E07

IMS: What's New and What's Next

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IMS Continues Growing

Illuminata, Inc. (see www.illuminata.com): **IMS: Scaling the Great Wall**

Abstract: A 35-year-old hierarchical database and transaction processing system is currently growing faster than the world's most popular relational database system. Pretty funny, huh?

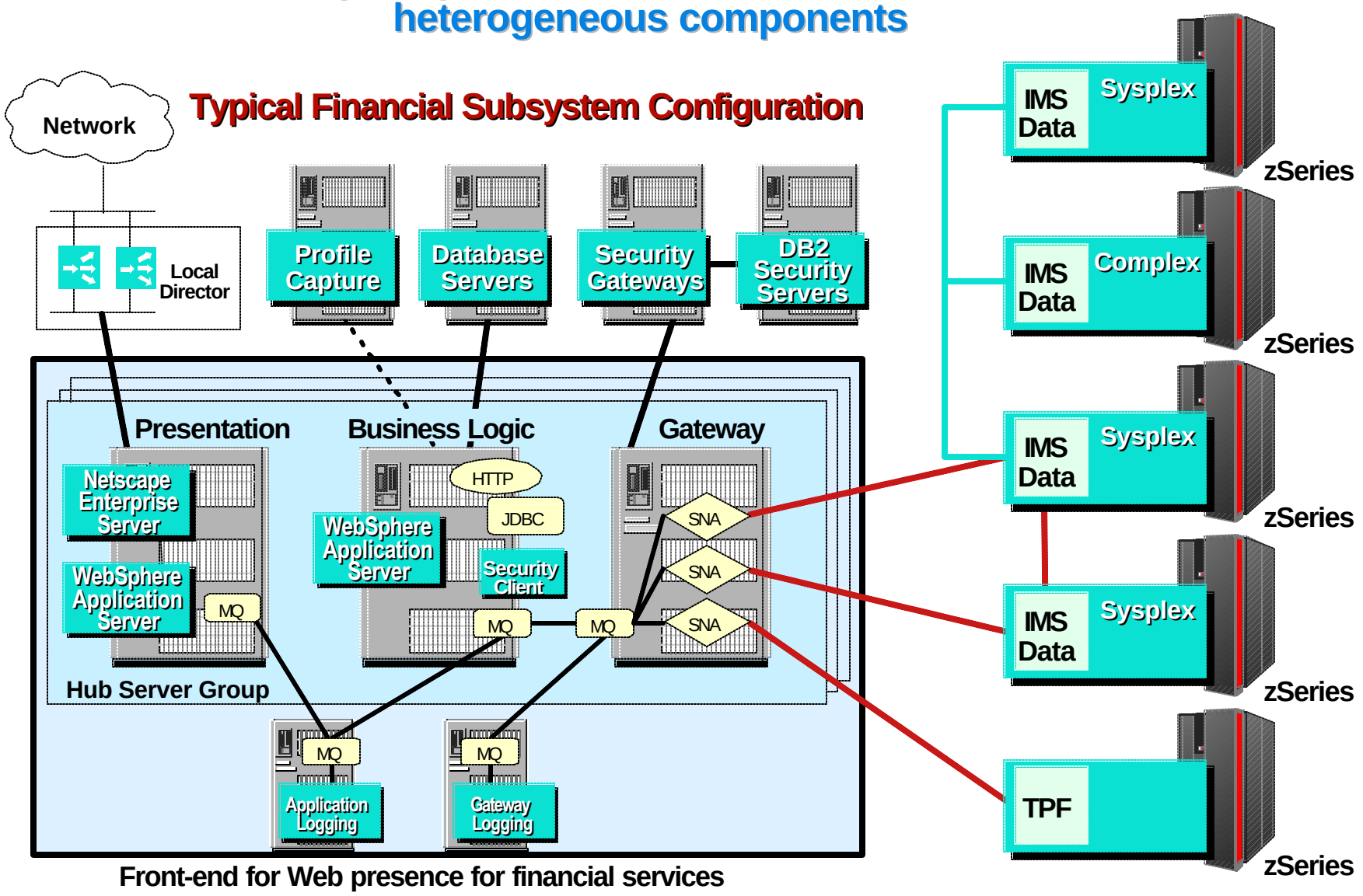
Actually, IMS is not forging new ground with innovative marketing or customer-acquisition strategies. It's more the other way around -- it's keeping the same old customer base, but the base is growing, a lot. IMS and the mainframes it runs on underpin the vast majority of banks and banking transactions worldwide. And the banking world is growing. China alone may provide more growth in the next few years than the rest of world has in the last decade, and it is certainly not the only Pacific Rim country modernizing its banking system. Combine that kin of geographic growth with advances in online banking in the developed world and it's no wonder mainframes, especially IBM's newer zSeries machines, and IMS are growing. They're the only products capable of keeping up. The only question is, will that growth strain even IMS capacity?

RedMonk (see www.redmonk.com): **Tooling Up for Mainframe Competition**

IBM's Venerable IMS transaction processing platform, for example, grew 8% in 2002. For the first time in many years the IBM mainframe is finding entirely new customers, rather then just increased workloads within the existing customer base. This growth is largely because the mainframe has proven itself as an ebusiness workhorse.

Infrastructure Trends: Complex System Topology

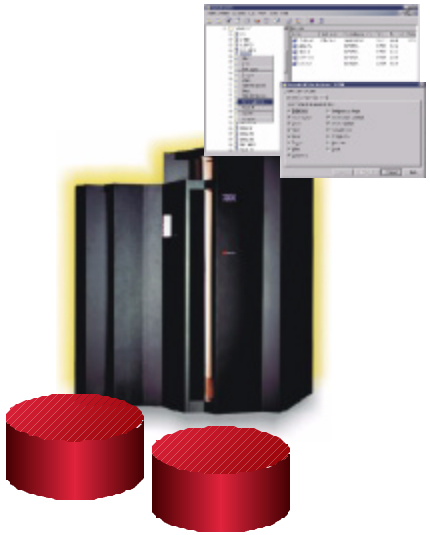
The increasing challenge of managing large systems is due to the inherent complexity of the solution and the sheer number of heterogeneous components



IMS Continues to Address Challenges of a Rapidly Changing World

Providing Quality through On-Demand Solutions

- **Information Integration and Open Access with New Application Development/Connectivity**
  - ✓ Ease/broaden user access
  - ✓ Web, Java, XML and Linux access
  - ✓ Ease application developer effort
  - ✓ Auto-application-generation tools
- **Manageability Ease with Autonomic Computing**
  - ✓ Ease installation and operations efforts
  - ✓ High levels of security
  - ✓ End-to-end transaction integrity
  - ✓ Real time data currency
  - ✓ Highest code quality
- **System Scalability for Virtualization in Performance/Capacity/Availability/Recovery**
  - ✓ Handling increasing workload
  - ✓ Handling unpredictable volumes
  - ✓ More hours for workload
  - ✓ Continuous up time for applications and user access
- **e-business with IMS extends the investment**



IMS V7 Database Manager Enhancements

Integration with Applic Devt/Connectivity

- **IMS Java and XML support**
- **Open Database Access (ODBA)**

Manageability

- **Installation enhancements**
  - ► Usability enhancements
  - ► HALDB samples
- **Logger enhancements**
  - ► Administration and Control
- **External Subsystem Attach Facility diagnostic enhancements**
- **IMS systems parameter display**
- **Fast Path Enhancements**
  - ► I/O error handling enhancements
  - ► Performance monitoring support
  - ► Multiple Area Data Set I/O Timing
  - ► Expansion of compressed data for Single dependent segment Scan
- **IMS Monitor enhancements for FP and FF**

Scalability in Performance/Capacity and Availability/Recovery

- **High Availability Large Database**
- **Application Control Block Generation (ACBGEN) enhancements**
  - ► increased number of program limits
  - ► time/version info added
- **DBRC Enhancements**
  - ► Recovery Control (RECON) online upgrade, online access, large record warning, loss notification, improved diagnostics
  - ► Image Copy Genmax and Recovery enhancement
  - ► DB administration enhancements
- **Forward Recovery enhancements**
  - ► Change accumulation spill record handling for smaller, faster change accums
- **Image Copy 2 Enhancements**
  - ► compression option added for space savings
- **I/O Performance enhancements**
  - ► Ficon support
  - ► ESS support
- **CSA Constraint relief**

IMS V7 Transaction Manager Enhancements

Integration with Application Devt and Connectivity

- IMS Java and XML support
- OTMA Callable Interface
- **ETO Enhancements**
  - ►Associated Printer support
  - ►Autologon enhancements
  - ►LTERM assignment flexibility
  - ►ETO descriptor record limit removed
  - ►Command Compatibility

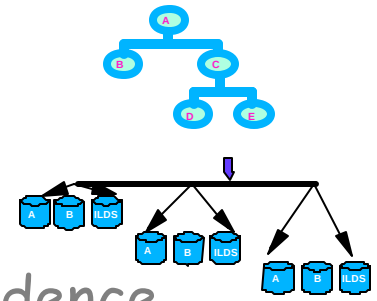
Manageability

- **Sysplex Queue Sharing Enhanced**
  - ►CQS enhancements for Shared Queues
  - ►Asynch APPC/OTMA for Shared Queues
- **Routing Exit enhancements**
- **RACF Pass Ticket Support**
- **Clarified USERID for applications**
- **External Subsystem Attach Facility (for DB2) Trace enhancements**
- **Installation enhancements**
  - ►Usability enhancements
  - ►Java samples
- **IMS systems parameter display**

Scalability in performance, capacity, and availability

- **Rapid Network Reconnect**
- **Deferred VTAM ACB Open to prevent time-outs**
- **Improved checkpoint frequency control**
- **SLUP Finance Session Coldstart capability**
- **VTAM Generic Resources enhancement for VTAM to manage the affinity**
- **Queue Space Notification Exit**
- **I/O SPOOL usability and performance enhancements**
- **SLU2 exception response enhancement**

IMS V7 HALDB for IMPROVED CAPACITY & DATA AVAILABILITY



- ✓ Extends IMS Full Function database size
  - ➡ 1001 Partitions x 10 data set groups x 4G = 40 Terabytes
- ✓ Provides data availability through partition independence
- ✓ Provides easier manageability with smaller partitions of the database
- ✓ **Enhancements since IMS V7 GA:**
  - **Performance Improvements in**
    - ► Secondary index migration
    - ► Indirect list data sets (ILDS) creation
    - ► DFSMAIDO
    - ► Secondary index option during Load
  - **Management Improvements with**
    - ► Recon Partition List Command support
    - ► Batch command initialization and change/delete of HALDB and associated partitions
    - ► Limit BMP/Batch/JBP Calls to one partition
    - ► Unload Reload status enhancement
    - ► PCB label Processing

Assicurazioni Generali implementing HALDB

Challenge:

- **Partition DB Support solved the database size limit back in 1997, but availability issues also needed to be addressed.**

Solution:

- **IMS V7 HALDB**

Benefits:

- **Secondary Index Partitioning**
- **Concurrency**
- **IMS code**
- **Availability with Parallel IC/REORG/RECOVERY**
- **Capacity for planned 30GB DB with 9 partitions**

IMS V7 DBRC Enhancements for Eased Recovery and Manageability

- **DBRC Concurrent RECON Upgrade**
  - RECON can be upgraded without stopping pre-IMS V7 systems
- **RECON Loss Notification**
  - MVS console message for RECON loss
  - Benefit - automation aid
- **DBRC Support for PROCOPT=L/LS**
  - Image Copy required at initial database load
  - Benefit - improved data integrity
- **DBRC Image Copy GENMAX**
  - GENMAX no longer automatically increased when number of image copies specified is exceeded
  - Benefit - usability
- **Large RECON record warning**
  - Warning message
  - Benefit - automation aid, increased availability
- **RECON Access improvement**
  - Change to scheme to serialize accesses to RECON
    - online system favored over batch jobs
  - Benefit - reduced I/O bottlenecks that impact online systems
- **DBRC serviceability**
  - LIST.DBDSGRP, LIST.HISTORY enhancements

✓ **Enhancements since IMS V7 GA:**

- **Support of HALDB performance/management enhancements**
- **List History timeline - can just point to the timeline only**
- **DD Cards - alt DD for SYSIN**
- **Genjcl user partition support**

IMS V7 Java for ***Integrated e-business Application Development/Connectivity***

✓ Application Programmer Productivity

- **Provide a set of packages (groups of classes) for I/O message handling and access to IMS services and support APIs familiar to Java programmers**
- **Java access to IMS input/output message queues**
- **Provide JDBC access to IMS DB and DB2 data for IMS TM/Batch applications**
- **Use Visual tools for development**

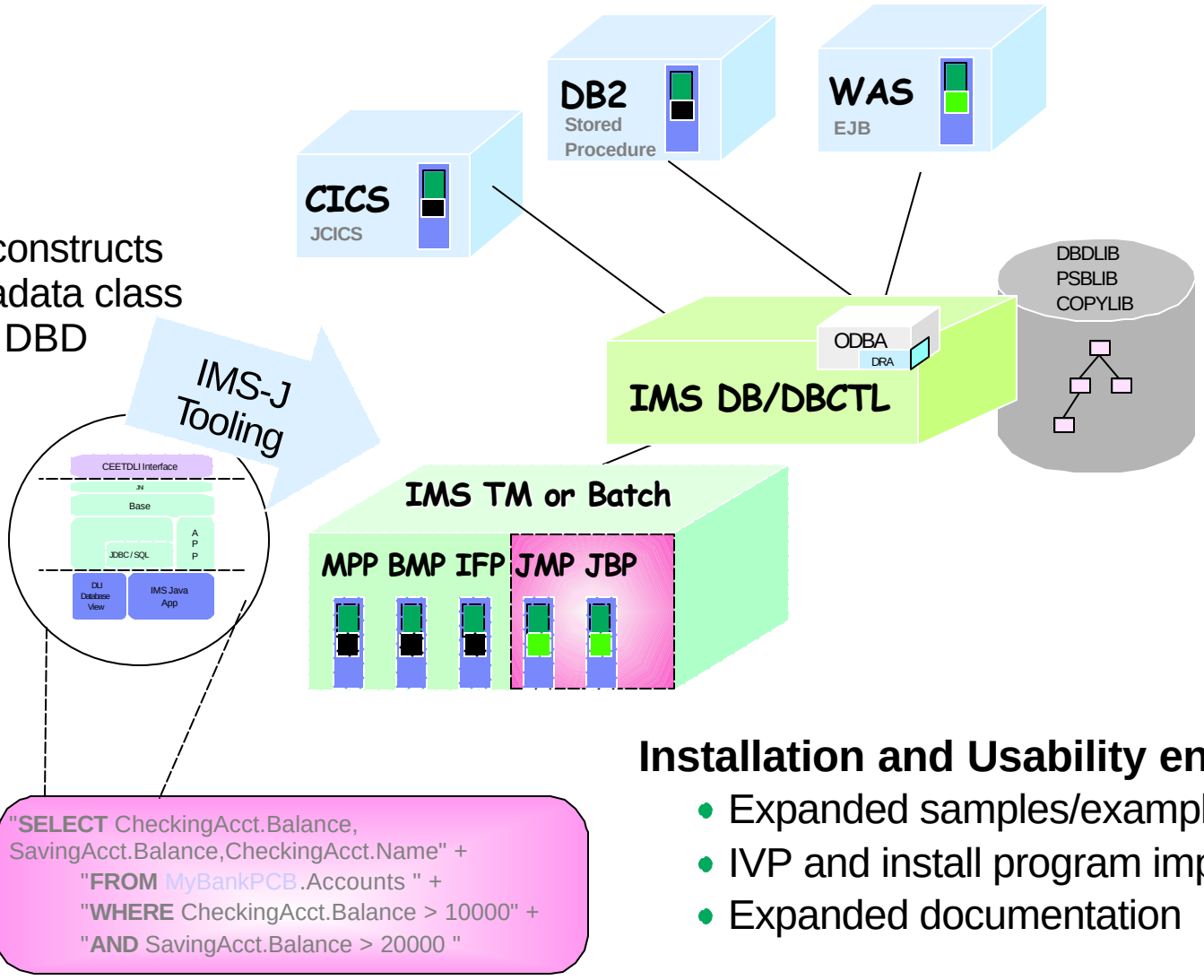
✓ Enhancements since IMS V7 GA

- **New Java Dependent Regions (JMP and JBP) provided to support Persistent Reusable Java Virtual Machine replacing HPJ compiler**
- **JDBC access to IMS DB from CICS Java applications, DB2 Stored Procedures, or WebSphere ejbs in local OS/390 and z/OS environments**
- **New Java Tool support**
- **Java Installation and Usability Enhancements**
- **Java-Cobol Interoperability/Usability enhancement (2003)**
- **COBOL-XML support for parsing/transforming XML documents (2003)**

