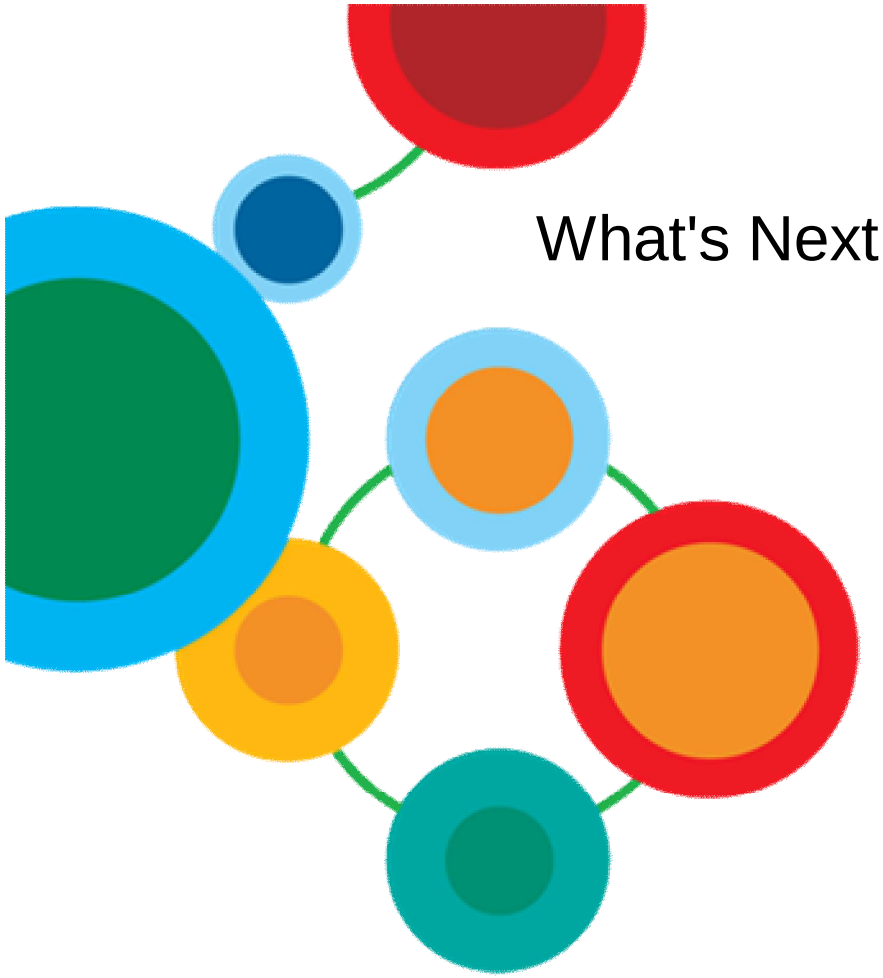

What's Next for IMS: The IMS 12 Era Arrives!

IMS 12: Faster than Ever

Betty Patterson
IBM Distinguished Engineer
IMS Architect

Please Note:

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Performance is based on measurements and projections using standard IBM benchmarks in a controlled environment. The actual throughput or performance that any user will experience will vary depending upon many factors, including considerations such as the amount of multiprogramming in the user's job stream, the I/O configuration, the storage configuration, and the workload processed. Therefore, no assurance can be given that an individual user will achieve results similar to those stated here.

IMS: Investing in Innovation Continues…

Announcing IMS 12 General Availability – October 28, 2011

Announcement letter is available on the IMS website: www.ibm.com/ims

Modernize Application Interoperation/Integration

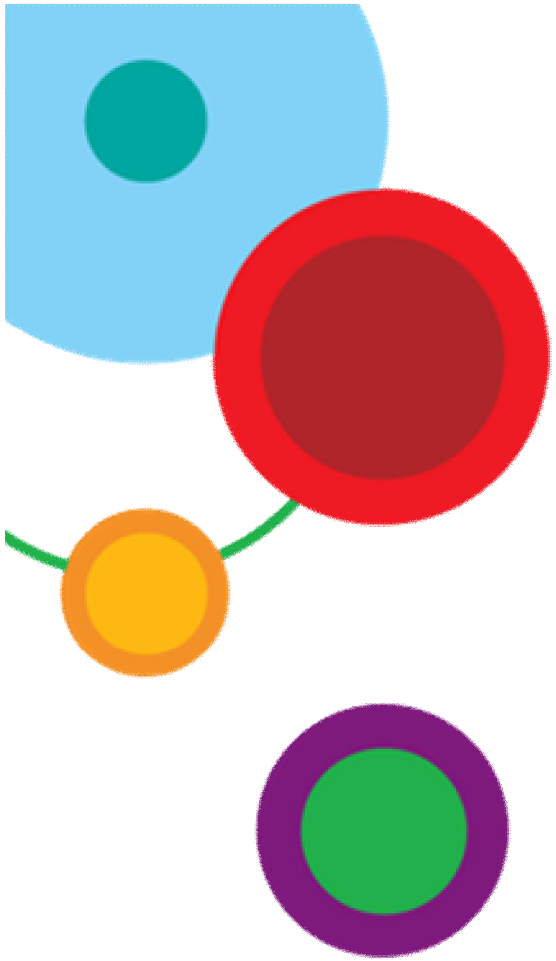
- Standard Tools/Interfaces to Speed Deployment

