

F01

# Data Management Tools for IMS

Dan Wardman

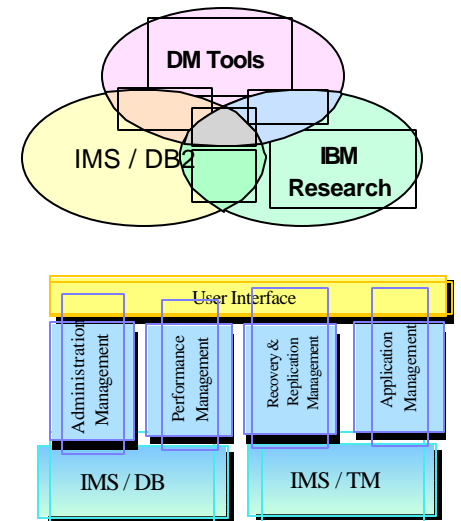


Miami Beach, FL

October 22-25, 2001

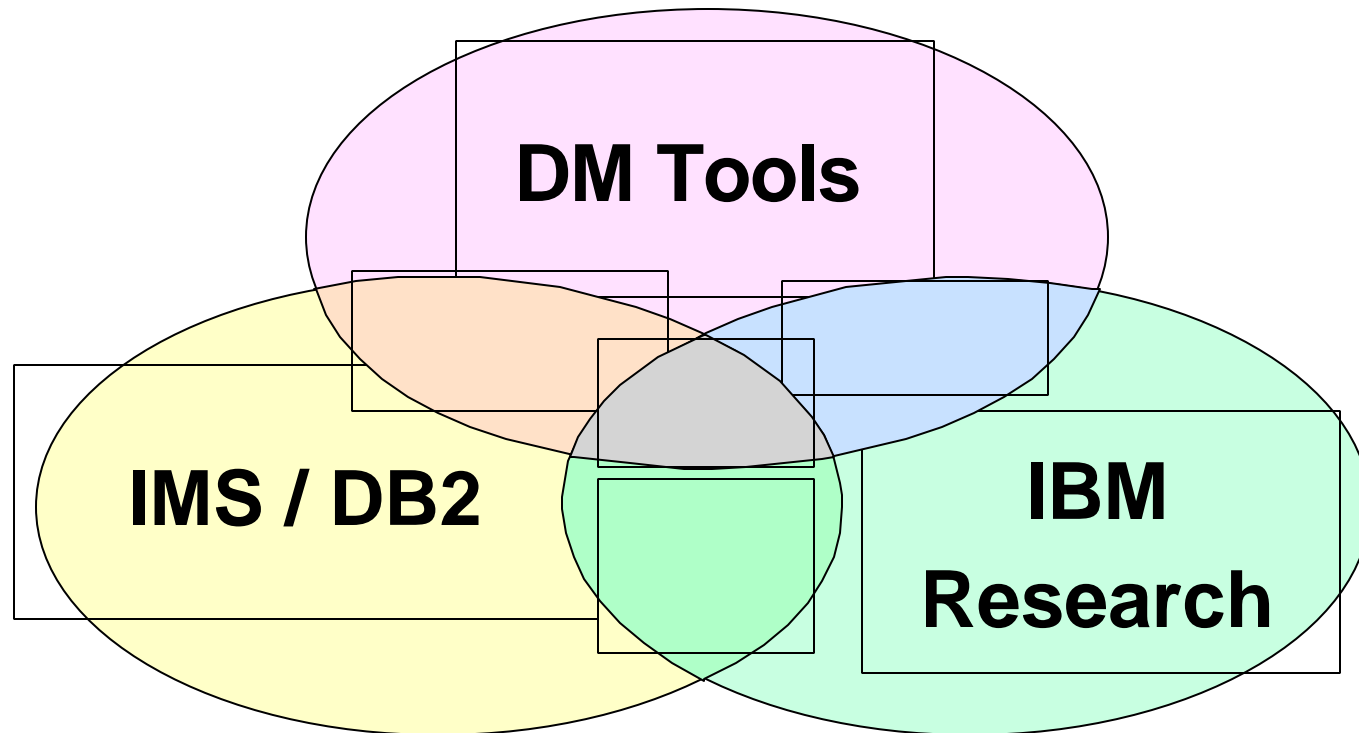
# Agenda

- Data Management Tools for IMS
- Comprehensive solutions and future directions
- Summary
- Questions