JDBC Access to IMS Data

DLIModel Utility

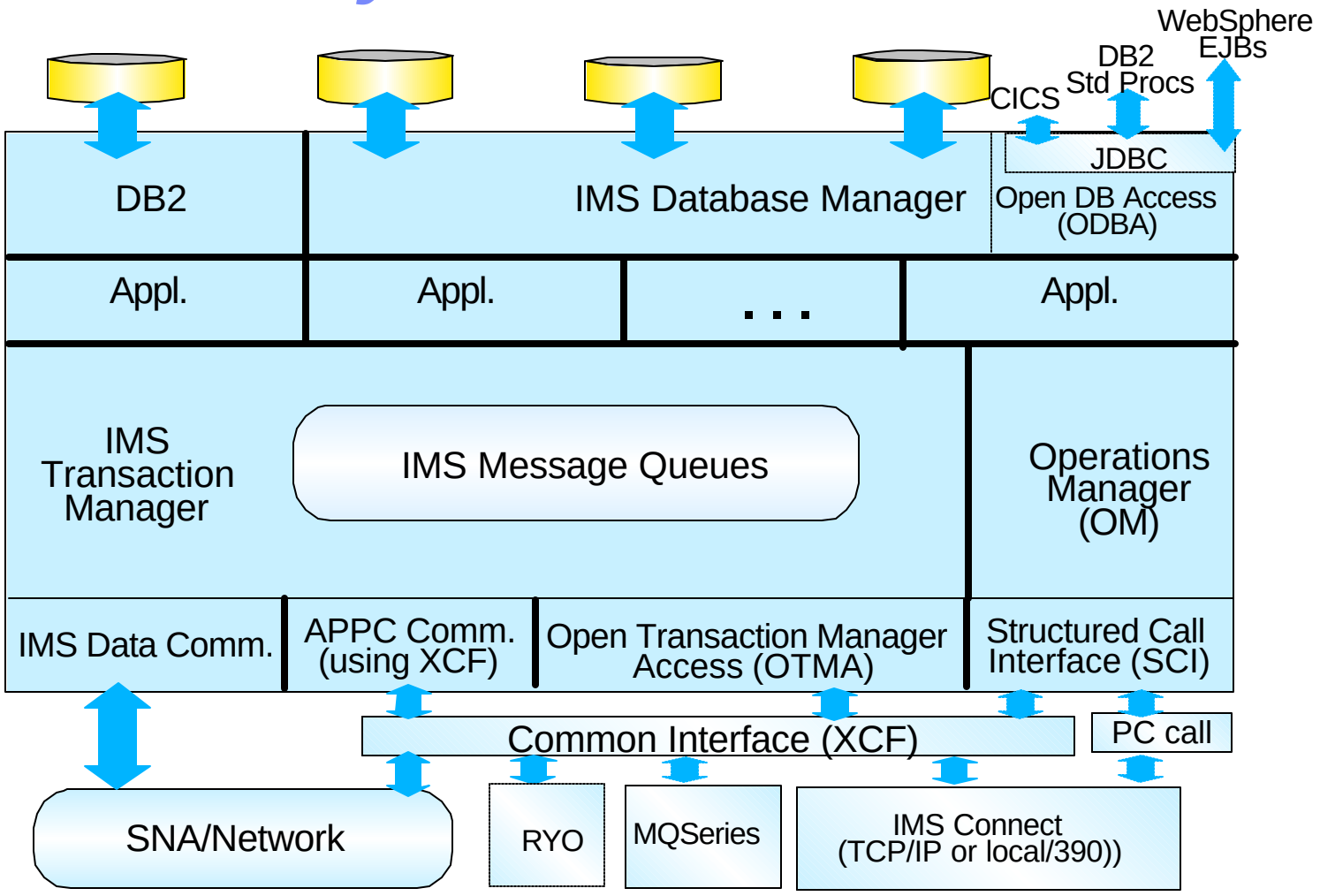
- Automatically constructs IMS Java metadata class from PSB and DBD



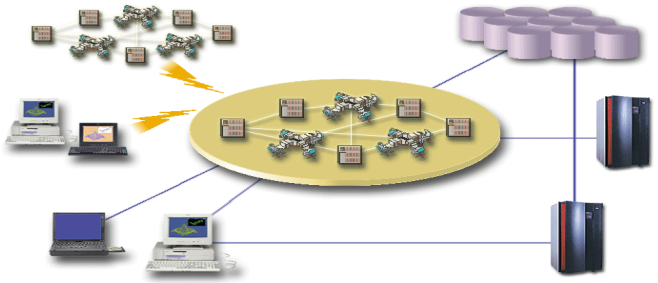
Installation and Usability enhancements

- Expanded samples/examples
- IVP and install program improvements
- Expanded documentation

Middleware Subsystem Access

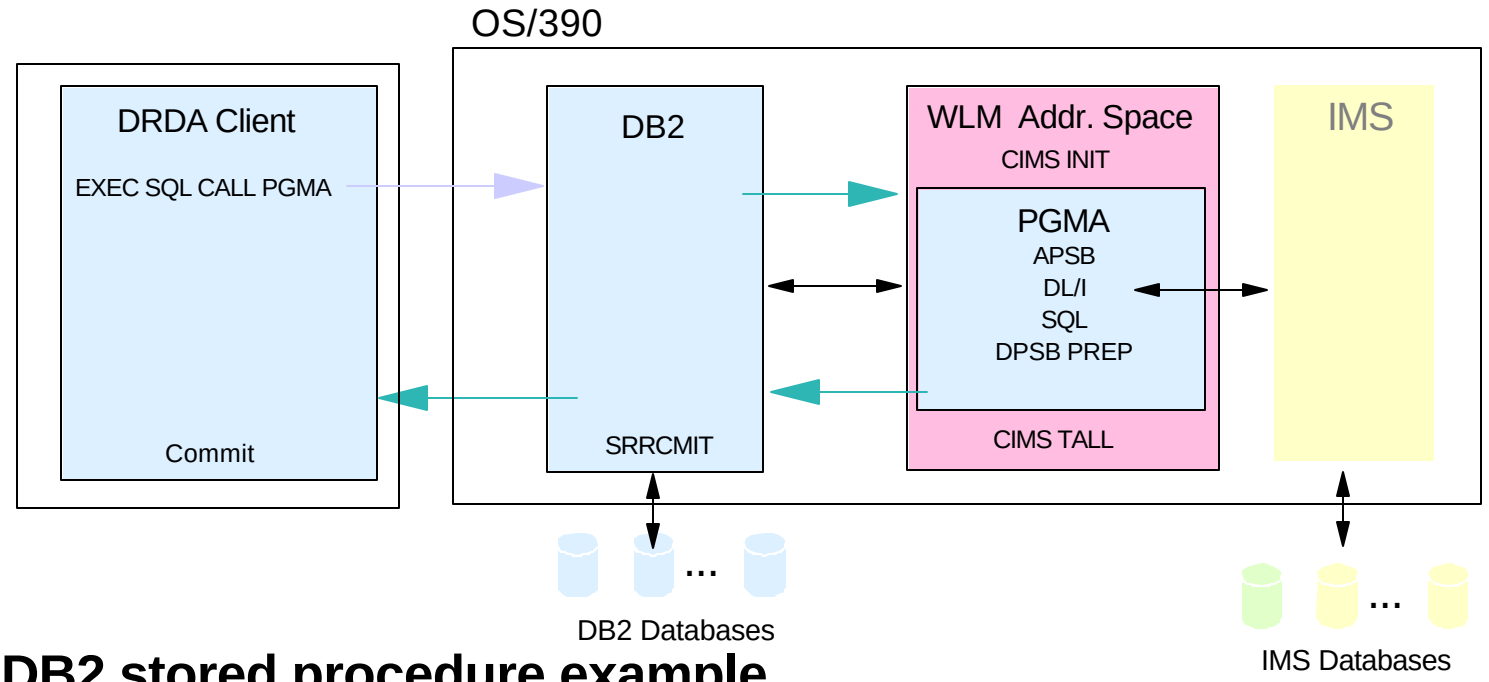


What is Open Database Access?



- Open Database Access (ODBA) is a callable interface for accessing data managed by IMS DB
  - Based on the DRA interface provided for CICS applications
  - Also provided through the IMS V6 service process
- ODBA allows IMS DB and OS/390 application programs to be developed, installed, and maintained independently of each other
- ODBA provides for failure isolation and independent resource recoverability
  - Requires OS/390 Resource Recovery Services (RRS)

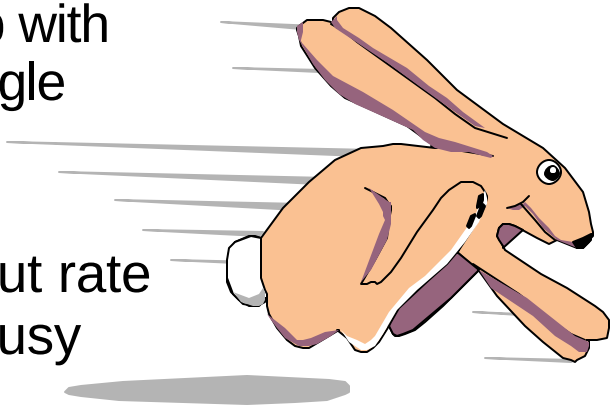
DB2 Stored Procedure Example



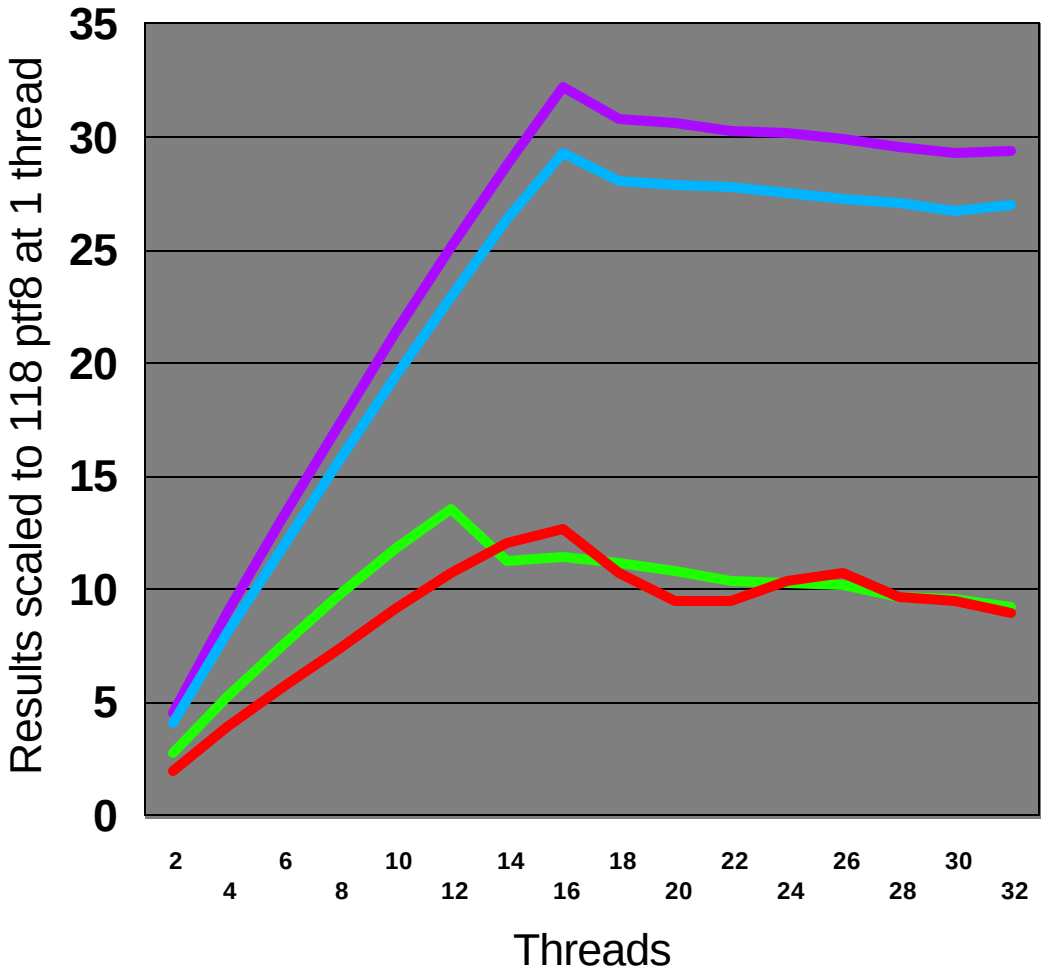
- **DB2 stored procedure example**
  - DL/I calls to IMS DB
  - Client program does commit when stored procedure returns or DB2 can issue SRRCMIT
- **Enhancements since IMS V7 GA**
  - JDBC calls to IMS DB from DB2 Java Stored Procedures, IMS and CICS/390 Java applications, and WebSphere ejbs

IMS Java Application Support

- An IMS Fast Path workload was converted to run in the IMS Version 8 JVM environment
- Experiments conducted at the IBM Silicon Valley Lab with 82 JMP regions on an IBM zSeries 900 2064-116 single image 14-way server
- The Java transaction achieved a steady throughput rate of 2134 transactions per second with 61% CPU busy
- The Java Dependent Region enhancement is production ready and provides high performance access to your IMS data
- Further performance tuning hints and tips can be located at IMS Family web site on the presentations/papers page