Streamline Installation/Management

- Simplify Interfaces, Ease Operations
- Heighten Availability, Increase Productivity

Enable Efficient Growth

- Alleviate Bottlenecks
- Reduce costs
- Optimize performance and resilience



IMS 12 Overview

IMS 12 Highlights

Database Management

IMS Database
- CICS Open Thread TCB support (Threadsafe)

Full Function Database
- FF Dynamic DB Buffers
- DB Storage Enhancement
- Additional FF Enhancements

Fast Path Database
- FP Buffer Manager 64 bit Enhancements
- FP DEDB Secondary Index Enablement
- Additional FP Enhancements

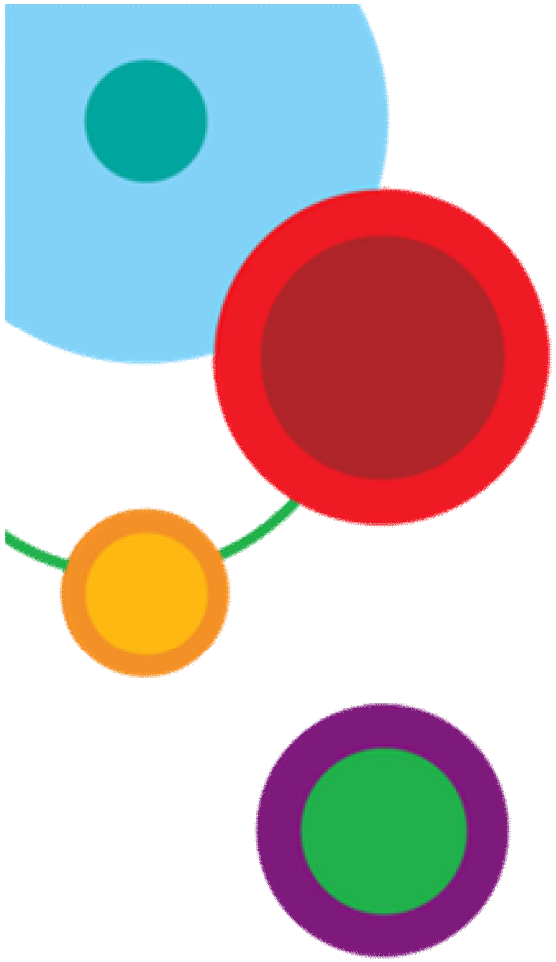
DBRC
- DBRC Enhancements
- Migration/Coexistence

Systems Management

- Scheduling Pool Stg Enh
- Extended Address Volume Support for non-VSAM
- IMS Repository and Usage for DRD Resources
- IMPORT Command Enhancement
- Member OLC Enhancement
- Logger Enhancements
- Syntax Checker Enhancements
- Diagnose Command Enhancements

Transaction Management and Connectivity

- IMS to IMS TCP/IP Communications
- MSC TCP/IP Support
- OTMA TCP/IP Support
- IMS Connect Type-2 Commands Support
- Additional Connect Enhancements
- Send Only w/ACK for Callout
- OTMA Security Enhancements
- APPC/OTMA Sync SQ
- Enhanced CQS Traceability



IMS 12
Database Enhancements

DRA Open Thread TCB Enablement for CICS Threadsafe

Solution

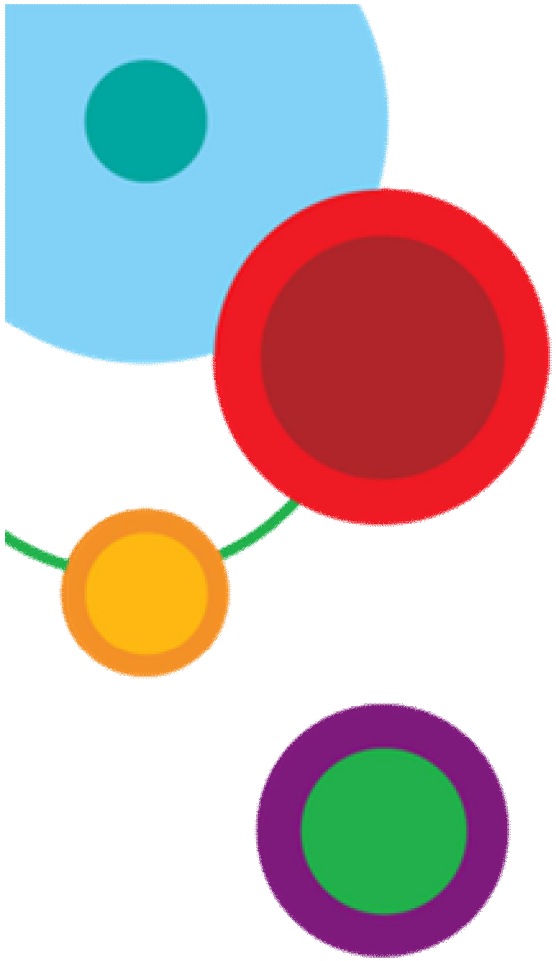
- Enables DBCTL support for CICS Open Transaction Environment TCBs (Threadsafe)
- Allows EXEC DLI and CALL DLI from CICS applications to run on a CICS thread
- Eliminates the creation of DRA Thread TCBs
- Requires CICS TS 4.2
  - Compatibility apars for use of CICS TS 4.2 with IMS 10 and 11