# Data Management Tools

- Tools from the company that builds world class databases



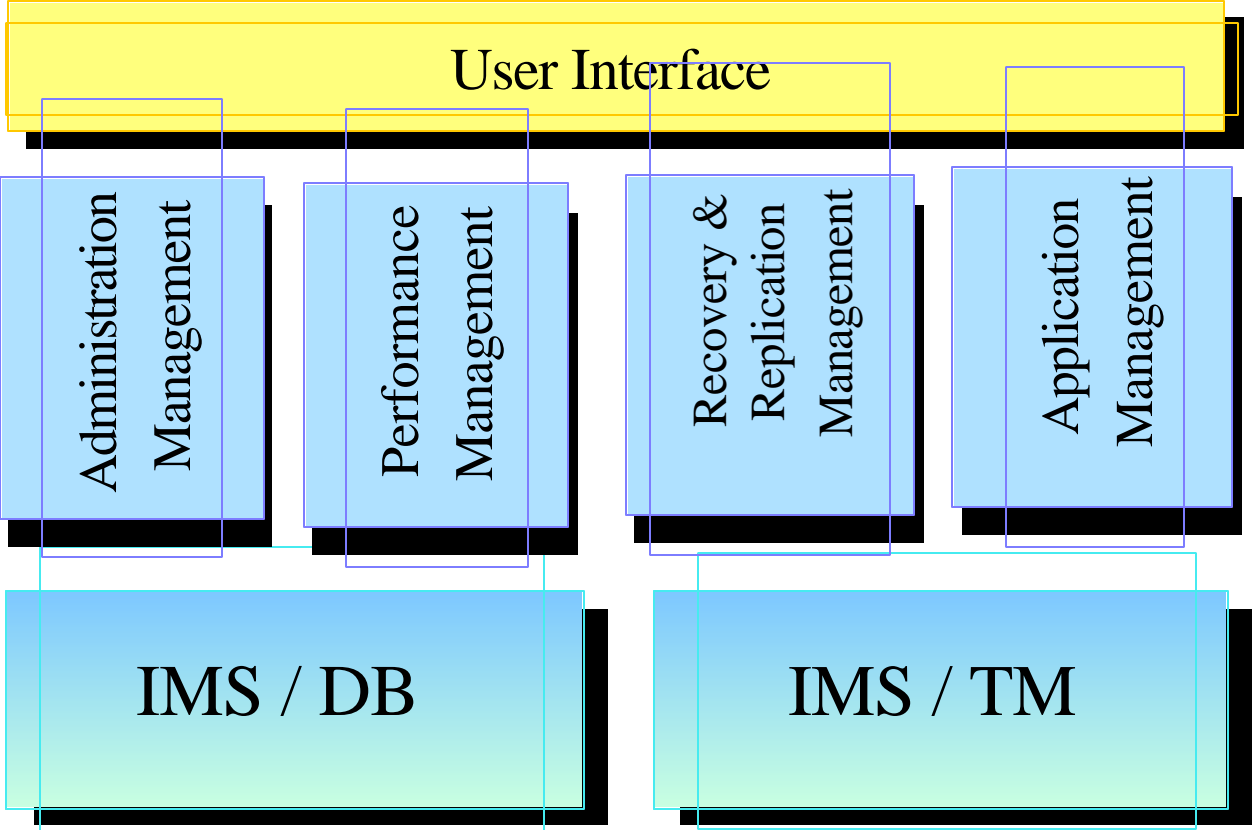
**Not just a database tools vendor**

# Data Management Tools Today and Tomorrow

- Data Management Tools is a unique model in the database tools industry
- Investment increased to support future needs
  - ▶ New functions
  - ▶ New Versions
  - ▶ New Tools
- Comprehensive solutions now and more coming
- Independent of IMS versions
- Tool integration
- Products tested under same configurations and workloads as IMS
- Functions supplied through tools or through IMS

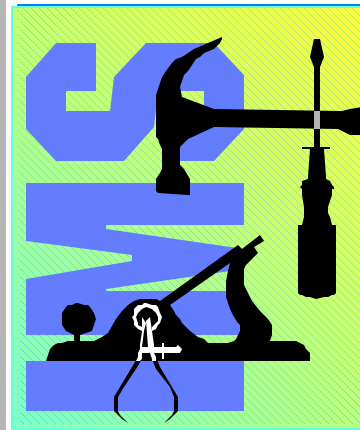
**Not just a database tools vendor**

# IMS Tools Solutions



# IMS Tools Product Portfolio

- IMS Administration**
- ▶ **IMS High Performance Unload 5655-E06**
  - ▶ **IMS High Performance Load 5655-E07**
  - ▶ **IMS High Performance Prefix Resolution 5655-E08**
  - ▶ **IMS Index Builder 5655-E24**
  - ▶ **IMS Parallel Reorganization V2 5655-F74**
  - ▶ **IMS High Performance Pointer Checker 5655-E09**
  - ▶ **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 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 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 with optional Image Copy
    - Online Data Extract
    - Online Area Extender



## Performance Management

- ▶ **IMS Performance Analyzer 5655-E15**
- ▶ **IMS Network Compression Facility 5655-E41**
- ▶ **IMS Queue Control Facility 5697-E99**
- ▶ **IMS Dynamic Resource Control Facility 5697-D14 (PSLC)**
- ▶ **IMS Workload Router 5697-B87 (PSLC)**

## Recovery / Replication

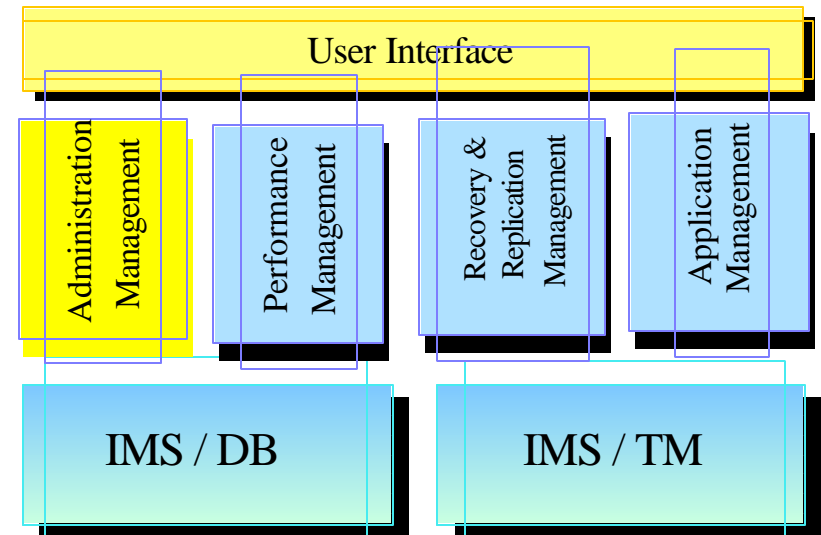
- ▶ **IMS Image Copy Extensions 5655-E10**
- ▶ **IMS DEDB Fast Recovery 5655-E32**
- ▶ **IMS Recovery Saver 5655-E16**
- ▶ **DB2 Recovery Manager 5697-F56**
- ▶ **Online Recovery Service (ORS) 5655-E50**
- ▶ **IMS Data Propagation 5655-E52**
- ▶ **IMS High Performance Change Accumulation 5655-F59**

## Application Management

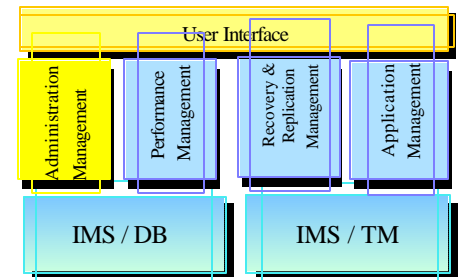
- ▶ **IMS Connect 5655-E51**
- ▶ **IMS Message Format Services Reversal Utilities 5655-F45**
- ▶ **IMS Program Restart Facility 5655-E14**
- ▶ **Batch Terminal Simulator 5655-A14 (PSLC)**

# Administration

- ▶ **IMS High Performance Unload 5655-E06**
- ▶ **IMS High Performance Load 5655-E07**
- ▶ **IMS High Performance Prefix Resolution 5655-E08**
- ▶ **IMS Index Builder 5655-E24**
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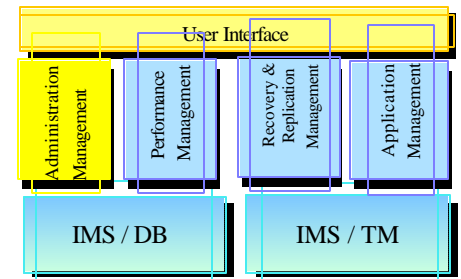
# Database Reorganization



- Products that support reorganization of full function IMS DataBases
  - ▶ IMS High Performance Unload (5655-E06)
  - ▶ IMS High Performance Load (5655-E07)
  - ▶ IMS High Performance Prefix Resolution (5655-E08)
  - ▶ IMS Index Builder (5655-E24)
  - ▶ IMS Parallel Reorg



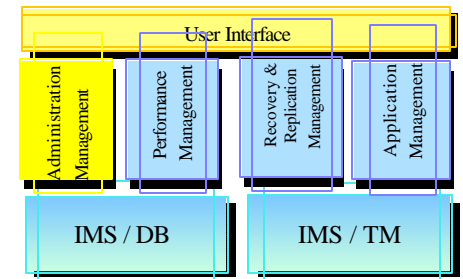
# IMS HP LOAD and HP UNLOAD



- IMS High Performance Unload
  - ▶ Replaces / Enhances DBT HSSR feature
    - fully compatible JCL
  - ▶ Includes full support for HALDB
    - unload one, several or all partitions
    - migration/fallback support
- IMS High Performance Load
  - ▶ Includes two utilities
    - DB Load Utility
    - HDAM Physical Sequence Sort for Reload
  - ▶ Supports HALDB
  - ▶ Can be used to initialize empty DBs