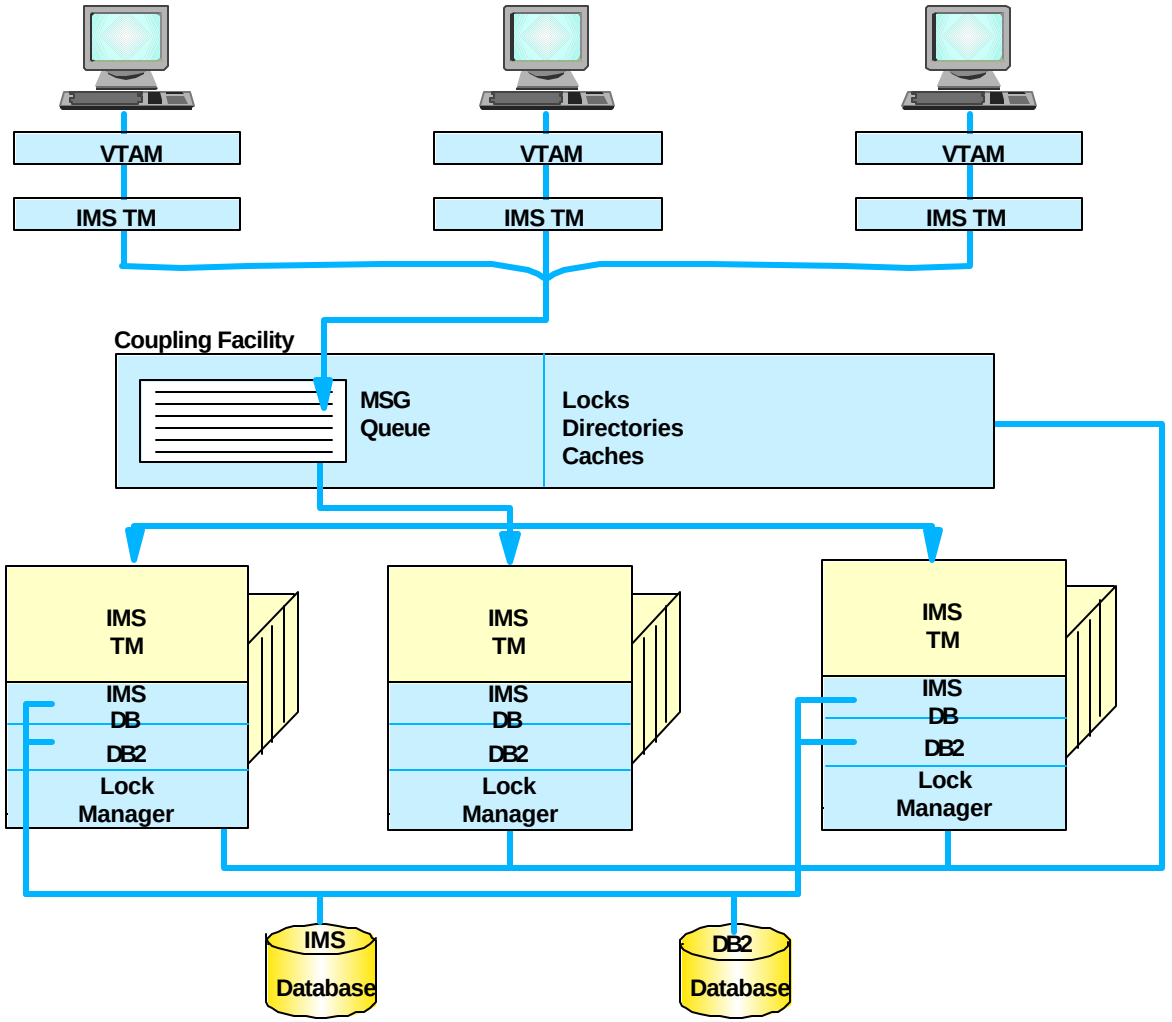
Sample Java Application Performance on Various S/390 JVMs *(IBM Poughkeepsie)*



Freeway 16way
zOS 1.4
Heap size - 1400MB

Sept 27, 2002

IMS in a Parallel Sysplex



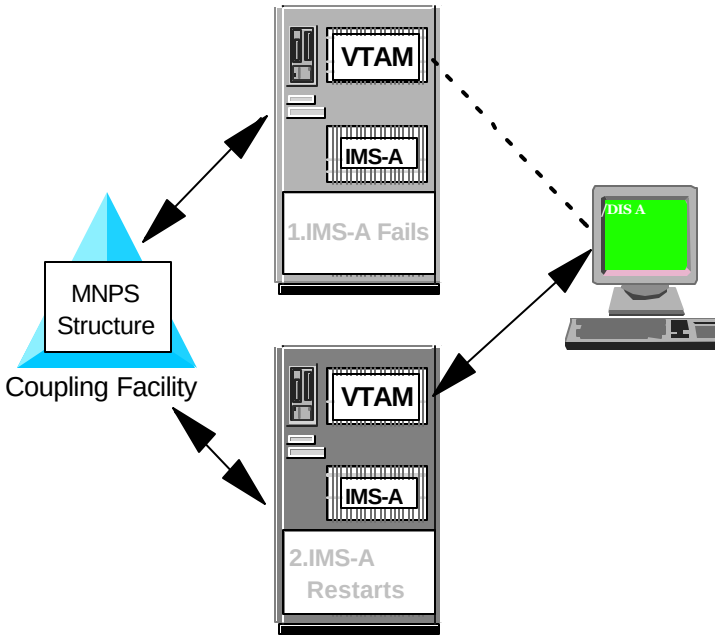
- **Allocation of workstations**
- **Dynamic Workload Balancing**
- **Data Sharing**
  - IMS DB
  - DB2

Easier access and management of enterprise applications and data

IMS V7 Rapid Network Reconnect for IMPROVED AVAILABILITY

Highlights

- **Terminals automatically reconnect to restarted IMS**
  - end user signs on again after IMS restart
- **VTAM maintains persistent session**
  - Single node persistent session (single IMS/CEC)
    - after IMS restart of failed IMS
    - network reconnects to restarted IMS in same CEC
    - Coupling Facility not required
  - Multinode-persistent session (>1 CEC/IMS)
    - After IMS restart of failed IMS
    - Network reconnects to restarted IMS in another CEC
    - IMS application must register in Coupling Facility MNPS structure
- **If MNPS, all VTAMs with MNPS must be connected to Coupling Facility structure**



Benefits

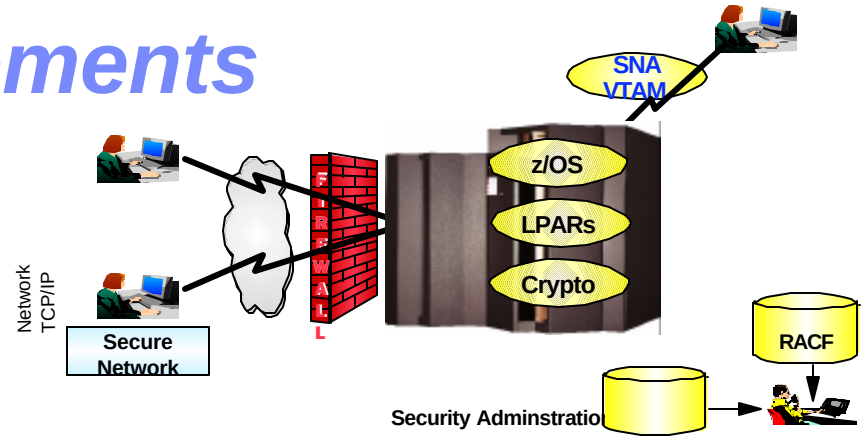
- **Faster reconnect time after IMS, MVS, or VTAM failure in a sysplex environment**
- **Permits IMS TM to automatically reconnect terminal sessions following any kind of IMS failure and subsequent IMS restart**

IMS V7 Common Queue Server Enhancements

Highlights

- Support for multiple clients
  - Achieves better utilization of the CQS address space
    - Storage
    - Problem determination
    - Operations
- Security checking during CQS registration
- Interface enhancements
  - Diagnostics
  - CQS requests

IMS V7 Security Enhancements



Highlights

- **Enhanced PassTicket Support (uses RACF or equivalent)**
  - New keyword parameter on the /SIGN ON command
    /SIGN ON userid PassTicket APPL applname
  - Provides greater flexibility for the end-user/program
    - PassTicket creation can use IMSID (same as before)
    - PassTicket creation can use the IMS application name
  - Allows the creator of PassTickets to specify the value by which it knows IMS
- **New system-wide default SAPPLID=applid in DFSDCxxx**
  - Enables the use of PassTickets for VGR connections to IMS
- **USERID Clarification**
  - An indicator associated with the **userid** field that defines its content
  - Provides a method that allows IMS application programs and exits to determine whether a user was signed on at the time a transaction was entered

IMS V7 Enhancements in 2001/2002 through the Service Process

Integration/Openness with application development/connectivity

- New Java Region Types, JDBC access, and Tooling
- APPC and OTMA Message enhancements
- OTMA Security and Management Enhancements
- External Subsystem Support enhanced for DB2 MVS group support
- Additional Sense Codes/Message Information for use with z/OS Communications Manager
- Optional use of VTAM Generic Resources (VGR) for InterSystems Coupling (ISC) support

Manageability

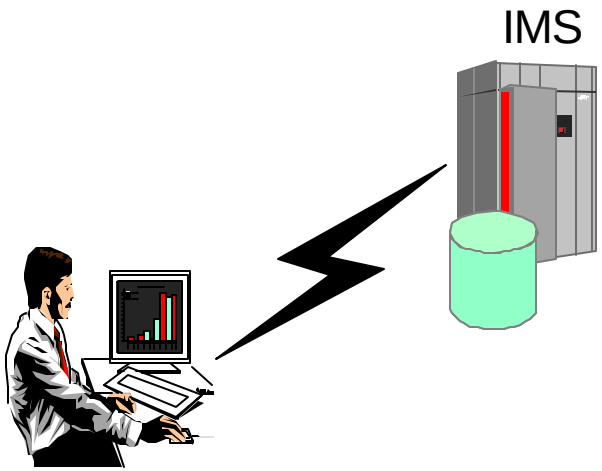
- Enhanced HALDB and DBRC Performance/Management
- Batch Resource Recovery Service (RRS) enhancement
- System Log Data Set (SLDS) Read Support
- Remote Site Recovery (RSR) Enhanced Statistics

Scalability

- 64-bit real support
- 255 OSAM Database Buffer Subpools
- Fiber Channel support
- Fast Path (FP) Page Fix enhancement reduces MVS overhead in page fixing FP buffers

APPC and OTMA Message Enhancements

- /DIS QCNT APPC MSGAGE command to include destination LUNAME and TPNAME
- /DIS QCNT OTMA MSGAGE command to include outbound message TMEMBER and TPIPE



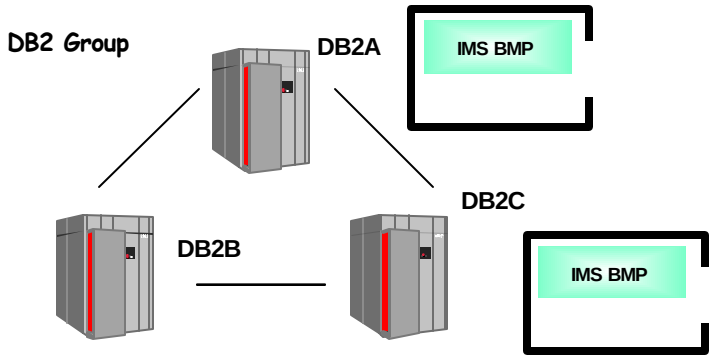
OTMA Security/Management Enhancements

- Enhanced Message Control
- Use the OTMA ACEE hash table for the AUTH call
- OTMA member-specific security level support
- Expand the OTMA ACEE hash table size

IMS External Subsystem Attach for DB2 Groups

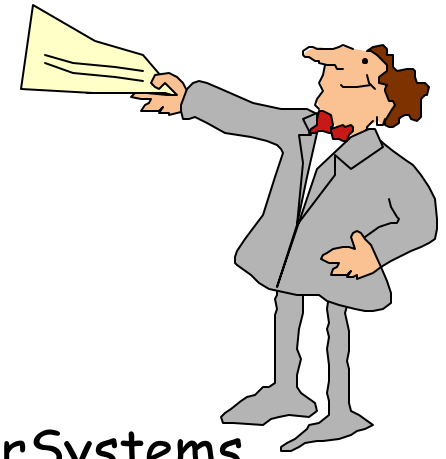
Allows easy movement of BMPs between data sharing systems

- For all IMS online region types
  - SSM members do not have to be changed
- IMS dependent region may attach to any DB2 using the DB2 group attach name
  - DB2 group attach name is specified as the subsystem name in the dependent region IMS SSM member (instead of DB2 subsystem name)
- Restart 'resolve in-doubt' processing automatically uses the specific name
  - Emergency restart must have 'original' DB2 available



IMS TM Connectivity/Scalability enhancements

IMS Sense Code/Messages Enhancements provide additional Information for use with z/OS Communications Manager



- Providing Signon screen after LUSTAT x"082b'
- Including the TCP/IP address in IMS messages

Optional Use of VTAM Generic Resources for InterSystems Coupling (ISC) support

- Allowing no Uservar name for ISC sessions to more easily move ISC sessions

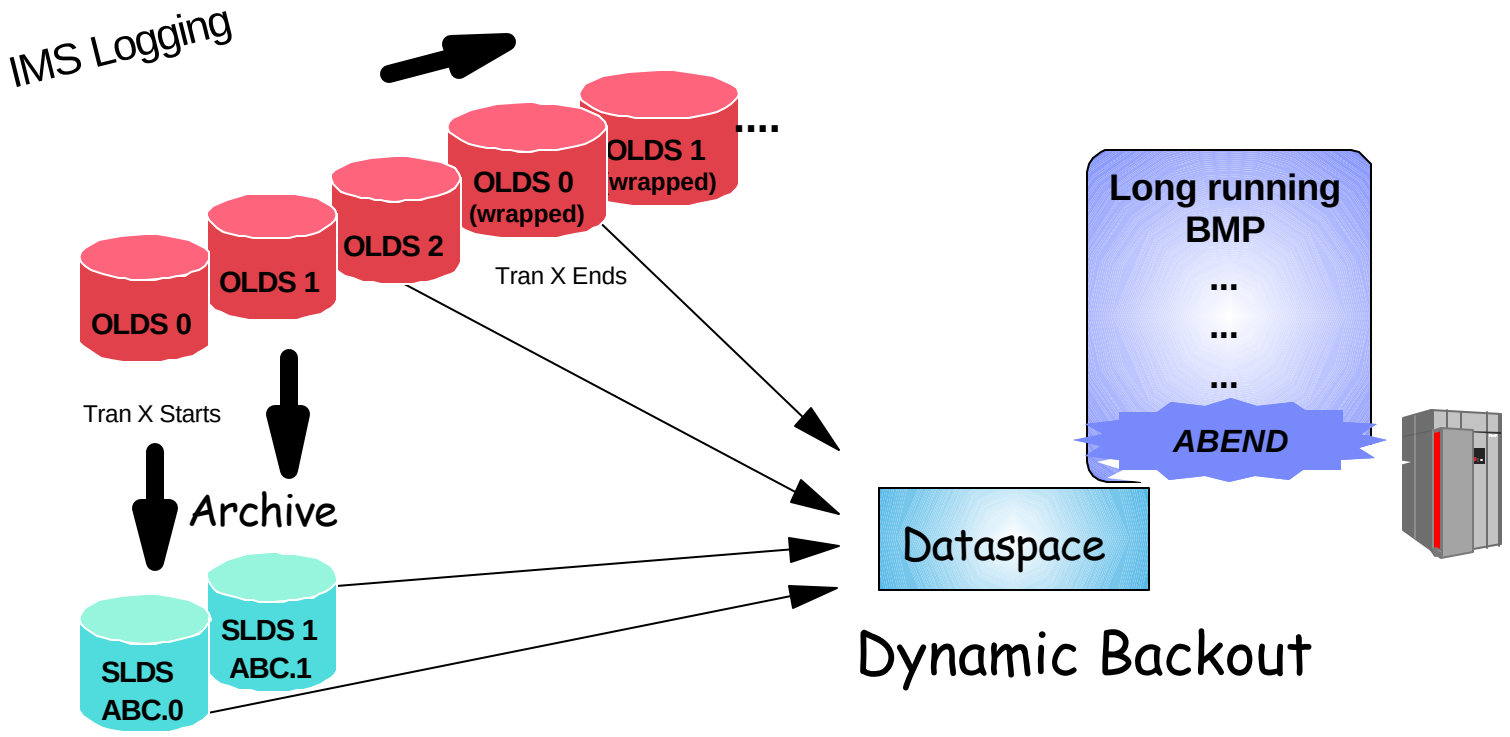
Resource Recovery Services (RRS) Enhancements for **Eased Manageability**