    IMS 10 (PM31730)

    IMS 11 (PM31729)

Value

- Eliminates costly TCB switches
- Reduces CPU usage
- Increases throughput for CICS / DBCTL users
- Reduces use of 24-bit Local System Queue Area (LSQA)



IMS 12
Full Function Database Enhancements

Full Function Dynamic Database Buffer Pools

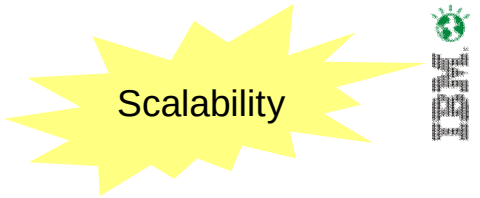
Solution

- Provide for dynamic change to an OSAM or VSAM buffer pool without recycling IMS systems to pick up the change
- Commands are used to add, change, or delete Full Function Database Buffer Pools
- Increase VSAM buffer pool limit (from 16 to 255)

Value

- Improves buffer pool management
- Eliminates system down time for modifications
- Flexibility with the ability to adjust DB buffers to business needs to improve application performance

IMS Storage Pool Enhancement



Solution

- Storage for selected pools can now be page fixed in 64-bit real storage
  - IMS PSB Scheduling pools (TM/DB, DBCTL, DCCTL)

    PSB CSA pool **PSB Work Pool**
  - Pools related to Full Function Database usage (TM/DB, DBCTL)

    DLI PSB pool **DMB Pool** **DB Work pool**
- Pools continue to be allocated in 31-bit virtual

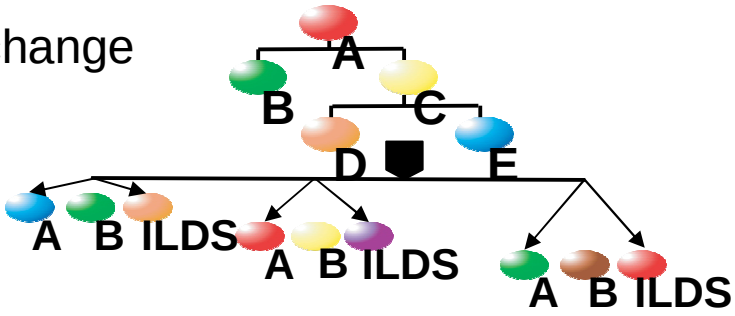
Value

- Could reduce use of 31-bit fixed real frames, relieves 31-bit real storage constraint and improve application scheduling performance
- Customers with large pools who previously could not page fix these pools due to storage constraints may now be able to page fix due to an increase in available real storage

Additional Full Function Database Enhancements

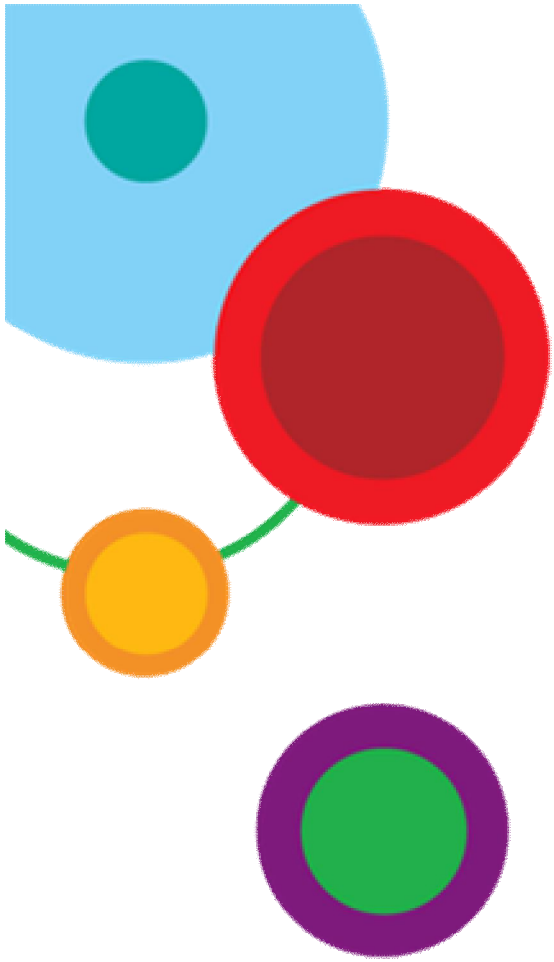
Solution

- Display status of randomizers and partition selection exit routines
- Optional DFS2291I diagnostic messages for U3310 for lock timeouts
- RACF userid in Data Capture batch log records (9904)
- Eliminates IMS U0080 abends for OSAM Open, Close, and EOV processing - DFS0730I issued
- Batch Data Sharing jobs survive CF cache structure access failures
- HALDB Partition name reuse after structure change
- Reuse of local DMB numbers
- Message DFS993I sent to system console



