications

The Bekins Company

e-business

Challenge:

- Quickly develop new ways to provide services to customers and authorized agents

Solution:

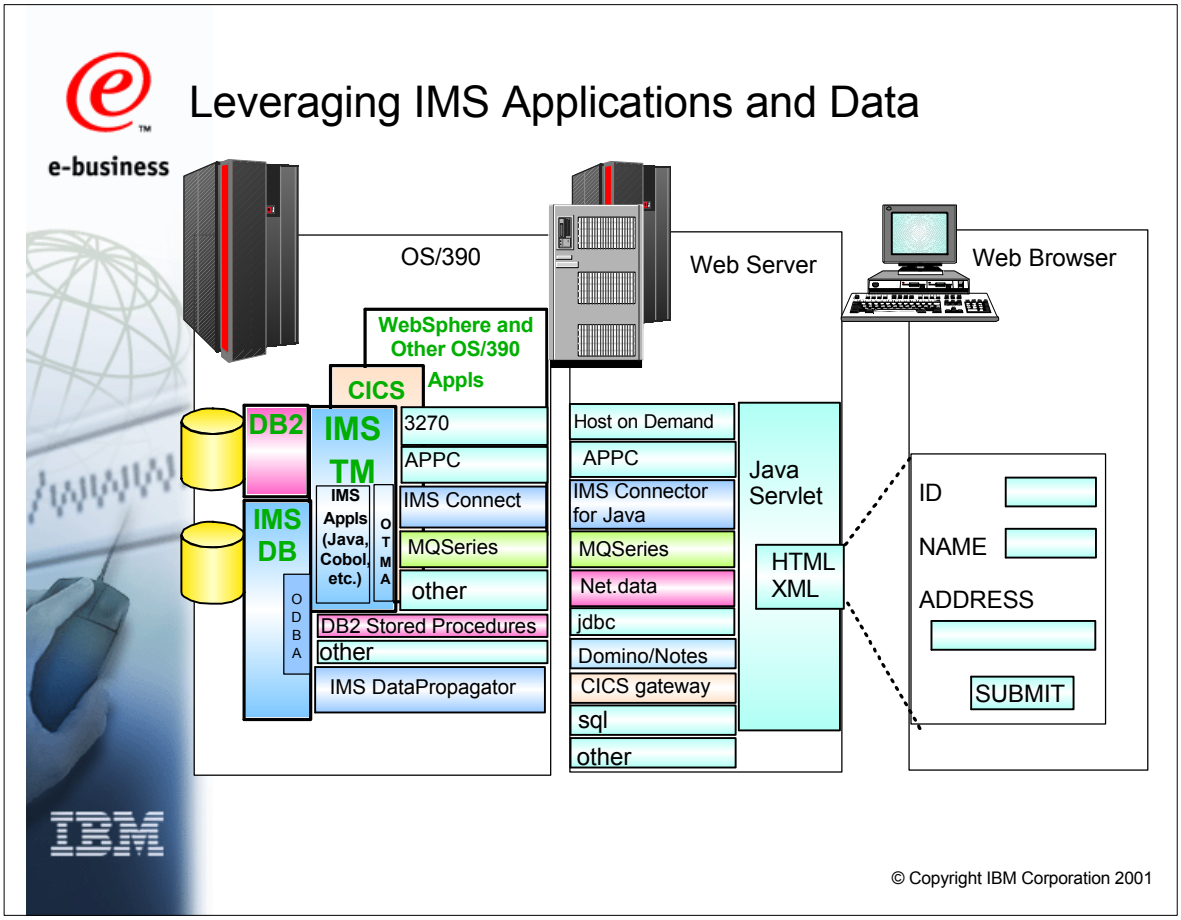
- Publish parts of Web-based shipping and tracking system as web services and integrate the services with existing workflow
- Create private e-marketplace to broker shipping orders to authorized agents
- Offer customers automated access to available capacity

Benefit:

- "The potential benefits from extending our business capabilities through Web services will make the $10.3 million payback we attributed to our first B2B e-business application seem like a drop in the bucket."

-- Randall Mowen, Director of Data Management & e-business Architecture

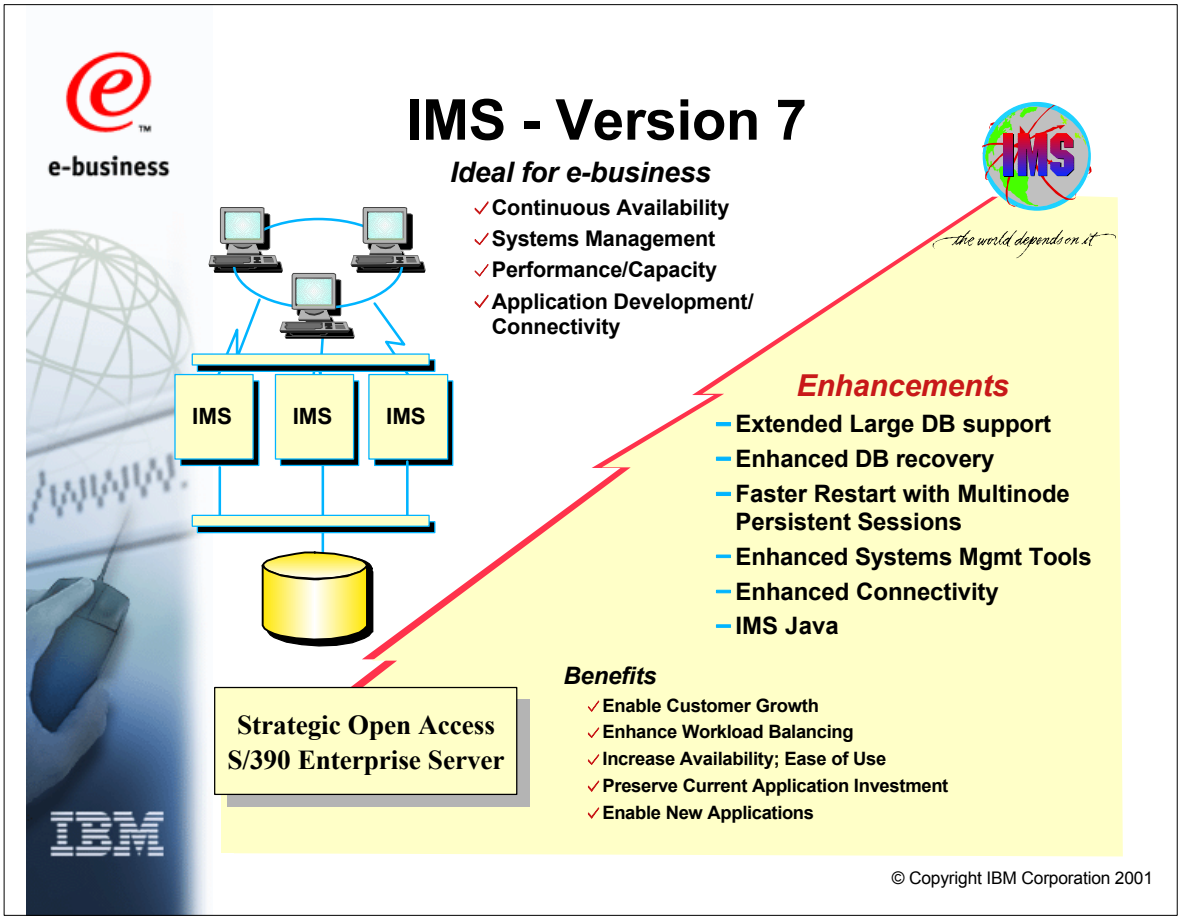
- Bekins has been providing high-quality transportation and distribution services across North America for more than a century. The company's e-business journey started in July 1999 when it launched a Web-based shipping and tracking system for its customers, including major e-commerce retailers who ship high-value products direct-to-business and direct-to-consumer. The goal was to put shipment tracking information directly into the hands of its customers and their end customers via the Internet, in order to stay competitive and improve customer service.
- Using the IBM WebSphere platform, including VisualAge for Java, company developers completed the initial release in record time, providing a highly robust, scalable and secure e-business solution which resulted in total financial benefits of more than $10.3 million annually, in terms of increased revenue, reduced operating expenses and IT Development savings. It paved the way for Bekins to quickly move even more of its business online, now getting added mileage of new applications for Order management and Inventory management.
- Both solutions run on IBM WebSphere platform including WebSphere Application Server running on WinNT, IBM WebSphere Studio and IBM VAJava. Within this framework, developers are able to quickly web-enable existing COBOL applications. These applications access data from IMS and DB2 databases on the IBM S/390 platform.



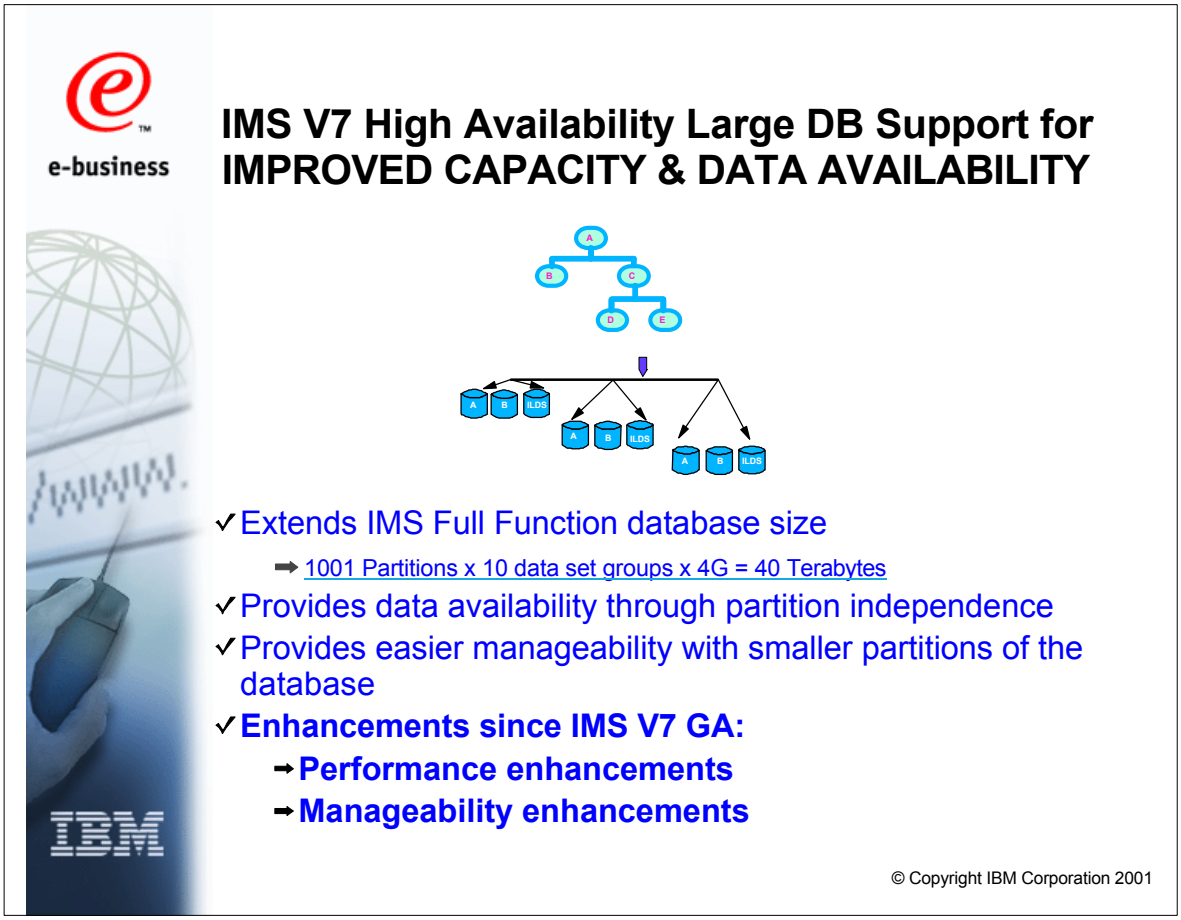
- Connectivity has always been a priority with IMS. IMS traditionally has supported a number of communications facilities (e.g.. 3270, APPC, TCP/IP, MQSeries, etc.). These solutions can use workstation or S/390 servers to access IMS. Information can be retrieved from the server system in a two-tier environment or in a three-tier environment. The Web servers have used connectors for IMS, DB2, CICS, MQ, etc., to communicate with the applications and data and to generate the formatted screen to be displayed on the browser. Our strategy here is to ship connectors with their tooling with VisualAge Java and with WebSphere for consistency across platforms and subsystems. We want people to connect regardless of the tool they are using and regardless of what they want to connect with. IBM's goal is to do the best job of integrating our tools. Applications can also use these tools to display information on the internet using HTML (Hypertext Markup Language), a markup language for describing pages of information displayed, or XML (extended markup language), for data interchange. Mapping activities, as well as enhanced function, can take place in the web server between the web and the existing network protocols and input/output streams.
- IMS has taken advantage of the new Cross Coupling facility (XCF), a software facility that allows MVS subsystems to communicate more efficiently, with its Open Transaction Management Access (OTMA) facility. This IMS access for TCP/IP through IMS Connect, for MQSeries, etc., provides a more efficient and richer capabilities in accessing existing, unchanged IMS applications. MQSeries solutions built on the IMS OTMA interface provide e-business access to IMS for other environments such as VisualAge Interspace to Visual Basic programs (i.e.. COM/DCOM) and Lotus Notes/Domino for notes and collaboration.
- New IMS application development for e-business can also take place with the IMS V7 Java support and the Java tools being provided.
- And the IMS Open Database Access facility (ODBA) provides a callable interface for easier database access as well. This facility as well as the new IMS V7 JDBC access to IMS DB data is being used by DB2 Stored procedures, so access is provided to IMS DB data as well as DB2 data and, through this, access can be provided through DB2 Connect out to the web.
- IMS Distributed Business Intelligence solutions are being provided through data replication/propagation tools, such as the IMS DataPropagator.
- The IMS DataPropagator provides synchronous and asynchronous updates passed between IMS DB and DB2 databases to enable consistency and use in a mixed database environment. The IMS Data Propagator can provide IMS customers with advanced data integration and analysis capabilities, while leveraging their existing IMS data assets. IMS Data Propagator has been enhanced to run with IMS V7. Additional requirements are for near real time asynchronous update, Improved user interface, and support for additional environments.
-

- The Sanlam Group is one of the most well established financial services groups in South Africa. It is the second largest life assurer and asset manager in South Africa with more than two million policyholders. Ninety percent of the work Sanlam processes is in life administration, and the remaining ten percent is in fund management, human resources, and health insurance administration.
- Sanlam needed a cost-effective and secure solution to provide its insurance brokers with access to its IMS legacy application. Initial implementations via Microsoft Windows NT platforms proved to be problematic, complex, and unreliable. Furthermore, Sanlam needed a solution for smaller banks that did not want to invest in network infrastructures. These banks did not have a network infrastructure with Sanlam, but needed to perform policy administration functions, such as the ceding of policies, enquiry of policy holder details, and normal policy administration, such as change of address. This function had previously been done manually, but was error-prone and time-intensive. Larger banks with a network infrastructure in place with Sanlam had an advantage over the smaller banks by providing better service to their clients. Having online access at a significantly reduced cost via the Internet would enable the smaller banks to provide the same level of service to clients as the larger banks. Sanlam also needed a way for policy holders to view their own policies.
- Sanlam adopted IBM's Application Framework for e-business to simplify connectivity to its S/390 and existing systems. It implemented the S/390 Domino Go Webserver to provide secure internet access to existing IMS/ESA applications and a back-end DB2 database. Together with RACF and SSL, this solution provides secure Internet access to the existing IMS/ESA applications.
- By implementing the S/390 Web server, Sanlam has been able to provide a more cost-effective service to the broker community. This efficient solution allows the broker to use standard Web browsers to serve clients, without incurring heavy infrastructure costs. Internet access to the S/390 is a quick, cost-effective solution, and it allows for further Java development. All Sanlam brokers, policy owners, and smaller banks will have secure access to the S/390 existing applications from the Internet.