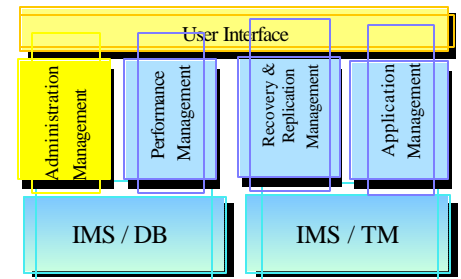
# IMS Index Builder 5655-E24



- ▲ Simplifies Index recovery and maintenance
- ▲ Reduces Index maintenance time
- ▲ Eliminates need to image copy Indexes

- Add or Rebuild all or some secondary indexes of an IMS database
  - ▶ Using as input:
    - Output from initial load or reload after a reorg
    - DL/I scan of the IMS database
    - Output from prefix resolution (DFSURIDX)
  - ▶ Supports empty secondary indexes
  - ▶ Easy-to-use one step procedure
- DBRC notification support
- HALDB support for IMS V7
- Rebuild HIDAM primary index

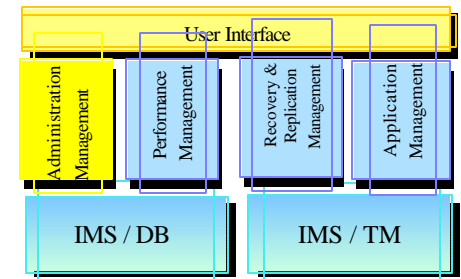
# IMS Parallel Reorganization V2



- Replaces IMS Parallel Reorganization V1
  - ▶ Supports IMS V6 and V7
- Functional Improvements
  - ▶ Execution of the following utilities in one address space
    - IMS HP Unload
    - IMS HP Load
    - IMS Index Builder
  - ▶ Dynamic allocation of Input and Output database datasets
  - ▶ Full DBRC support, including DBRC notification
  - ▶ Automated name swapping
  - ▶ Automated IMS Command Processing

***IMS Parallel Reorganization provides the infrastructure to operate IMS HP Unload, IMS HP Reload and IMS Index Builder in parallel, allowing a significant reduction in the reorganization time.***

# HP Pointer Checker

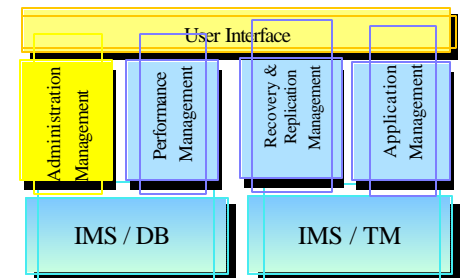


## ■ IMS High Performance Pointer Checker

- ▶ Replaces DBT SMU key components
  - Pointer Checker
  - Space Monitor
- ▶ New thresholds can be monitored and reported
  - Available extents
  - CI and CA splits
  - Used space as % of Allocated space
  - In last extent (DB or DSet)
  - No. of days since last reorg

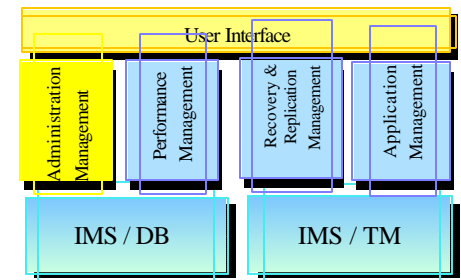
- ◆ *Executes on DB or image copy (including H/W Concurrent Copy of IMS V6)*
- ◆ *Also includes **HD Tuning Aid, DB Historical Data Analyzer, and DB Segment Restructure Utility***

# DB Repair Facility and Fast Sysgen

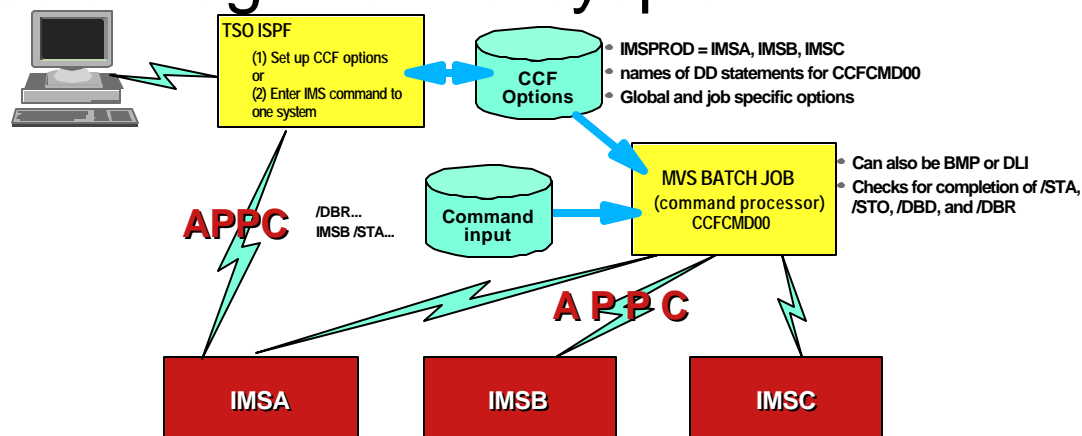


- IMS DB Repair Facility
  - ▶ Supports VSAM and OSAM DBs
    - **DEDB support via APAR PQ44923**
  - ▶ Interactive via an ISPF front-end
  
- IMS Fast Sysgen
  - A high-performance tool for doing a MODBLKS Gen
  - Can be done as a **single step** batch job ...
  - ▶ Merge/Clone
    - Reads MODBLKS for up to 64 IMS systems
    - With the CLONE option, builds an additional system definition
  - ▶ Sysgen Compare
    - Verifies that two sets of MODBLKS and MATRIX modules are the same

# IMS Command Control Facility

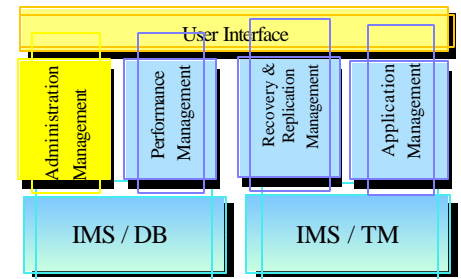


- Issue commands for IMS TM or IMS DBCTL systems
  - ▶ via a batch utility or from a TSO session via ISPF
- Via the batch processor
  - ▶ Process IMS commands in all or selected systems of an IMSplex
  - ▶ Ensure successful processing of database /START, /STOP, /DBR, and /DBD commands
  - ▶ Synchronize Online Change and database commands across all regions in a sysplex