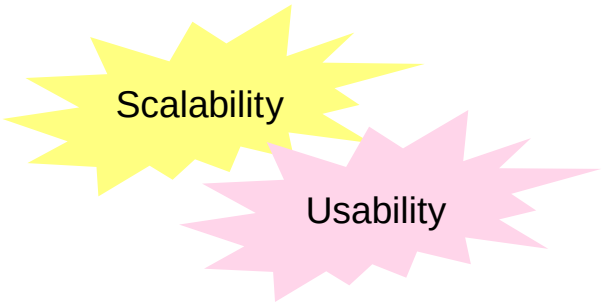
Value

- Scalability by reusing unused local DMB numbers
- Serviceability by providing additional information
- Availability by reuse of DMB numbers and eliminating of some hangs
- Enhance the availability and usability for HALDB, OLR and batch users of IMS



IMS 12
Fast Path Database Enhancements

Fast Path 64-bit Enhancements



Solution

- FP subpools made more dynamic
  - Compression and pre-expansion
  - Resizing and cleanup
- Additional FP buffers are moved from ECSA to 64-bit storage
  - FLD calls
  - SDEP calls during /ERE and XRF tracking
- Query Pool Type (FPBP64) command enhancements
  - SHOW(STATISTICS) added
  - SHOW(ALL) now displays subpool status

Value

- Reduce ECSA usage
- Smarter usage of subpools

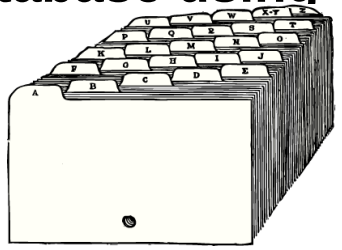
Fast Path Data Entry Database (DEDB) Secondary Index Enablement

Solution

- **Provide secondary indexing infrastructure for Fast Path DEDBs**
  - Secondary indexes are full function databases (HISAM or SHISAM)
  - Support for maintenance of secondary indexes
  - No support for the creation of secondary indexes
- **Tools or utilities to build a secondary index database for DEDB databases exploiting this function could be separately offered by IBM or other vendors**

Value

- **Enhance usability by providing Fast Path DEDB secondary indexing infrastructure in IMS to access a DEDB database using a secondary key sequence**
  - Access via an alternate key



Fast Path Logging Enhancements

Solution

- Option to reduce logging for asynchronous changed data capture
  - Before IMS 12 asynchronous changed data capture writes ‘before’ and ‘after’ image log records (x’99’)
  - IMS 12 has option not to write these records for DLET calls or ‘before’ records for REPL calls for DEDBs
  - Specification on EXIT= parameter of DBD and SEGM macros in DBDGEN
- Option to log entire segment for REPL calls of DEDBs
  - ISRT and DLET always log the entire segment
  - Before IMS 12 only changed data in 5950 segment was logged for REPL calls
    - Specified in DBRC with new keywords for the INIT.DB, CHANGE.DB, INIT.AREA, and CHANGE.AREA DBRC commands

Value

- Can use full segment logging for disaster recovery tracking
- Optional log reduction for x’99’ data capture log records reduces logging overhead & improves performance where logging is a constraint

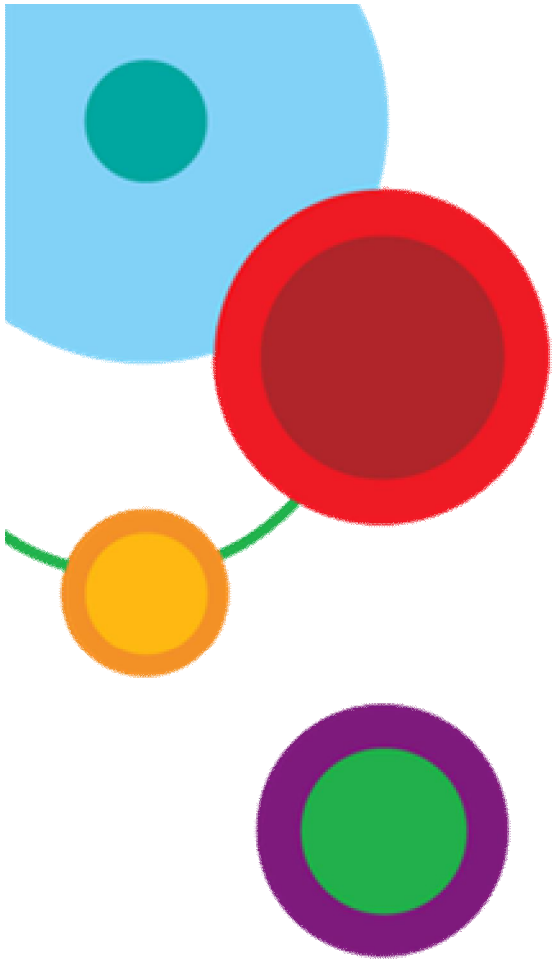
Fast Path Serviceability

Solution

- DEDB data sharing enhancement
  - When an IMS system sends a notify message to its data sharing partner systems, new message DFS0066I is issued for each responding system
  - Any partner that fails to respond causes the IMS that originally sent the notify message to issue DFS3770W
  - User may need to cancel the IMS for which there is no DFS0066I message