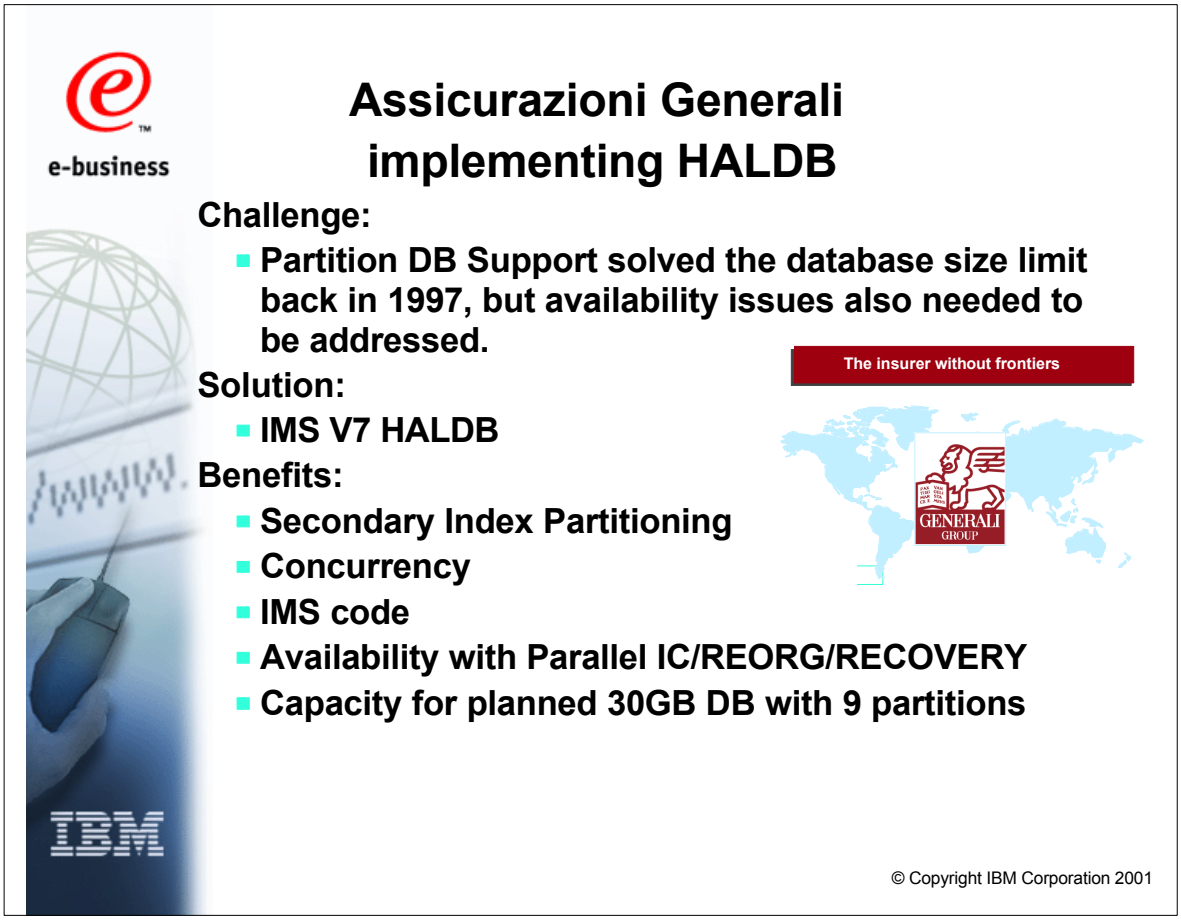
- VisualAge Pacbase is a repository-based application development environment. It offers lifecycle coverage of AD needs from analysis and design to production. It produces web-based e-business applications as well as Batch and Online across 30+ platforms This slide sums up here in key points and in three categories everything you have to know about the product: The development, runtime, and in maintenance of the applications. VisualAge Pacbase is used by other customers in other ways as well.
- Caja Madrid is a large banking customer, who was challenged with building a new insurance and customer relationship management system, to be deployed on the ranch network for over 9000 users. Their solution was to use VAPacbase and VisualAge for Java in conjunction with IMS and MQSeries to build their new systems. Using these tool, they now have 45,000 programs in production and have protected their investment, providing a smooth professional evolution of their development staff.



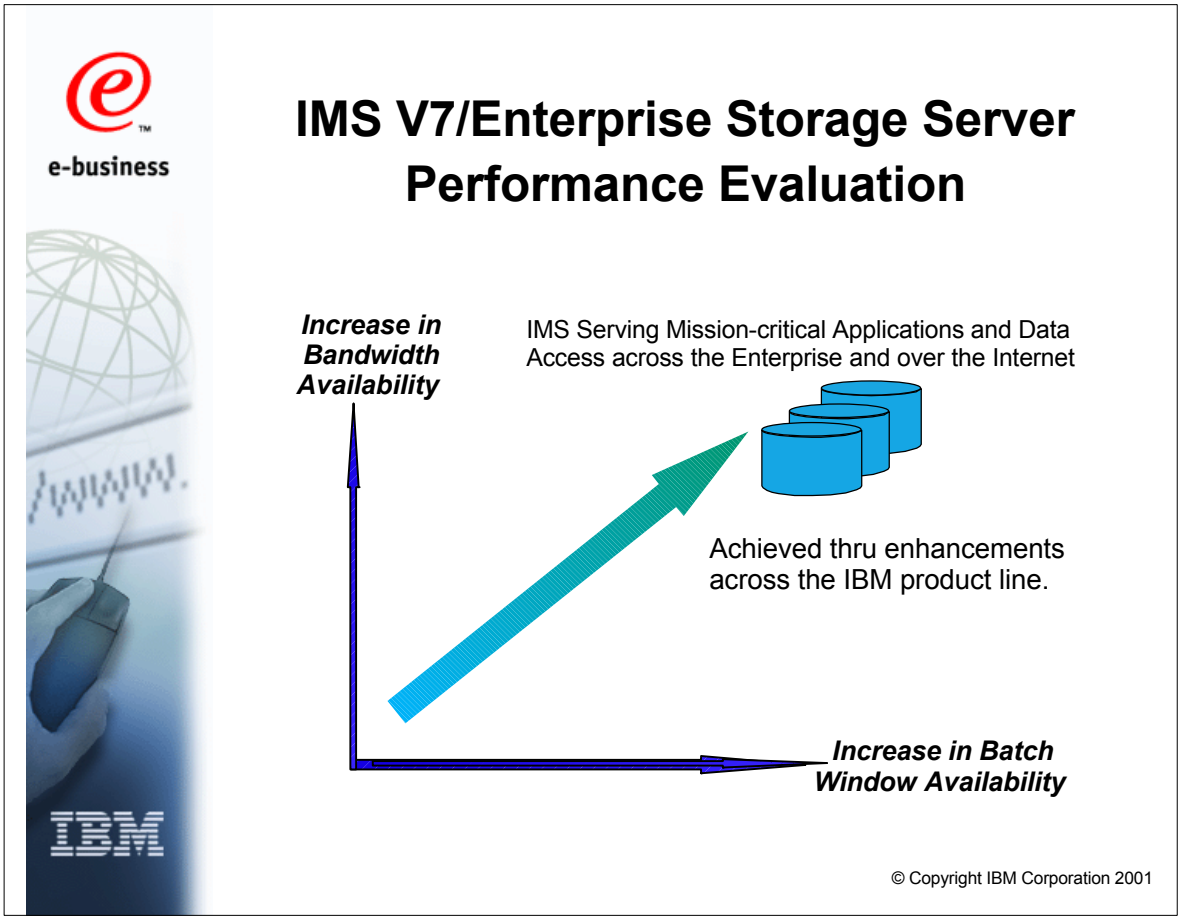
- To help all our customer with growth, availability, and systems management, today we are providing IMS Version 7 and some related tools. It includes the new Rapid Network Reconnect facility, providing faster reconnect, utilizing the facilities of VTAM's Multinode Persistent Sessions. IMS is also providing enhanced support for database recovery. And IMS is extending its large database support and extending partitioning to other database types. Other support in IMS V7 is also being provided to enhance operations across the Sysplex, and to improve workload balancing, single system image, and backup and recovery. These enhancements, as well as additional items, are provided to continue improvement in availability, systems management, performance/capacity, and for optimizing use of IMS in enterprise and network computing environments.



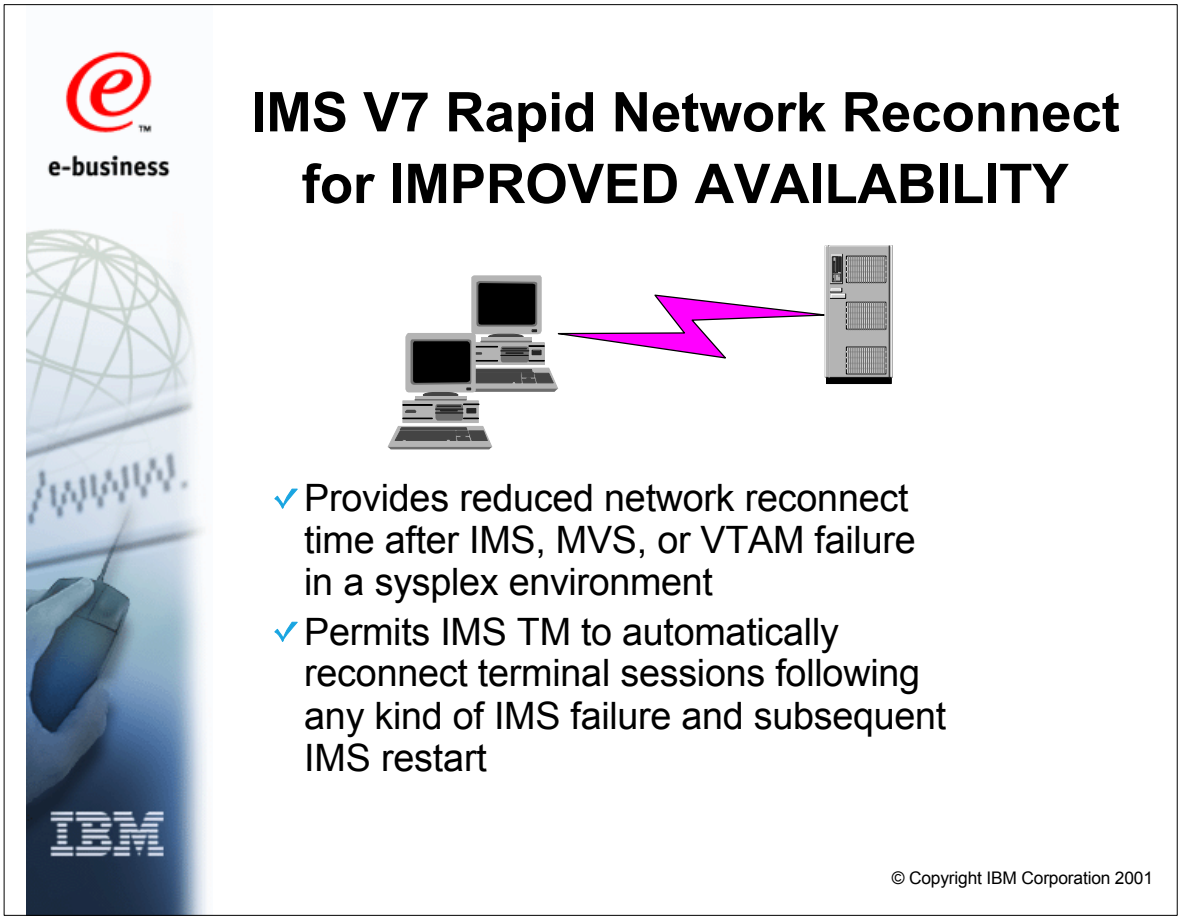
- IMS V7 High Availability Large Data Base Support allows for 1001 partitions to a max capacity of 40 gigabyte each. This means you can have over 40 Terabytes OSAM and VSAM databases. That would be 20,000 3390 devices. This works out to 6600 bytes for each person on earth. This compares to V5/6 when we just expanded to allow 8 gigabyte databases
- This support also allows for a partition to be taken offline, have something done to it and be independently brought back online. This means each partition could be individually unloaded and reloaded and while offline a batch reorg could be done to on it. Or the entire database could be taken offline and each partition could be reorged in parallel, greatly speeding up the offline reorg process.
- Since delivery of IMS V7 HALDB we have been providing additional enhancements for performance and manageability to ensure this as the base for any future database activity. Performance improvements were provided in secondary index migration, ILOG data sets (ILDS) creation, and DFMAIDO. Management enhancements were provided with RECON partition LIST command support and Batch Command initialization of HALDB and its associated partitions.