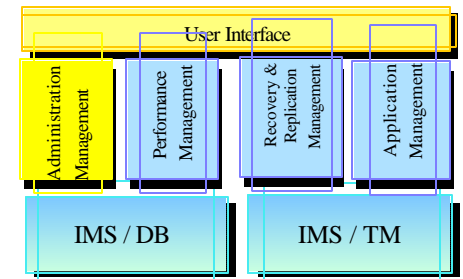


# IMS Data Base Control Suite

- Intuitive ISPF Front-end integrates control of DB Administration activities
  - ▶ Backup & Recovery
  - ▶ Change Accumulation
  - ▶ Other DBRC functions
  - ▶ DB Reorganization
  - ▶ Pointer checking and space monitoring\*
  - ▶ DB Repairing\*
  - ▶ Library (DBD/PSB/ACB) management\*
- Supports Full Function, HALDB, and Fast Path DBs
- Exploits IMS Base Utilities and/or IBM High Performance Tools



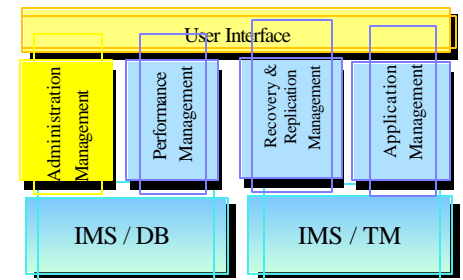
# IMS ETO Support Tool



- The ETO Support Tool allows you to define your ETO requirements in a DB which is read into in-memory tables
  - ▶ no exits need be coded
  - ▶ DB can be updated via batch or IMS transaction
  - ▶ tables can be dynamically refreshed
- **V2R2 Enhancements - Announced 09/2001 - GA 12/2001**
  - ▶ Shared Queue support
  - ▶ SLUTYPEP support
  - ▶ SLU1 console support
  - ▶ LTERM beginning by numeric value



# Fast Path Tools



## ■ Fast Path Basic Tools

### ▶ DEDB Unload/Reload

- New fast Unload option via DFSMS media Manger
- Link between Reload and ICE to produce IC and notify DBRC
- Enhanced Reports

### ▶ DEDB Pointer Checker

- Includes support for Hardware Concurrent Copy (IC2)

### ▶ DEDB Tuning Aid

## ■ Fast Path Online Tools

### ▶ DEDB Online Pointer Checker

- Online interface to DEDB Pointer Checker and DEDB Tuning Aid

### ▶ DEDB Online Data Extract

### ▶ DEDB Online Area Extender

# Other DB Administration Tools

- Library Management Utilities

- ▶ DBD/PSB/ACB Mapper
- ▶ DBD/PSB/ACB Compare
- ▶ DBD/PSB and ACB Reversal

- IMS Advanced ACB Generator

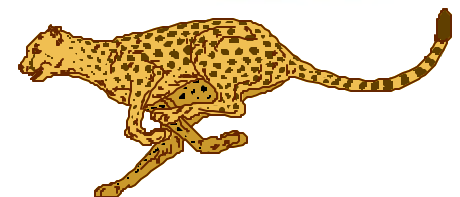
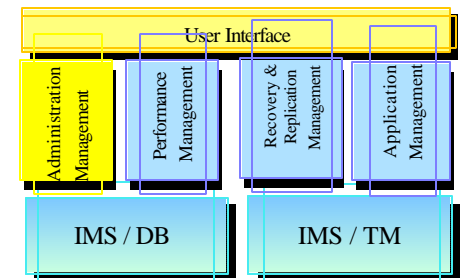
- Replaces “Fast ACBGEN” tool

- IMS Sequential Randomizer Generator

- ▶ Builds a sequential randomizer

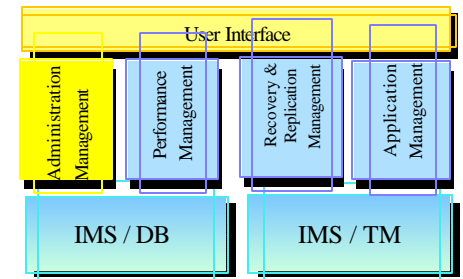
- IMS Hardware Data Compression - Extended

- ▶ Works on Image Copies, High Performance Unload files and IMS Unload files



# IMS Administration Tools

## Future



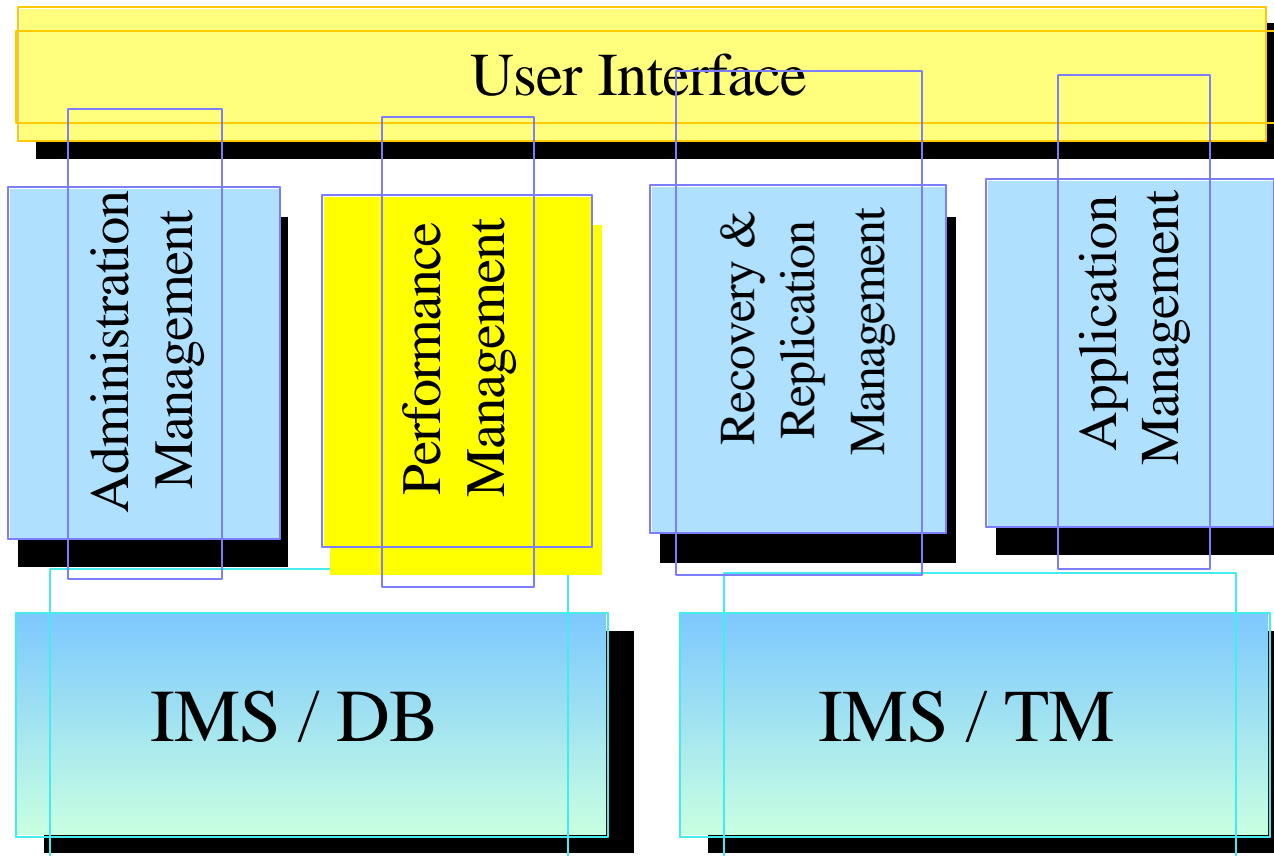
### ■ Utilities enhancements

- ▶ Faster I/O operations (Load, Unload, etc..)
- ▶ Data availability improvements
  - Online Reorg
- ▶ Usability enhancements to improve DBA productivity