Value

- User can determine which IMS is non-responsive providing a quicker response to a system hang



IMS 12
Database Recovery Control (DBRC) Enhancements

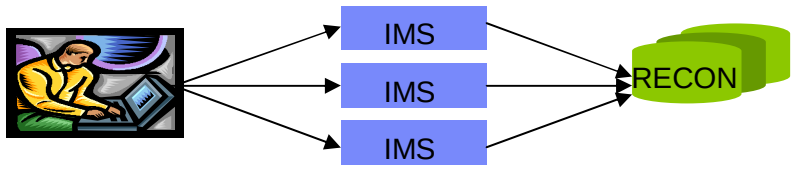
DBRC Enhancements

Solution

- Remove the 32K output buffer constraint for DBRC LIST commands entered through the Operations Manager (OM) API
- Enhance the following DBRC commands:
  - CLEANUP.RECON – now includes CA record data
  - LIST.HISTORY – increased timestamp precision/new data
  - INIT.CA, INIT.IC, NOTIFY.CA, NOTIFY.IC – VOLLIST parameter now optional if data sets cataloged
  - INIT.CAGRP, CHANGE.CAGRP – retention period added to GRPMAX
  - GENJCL – userkeys increased from 32 to 64 and new %DBTYPE kwd added
- Add user data fields to the DBDS recovery records (IC, RECOV, REORG, and CA)

Value

- Improve the reliability, availability, maintainability, serviceability, and usability of DBRC and the RECON data sets



DBRC Migration/Coexistence

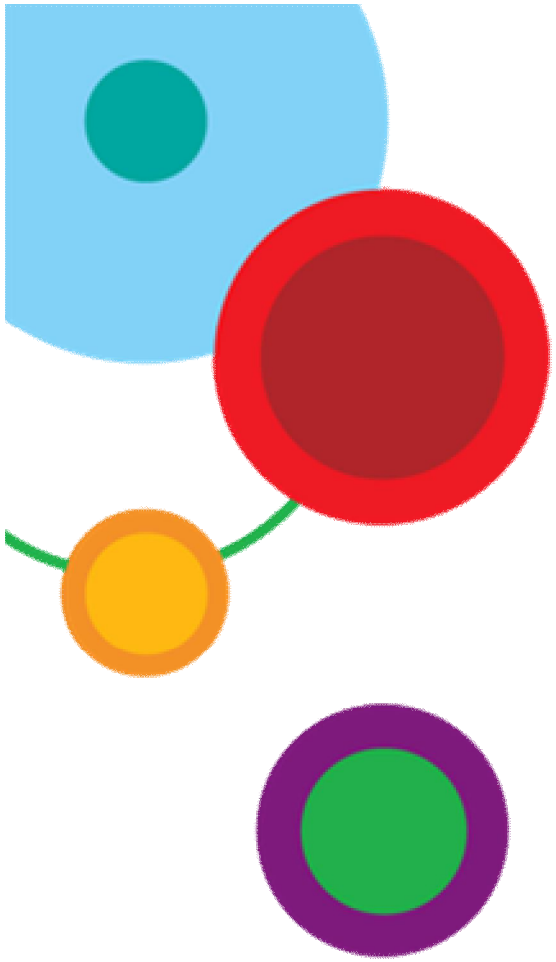
Usability

Solution

- Provide support for migration and coexistence from IMS 10 and 11
  - RECONs are upgraded
    - IMS 11 to IMS 12
    - IMS 10 to IMS 12
  - Databases are compatible
  - Applications are compatible

Value

- Ease migration to IMS 12



IMS 12
Systems Management Enhancements

Extended Address Volume (EAV) Support

Scalability

Solution

- Non-VSAM data sets can reside in Extended Address Space (EAS) on EAV volumes to satisfy growing DASD storage requirements.
  - Requires z/OS 1.12 and above
- EAV supported for the following non-VSAM data sets:
  - Full Function Overflow Sequential Access Method (OSAM) data sets
  - IMS Online Log Data Sets (OLDS)
  - IMS Log Write Ahead Data Sets (WADS)
  - IMS Spool data sets

Value

- Provide relief for systems running out of z/OS addressable disk storage
- Allows more data sets on a single larger volume
- Less need for multi-volume OSAM
- Alleviate disk storage constraints providing greater scalability to grow business solutions