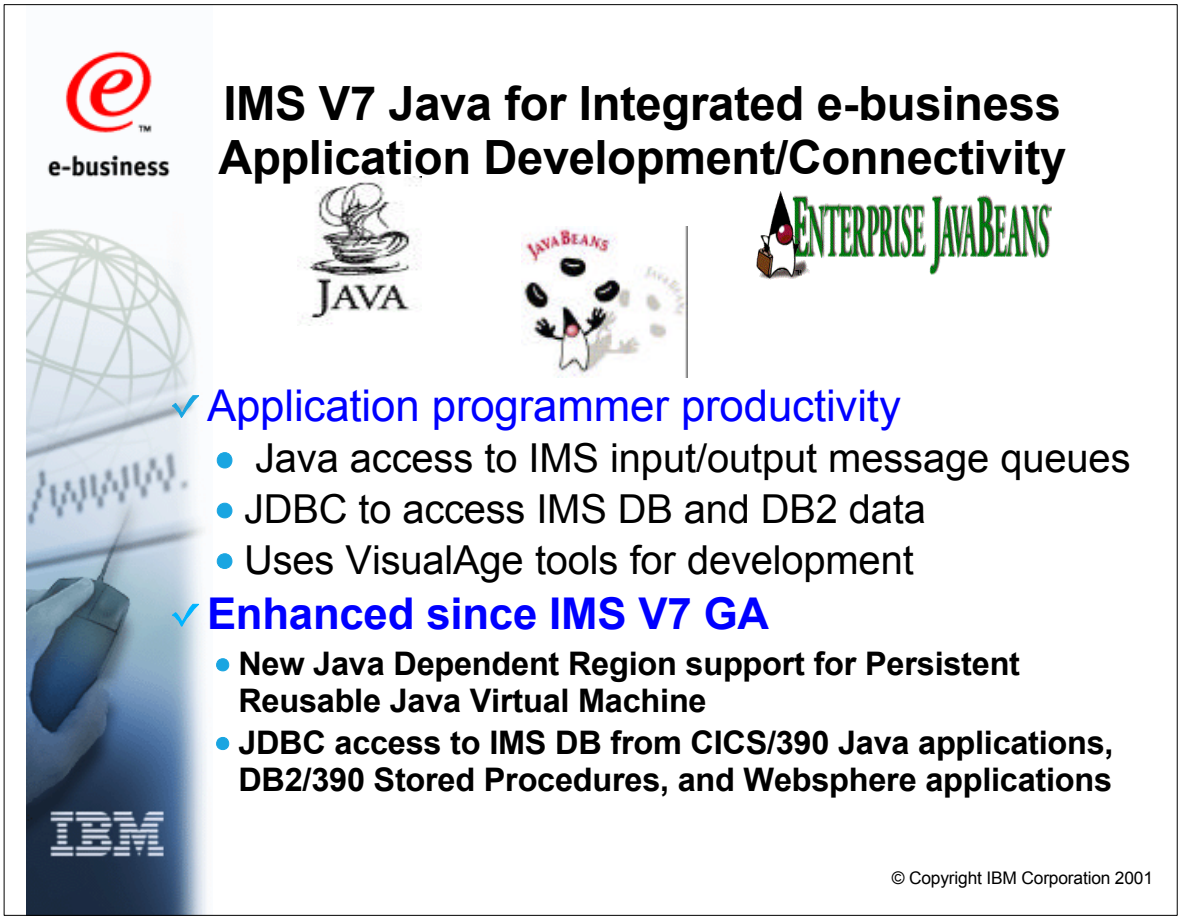
- The Generali Group consists of 500 companies directly or indirectly controlled by the Trieste-based Parent Company, Assicurazioni Generali, Italy's top insurance company. The Generali Group carries on insurance operations in some 50 markets over the five continents, through a network of more than 140 local units (branches and subsidiary companies) as well as through a number of specialized offices providing assistance to multinational clients the world over. In terms of written premiums, the Generali Group holds the third place in Europe and ranks among the 20 largest insurers at world level.
- IMS has a strong presence in Generali's Italian IT infrastructure. Five IMS Systems (two production) run the major IMS business critical applications. First and only company in Italy with IMS DB FF Partitioning (since 1997), QPP customer for IMS Version 4.1 in 1990 (ETO Support) and IMS Version 7 in 2000 (HALDB & IMS Connect). HALDB and IMS Connect are the major IMS projects undergoing this year. Planned production for HALDB and IMS Connect is 2Q 2001.
- Generali is implementing HALDB in 2Q2001 to provide the capacity and availability they require for their databases.
- Secondary Indexes - with HALDB you can now partition secondary indexes
- IMS code - Generali are really pleased that the solution they will use is integrated in as "IMS code" as opposed to a separate product.
- Availability due to parallel ic/reorg/recovery - their data is more available as a partition at a time (or in parallel) can be image copied/reorged/or recovered. (Not the entire DB is affected)
- HALDB gives them the capacity to be able to store 30GB of data in 9 partitions for one of their DBs (but it is also capable of handling even bigger DBs)



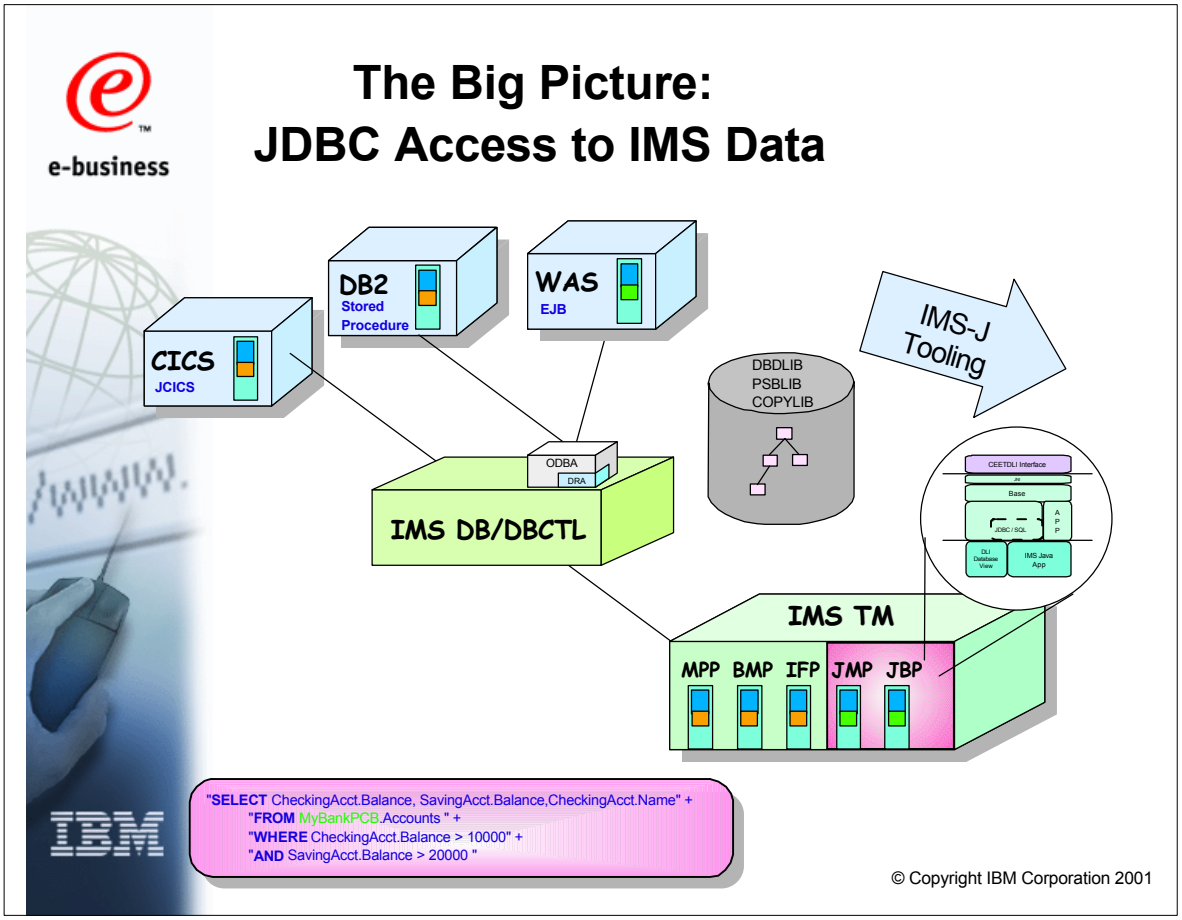
- IMS solutions also exploit IBM Enterprise Storage subsystem products to optimize performance. Testing with IMS Version 7 and the Enterprise Storage Server (ESS) have demonstrated increases in Online Log Data Set logging Bandwidth and in Batch window availability.
- Test results indicated a possible 1/3 reduction in utilities and sequential update Batch Message Programs that increase the overall batch window availability.
- They also indicated an overall improvement of 175% in bandwidth over the IBM RAMAC Virtual Array (RVA) storage subsystem and 500% over the IBM RAMAC2 storage subsystem.
- We are continuing to identify, develop, and exploit new features and advance functions together with IBM's OS/390, Network, Storage and Enterprise servers to provide continually increasing performance for our customers. And we are publishing the details of these measurements in our Newsletters and on our website.



- IMS Systems availability is also being improved. Rapid Network Reconnect improves system availability by allowing IMS TM to automatically reconnect terminal sessions following any kind of IMS failure and subsequent restart -- reduces network reconnect time after IMS, MVS, or VTAM failure in a Sysplex environment.



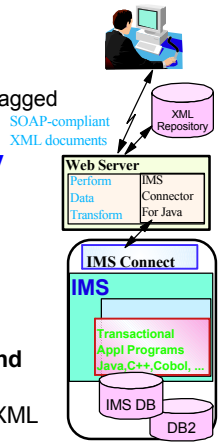
- Java is the base for new application development and connectivity.
- In the base of IMS Version 7 is our IMS Java application support to enhance the ability of our customers and business partners to provide integrated e-business application development with IMS.
- The object of this function is to provide support for you to write Java applications and run them as IMS applications using Visual Age workstation and host tools for development and testing.
- Compiling was provided initially through the High Performance Java compiler.
- We provide access to IMS TM message queues and to IMS DB and DB2 data through JDBC.
- Enhancements are being provided to this support for IMS DB access from CICS/390 Java applications, DB2/390 Java Stored procedures and WebSphere applications, opening IMS DB up to better integration and use across platforms and across application environments. IMS would also be providing this support for Websphere application Server access to IMS.
- New Java Region Types are also being provided. IMS V7 Java support cuirrently utilizes the Java Compiler, which is now being obsoleted by the new Persistent Reusable Java Virtual Machine (JVM). This new Java region support enhances the IMS V7 Java support to allow Java applications in IMS to be developed and run with the new Persistent Reusable JVM, providing enhanced tool support for developing these Java applications to run in IMS.



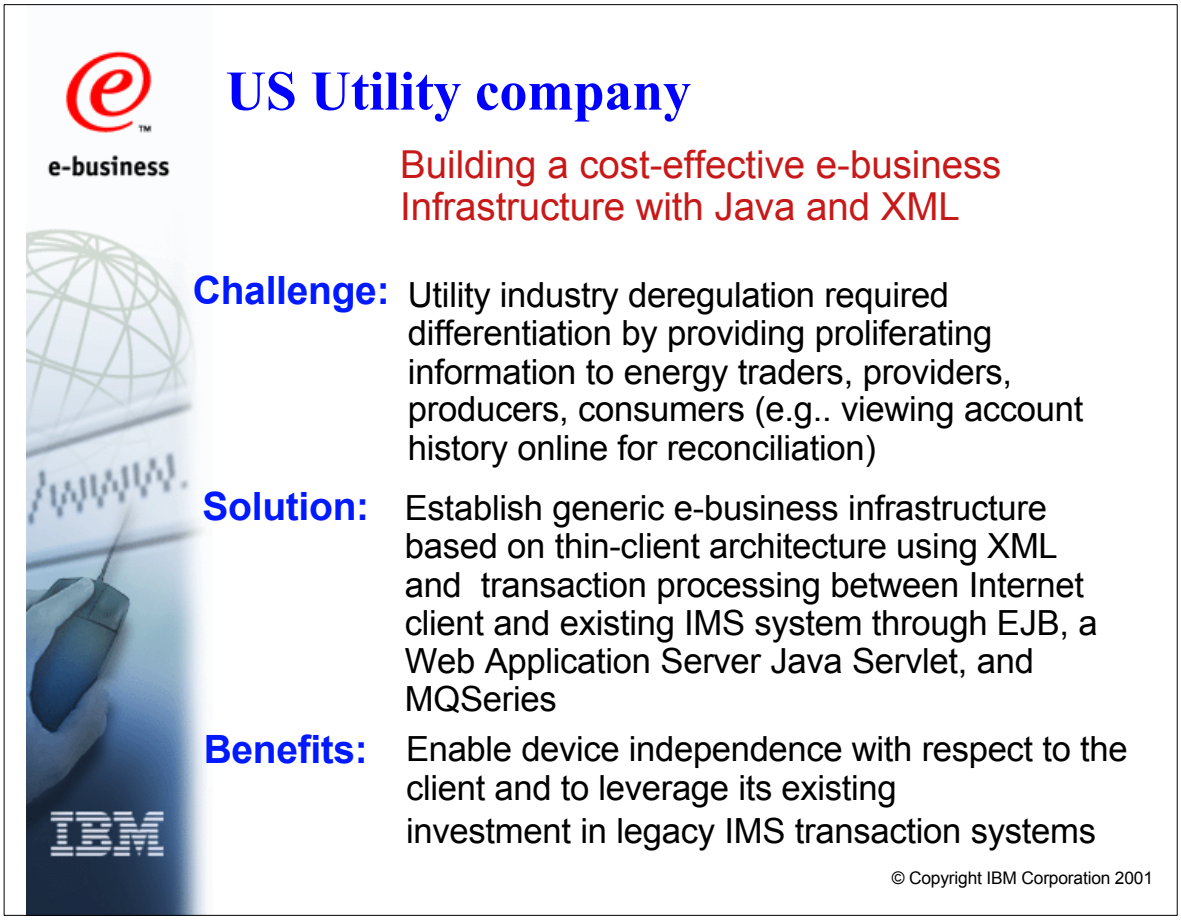
- IMS has been taking advantage of the Java environment for Web connectivity to IMS applications, for writing IMS applications running in IMS, and for writing applications running in other environments that access IMS DB data. And IMS continues to enhance its Java application support and access to IMS DB through JDBC.
- JDBC support enhances the IMS Java support for enabling JDBC access to IMS DB data not only from IMS TM environments but also now from a CICS/390 Java application, DB2/390 Java Stored procedure, and/or a WebSphere/390 Enterprise Java Bean.
- Java tooling can be used.
- And applications running under IMS TM can take advantage of the new Serially Reusable Java Virtual Machine support in the new Java Message Processing and Java Batch Processing regions .

XML and IMS for Transparent Application Integration

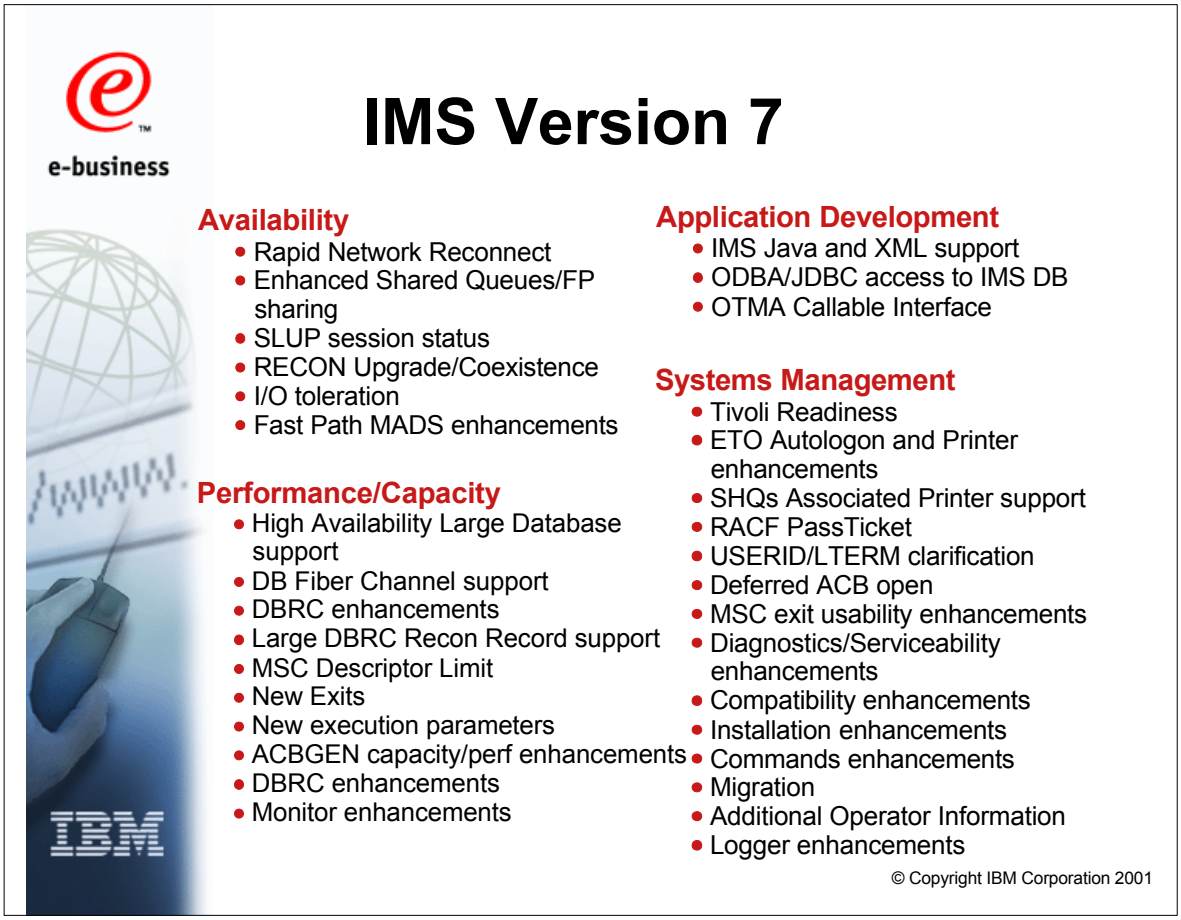
- **Processing XML Documents in New IMS Applications Today**
  - **Customers can write IMS C++ or IMS Java applications using the XML Toolkit for OS/390**
    - Tran code still must be EBCDIC, rest of data can be XML
    - Java/C++ program can invoke XML parser to convert to non-tagged data
- **Bridging XML and Existing IMS Applications Today**
  - **Using MQSeries Integrator**
    - Dictionary support for messages
    - Routing and processing based on message content
    - US Utility built cost-effective e-business infrastructure to IMS
- **XML and IMS Requirements**
  - **Processing XML Documents in new/changed IMS Cobol and PL/I applications using the XML Toolkit for OS/390**
  - Supporting SOAP(Simple Object Access Protocol)-compliant XML documents for Industry tooling and evolution to Web Services
  - Transforming XML for existing IMS applications using Web Server and/or IMS Connect
  - Using XML as an IMS Data Definition language