Batch RRS Support

- Allows batch programs to use MQ with coordinated commit
- Provides for a full two phase commit for batch programs accessing DB2 and IMS DB
  - Today's Batch Attach from DB2 does not support coordinated commit
- Allows for work which captures data and propagates it to another system (ex. DPROP for IMS -> DB2) to participate in the 2-phase syncpoint process

System Log Data Set (SLDS) Read Support

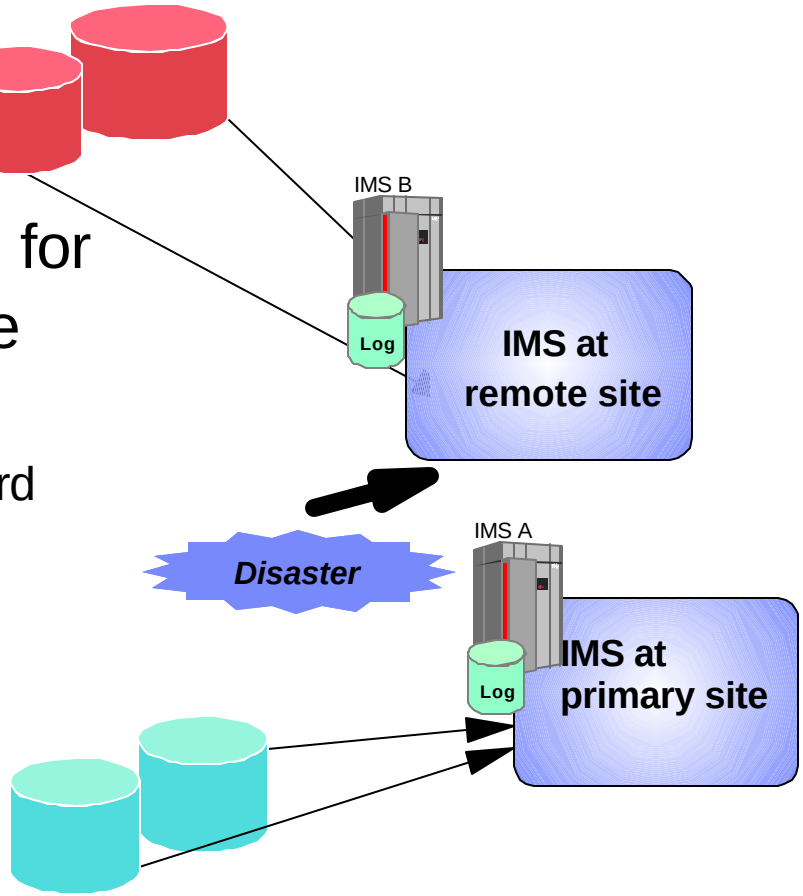
- The IMS Logger is now able to read SLDSs for Dynamic Backout, avoiding the need for batch backout in some cases
  - Example -- A long running application requires uncommitted updates on the SLDS after the OLDS have wrapped
- In a Shared Message Queue environment SLDS will now be dynamically mounted when /CHE is issued and the messages are only available on SLDS



Remote Site Recovery (RSR) Enhanced Statistics

New statistical information for better analysis of Database Trackers performance

- Primarily during the Online Forward Recovery process



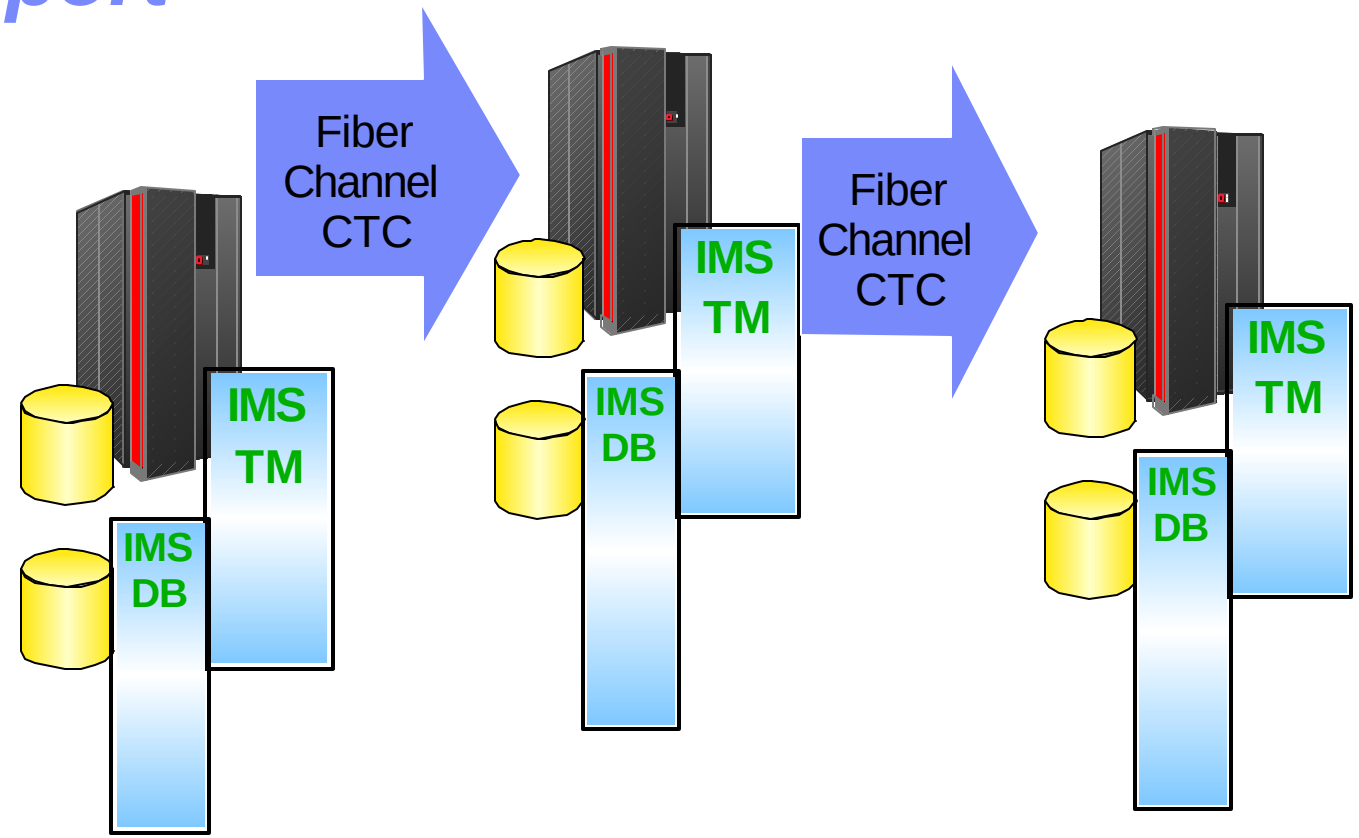
IMS 64-bit Real Support for ***Enhanced Scalability***

- OS/390 V2R10 or z/OS support 64-bit real addresses on z900
  - Addresses above the 31-bit address limit of 2 gigabytes are "above the bar"
  - IMS V7, V6, and V5 are enabled for 64-bit
- OSAM supports real addresses above the 2GB bar
  - I/Os may be done with buffers above the bar
  - Database buffers may reside in real storage above the bar
  - Log buffers may reside in real storage above the bar
    - In previous releases of IMS, data in buffers which are above the bar must be moved below the bar before I/O is done
- Fast Path storage moved above the 2GB bar

Increased OSAM Database Buffer Subpools

- **Up to 250 OSAM database buffer subpools may be defined**
  - Previous limit was 100
  - Provides additional buffer pool tuning possibilities
  - Also available in IMS V6

IMS Multiple Systems Coupling Fiber Channel CTC Support



Providing Reliable, High Bandwidth Host-to-Host Communications Support between IMS systems.

IMS V7 Enhancements in 2003 via Service process

Integration/Openness

- Java/XML enhancements
  - Java-Cobol Interoperability
  - COBOL-XML support for parsing and transforming XML documents
- Enhanced OTMA Security

Manageability

- HALDB label processing
- /Exit Conversation Enhancements
- Option to disable Sysplex TM for Static ISC
- Fast Path enhancements

Scalability

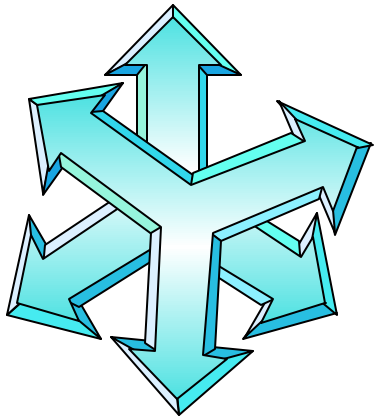
- RRS = Y/N to avoid unnecessary overhead.
- Dynamic Lterm creation
- Enhanced Sysplex Coupling Facility support

OTMA Security/Management Enhancements

- Dynamic Refresh of Aging value for OTMA ACEEs Hash table
- Pass OTMA userid to new routing exit

IMS TM Management/Scalability Enhancements

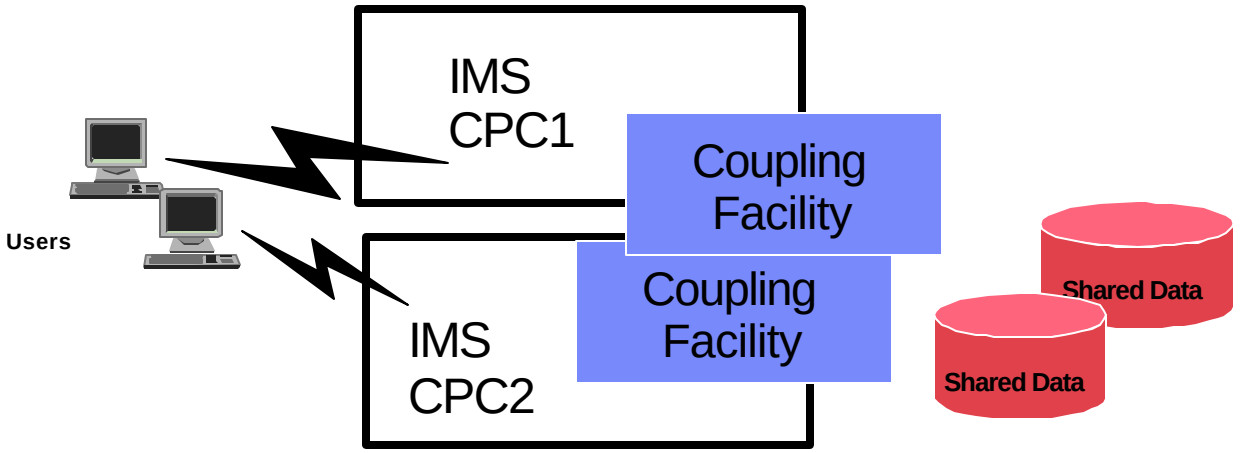
- /Exit Conversation Enhancements
  - Deletes the conversation off the shared queue
- Option to disable Sysplex TM for Static ISC
  - To allow backup through duplicate names for multiple sessions between systems
- Dynamic Lterm creation
  - To allow for the dynamic creation of remote Lterms



IMS Fast Path Manageability/Scalability Enhancements

- Shared Virtual Storage Option (VSO) Disaster Recovery Remote Site support
  - Facilitates handling at a disaster site
- Local VSO eXtended Recovery Facility Tracking performance enhancement
  - Enhances performance for large number of updates
- Reduced Abends
- Serviceability/Usability Enhancements

IMS Sysplex Coupling Facility Enhancements



- CF Duplexing for IMS Shared Queues and Fast Path (FP) Expedited Message Handler (EMH)
- CF Duplexing for IMS Data Sharing through IMS Resource Lock Manager (IRLM)
- IMS Fast Path Virtual Storage Option (VSO) CF support
  - System Managed Duplexing
  - Automatic Altering
  - System Managed Rebuild

IMS V8 Database Manager Enhancements

Integration/Open with Appl. Devt and Connectivity

- Dynamic LE Runtime Parameters

Manageability

- Single Image Operations Manager
- Syntax Checker
- Removed RSR RLT/DLT install checking
- Packaging/Install/IVP enhancements

Scalability in Availability/Recovery/ Performance/Capacity

- IMS/DB2 Coordinated disaster recovery support
- DBRC Enhancements
  - ►Automated Recon Loss Notification
  - ►Eliminate Abends
  - ►Recon Command authorization
  - ►16M Recon Record size
  - ►Prilog Compression
- Parallel Database Processing
- Fast Path DEDB Enhancements
  - ►Non Recoverable DEDBs
  - ►DEDBs increased to 2048 areas
- CSA/VSCR Enhancements

IMS V8 Transaction Manager Enhancements

Information Integration with Appl. Devt and Connectivity

- Dynamic LE Runtime Parameters

Manageability

- Sysplex Wide Resource Manager
- Single Image Operations Management
- Sysplex Terminal Management
- Transaction Trace
- Syntax Checker
- Packaging/Install/IVP enhancements.

Scalability in Availability/Recovery/ Performance/Capacity

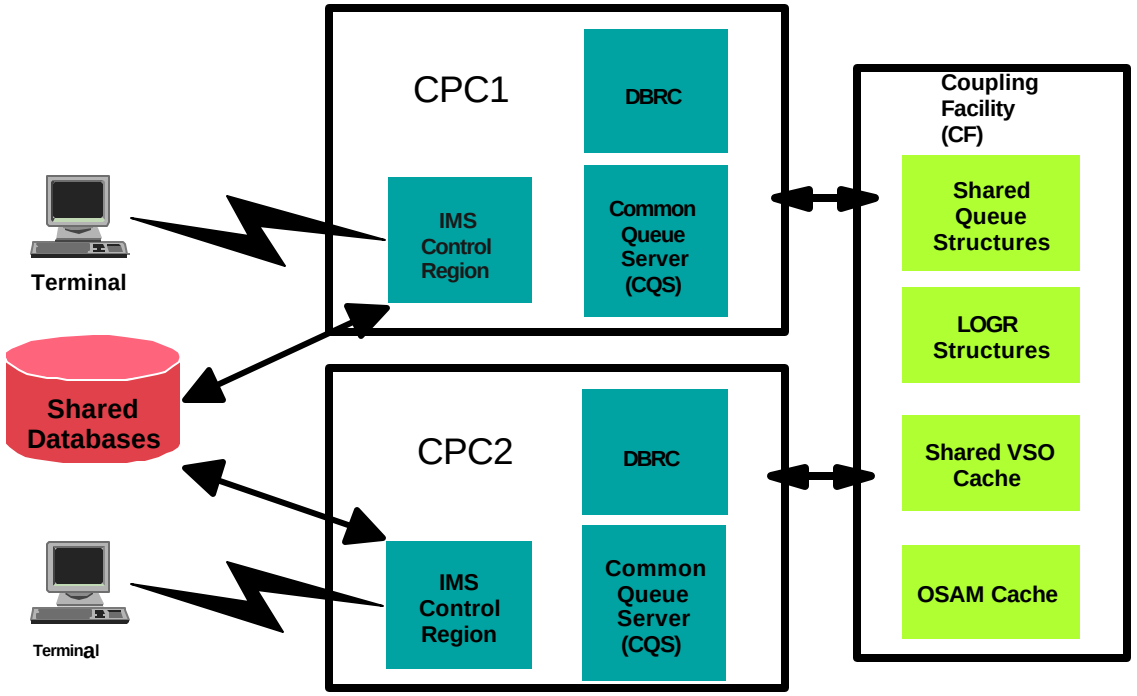
- APPC enhancements
- CSA/VSCR enhancements
- Common Service Layer address spaces