IMS Scheduling Log Record Enhancements

Solution

- Enhanced 07 and 56FA log records
  - New fields to show zAAP/zIIP specialty engine time
  - Existing time field now used only for general CP time

Value

- For IMS applications that include Java processing, the IMS log records would now indicate how much of the application processing time is on a specialty engine vs. a general processor

IMS Repository and Usage for Dynamic Resource Definition (DRD) Resources

Solution

- Provides an optional single centralized store for the DRD resource definitions
  - IMS Resource Definition Data Set (RDDS) can continue to be used instead of the repository
- Enables IMS systems to manage, store, share, and retrieve resource definitions
  - Database, Program, Transaction, Routing Code and related descriptors
  - DB, DBDESC, PGM, PGMDESC, RTC, RTCDESC, TRAN, TRANDESC
- Allows DRD resource definition changes to be made in repository and rolled to one or more active IMS systems
- DRD UI supports new options for Query, Import and Export commands
- Syntax Checker and IVP support for repository

Value

- Simplifies management of IMS resource definitions
- Eliminates the need for managing multiple RDDS for each IMS

Import Command Enhancement

Usability

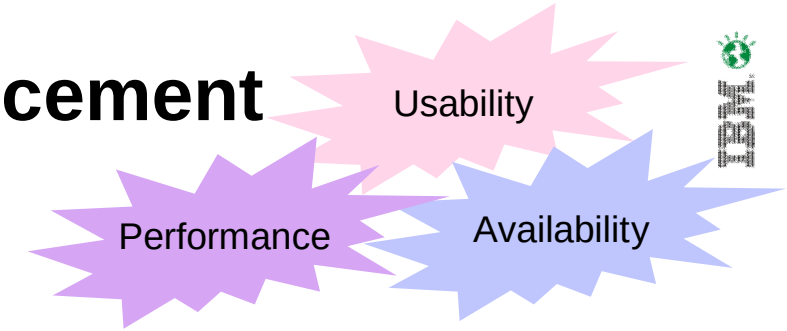
Solution

- IMPORT command is enhanced to support an optional update function
  - New resources are created
  - Existing resources are updated

Value

- Enhances usability of the IMPORT command

Member Online Change Enhancement



Solution

- New option to allow Member Online Change to only bring in PSB members and new DBD members
  - Specified in the NAME() parameter of the INIT OLC command

Value

- Could provide significant performance enhancement when there are huge number of ACB members in ACBLIB
  - Eliminates the process of determining the associated ACB members for the PSB and DBD members affected by the OLC, when the user knows it is not needed

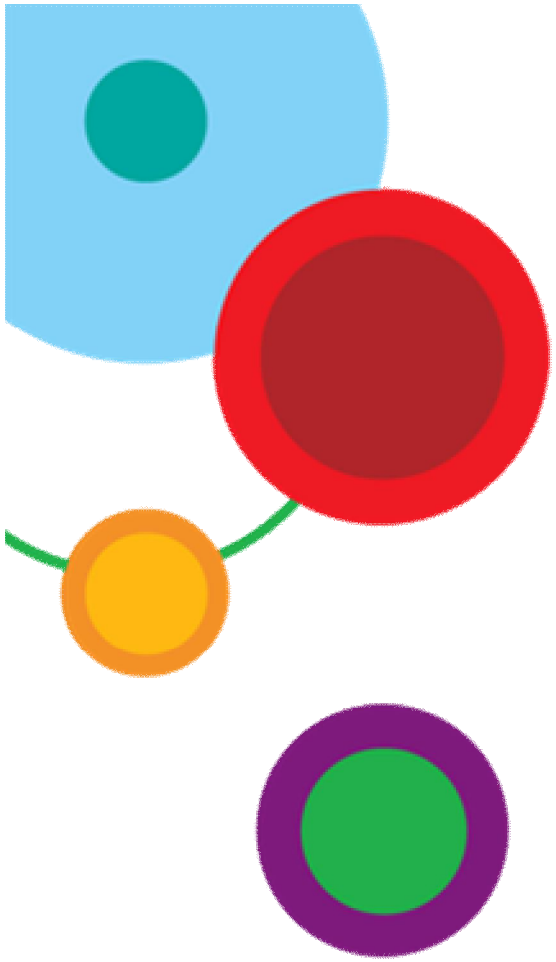
Logger Enhancements

Solution

- Optional Extended Format Support for OLDS and SLDS
  - Allows OLDS and SLDS to be striped
- Optional IMS log buffer storage moved above the 2 gigabyte boundary
- WADS management changed to be more efficient
  - Track groups no longer used
  - WADS written in wrap around fashion

Value

- Increased OLDS write capability
- Increases logging speed
- Improves logging bandwidth
- Reduced 31-bit ECSA usage