- XML is critical for future transparent application integration.
- Today, XML documents can be processed in new IMS Java and C++ Applications, through use of the XML Parser, and/or access existing IMS applications using MQSeries.
- We are also making available IMS COBOL and PL/I XML Application Capability which provides for sending and receiving XML documents directly from new IMS COBOL and PL/I applications. The XML Enabler for COBOL and PL/I can be used to enhance your existing high performance IMS transactions written in COBOL and PL/I in a Business-to-Business environment by receiving and sending XML documents. IMS supports the transmission of XML documents in the data portion of the IMS message. The messages can be placed and retrieved for the IMS messages queue for all messages regions for IMS Message Processing Programs, Fast Path Programs and Batch Message Processing Programs.
- Future requirements also offer enhanced support for industry tooling, additional languages, transformation, and the use of XML as an IMS Data Definition language.
- IBM's IMS E-Commerce Connectors Team at the Silicon Valley Laboratory developed the Common Application Metamodel (CAM). CAM is an IBM open standard initiative for Enterprise Application Integration (EAI). It was submitted as a proposal to the Object Management Group (OMG). OMG is the world's largest software consortium with a membership of over
- 800 vendors, developers, and end users. See http://www.omg.org.
- A good description of CAM is part of a draft document, with diagrams and illustrations, at the web site for the Instituto Tecnologico de Informatica in Spain. Sections 6 (page 13) and 9 (page 79) are of special interest to those who have labored in the Open Transaction Management Access (OTMA) vineyards.
- See http://www.iti.upv.es/iti/i+d/mirrors/ftp.omg.org/pub/docs/ad/00-08-12.pdf.
- CAM defines and publishes a metadata exchange standard for information about accessing enterprise applications such as CICS and IMS. Anyone who has written COBOL COPYBOOK to XML translators or who has tried to make IMS message contents discernable to Java code, as have I, knows there has just got to be a better way. CAM is that better way!
- Because CAM provides physical representation of data types and storage mapping to support data transformation in an EAI environment, it enables Web services for enterprise applications.
- IBM has indicated CAM in their statement of direction for IMS. Now that the Object Management Group (OMG) has accepted CAM as an industry standard, we expect third party software developers to also adopt CAM,

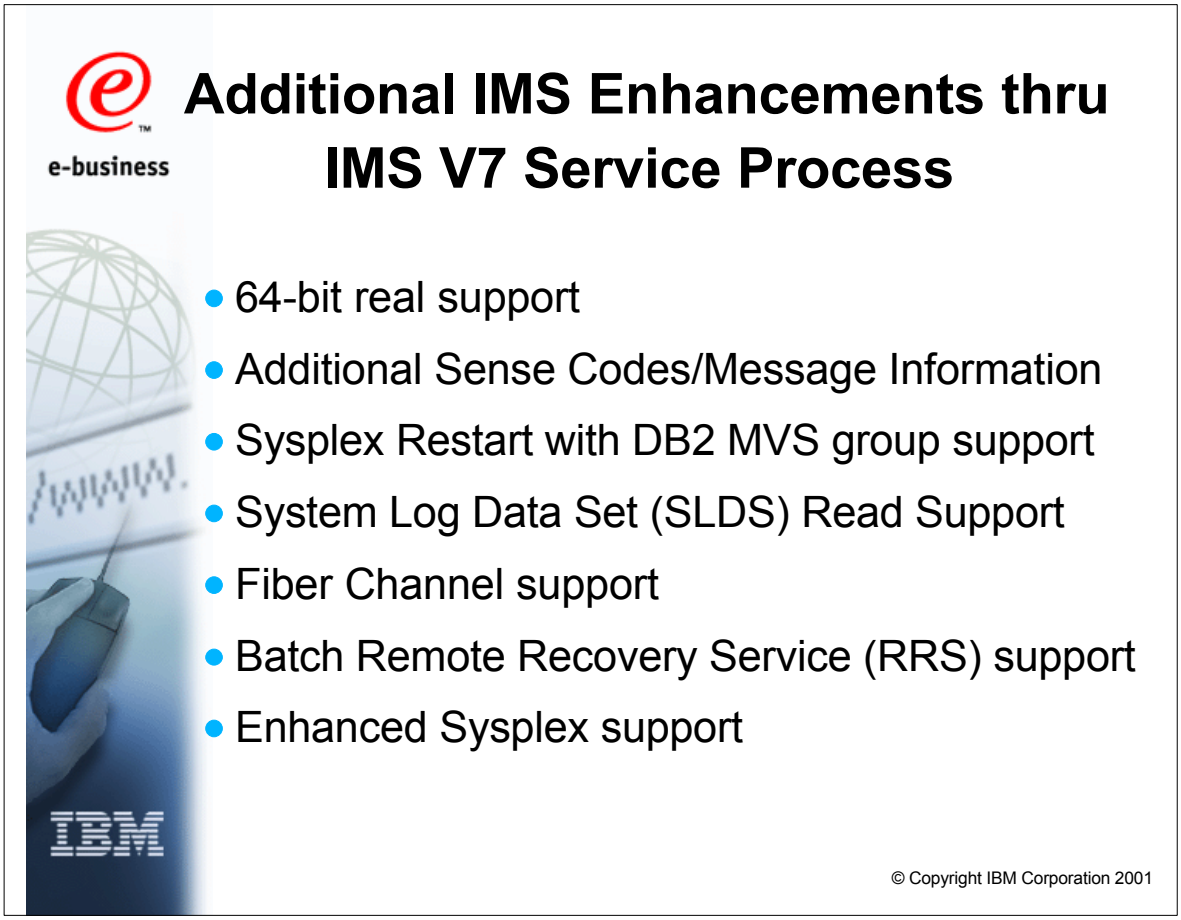


- A US based Utility Company supplies, markets and delivers energy to hundreds of thousands of customers across many US states. They are establishing an e-business vision to address a number of Business-to-Business(B2B) and Business-to-Consumer(B2C) application needs. They need an infrastructure that will enable it to achieve device independence with respect to the client and to leverage its existing investment in IMS transaction systems. Their environment is heterogeneous, consisting of OS/390, AIX, Solaris, and Windows NT servers with Windows NT, Windows 98, Solaris, and AIX clients. To cost effectively build applications that will run in this environment, they have been evaluating the Java technology for run-time independence and XML for platform-independent data and the proliferation of Customer Data in the wake of Y2K. As they embark upon the deregulation of the utility industry, the ability to provide information to energy traders, providers, producers and consumers is becoming the differentiating factor among utility companies. In response to the growing need to proliferate information and to address Y2K concerns relative to energy usage monitoring systems, they decided to provide customers with the ability to view their account history online. Since they do not always play the role of provider to all consumers, it is important that a residential customer could compare its meter usage records against billing invoices from the customer's provider. Thus, such a tool would enable users to perform some reconciliation checks against bills from energy providers after the Y2K issue.
- Building an e-Business Infrastructure they used this business need to establish a generic e-business infrastructure based on a thin-client architecture. The vehicle for achieving the project objectives included a combination of products and code supplied by IBM. The end-to-end operation of the Customer Account History application was an exercise in transaction processing between an Internet client and an existing system through a middle-tier server. A client submits a Customer/Meter value pair, which invokes the sending of an XML based request message from a WebSphere Application Server to an existing backend MQSeries server. MQSeries then triggers a Parser/generator program, which handles the parsing of the XML request into a formatted IMS transaction. The result from the IMS transaction is then converted into an XML response and sent back to a servlet on the WebSphere Application Server via connected MQSeries queues. Additionally, Java technology would then create the appropriate HTML for presentment of the Customers' bill and usage history as well as payment data.
- Since the WebSphere Application Server and the legacy IMS Application communicate over MQSeries message queues, this application used an Enterprise JavaBean (EJB) to address session management of the request and response queues. This EJB was a critical component of the system since it not only addressed session management of the application, but it also provided the same generic function required by any future applications.

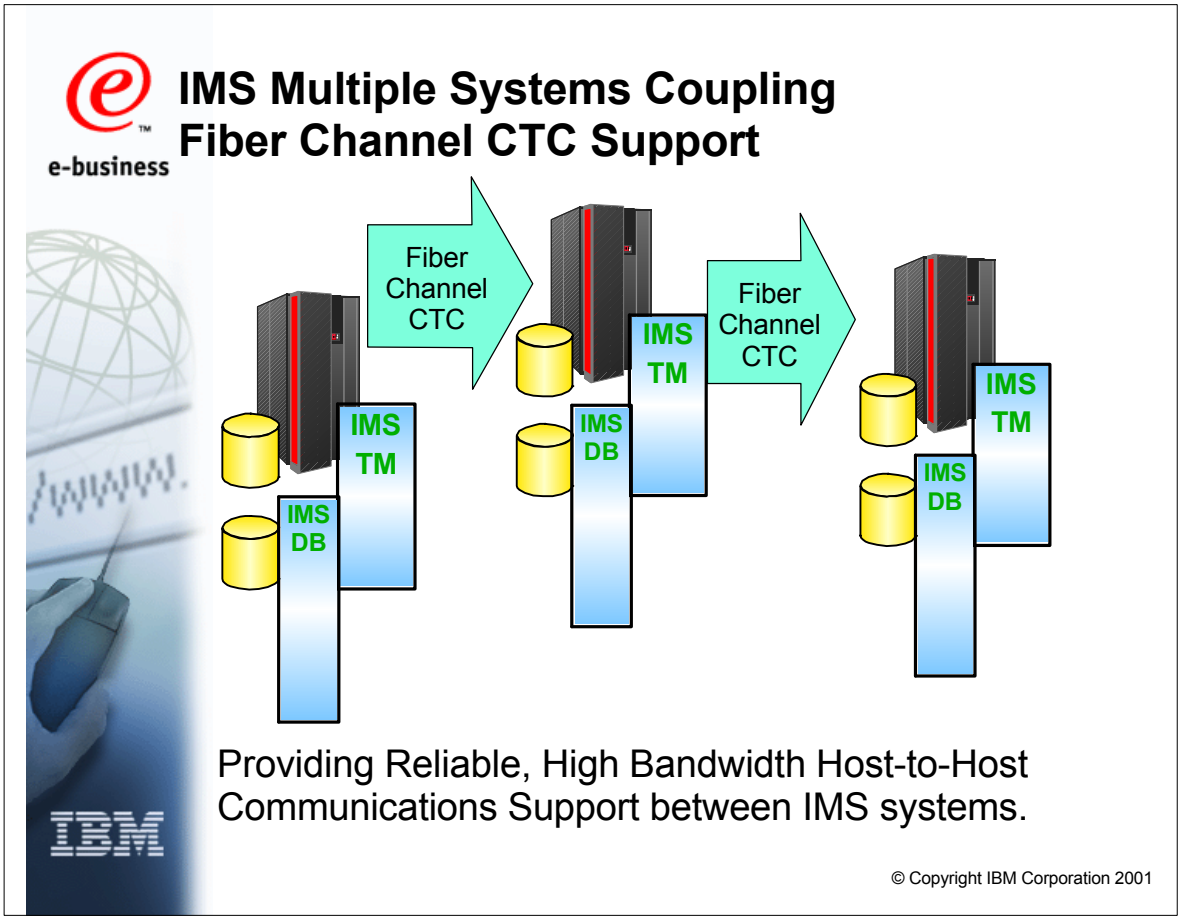


- IMS V7 itself also includes numerous other availability, performance and systems management enhancements. In addition we are focusing on Application Development enhancements for IMS. To name a few of these additional enhancements:
- Rapid Network Reconnect, utilizing the facilities of VTAMs Multinode Persistent Sessions, permits IMS TM to automatically reconnect terminal sessions following any kind of IMS failure and subsequent IMS restart, thereby reducing network reconnect time after IMS, MVS or VTAM failure in a sysplex environment. It provides fast terminal reconnect to IMS by eliminating terminal logons and VTAM session startup traffic. IMS restart is required after IMS failure.
- Shared Queues and Fast Path sharing enhancements, utilizing the coupling facility, provide asynchronous APPC/OTMA (open transaction manager access facility) shared message queue enablement, additional client support (multiple clients and additional client information and control), enable user autologon for a printer when application output becomes available and performance and miscellaneous enhancements to shared Fast Path Expedited Message Handler (EMH) and Sequential Dependent Segments (SDEPs).
- IMS is being made Tivoli ready and enhancements are being provided for management of IMS through the Tivoli Global Enterprise Manager, and the Tivoli Manager for OS/390.
- IMS Database Recovery Control (DBRC) enhancements improve diagnostics information, improve Database integrity protection, eliminate abends, provide large Recon record support, Recon loss notification, and migration/coexistence.
- IMS is also supporting XML through interoperation with the OS/390 XML Parser, Java edition.