IMS V8 Dynamic LE Runtime Parameters

Eases Application Development

- Dynamically updates Language Environment (LE) runtime parameters for an IMS Transaction or Batch Message Program
- Makes it easier to use Debug Tool for application testing
- Done without requiring CEEROPT and CEEUOTP to be changed, reassembled, and relinked when parameters need to be changed

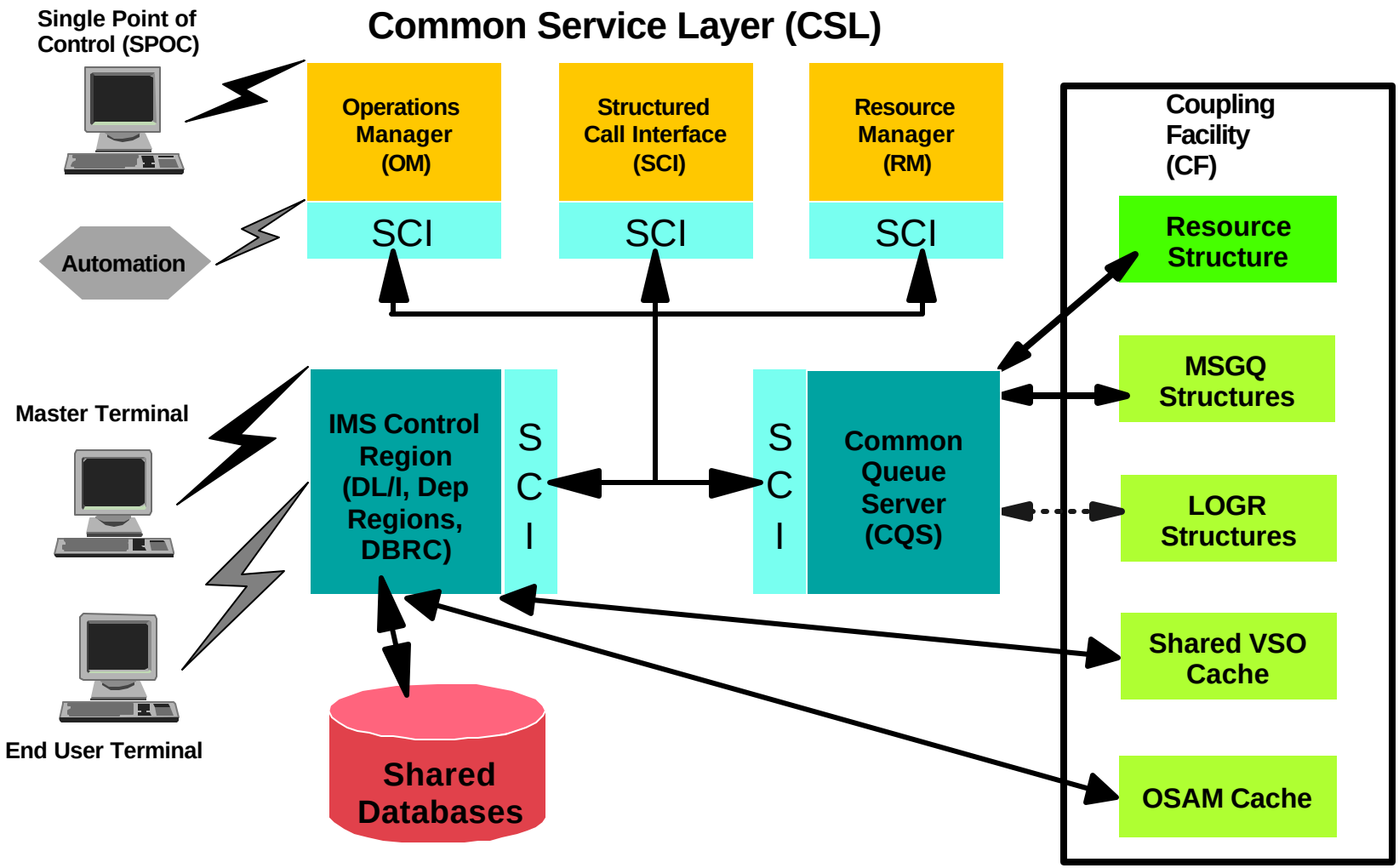
IMS Sysplex Manageability



SYSTEMS MANAGEMENT REQUIREMENTS

- PRESENT A SINGLE SYSTEM IMAGE AND PROVIDE EASE OF USE THROUGH A SINGLE POINT OF CONTROL ACROSS THE SYSPLEX
- ENABLE USERS TO RESUME STATUS ON ANOTHER IMS IN IMSPLEX
- COORDINATE/MANAGE ONLINE CHANGE ACROSS THE IMSPLEX
- ADDITIONAL REQUIREMENTS

IMS V8 Sysplex Management Enhancements



Structured Call Interface provides communication interface between IMS address spaces on same or across CPCs using XCF

IMS V8 Sysplex Terminal Manager

Recovers terminal state information after a session reconnect, and allows the terminal user to log back onto another IMS after a failure.

- Allows VTAM to manage Generic Resource affinity while IMS can maintain VTAM terminal and user state data, if requested
- Enforces resource type consistency for message destinations and resource name uniqueness
- Supports global callable services for terminals/users, allowing user exits to obtain node and user information across IMS Sysplex
- Uses the Resource Manager to share VTAM terminal-related resources in the IMS Sysplex
- Autologons can be initiated from a single IMS in the Sysplex

IMS V8 Transaction Trace

Eases serviceability

Utilizes OS/390 and z/OS Transaction Trace facility for

- **Tracing a unit of work** through subsystems
- **Enabling show of flow** through components
- **Providing a consolidated place** to store tracking information
- **IMS Trace points** provided for
  - IMS Entry
  - IMS Exit
  - DL/I Entry
  - DL/I exit

IMS Resource Definition Manageability

Current System Generation Process

- **Two stage, Batch, Assembler process**
  - **Cold Start**
  - **Online Change**
    - Databases, Trans route codes, Appls, Security
    - Quiesces whole system

Requirements

- **Reduce system generation time/effort**
- **Improve availability during change**

IMS Resource Definition Manageability Staging

Reducing IMS System Generation effort

- **IMS V4 stopped using sysgen to support new function**
- **IMS V5/6 removed conditional assembly modules**
- **IMS V7 put non-conditional link-edit modules under SMP control**
- **IMS V8**
  - Removed RSR RLT/DLT feature install checking
  - Resource Manager/Coordinated Online Change
  - Syntax Checker
  - Packaging/Installation/IVP enhancements

IMS V8 Syntax Checker

Helps Reduce System Generation effort

- **New IMS ISPF application** which assists Systems Programmers in defining and maintaining the IMS parmlib members residing in the IMS PROCLIB
- **Parameter and value checking and detailed help text** at the parameter level tailored to the IMS version
- **Assists in moving from release to release** by identifying new parameters and obsolete parameters
- **Provide ability to ensure parameters are valid** prior to shutting down and restarting your IMS Control Regions.

IMS V8 Packaging, Installation and IVP Enhancements

New IMS Packaging and Installation Process

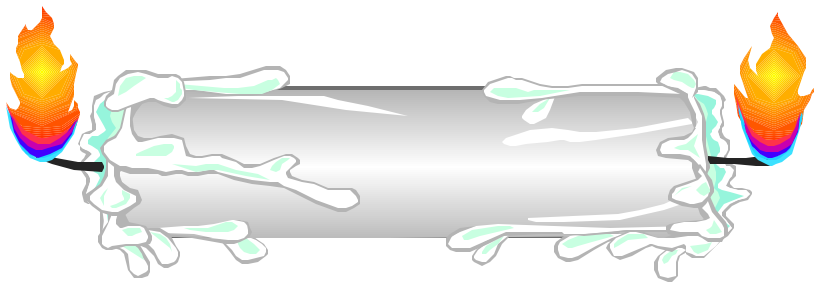
- SMP/E jobs removed from Install/IVP Dialog Process
- SMP/E Receive, Apply, Accept processing
- New Target and Distribution datasets
- No DFSJCLIN Job provided

Installation Verification Program Enhancements

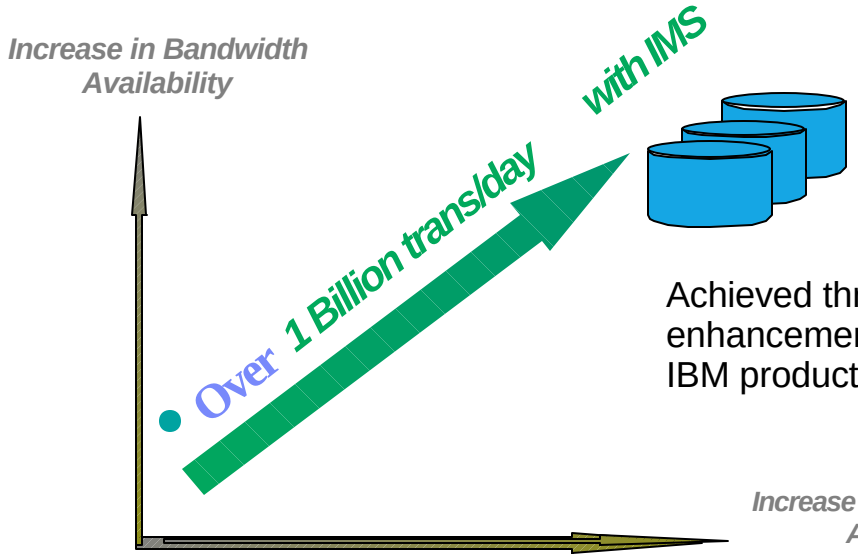
- OM, RM, SCI, SPOC Sample Application
- Syntax Checker Sample Application

IMS V8 DB Recovery Control Enhancements

- **Automatic Recon Loss Notification** for quicker loss recovery
- **Eliminate abends** when authorizing database
- **RECON Command Authorization** controls RECON access/update via DBRC batch commands
- **16M RECON Record Size** helps users avoid problems caused by Recon Record size exceeding VSAM record size max
- **Prilog Compression** reduces overhead, improves performance



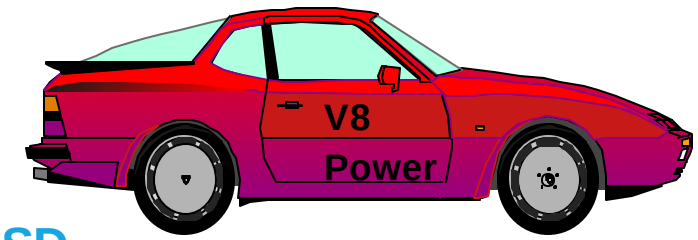
IMS V8 Scalability in Performance/Capacity/Availability/Recovery



IMS tight integration with IBM Storage
Take advantage of PAV !!

Achieved thru enhancements across the IBM product line.

- ✓ **Local systems:**
  - z/Architecture 64-bit mode
  - Parallel Database Open
  - Up to 2048 Fast Path Areas per DEDB
  - CSA reduction
- ✓ **Parallel Sysplex:**
  - CSL address space
  - CF structure duplexing
- ✓ **Increased performance with Shark DASD**
  - MSC response time in microseconds
  - OLDS logging bandwidth up to 26.9 MB sec



IMS V8 Enhancements in 2003 via Service process

- Java and XML enhancements
- DB Image Copy 2 Enhancements
- Coordinated Online Change
- APPC/OTMA Shared Queues Support
- Items from V7 Enhancements in 2003

Also provided as part of DB2 V8 Control Center via a Fixpack

- IMS Control Center

IMS V8 Java and XML enhancements

Eases Application Integration

- WSADIE Service Definition creation for MFS-based applications to enable use as Web Services
- MFS Web Services support enabling customers to publish existing transactions as Web Services and connect to IMS via SOAP and EJB bindings.
- SQL enhancements for new SQL keywords and Aggregate functions enhancements
- JDBC 2.0 support, including the ability to obtain scroll insensitive result sets.
- IMS DB-DB2 Interoperability from within a Java dependent region

IMS V8 Image Copy 2 Enhancements

Eases Image Copy coordination and management

- **Multiple utility control statements** can be copied per execution
- **Group name support** names the datasets in one execution so can start and/or stop as a group
- **Single output data set** can be created for multiple image copies
- **DFSMSdss Optimize option** supported

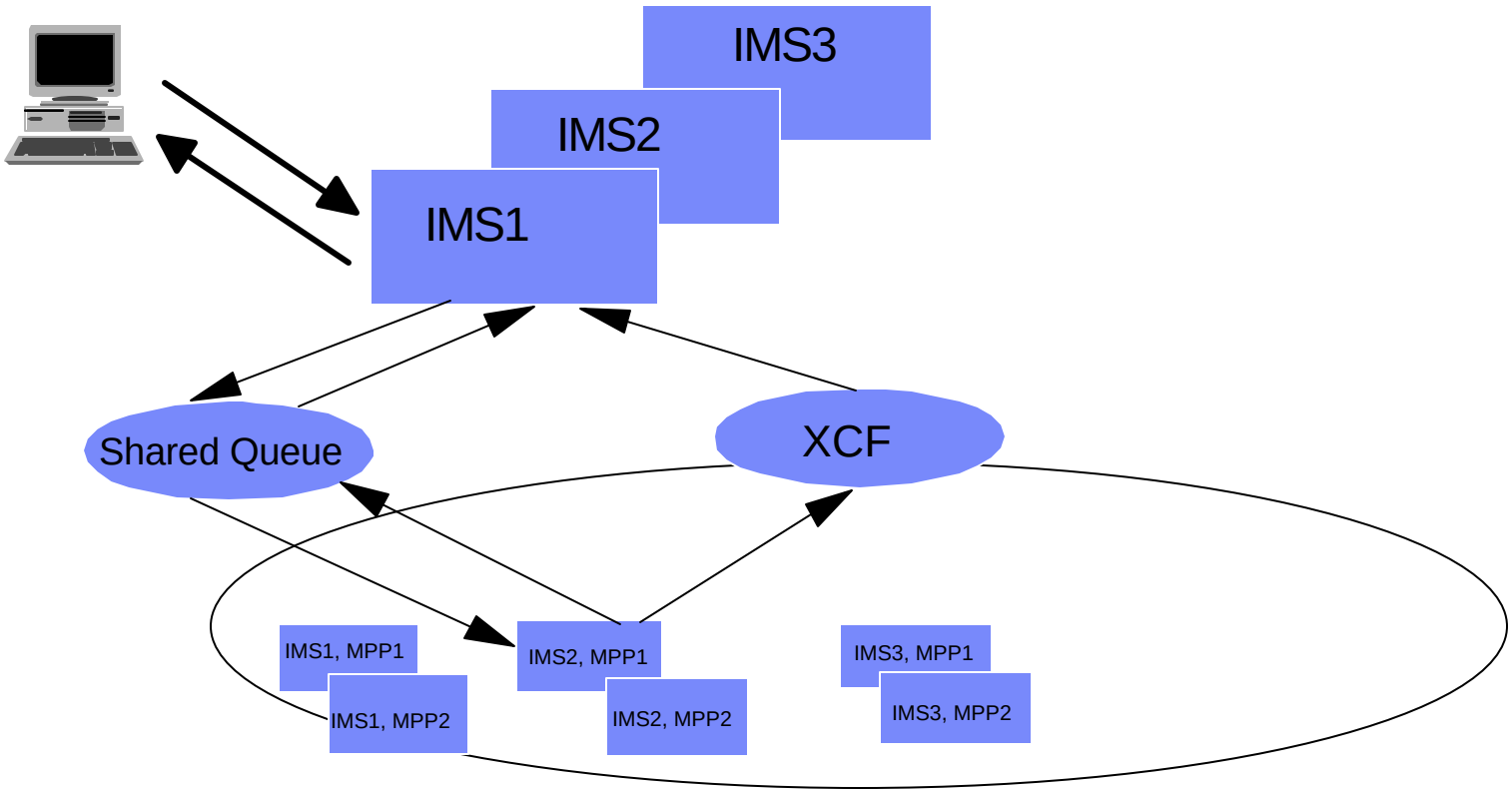
IMS V8 Coordinated Online Change

Eases, manages, and automates change across the IMS Sysplex.