IMS 12
Transaction Management and Connectivity Enhancements

IMS to IMS TCP/IP Communications

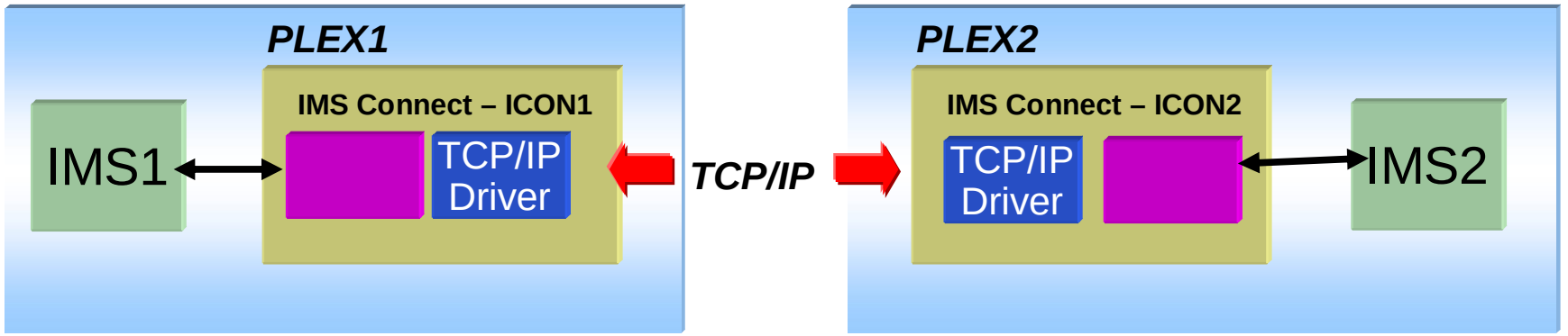
Usability

Solution

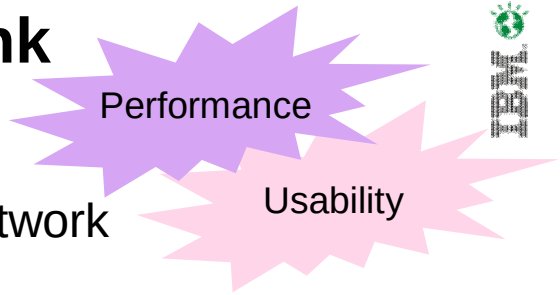
- Provide communications between IMS systems using TCP/IP via two IMS Connect instances

Value

- Enhances connectivity
- Supports TCPIP communications to invoke transactions between IMS systems without having to create or maintain a separate gateway solution
- Reduces the maintenance cost by eliminating the need to maintain a RYO IMS Connect gateway application solution



Multiple Systems Coupling (MSC) TCP/IP Link

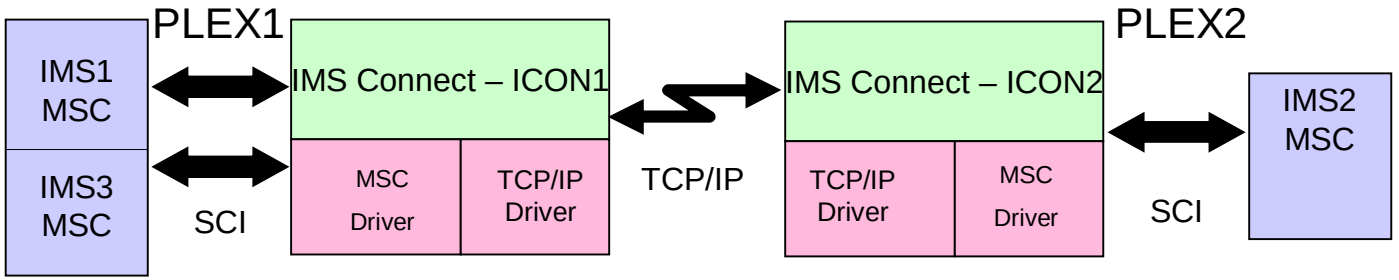


Solution

- Support for MSC communications across a TCP/IP network
  - New physical link type MSPLINK TYPE = TCPIP
- MSC communicates with IMS Connect within a IMSPlex to send/receive messages via the TCP/IP network
  - IMS Connect manages the TCP/IP communications
  - MSC manages the message processing
  - Structured Call Interface (SCI) used for communication

Value

- Increased usability by allowing migration of links from SNA to TCP/IP
- Increased availability if VTAM/SNA and TCP/IP are used together for redundancy
- Potential increased MSC bandwidth