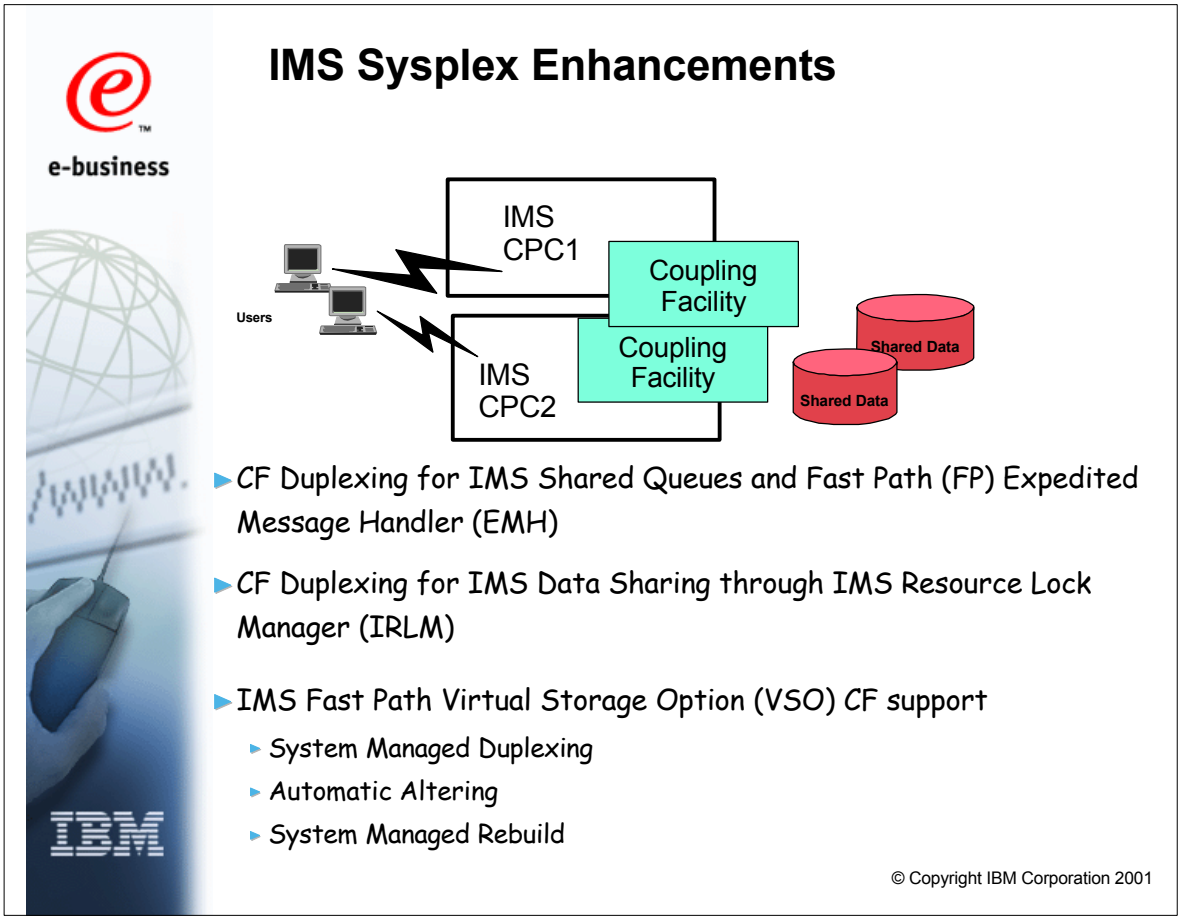
- IMS Version 7 became Generally available on October 27, 2000.
- Since GA a number of new enhancements have been provided.
- We are also preparing education classes and services offerings to help all our customers prepare and more readily migrate to IMS V7.
- In addition a number of redbooks are available or in final preparation, bringing in IBM field and customer personnel to provide hands on experience for installation and use of IMS V7, Java, HALDB, and ORS, and new ones are planned on performance, connectivity and management.
- Online information and timely updates are available through the web at our continually improving website at ibm.com/ims



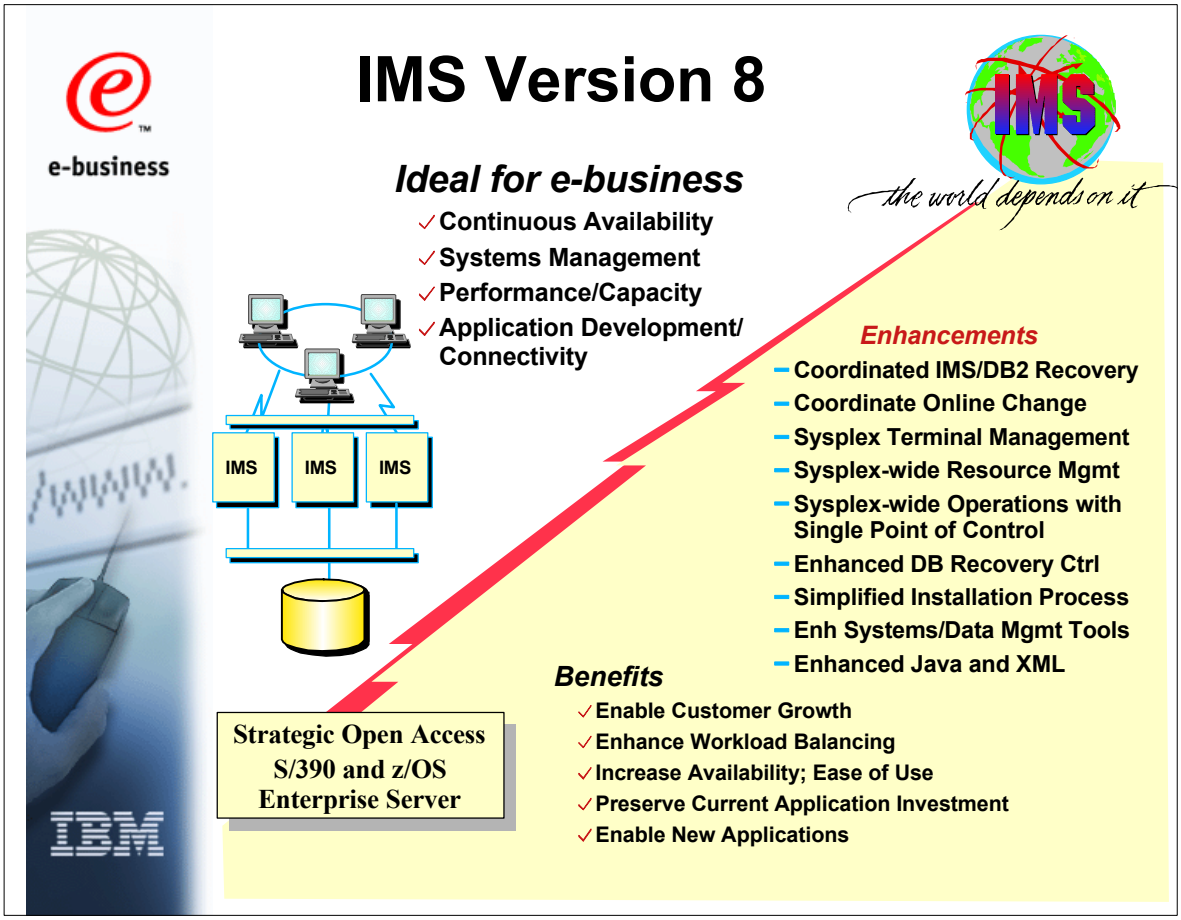
- In addition to the IMS and Tools enhancements since V7 GA already mentioned, there were a few additional ones are being provided through the IMS service process this year are:
- 64-bit support for enhanced capacity
- Additional sense codes and information on IMS V7 messages were provided for enhanced support of the zOS and OS/390 Communications Manager. IMS is now sending a signon screen afterLUSTAT x"082b' and is including the TCP/IP address in IMS messages.
- IMS support for DB2 MVS groups is an IMS Dependent Region Group attach, providing Dependent Region access to available DB2, for Sysplex restart.
- IMS V7 System Log Data Sets (SLDS) Read Support allows internal log read requests access to SLDS data after restart completes. IMS had always had access to the Online Log Data Sets (OLDS) and restart had always been able to read from SLDS. Prior to this enhancement, the restriction on SLDS access after restart had been an occasional concern when long running Batch Message Programs (BMPs) didn't take enough checkpoints or something got into a loop writing lots of log data, causing the OLDS to wrap unusually quickly. This restriction also allowed the loss of messages in a shared queues environment in situations where the messages are committed at a time when shared queues were not available. With this enhancement, these messages could be retrieved from the SLDS datasets.
- IMS is providing support of the new FICON CTC support by IMS Multiple Systems Coupling (for communication between IMS systems). It is also enhancing the existing FICON support through use with the IMS Write Ahead Data Set (WADS).
- Batch RRS support allows batch programs to use MQ with coordinated commit. It also provides for a full two phase commit for batch programs accessing DB2 as well as IMS DB, where today's Batch Attach from DB2 does not support coordinated commit. And it also allows for work which captures data and proprogates it to another system (DB2) to participate in the 2-phase syncpoint process along with the IMS work, thus making sure that all the work is done or not done where it is all part of the same unit of recovery.
- IMS is also planning to continue to provide Sysplex enhancements, utilizing the new CF duplexing support.



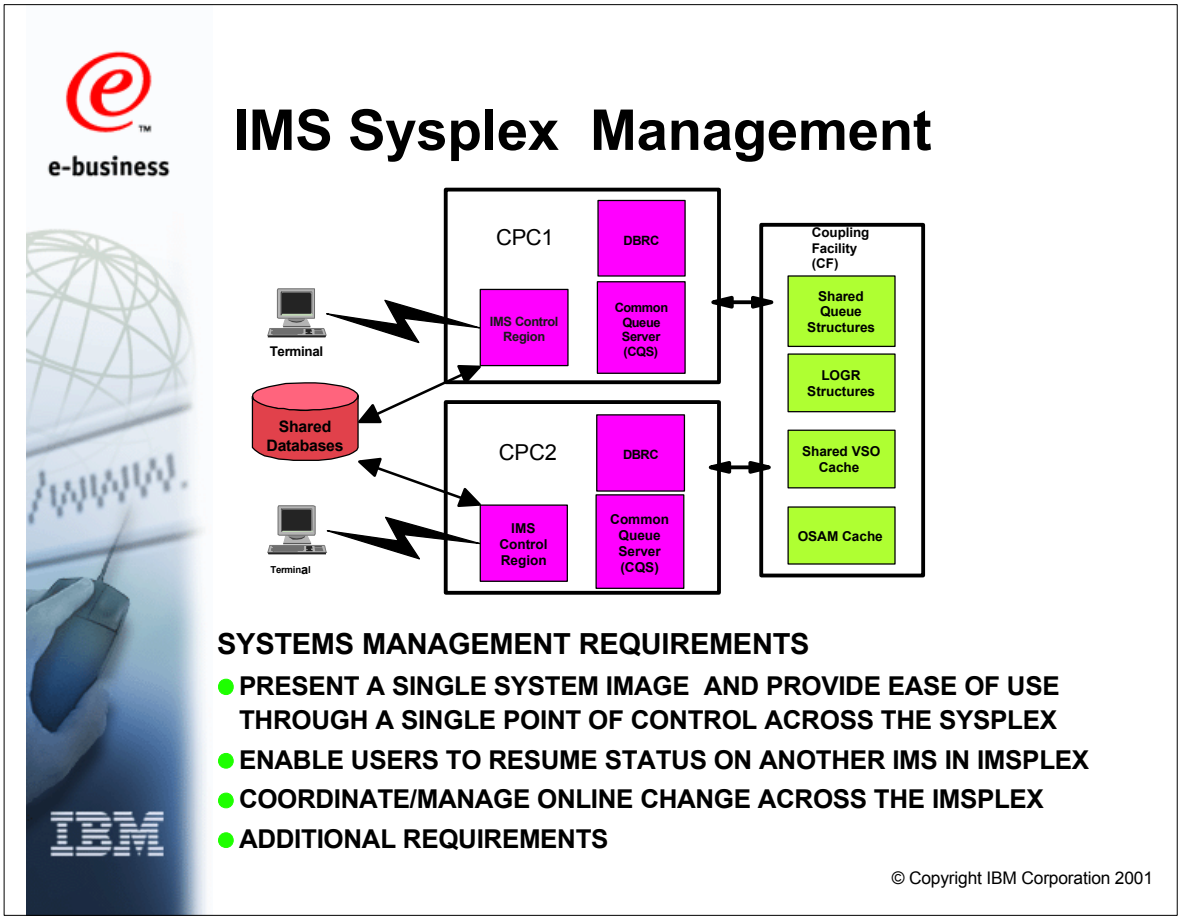
- IMS is providing support for the Fiber Connection (FICON) Channel-to Channel (CTC) support through its Multiple Systems Coupling (MSC) Facility, enabling higher message throughput between processors.
- IMS MSC FICON CTC support increases the volume of IMS messages that can go between IMS systems when using the IMS MSC facility. The IMS MSC facility provides reliable, high bandwidth host-to-host communications support between IMS systems that IMS customers require. CTC is one of the physical host-to-host MSC connections supported by IMS. With the CTC bandwidth now being enhanced through the FICON channel support for CTCs on the new IBM zSeries processors, it is estimated that one FICON CHPID can do the work of a number of ESCON CHPIDs. This increased capability is the result of the faster data transfer and higher throughputs of FICON. The distance between hosts can also be increased. IMS MSC support, provided for this new FICON CTC support, could greatly improve the bandwidth across systems. IMS MSC Ficon CTC support requires at least one side of the MSC link be an IBM zSeries with the FICON channel and FICON CTC microcode. The other side (IMS) can be any processor with a FICON channel.
- FICON support is also being provided for the IMS Write Ahead Data Set (WADS). This support consists of setting a flag in the WADS I/O Block which indicates that the channel can perform channel command prefetching. This increases the execution speed of the channel program.
- The IMS FICON support is being provided for IMS V7 through the service process.