### ■ Automation tools

- ▶ Utilities scheduling
- ▶ Self-managed operations

# Performance Management



# IMS Performance Management Tools

## ■ IMS Performance Analyzer

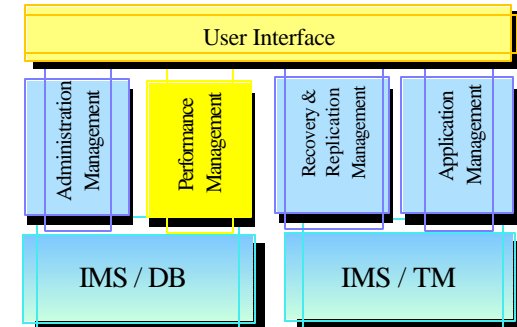
- ▶ IMS TM, IMS DBCTL or IMS Batch
- ▶ Full Function and Fast Path Data Bases
- ▶ Full Function Message Queueing and Fast Path EMH
- ▶ DASD Queues and Shared Queues (FF and EMH)
- ▶ Consolidated reporting for IMSPLEX
- ▶ Traditional SNA terminals, APPC, OTMA and MSC

## ■ Dynamic Resource Control Facility

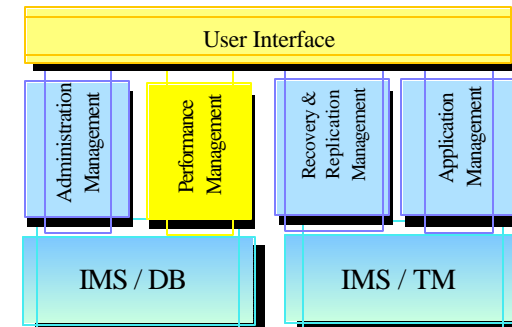
- ▶ Runs as an MPP (or Message-driven WFI BMP)
- ▶ 47 Functions in problem determination, monitoring, and analyzing performance

## ■ IMS Workload Router

- ▶ Non-Sysplex Environment
  - Exploit benefits of MSC for workload distribution
- ▶ Sysplex Environment
  - Balance transaction workload in sysplex



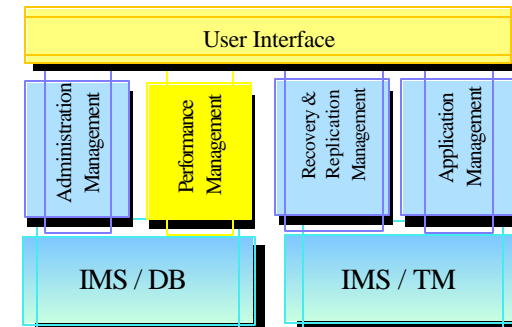
# IMS Network Compression Facility



- Replaces and enhances IMS Data Stream Tuner
  - ▶ Support for IMS V6 and IMS V7
- Compresses LU2 (3270) outbound data streams
  - Compression of all repeated characters
  - Elimination of non-display fields
  - ▶ IMS specific (not VTAM) solution
  - ▶ Improvement of the transaction response time to the user
  - ▶ Easy installation

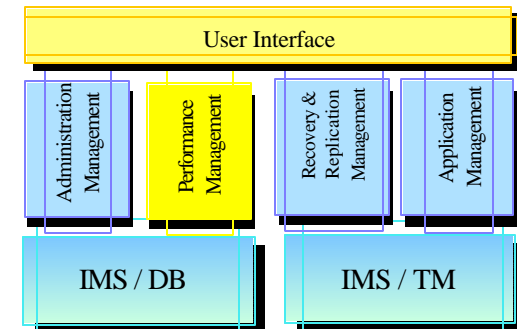
*IMS Network Compression Facility focuses on providing low cost basic compression and optimization of IMS 3270 and LU type 2 outbound data streams. It is an IMS TM specific solution designed to help lower the cost of IMS network operations. It provides the basic services in a simple and easy to use package*

# IMS Queue Control Facility



- Supports both **DASD Queues** and **Shared Queues**
- Traditional Functions
  - ▶ IMS message queue recovery after a cold start
  - ▶ IMS application program recovery
  - ▶ IMS stress, regression and application testing
  - ▶ Port messages to other IMS systems
- Queue Management Functions
- The QCF Space Notification Exit
- A TSO/ISPF interface provides panels to
  - ▶ look at queue status
  - ▶ list, view, copy or move messages off the IMS message queues (while IMS is active)
  - ▶ resume, abort or suspend