- Commands can be entered on one IMS
- Requests can be handled for coordinating change across all the IMSs in the IMS Sysplex
- Replaces manual coordination

IMS V8 Synchronous Shared Queues support

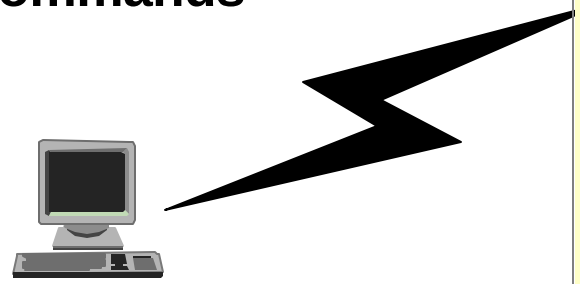
- **Provides for Sharing Messages between Sysplex Systems through IMS Queue Manager**
  - MVS APPC programs
  - OTMA Clients (MQ, IMS Connect, ...)

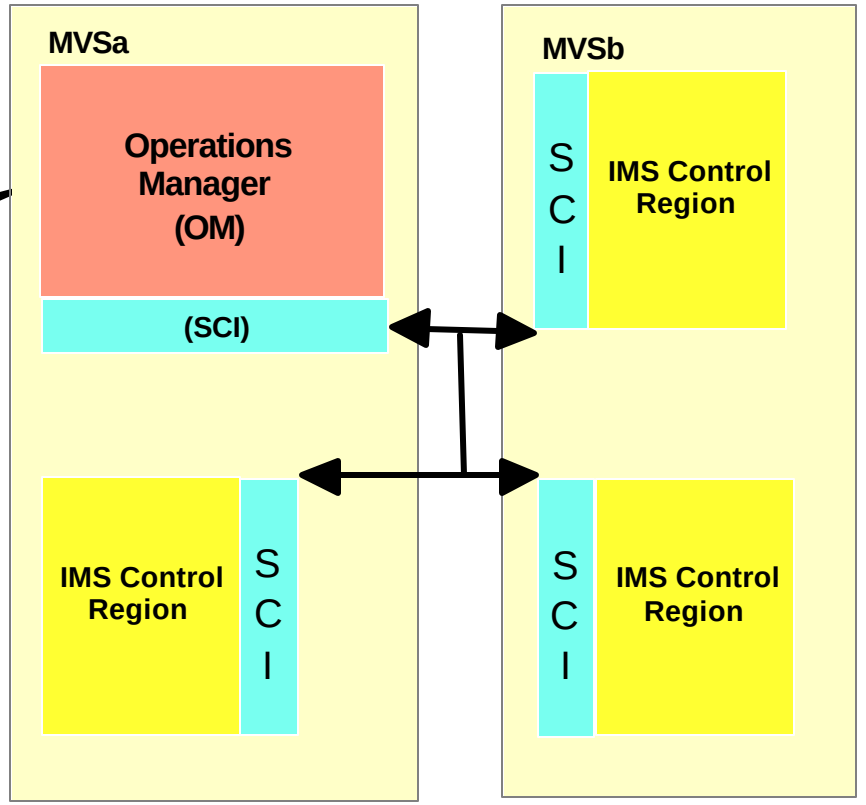


IMS V8 Easing Sysplex Operations Manageability

Operations Manager

- **Routes Commands**
- **Provides an API**
- **Provides Single Point of Control and supporting code for entering commands**





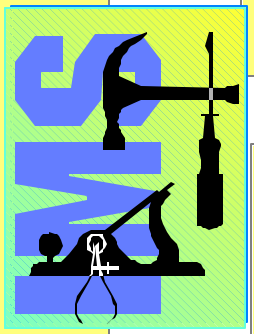
Single Point of Control (SPOC) can be used to control any IMS, with or without the presence of a Sysplex using

- **TSO/ISPF Application, or**
- **DB2 V8 Control Center through IMS Connect to IMS**

IMS Tools for Manageability

Database Administration

- IMS High Performance Unload 5655-E06
- IMS High Performance Load 5655-E07
- IMS High Performance Prefix Resolution V2 5655-I15
- IMS Index Builder V2R3 5655-E24
- IMS Parallel Reorganization V2 5655-F74
- IMS High Performance Pointer Checker V2 5655-K53I
- IMS Data Base Repair Facility 5655-E03
- IMS High Performance Sysgen Tool 5655-F43
- IMS Command Control Facility 5655-F40
- IMS ETO Support 5655-E12
- IMS Library Integrity Utilities 5655-I42
- IMS Library Management Utilities 5655-E04
- IMS Advanced ACBGEN 5655-E05
- IMS Sequential Randomizer Generator 5655-E11
- IMS Compression - Extended 5655-E02
- IMS Data Base Control Suite V2R2 5655-F76
- IMS Fast Path Basic Tools 5655-E30
  - DEDB Unload/Reload
  - DEDB Pointer Checker
  - DEDB Tuning Aid
- IMS Fast Path Online Tools V2 5655-F78
  - Online Pointer Checker
  - Online Data Extract
  - Online Area Extend
- IMS HALDB Conversion and Maintenance Aid V2 5655-K47
- Batch Backout Manager 5697-H75
- Data Encryption V1 5799-GWD
- IMS Online Reorg Facility 5655H97 ESP ONLY



Manage
Automate
Monitor
Tune...

Performance Management

- IMS Performance Analyzer V3R2 5655-E15
- IMS Network Compression Facility 5655-E41
- IMS Queue Control Facility V1.2 5697-E99
- IMS Workload Router V2.3 5697-B87
- IMS Buffer Pool Analyzer 5697-H77
- IMS Problem Investigator 5655-K50
- IMS Performance Monitor 5655-G50 ESP ONLY

Recovery / Replication

- IMS Image Copy Extensions V2R1 5655-J56
- IMS DEDB Fast Recovery V2R2 5655-E32
- Application Rec Tool for IMS & DB2 V1R2 5697-F56
- Online Recovery Service (ORS) 5655-E50
- IMS Data Propagation V3R1 5655-E52
- IMS High Performance Change Accumulation 5655-F59
- IMS Database Recovery Facility 5655-I44

Application Management

- IMS Connect V2R1 5655-E52
- IMS M FS Reversal Utilities 5655-F45
- IMS Program Restart Facility 5655-E14
- Batch Terminal Simulator V3 5655-J57
- IMS Multi-Dialog Manager 5697-H91

New/Enhanced IMS Tools

Announced March 2002:

- **IMS Index Builder V2 R2** - includes SCAN performance fix
- **IMS Queue Control Facility V1 R2** - Queue space user exit - freed up, Dynamic QCF table manipulation, Heavy user identification and action (threshold) support
- **IMS HP Prefix Resolution V2** - Eliminates Batch Pipes prerequisite
- **IMS HALDB Conversion Aid** - Utilities to assist in FF to HALDB conversion:
  - An easy to use ISPF Front-end
  - Automatic Data Base Definition (DBD) conversion
  - Test database conversion
  - Index pointer healing
  - Partition modeling tool
- **Service Stream enhancements** delivering 1H2002
  - **IMS HP Pointer Checker** - Dynamic Allocation Support
  - **IMS Parallel Reorg**
    - HALDB Support
    - DBD Reversal Support
    - HISAM/SHISAM Support
  - **IMS DB Repair** - FP support
  - **IMS Control Suite** - Monitor and HALDB support
  - **IMS Checkpoint Wrapper** (prpq) IMS V8 support/repackage
  - **IMS Connect** - Local/390 2-phase commit support

New/Enhanced IMS Tools

Announced September 2002:

- **Application Recovery Tool for IMS and DB2 Databases V1R2** - HALDB and Sysplex Sharing enhancements
- **IMS Index Builder V2 R3** - availability/usability enhancements
- **IMS Batch Backout Manager V1** - enhances database availability
- **IMS Buffer Pool Analyzer V1** - provides information and helps determine impact of buffer pool changes
- **IMS Database Control Suite V2R2** - performance, usability, productivity, recovery, and Tools integration enhancements
- **IMS DEDB Fast Recovery V2R2** - shortens the recovery time
- **IMS Performance Analyzer V3R2** - enhances reporting, dialog and documentation.
- **IMS Batch Terminal Simulator V3** - enhanced auditing and support for Java and new technologies
- **IMS Image Copy Extensions V2** - creates new copy data sets from the IMS Image Copy data set.
- **IMS Connect V1R2 enhancements** - provides J2EE resource manager for IMS transaction access

New/Enhanced IMS Tools
Announced April 2003

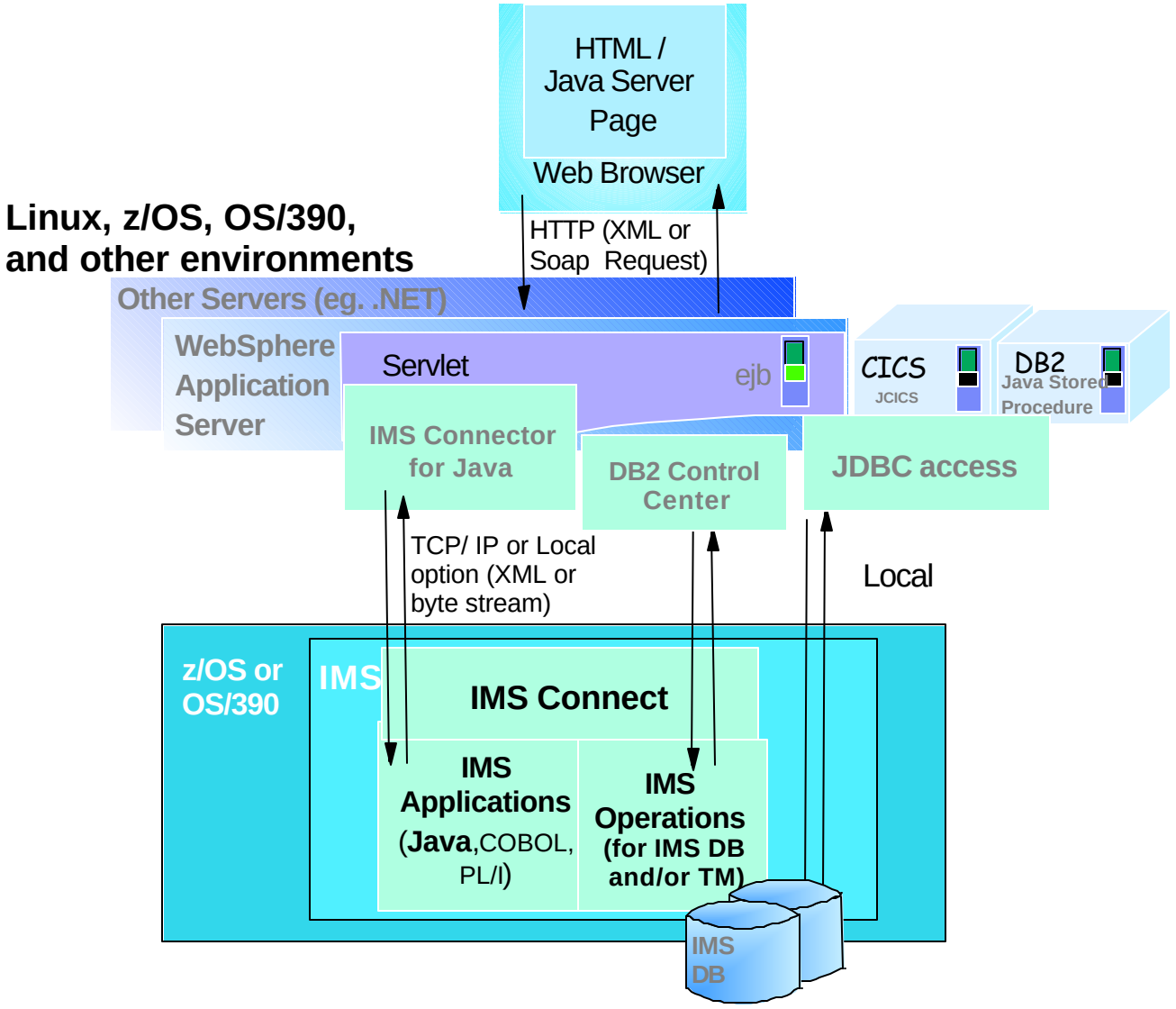
- **New Products/Versions:**
  - **IMS Library Integrity Utilities V1**
    - Replaces 2 current products:
      - **Integrity Checker** helps prevent system outages caused by databases corrupted by using wrong DBD
      - **Consistency Checker** ensure all the necessary definitions have been created for a database
  - **IMS HALDB Conversion and Maintenance Aid V2**
    - Extends HALDB Conversion Aid to provide maintenance functions
  - **Data Encryption for IMS and DB2 V1**
    - Eases Encryption exit build
  - **IMS Connect V2**
    - Distributed 2-phase commit, SSL security and other enhancements
  - **IMS HP Pointer Checker V2**
    - Performance Enhancements
- **Service Extensions**

New/Enhanced IMS Tools
Announced June 2003

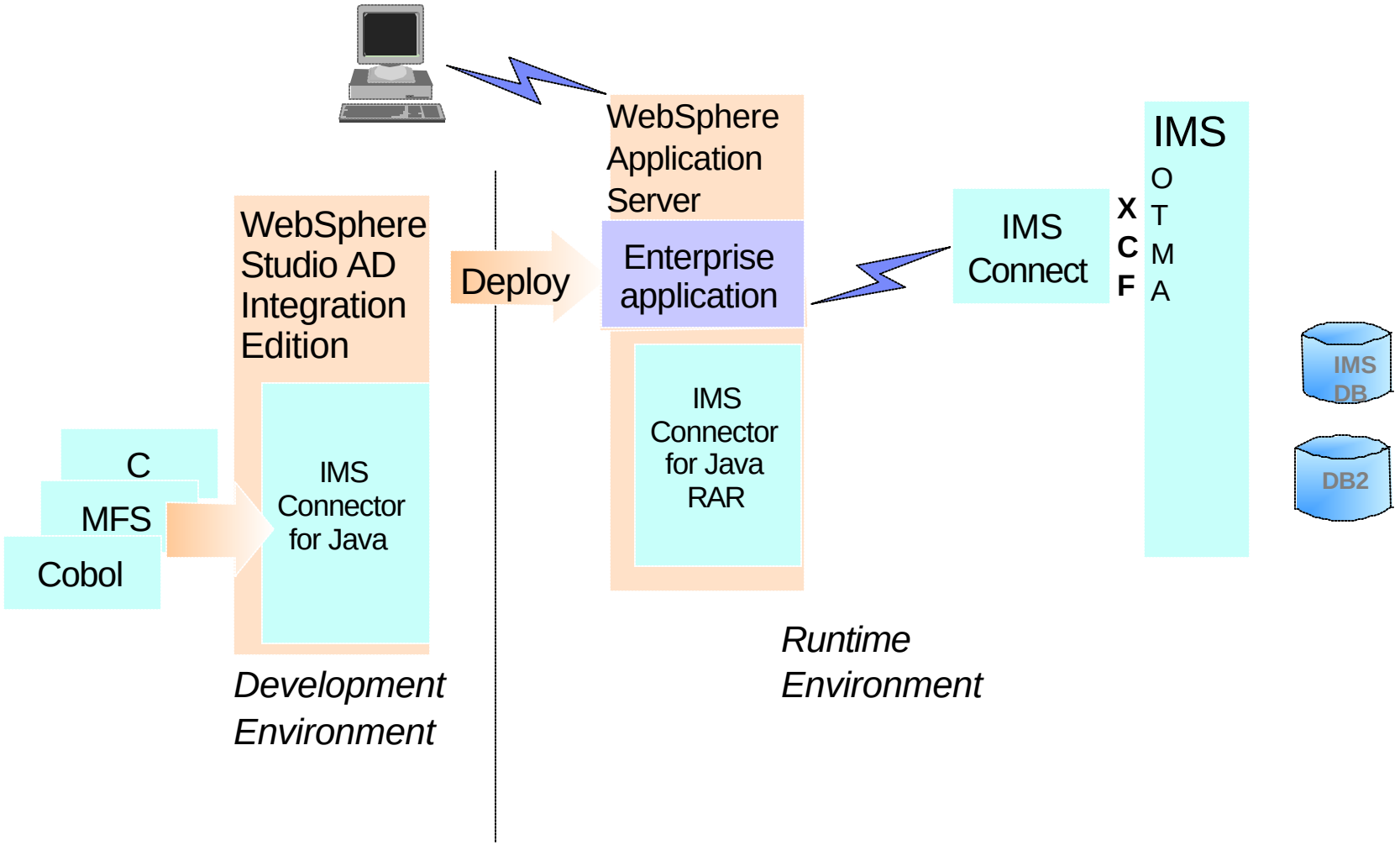
- 3 New Products
  - IMS Database Recovery Facility V2
    - Replaces Online Recovery Service V1
  - IMS Multi-Dialog Manager V1
    - Complements the existing IMS support for conversational transactions by managing the process of holding and resuming conversations for the end user.
  - IMS Problem Investigator V1
    - Features an enhanced level of problem determination services for IMS Transaction Manager (IMS TM) and IMS Database Manager (IMS DB) systems. These services include navigation aids, formatted and personalized reporting, and investigative procedures for IMS log data.