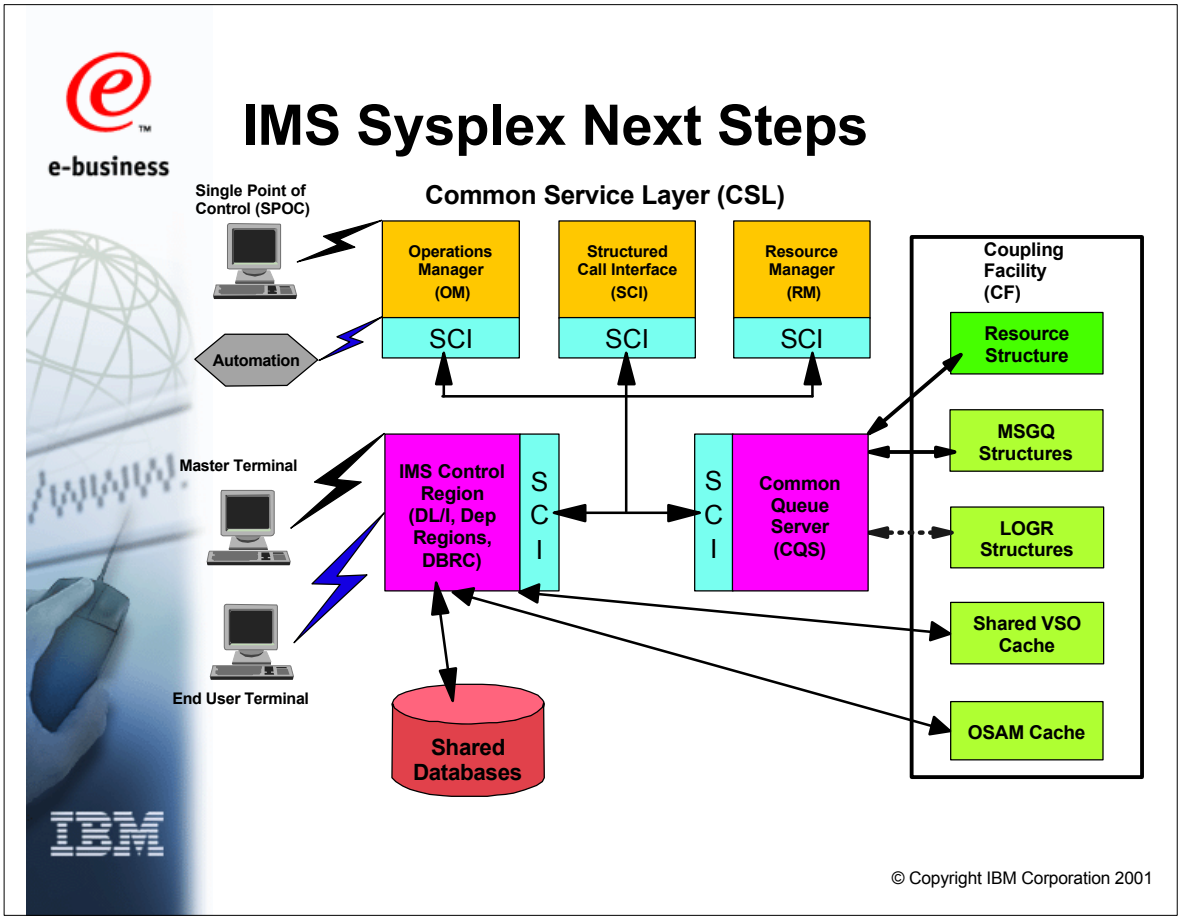
- IMS is providing Sysplex enhancements, as the operating support for this rolls out, for both the IMS Database and Transaction Manager.
- IMS will take advantage of z/OS's Coupling Facility (CF) duplexing function for IMS Shared Message Queue structures and IMS Fast Path Expedited Message Handler (EMH) structures. When CF duplexing is enabled, z/OS creates a duplex copy of the structure for failure recovery. If the IMS Shared Queues structure or the EMH structure fails or a connection to the structure is lost, z/OS switches to the unaffected structure instance without the overhead of a structure rebuild. CF duplexing also enables system-managed rebuild. MVS does the structure rebuild for a planned reconfiguration to do the structure copy if no IMS Common Queue Server (CQS) is up. The advantage to system rebuild is that CQS does not have to be up. CQS managed rebuild is still needed to address CF failure, structure failure, or loss of connectivity.
- CF Structure Duplexing support for IMS Data Sharing is being provided through the IRLM 2.1 service process.
- IMS is also providing the following IMS Fast Path Virtual Storage Option (VSO) Coupling Facility (CF) enhancements through the IMS Version 7 service process:
- - System-managed rebuild provides for rebuilding a VSO structure to enable migration of a VSO structure from one CF to another for planned reconfiguration without taking the VSO structure offline. All structures can thus be migrated using a single command.
- - Automatic Altering of VSO structure size and entry-to-element ratio provides for dynamically expanding or contracting a VSO structure based on its actual CF storage usage with exclusive control as needed. Over-configured CF storage can be reclaimed when OS/390 and/or zOS need CF storage.
- - System Managed Duplexing of VSO structures allowing dual VSO structure support without explicitly defining both primary and secondary structures in IMS Database Recovery Control (DBRC) Facility and in a CFRM policy. It provides for the automatic switch of modes when a loss of connectivity, a structure failure, or a CF failure occurs in one of the VSO structure instances.



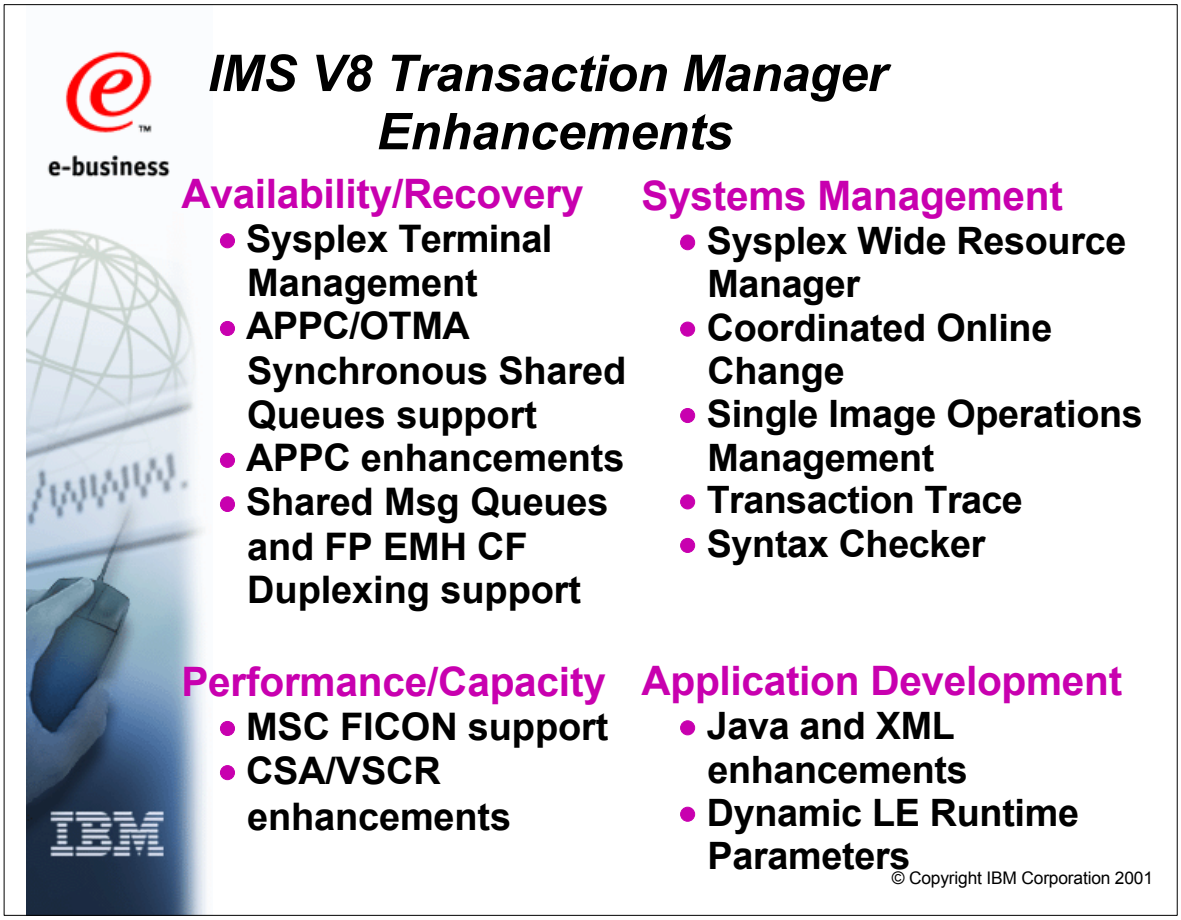
- We have announced our next version of IMS, Version 8. With IMS V8, IMS is focused on further strengthening its support as the e-business Server of choice. This is in support of IBM's Strategy for helping customers in their e-business enablement and the growth, availability, and systems management that the e-business environment requires. IMS focus thus is on continually improving performance/capacity, availability, systems management/usability, open access, and supporting tools for the e-business environment. The goal is to deliver the next stage of this function.
- IMS has been providing support as an e-business Server with improvements in data, workload, and network sharing. IMS provided workload management information and support of VTAM's Generic resources to help with the balancing of work across the Sysplex. IMS V8 provides more transparent Sysplex Terminal Management to enhance e-business availability.
- Systems Management too has been a key area with IMS customers in managing their e-business servers. IMS has focused traditionally on ensuring a single system image. . IMS would provide additional e-business Server management enhancements with Sysplex-wide Resource Management, Sysplex-wide Single Image Operations, Simplified System Definition and Improved Diagnostics.
- IMS is also providing continued enhancements to eliminate bottlenecks and impediments to growth.
- Java is a key area for new application development. IMS Java support and the IMS Connector for Java provide Java application development/execution in IMS and in applications/servlets accessing IMS. These IMS Java enablers utilize the VAJava development tools. IMS is providing enhanced performance for this environment, and providing better integration with the VisualAge and WebSphere development tool set. New Technology as it evolves with XML is also continuing to be exploited to enable new Application Development tooling. IMS is forging a strong alliance with the AD community to provide an integrated tool solution for supporting IMS Java and connectivity to the Internet.
- Additional Systems/Data Management and Business Intelligence tools are also being provided to better integrate and ease use of IMS as an e-business server. As tooling evolves we will continue to take advantage of the latest technologies for our customers to enhance their ability to use our products with these tools.
- In addition we continue to provide whatever we can for education and usability of our products. We are also providing our users information through an online Information Center.



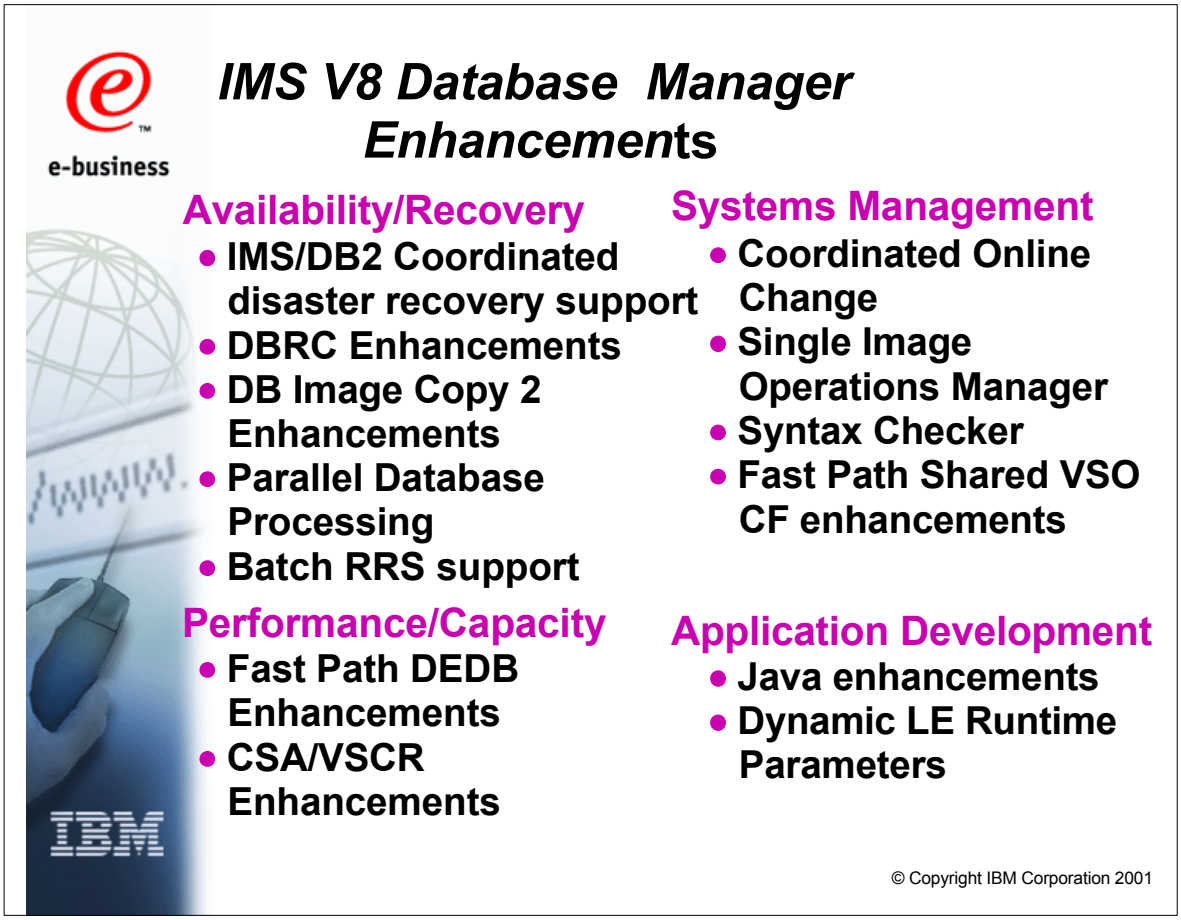
- IMS Version 8 continues to enhance the management of IMS.
- In the sysplex area we are helping our customers address the following requirements:
- The IMS Sysplex should present a single system image and provide ease of use through a single point of control.
- -- System management of IMSs sharing databases and/or message queues in a sysplex becomes more difficult as you add IMSs
- -- Most commands and automation processes today can only affect an individual IMS
- -- Commands may be entered using E-MCS console to route command to all IMSs in IMSplex
- -- Commands that affect the sysplex can be issued on each IMS
- VTAM Generic resource users need to be able to resume state on another IMS in the sysplex
- -- User cannot resume state if routed to another IMS
- Online Change should be coordinated and managed across the IMS Syplex
- -- Manual online change process is extremely difficult in IMSplex
- -- Each IMS today manages its resources locally
- -- Resources must be genned on each IMS
- -- Resource definition consistency is not enforced. A transaction defined on one IMS can be defined as an lterm on another
- -- Multiple users with the same name can sign on at the same time
- -- Multiple nodes with the same name can log on at the same time
- - -Multiple lterms with the same name can be active at the same time
- Additional IMS requirements
- -- Eliminate restriction that resource names and IMS keywords must be unique
- -- Provide synchronous responses for IMS commands



- IMS V8 provides the following management infrastructure and enhanced support:
- The Structured Call Interface is a new IMS address space which provides an interface for communication between IMS address spaces and provides communication on the same CPC or across CPC's using XCF
- The Resource Manager is a new IMS address space maintaining global resource information accessible by IMSs in the IMS Sysplex. It enables a user to resume work on another IMS and to enforce single active user signon in and IMS Sysplex, if requested. It enables name uniqueness enforcement for message destinations and provides support for IMS to coordinate Online Change across IMS Sysplex. It maintains local transaction tables to optimize performance
- Operations Manager. It is an IMS Address space which routes IMS Commands to interested IMS Modular Units across the IMSplex and consolidates IMS command responses. It provides an Application Programming Interface to allow a user or vendor to write tools to automate IMS operations. And it supports a Single Point of Control (SPOC) to present a single system image for the IMSplex by allowing the user to enter commands to all IMSs in the IMSplex from a single console. This SPOC is a 3270 TSO/ISPF Application running on S/390. It could also support a workstation Application connecting to OM.
- Sysplex Terminal Management allows VTAM to manage Generic Resource affinity while IMS can maintain VTAM terminal and user state data, if requested. It enforces resource type consistency for message destinations and resource name uniqueness. It supports global callable services for terminals/users allowing user exits to obtain node and user information across IMS Sysplex. It uses the Resource Manager (RM) to share VTAM terminal-related resources in the IMS Sysplex.