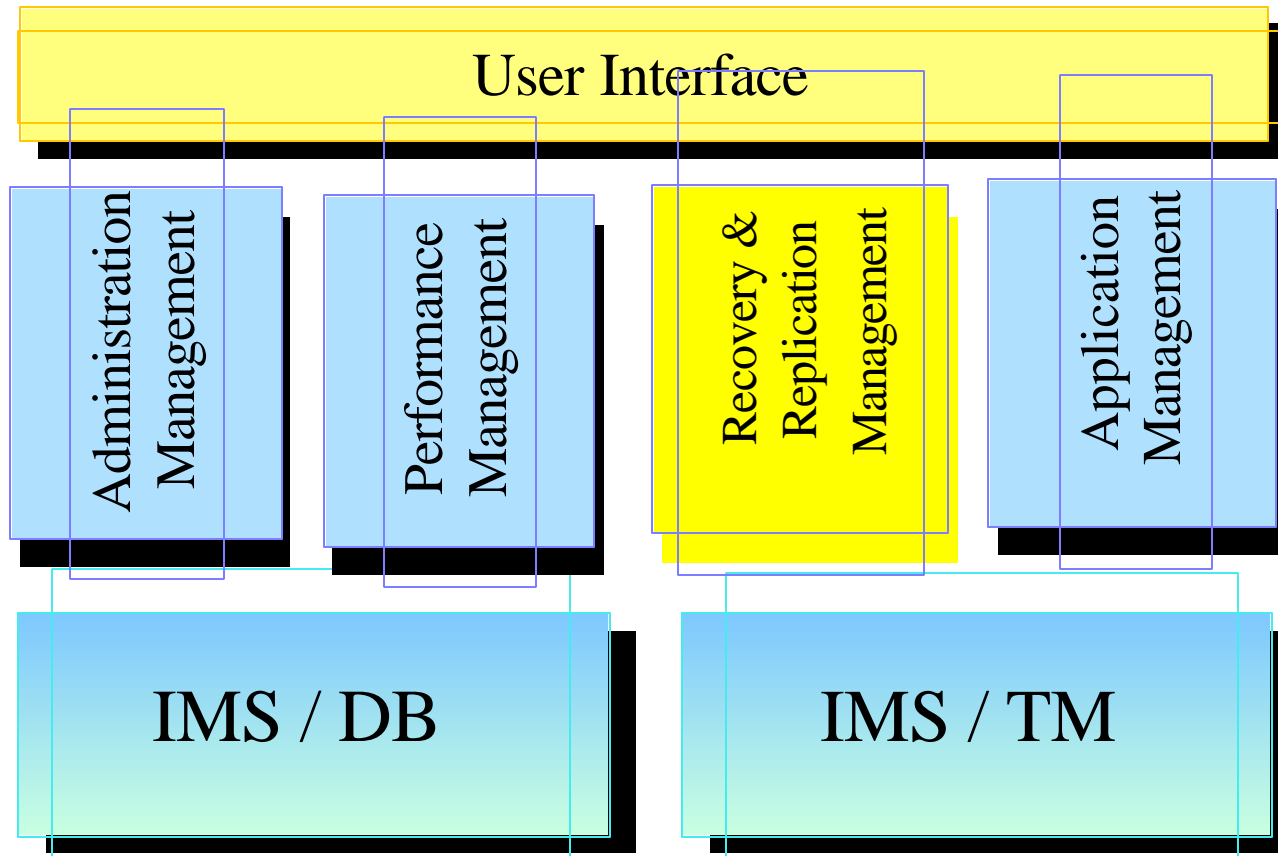
# Performance Management Tools Future



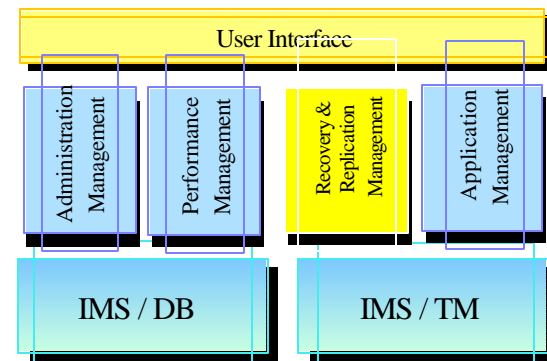
- Batch Monitor Improvements
- Online Monitoring Capabilities



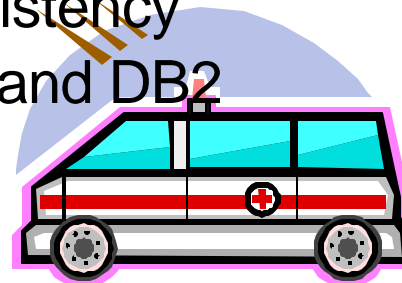
# Recovery & Replication Management



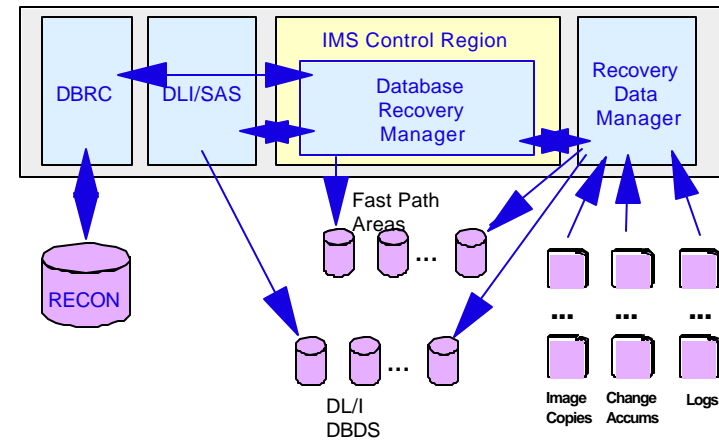
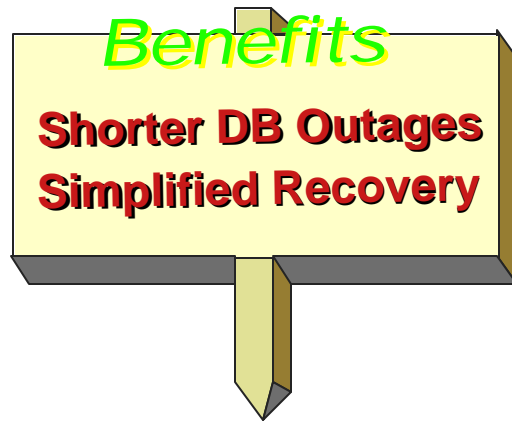
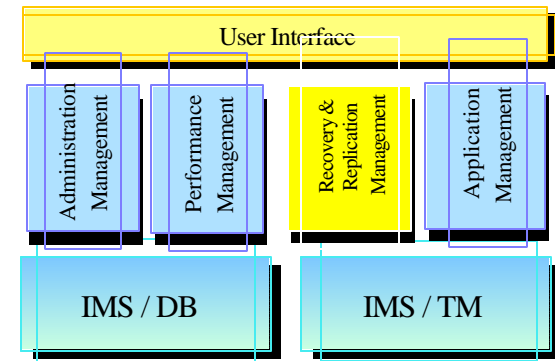
# Recovery Tools



- Image Copy Extensions
  - ▶ Provides pointer checking during batch image copy
  - ▶ Provides compressed image copy
  - ▶ Supports stacking of multiple output datasets
  - ▶ Can use Dynamic Allocation for all input and output datasets
- DEDB Fast Recover
  - ▶ Avoids full DEDB AREA recoveries during enforced cold start
- IMS Recovery Saver
  - ▶ restore an IMS system (all its databases, or a subset) to any point in time
  - ▶ For local system or remote site recovery
- DB2 Recovery Manager
  - ▶ Generates and runs all jobs necessary to recover a set of IMS and/or DB2 databases to a common point of consistency
  - ▶ Creates a point of consistency across IMS and DB2
    - called a “Virtual Image Copy”