- 2 New Product Early Support Programs (ESP)
  - IMS Online Reorganization Facility V1
    - Full Function and HALDB
  - IMS Performance Monitor V1
    - Views of IMS overall performance

Integrated/Open Access with IMS for ***e-business***
Application Development/Enablement Solutions



IMS e-business Connectivity Environment



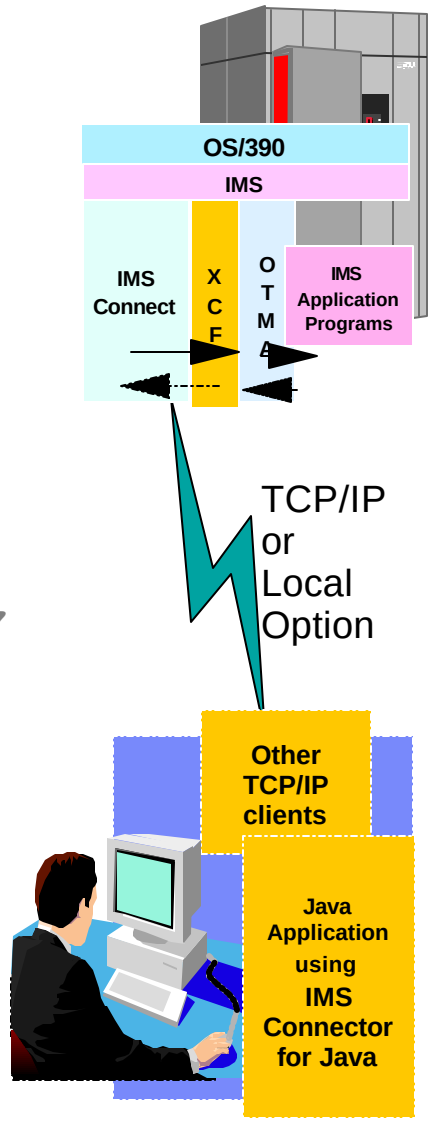
IMS Connect for Broader e-business Connectivity

IMS Connect V1R1

- ✓ **Provides 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
- ✓ **Base function runs with IMS 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



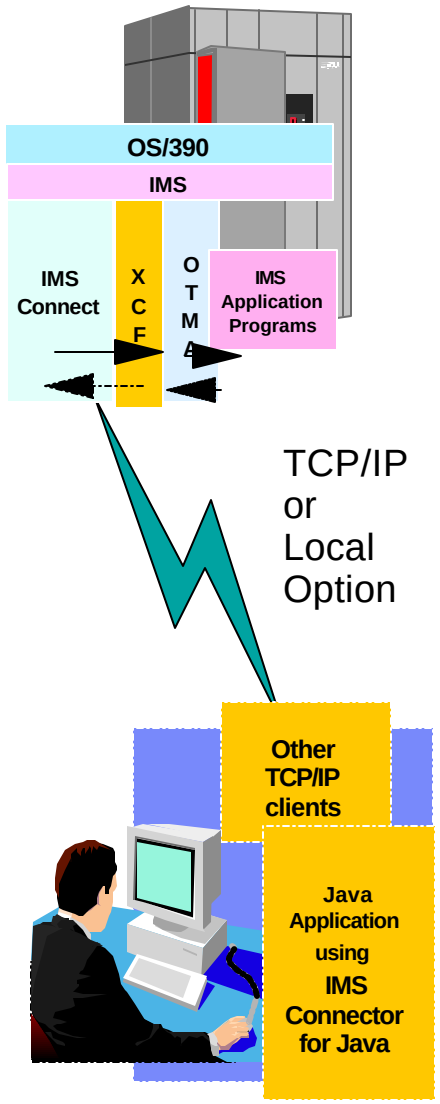
IMS Connect for Broader e-business Connectivity

IMS Connect V1R2

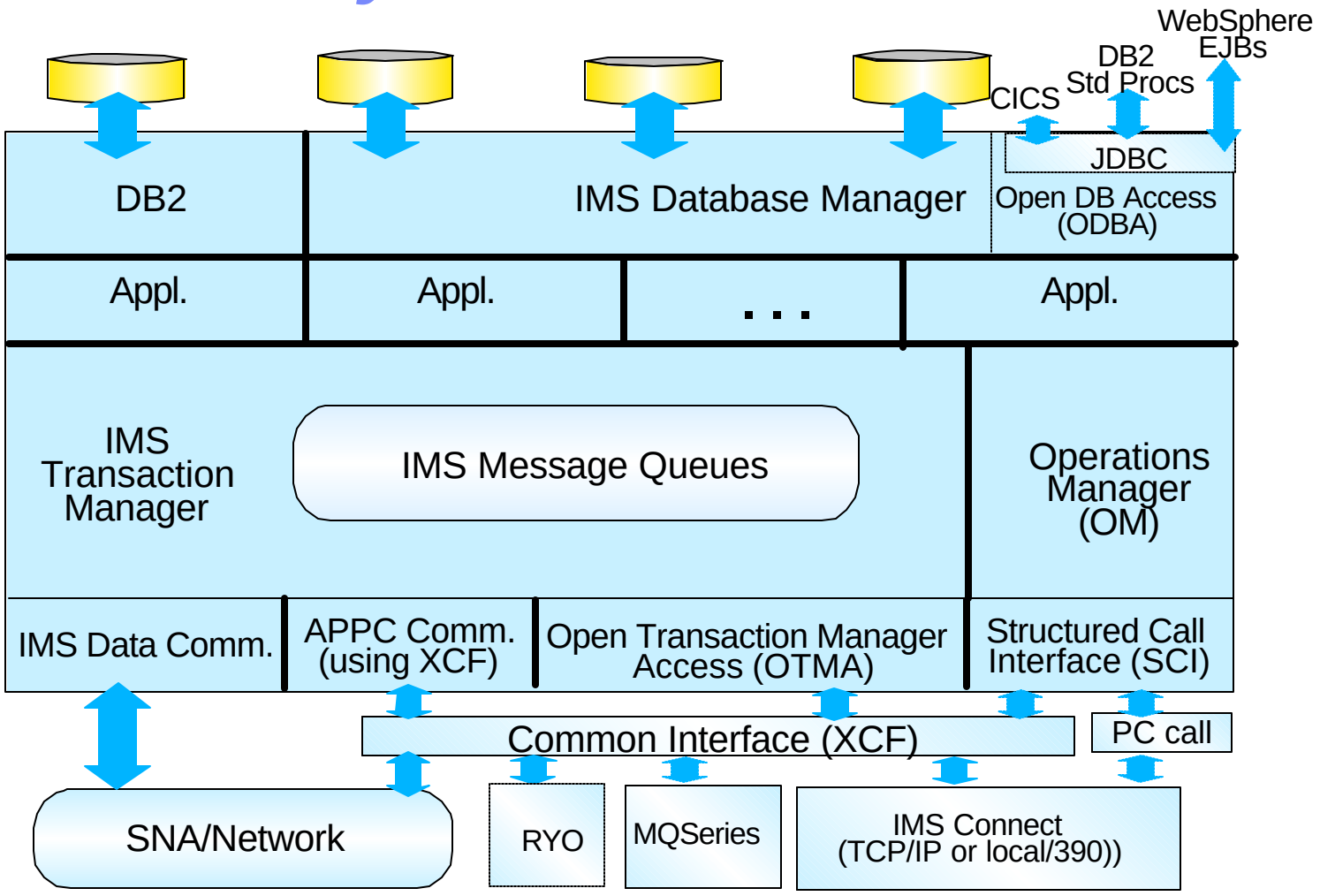
- ✓ IMS Connector for Java J2EE Runtime support for WebSphere access
- ✓ Used with VAJava/WASADIE's IMS Connector for Java J2EE Development support

IMS Connect V1R2 Enhancements

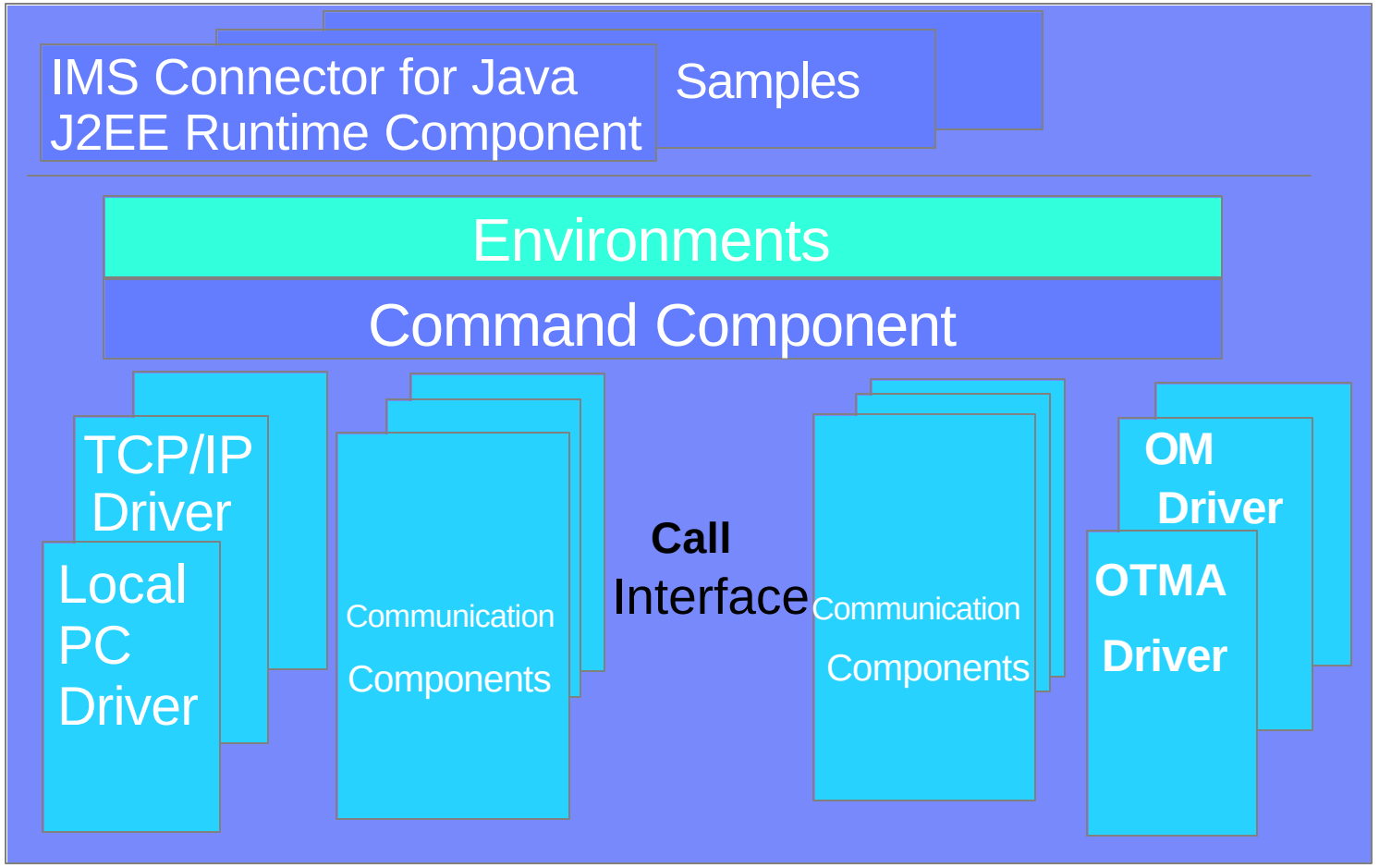
- ✓ Two-phase Commit Support in Local 390 environments
- ✓ Security enhancements
  - Passticket support
  - IMS Connector for Java Container-managed Sign-on support for local option
  - User Message Exits
- ✓ More Granular timeout (eg. by transaction)
- ✓ ipv6 support
- ✓ IMS V8 Operations Manager distributed interface
- ✓ **IMS Operations Manager distributed interface and future enhancements require IMS V8**



Middleware Subsystem Access



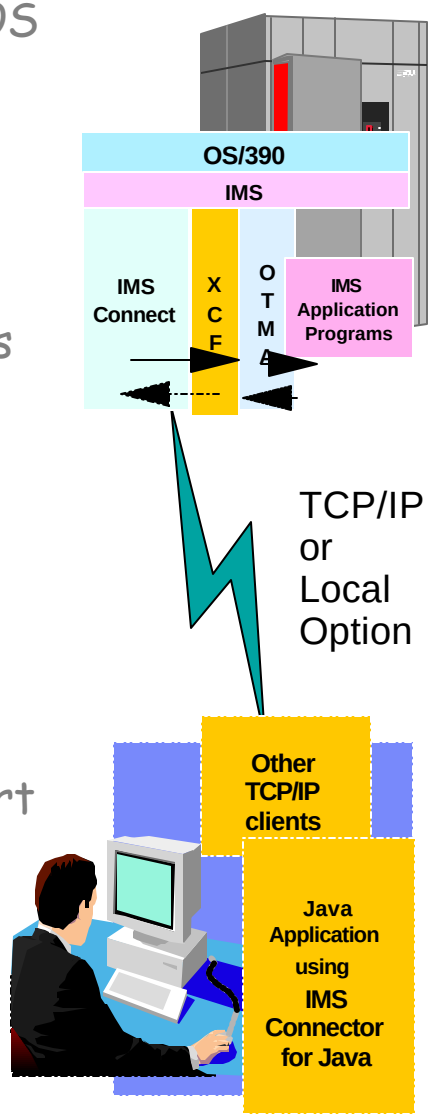
IMS Connect Internal Structure Provides Connectivity Base for Future