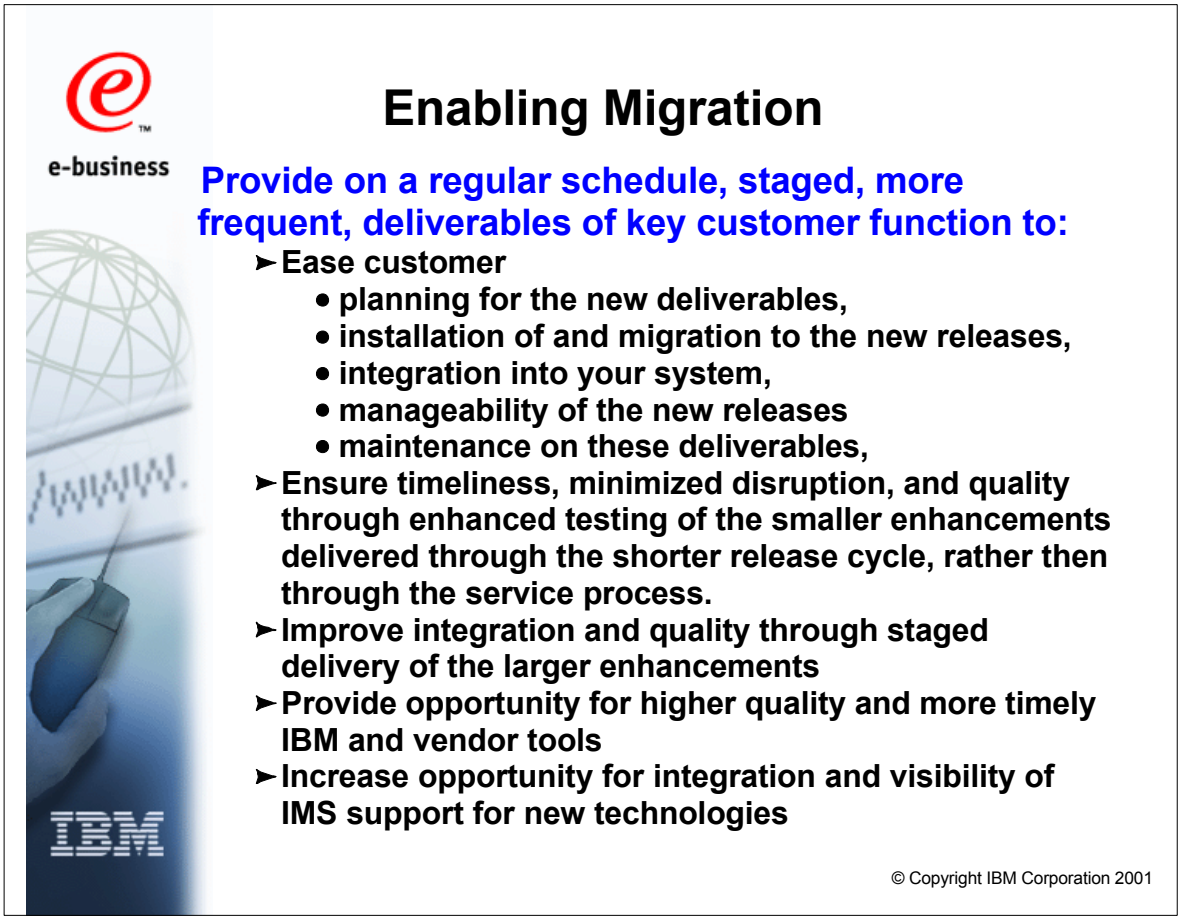


- In addition to these, IMS V8 Transaction Management enhancements include:
- Enhanced application development/execution and connectivity with Java and XML. With V8 we are providing a Dynamic Language Environment Runtime support and enhancing XML and Java support.
- Improved systems availability in error handling and network reconnection With IMS V8 support is provided for the Sysplex with enhanced terminal management, APPC/OTMA use of Shared Message Queues, and Shared Message Queues and Fast Path Expedited Message Handler support for CF Duplexing.
- Increased performance/capacity in routing and in workload balancing. This year we are making available Fiber Channel support for Multiple Systems Coupling Facility Channel-to-Channel support for increased bandwidth between systems. With IMS V8 we are also providing improved CSA/VSCR usage.
- Improved manageability with single point of operations control and concurrent online change for the sysplex, and in easing systems generation. With IMS V8 we will be providing a significant step forward in Sysplex operations, providing a Single point of control and Concurrent Online Change along with a Sysplex Operations Manager and Resource Manager. IMS V8 also provides syntax checking and other installation enhancements, and Transaction trace, enhancing serviceability.

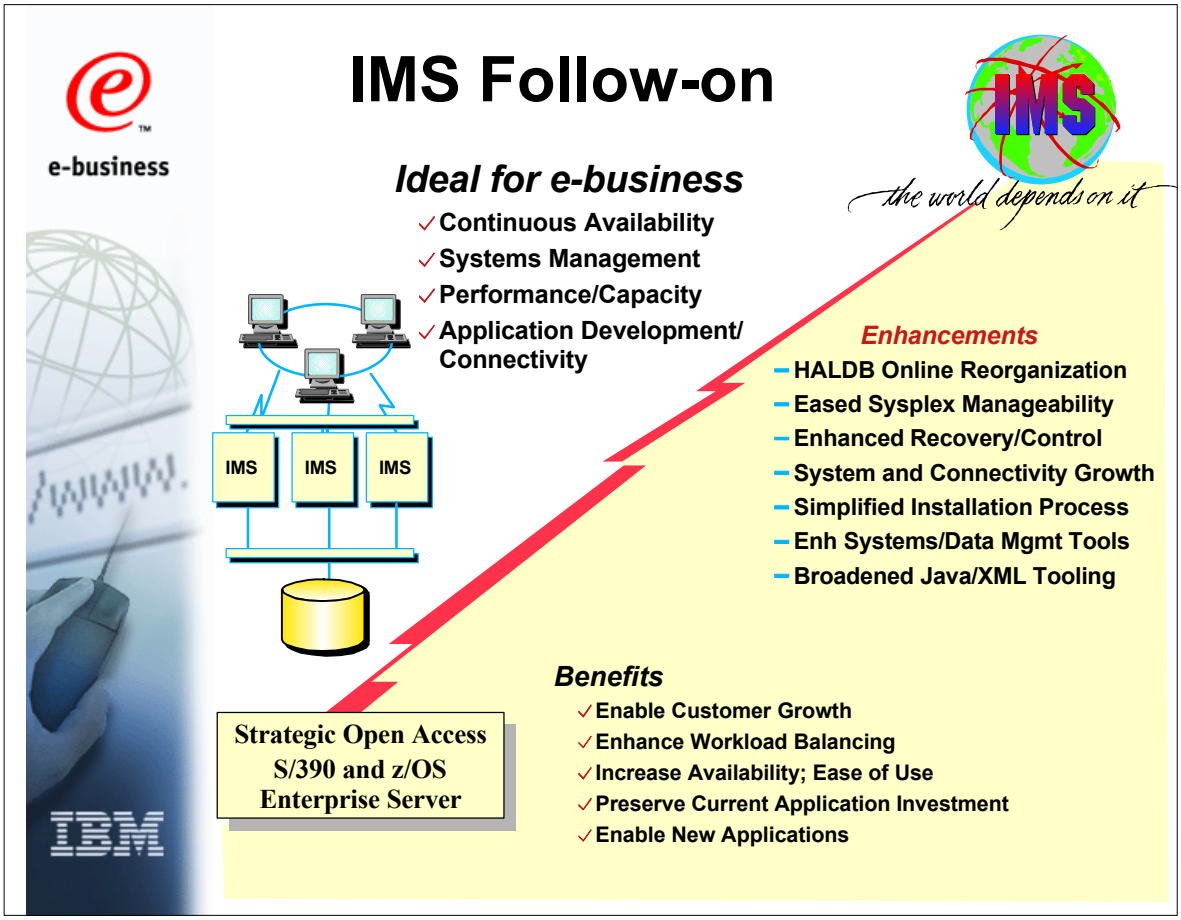


And additional IMS V8 Database Management enhancements include:

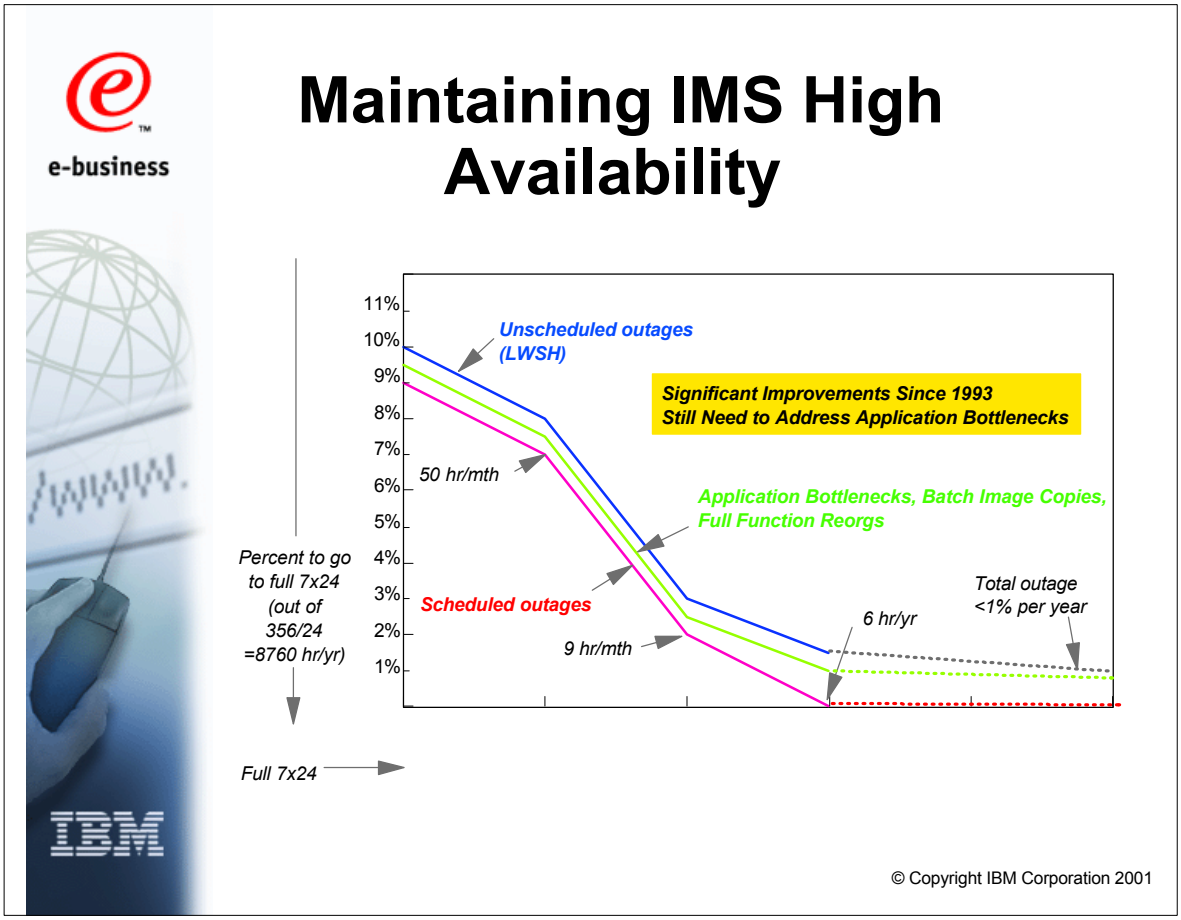
- Enhanced application development and connectivity with Java and XML, including JDBC access to IMS DB from CICS, DB2, and WebSphere environments.
- Improved availability in database restart and recovery. With IMS V8 enhancements are being provided for DBRC. Additional enhancements are also being provided for coordinated disaster recovery between IMS and DB2, Parallel Database processing and IMS Batch support for MVSs Remote Recovery Service.
- Increased performance/capacity in logging, recovery, and in database size. With V8 we are providing increases to the Fast Path Virtual Storage Option of greater than 240 areas and improving the CSA/VSCR usage.
- Improved manageability with single point of operations control and concurrent online change for the sysplex, and in easing systems generation. With IMS V8 we will be providing a significant step forward in Sysplex operations, providing a Single point of control and Concurrent Online Change along with a Sysplex Operations Manager and Resource Manager. IMS V8 also provides syntax checking and other installation enhancements, and Transaction trace, enhancing serviceability.



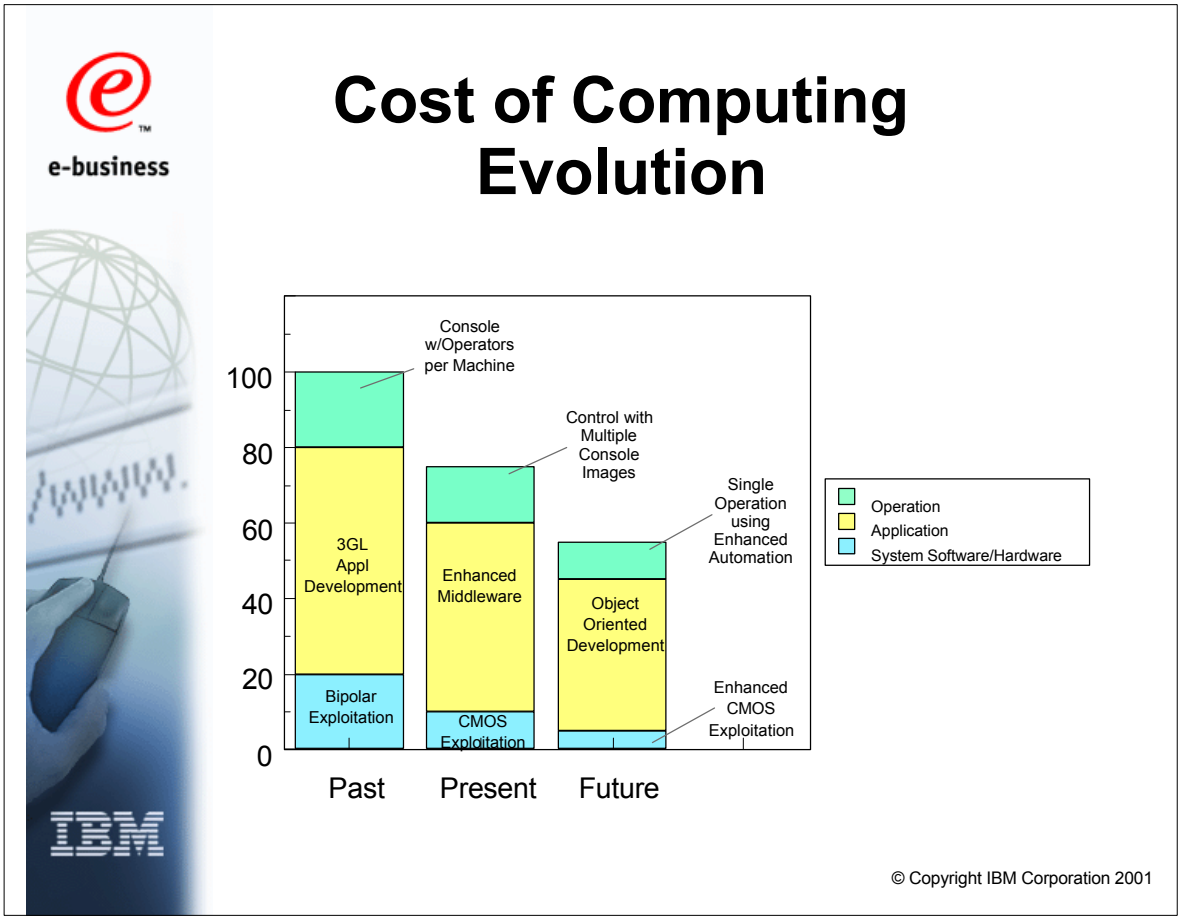
- We are also helping to enable migration with Version 8 by changing the to a staged, more frequent, regular deliverable schedule of key customer function to:
- Ease customer
  - planning for the new deliverables,
  - installation of and migration to the new releases,
  - integration into your system,
  - manageability of the new releases
  - maintenance on these deliverables,
- Ensure timeliness, minimized disruption, and quality through enhanced testing of the smaller enhancements delivered through the shorter release cycle, rather then through the service process.
- Improve integration and quality through staged delivery of the larger enhancements
- Provide opportunity for higher quality and more timely vendor tools
- Increase opportunity for integration and visibility of IMS support for new technologies in strategic announcements and conferences.