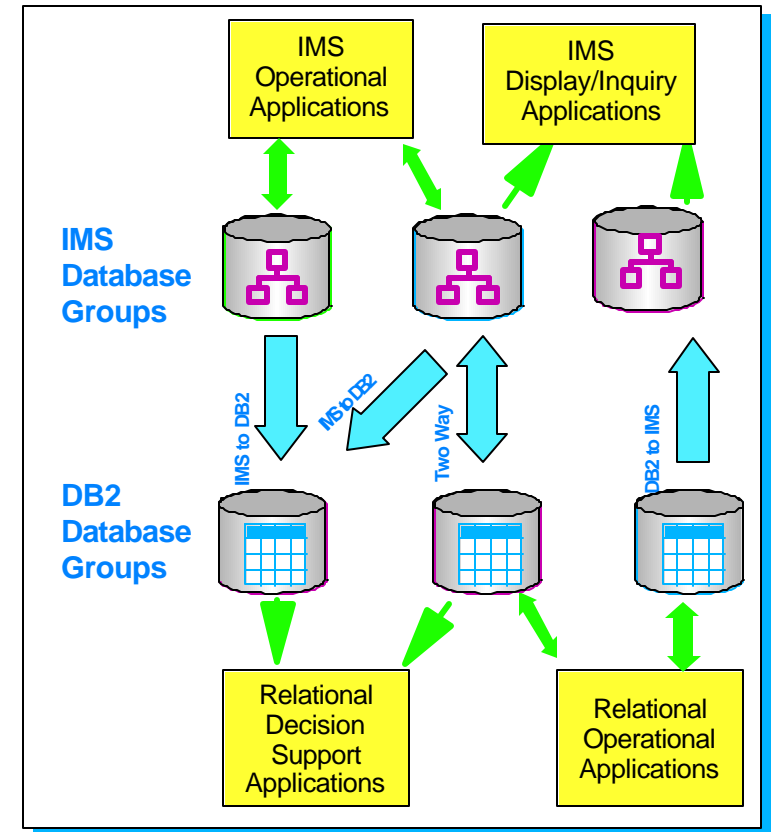
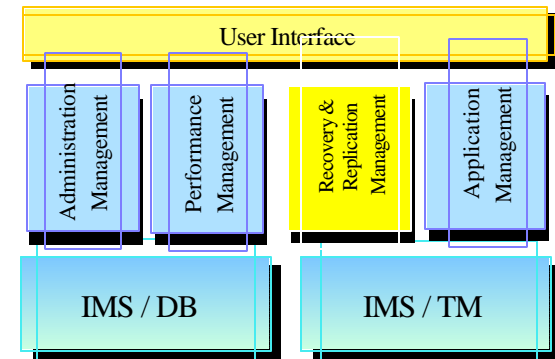
# Online Recovery Service



- Online Commands used to
  - ▶ Build list of DBs/AREAs to be recovered
  - ▶ Start recovery for a list
- Online IMS is used to recover IMS database data sets
  - ▶ Input data sets read in parallel
  - ▶ DB data sets recovered in parallel
  - ▶ Change accumulation input is optional, including in a data sharing environment
  - ▶ Time stamp recovery to any time is supported

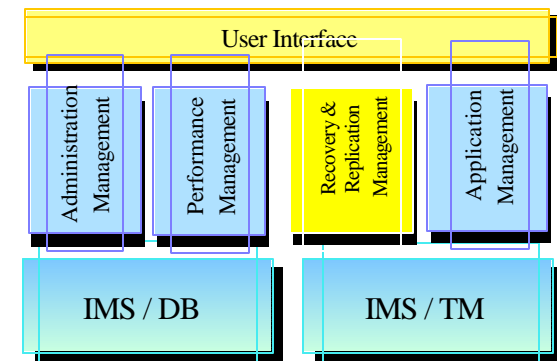
# IMS DataPropagator V3

- Decision Support
  - ▶ User access to stable data
  - ▶ Propagate only the data of interest
  - ▶ Exploit relational technology for query
- Application coexistence
  - ▶ Two masters
  - ▶ Data in both systems synchronized
- Application Migration
  - ▶ Gradual, orderly migration
  - ▶ Minimal risk
- Multiple Ways to Propagate
  - ▶ Synchronous
  - ▶ Log Asynchronous
  - ▶ **New Near Real-Time via MQSeries**



**No Change to Existing Applications**

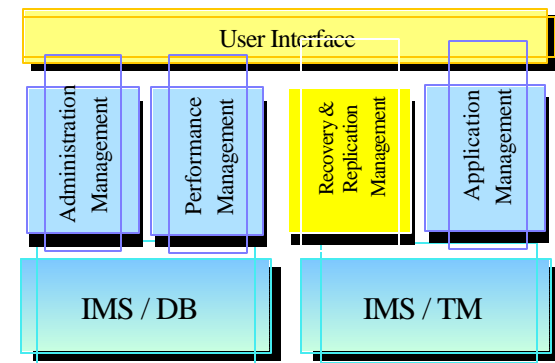
# IMS High Performance Change Accumulation



- **Replaces the IMS Change Accumulation utility**
  - ▶ **Parallel execution of multiple IMS CA jobs in a single Job.**
  - ▶ **Parallel streaming of both input and output data**
    - **Input data from RLDS's**
    - **Output data to new CA's datasets**
  - ▶ **Single pass of input/output**
  - ▶ **Supports IMS V6 and V7**
- **ISPF and Batch Interface**
  - ▶ **Automatic submission**

*IMS HP CA provides an environment in which multiple CA jobs can be run in parallel, instead of in sequence.*