IMS Connect for Broader e-business Connectivity

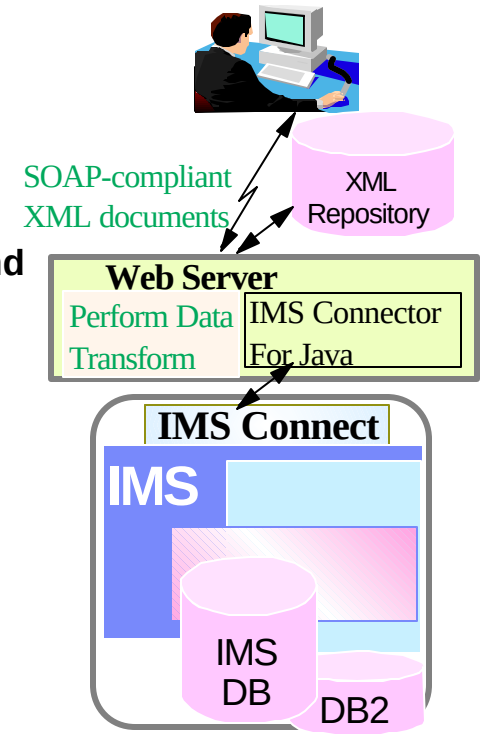
IMS Connect V2

- ✓ J2EE XA Two-phase Commit Support for Distributed and z/OS environments across TCP/IP
- ✓ SSL support for enhanced security control
- ✓ PING support for determining IMS Connect availability
- ✓ IMS Connector for Java also adds
  - MFS Web Services support for publishing IMS applications as Web Services
    - To enable IMS customers to publish existing MFS-based IMS applications on the Internet as Web Services
    - New component IMS MFS Transformer
    - Work in conjunction with the MFS Importer, "plug-in" to Websphere Studio Tools
    - Allow Web Services and B2B on MFS based IMS applications
  - Container-managed and Component-managed Sign-on support
  - Run as thread identity support for z/OS environments for enhanced security
  - Commit mode 0 support to broaden application support
  - WAS V5 for z/OS support
- ✓ **IMS enhancements require IMS V8**



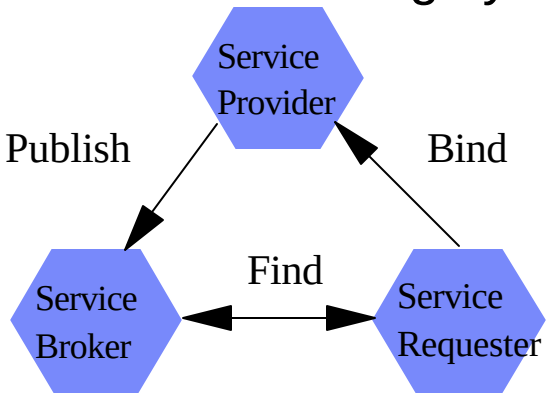
XML and IMS for Transparent Application Integration

- **Processing XML Documents in New IMS Applications Today**
  - **Customers can write IMS Java applications using the XML Toolkit for z/OS**
  - **Customers can write IMS Cobol/PL/I applications using parsers in Enterprise COBOL/PL/I z/OS compilers**
    - Tran code still must be EBCDIC, rest of data can be XML
    - The IMS program can invoke XML parser to convert to non-tagged data
  - **Customers can use WSED 5.0 XML Converters for COBOL to generate XML outputs from COBOL applications**
- **Bridging XML and Existing IMS Applications Today**
  - **Using MQSeries Integrator to support IMS COBOL and C applications**
    - Dictionary support for messages
    - Routing and processing based on message content
    - US Utility built cost-effective e-business infrastructure to IMS
  - **Customers can enable IMS applications as Web Services via WAS 5.0 and WSAD-IE 5.0 to support IMS COBOL, C and MFS-based applications**
- **XML and IMS Requirements**
  - **Enhanced PL/I support**
    - **Generate XML output from PL/I applications**
    - **Enable IMS PL/I applications as Web Services**
  - **Transform XML for existing IMS applications inside IMS Connect**
  - **IMS XML DB Support**
    - **Support storing, retrieving, and querying XML in IMS databases (V9)**
    - **Generate XML schema for existing IMS databases (V9)**
    - **Create new IMS XML databases**
    - **Dynamic definition of IMS applications and DB enabling rapid deployment of XML in IMS DB.**

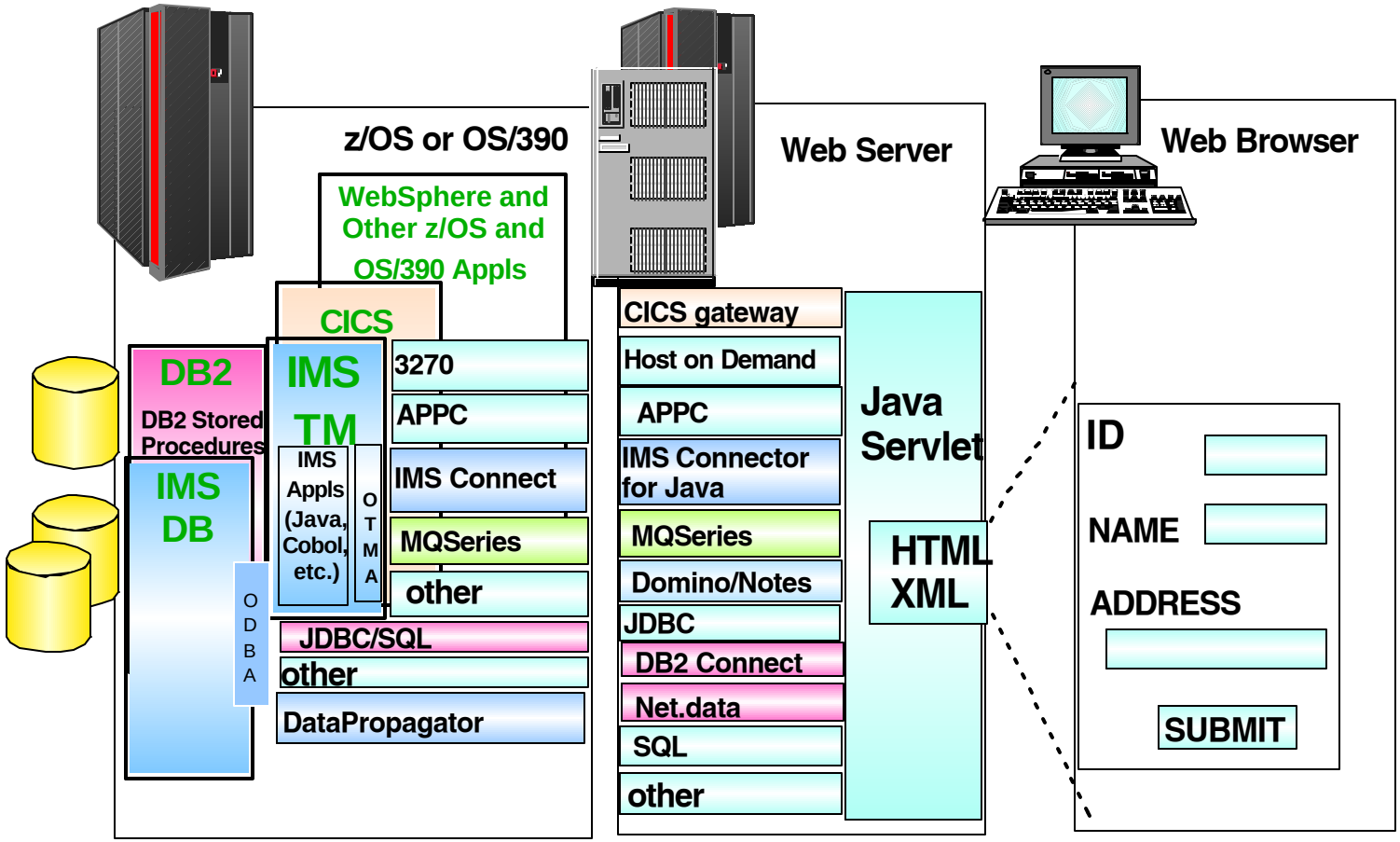


Web Services - The Next Step In The Evolution of the Web

- Allows programmable elements to be placed on web sites where others can access distributed behaviors
  - Web Services are emerging as building blocks for constructing B2B applications that integrate business processes over the Internet
- Views everything as a service that can be automatically discovered and connected on the internet (i.e. Web Services are applications that can be described, published, located and invoked over a network).
- Applications can use XML to expose their features while remaining neutral with respect to any operating system, programming language or backend server
- Requires generation of Web Services Definition Language (WSDL) for applications
- Typically transactional, requiring integration with existing systems



Leveraging IMS Applications and IMS Data for Integration



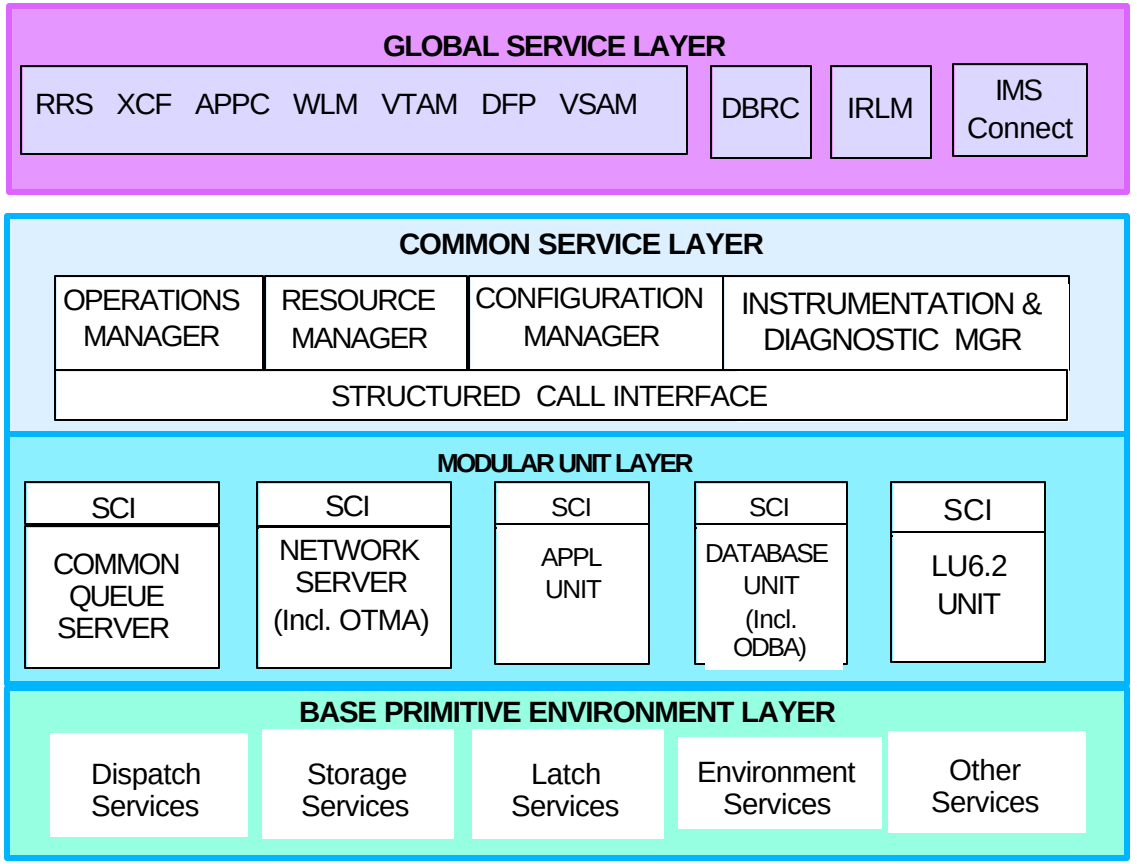
Enabling Migration

Provide on a regular schedule, staged, more frequent, deliverables 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 IBM and vendor tools
- Increase opportunity for integration and visibility of IMS support for new technologies

Strategic IMS Architecture

- **Goals:**
  - Integration with open interfaces from and between IMS parts
  - Manageability with restructured IMS components into independent units
  - Scaleability through allowing multiples of units
  - Mix and Match units to meet business needs
  - Fully exploit parallel sysplex environment

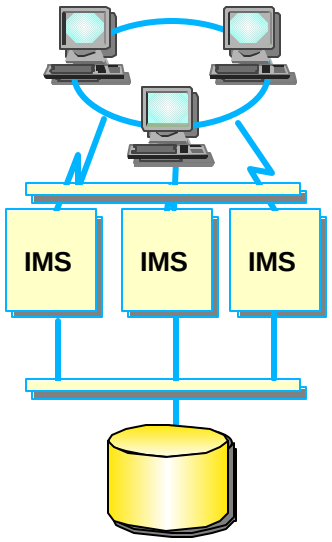


(BPE in V5, CQS in V6, OM, RM, SCI in V8, ...)

IMS Version 9

Ideal for e-business

- ✓ Integration with Application Development and Connectivity
- ✓ Manageability
- ✓ Scalability in Performance, Capacity, Availability/Recovery



Strategic Open Access z/OS Enterprise Servers

Enhancements

- Integration
  - Enhanced Security
  - XML data in IMS Databases
  - Broadened Java/XML Tooling
- Manageability with Autonomic Computing
  - Eased Sysplex Manageability
  - Eased Serviceability/Usability
  - Simplified Install/Definition Process
  - Enh Systems/Data Mgmt Tools
- Scalability
  - HALDB Online Reorganization
  - Enhanced Recovery/Control
  - System Growth

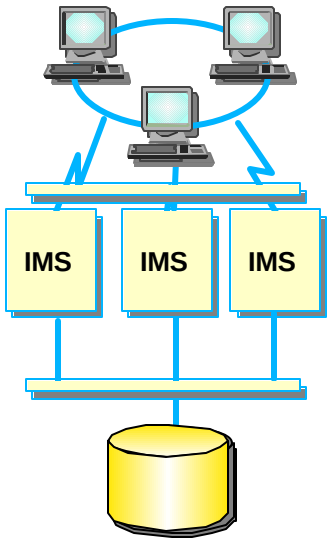
Benefits

- ✓ Enable Customer Growth
- ✓ Enhance Workload Balancing
- ✓ Increase Availability; Ease of Use
- ✓ Preserve Current Application Investment
- ✓ Enable New Applications

IMS Follow-on

Ideal for e-business

- ✓ Integration with Application Development and Connectivity
- ✓ Manageability
- ✓ Scalability in Performance, Capacity, Availability/Recovery



Strategic Open Access z/OS Enterprise Servers

Enhancements

- Integration
  - Enhanced Security
  - Enh XML data in IMS DBs
  - Broadened Java/XML Tooling
- Manageability with Autonomic Computing
  - Eased Sysplex Manageability
  - Eased Serviceability/Usability
  - Simplified Install/Definition Process
  - Enh Systems/Data Mgmt Tools
- Scalability
  - Enhanced MSC
  - Enhanced Recovery/Control
  - System Growth

Benefits

- ✓ Enable Customer Growth
- ✓ Enhance Workload Balancing
- ✓ Increase Availability; Ease of Use
- ✓ Preserve Current Application Investment
- ✓ Enable New Applications

IMS Information

IMS Information is available at http://www.ibm.com/ims

- Presentations/Papers, Newsletters, Redbooks, Fact Sheets, Announce Letters, additional documentatior
- Technical Support Info (search on IMS)

IMS Redbooks/Redpieces

- SG24-5753 IMS V7 Release Guide
- SG24-6945 IMS HALDB Guide
- SG24-6123 IMS Version 7 and Java Application Programming
- SG24-6536 IMS Version 7 Java Update
- SG24-6404 IMS Performance and Tuning Update
- SG24-6514 IMS e-business Connectors: A guide to IMS Connectivity
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