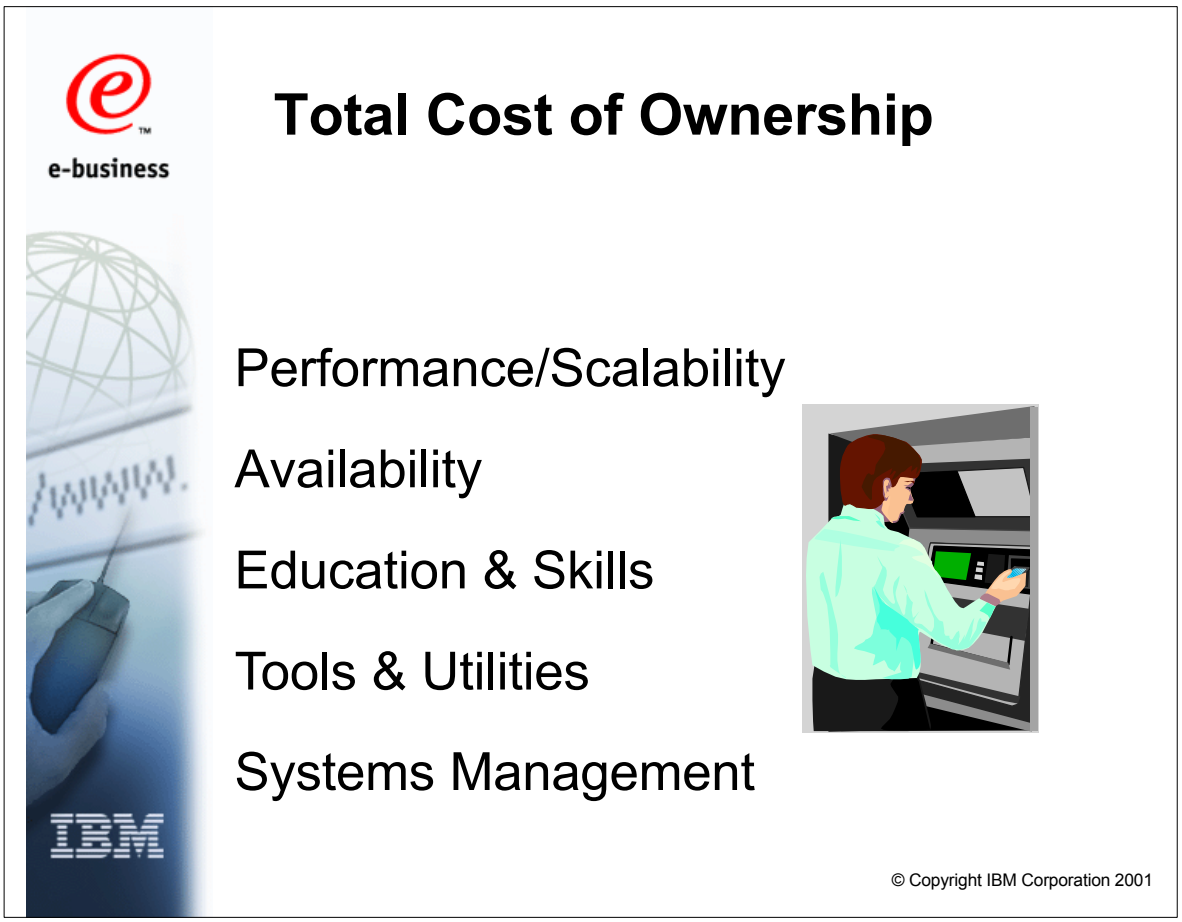
- After IMS V8, IMS is focused on further strengthening its leadership role, helping customers in their e-business enablement and the growth, availability, and systems management that the newer environments and cost measures require. IMS focus thus is on continually improving performance/capacity, availability, systems management/usability, open access, and supporting tools for the e-business environment. The goal is to deliver the next stage of this function.
- IMS has been providing Sysplex support to ensure the highest in availability/performance for Systems growth. IMS would continue to enhance their support for this environment and provide support for new capabilities in it.
- Systems Management continues to be a key area with IMS customers in managing their systems. IMS would continue to enhance its single system image with standard user-friendly commands and interfaces accessible across environments. IMS would also continue to ease the installation process and reducing/eliminating the gen requirement.
- IMS is also providing continued enhancements to eliminate bottlenecks and impediments to growth in the IMS systems and in connectivity to the IMS systems.
- Java continues to be a key area for new application development. IMS Java support and the IMS Connector for Java would be enhanced for the latest in standards to allow customers to take advantage of the latest in tooling. IMS is also providing enhanced performance for this environment, and providing better integration with the VisualAge and WebSphere development tool set.
- New Technology as it evolves with XML is also continuing to be exploited to enable new Application Development tooling. IMS is forging a strong alliance with the AD community to provide an integrated tool solution for supporting IMS Java and connectivity to the Internet.
- Additional Systems/Data Management and Business Intelligence tools are also being provided to better integrate and ease use of IMS as an e-business server. As tooling evolves we will continue to take advantage of the latest technologies for our customers to enhance their ability to use our products with these tools.
- In addition we continue to provide whatever we can for education and usability of our products. We would be continuing to enhance the way our users use our information through a graphical Information Center to help build customized books.



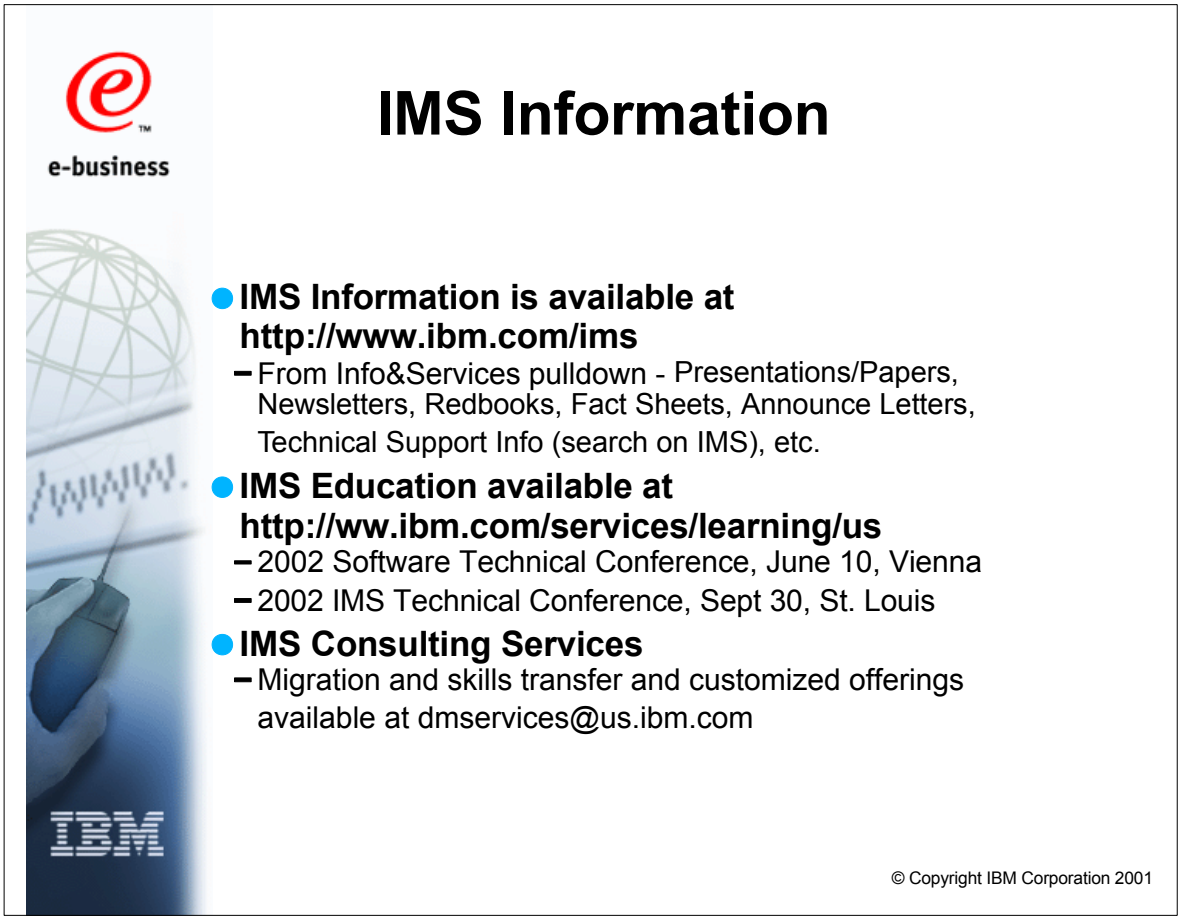
- In looking at what IMS has offered its customers, high availability has always been very key to IMS customers.
- Significant ongoing work to reduce defects has been going on to improve the unscheduled outages and improve availability That work has included continuous review of defects escaping test, early vendor involvement, integrated system evaluation test in POK before GA, ongoing integrated test in their Parallel Enablement Lab after GA, and expanded regression testing of fixes. This reduces any customer-seen problems and speeds up their installation process, as well as ensures continued improvement of availability in production.
- Since 1993, one customer has been driving down their planned and unplanned outage to less than 1% per year. Most of the scheduled outages have been taken care of. The bulk of what remains in scheduled outages is from application bottlenecks, batch image copies, and full function transaction reorganization activity.
- Other customers have sited over 2000 and 3000 days without an outage. IMS is providing the continuous availability being demanded for handling the requirements of e-business.



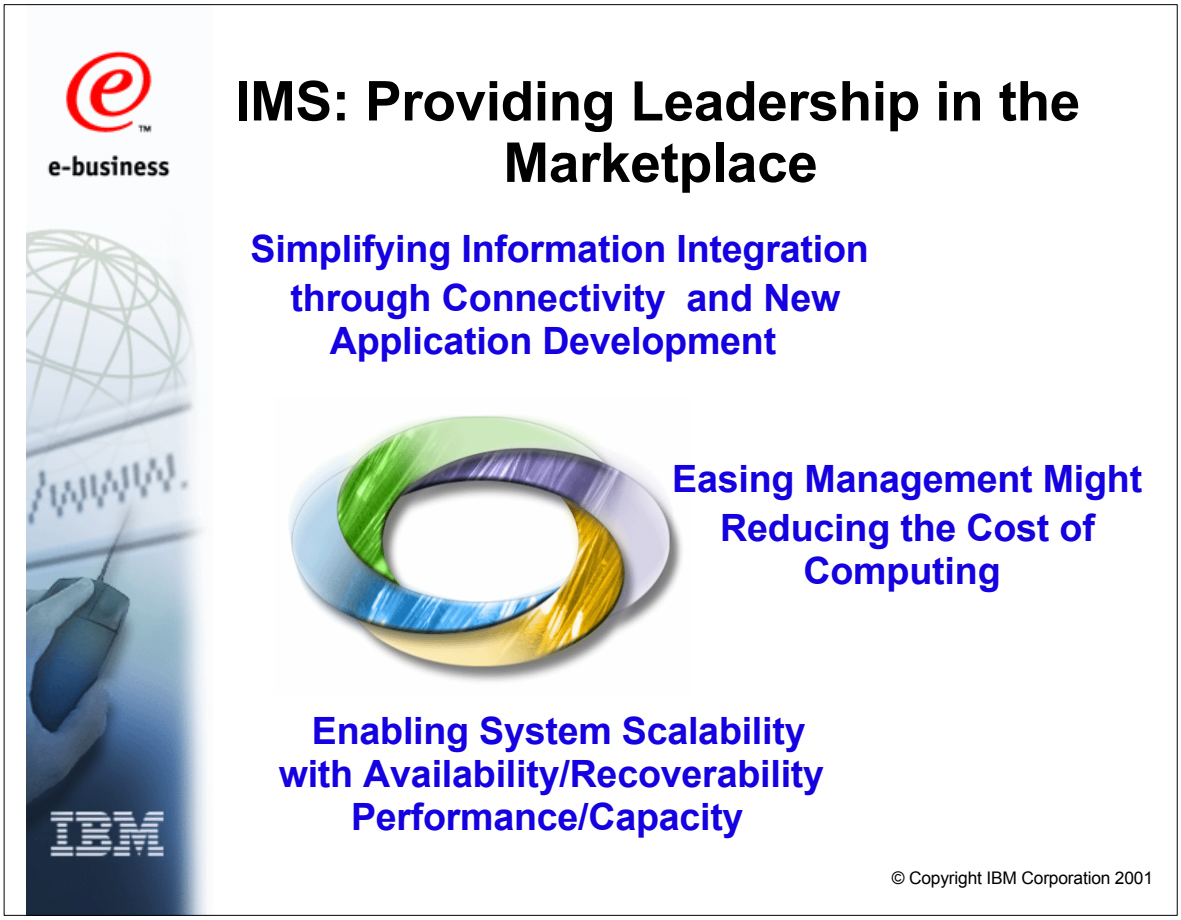
- IMS has significantly helped contribute to bringing down the Cost of Computing. IMS operational and other systems management improvements have continued to bring down the costs of Operations. Enhanced IMS Middleware and Object Oriented Programming has helped lower the application costs. And by exploiting the new CMOS technology and other advances in technology in the hardware and operating systems, IMS has helped lower the systems software/hardware costs.



- The total cost of ownership is much more than software and hardware costs. We continue to work on a wide range of items where you have concerns.
- The ability to scale as far as you need and using the processing capability efficiently continues to be a key concern.
- Finding people with S/390 education and skills has become more difficult. We are working with certification programs, training and with universities to continue building on our skill base.
- The cost of an outage can be tens of thousands of dollars per minute, so extending our traditional strength is crucial.
- Many customers pay more for tools and utilities than for the base products. We are helping to provide better value for the money.



- Message: A wide range of IMS e-business Information is available
- The IMS solutions are generally available along with other IBM products in support of IMS. Additional documentation and information is available from the IMS home page at http://www.ibm.com/ims.
- The IBM International Technical Support Organization has been producing redbooks with additional information, available at http:// www.redbooks.ibm.com
- Education and Services are also being provided.



- The e-business cycle focuses on leveraging your existing knowledge and information and transforming your core business processes, managing technology in building new applications, and providing organizational efficiency. In all this you need to be running a high performance, available, scalable, secure environment. You use existing data to sharpen decision making and responsiveness. You prioritize which processes and applications need to be extended. You build new reusable applications integrated with existing ones. And you maximize deployment on secure platforms. And for each of these elements of the cycle, we are providing you the IMS solutions that you will need to help make all this work easily. Built on the power of the S/390, billions of dollars worth of IMS applications have been developed to run your mission-critical work in a safe environment with IMS. If you have money in a bank, feed, house, clothe your family, or protect them with health or insurance services, use educational or government information, etc., most of the information about this is kept securely in IMS databases, accessed through high performance IMS transactions and rapidly being processed across the internet for wider use. IBM will continue to invest heavily in IMS to enhance IMS to meet the stringent requirements of its customers -- to help them transform their core business processes with emerging technologies using IMS. Exploiting the latest in technologically-advanced hardware and software, IMS will help customers achieve new levels of price-performance and, at the same time, leverage their exiting investment in skills and applications for information access across the internet.