# Recovery & Replication Tools - Future



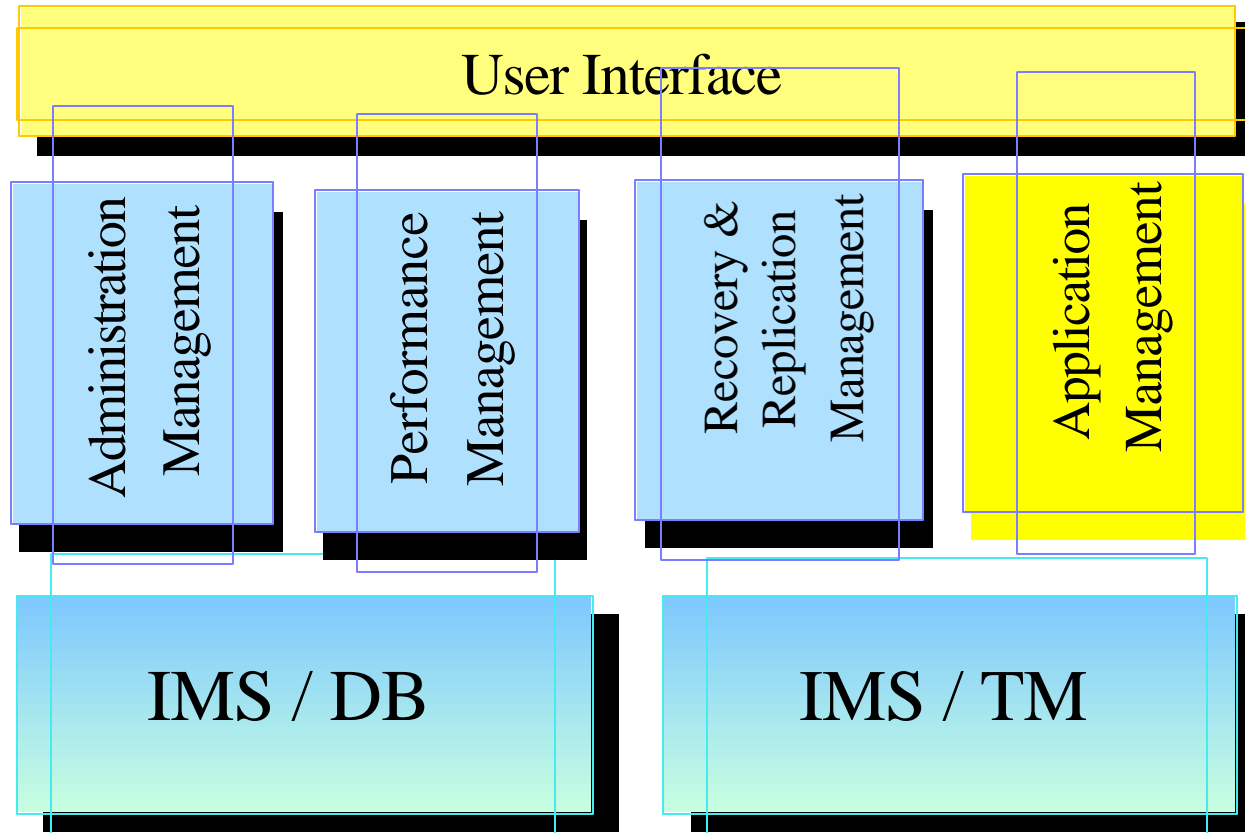
## ■ Recovery Management

- ▶ Online Recovery - ORS enhancements
- ▶ Point in time recovery
- ▶ DB2 Coordinated recovery
- ▶ Recovery automation
- ▶ Improved usability

## ■ Replication

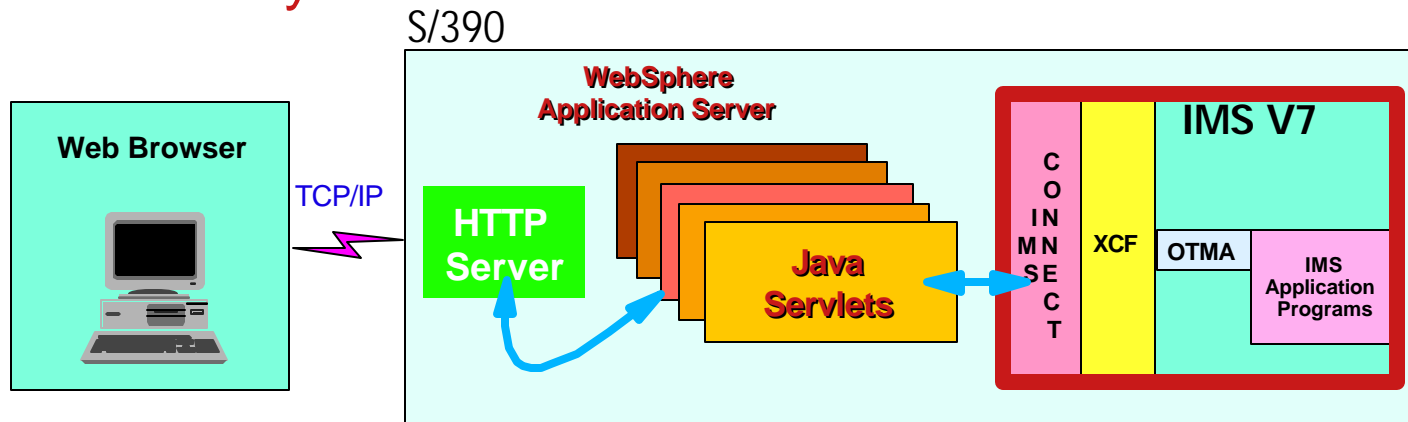
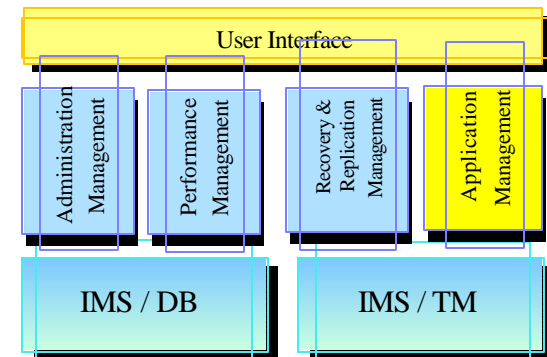
- ▶ Improved usability

# Application Management



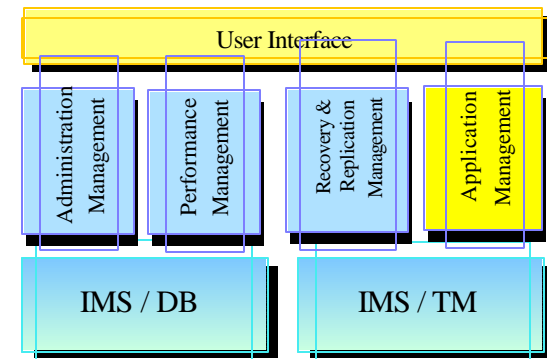
# IMS Connect V1R2

- Local OS/390 Clients for IMS V7
  - ▶ Clients running on same OS/390 as IMS Connect do not need to use TCP/IP, but can communicate via cross memory services directly with IMS Connect
  - ▶ Used by IMS Connector for Java 3.5.3
  - ▶ Performance boost for two tier e-business solutions
- Unicode support for IMS V7
  - ▶ For IMS applications that support Unicode - e.g.. IMS Java message processing programs
- Websphere Adapter support
- IMS Connector for Java J2EE Runtime support
  - ▶ J2EE as the industry-wide standard version





# Applications Management



## ■ MFS reversal Utilities

- ▶ Convert MFS MID/MOD/DIF/DOF control blocks back into IMS MFS utility control statements
  - Lost MFS source

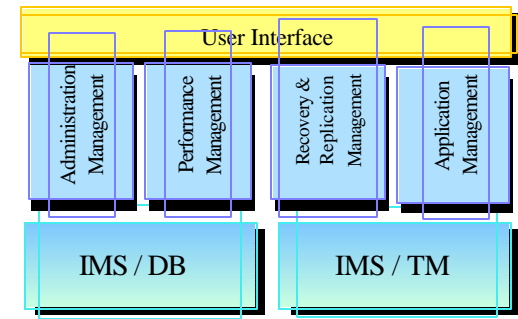
## ■ IMS Program Restart Facility

- ▶ Enhances IMS Application Extended Checkpoint/Restart facilities for stand-alone batch and BMP
- ▶ Enables restart
- ▶ on any system in sysplex
- ▶ without changes to JCL

## ■ Batch Terminal Simulator

- ▶ Call Trace facility for Application Developers
- ▶ Runs under TSO (or in batch)
- ▶ For verifying or debugging programs

# IMS Tools - Summary



- Data Management Tools is a unique model in the database tools industry
- Investment increased to support future needs
  - ▶ New functions
  - ▶ New Versions
  - ▶ New Tools
- Comprehensive solutions now and more coming
- Independent of IMS versions
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