Open Transaction Manager Access (OTMA) TCP/IP Connection Enhancement

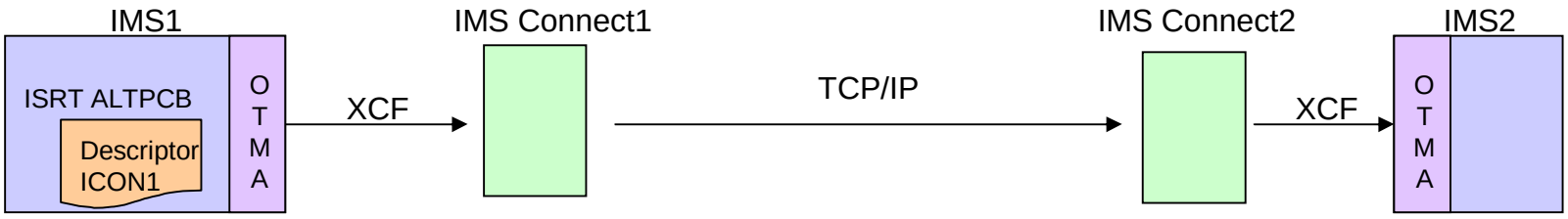
Usability

Solution

- OTMA can now send transaction messages from applications running in a dependent region across a one-way TCP/IP connection to another IMS system for processing
  - Using Send_Only_With_ACK protocol
  - A remote IOPCB reply would go on a remote HOLD queue (TPIPE = OTMxxxxx) and require a RESUME_TPIPE
- OTMA destination descriptor has new parameters specified when a remote IMS is the TCP/IP destination for transaction messages

Value

- Enhances connectivity
- Removes need for an intermediate gateway between IMS systems
- Simplifies definition of remote IMS system as TCP/IP destination for OTMA transaction messages



IMS Connect Type-2 Commands

Solution

- QUERY IMSCON and UPDATE IMSCON command support is introduced for IMS Connect resources, including:

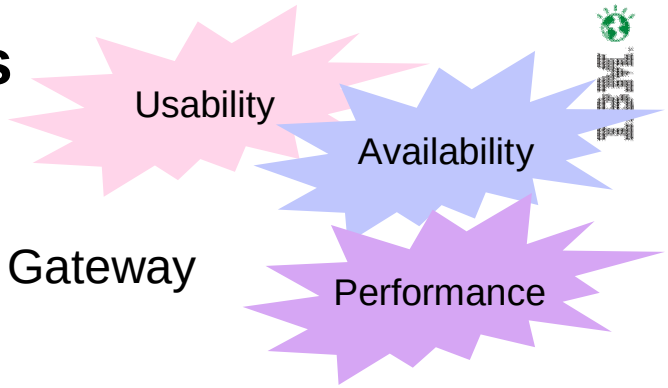
Alias	Datastore	MSC	Racfuid
Client	IMSPlex	ODBM	RmtIMSCon
Converter	Link	Port	SendClnt
UOR			

- Access to IMS Connect using a standardized command interface

Value

- Usability by controlling IMS Connect from a Single Point of Control
- Efficiency by using a single command to receive consolidated output that otherwise requires several WTOR & z/OS Modify commands
- Improve ease-of-use for managing IMS Connect resources
- Support all functionality available with existing WTOR and z/OS Modify commands

Additional IMS Connect Enhancements



Solution

- Ability to refresh XML converters for IMS SOAP Gateway without restarting IMS Connect
- Provide RACF Userid caching – reduces MIPS
- Return actual RACF return codes – more info for security errors
- Recorder Trace data capture – new trace points
- Commit Mode 0 (CM0) NoWait for ACK/NAK for RYO clients
- New READ client connection status
- Load modules for IMS-provided exits – no need to assemble/bind

Value

- Improve usability and availability for IMS Connect while providing better performance and diagnostics

Enhanced OTMA Security

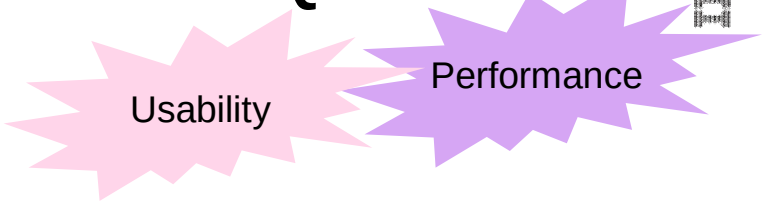
Solution

- New capability creates, shares and caches a single ACEE associated with a RACF userid
  - Shared across multiple OTMA member clients (TMEMBER)
- New maximum ACEE aging value of 99,999 seconds

Value

- Reduce the system storage for RACF ACEEs while providing better security and performance
- More efficient usage of storage for caching RACF ACEEs
- Higher IMS availability for applications

Enhanced APPC/OTMA Synchronous Shared Queues



Solution

- New capability removes the dependency on Resource Recovery Service (RRS) in a Shared Queues environment for
  - APPC synchronous conversations and OTMA CM1 (send-then-commit) interactions
    - Applies only to SYNCLVL = NONE | CONFIRM
      - » SYNCLVL = SYNCPT still requires RRS
  - IMS is the sync point manager rather than RRS
- Shared Queues Front-End and Back-End systems use XCF for communication

Value

- Improve performance and simplify the syncpoint process

Enhanced Common Queue Server (CQS) Traceability

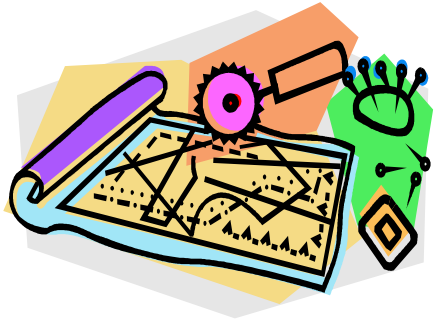
Serviceability

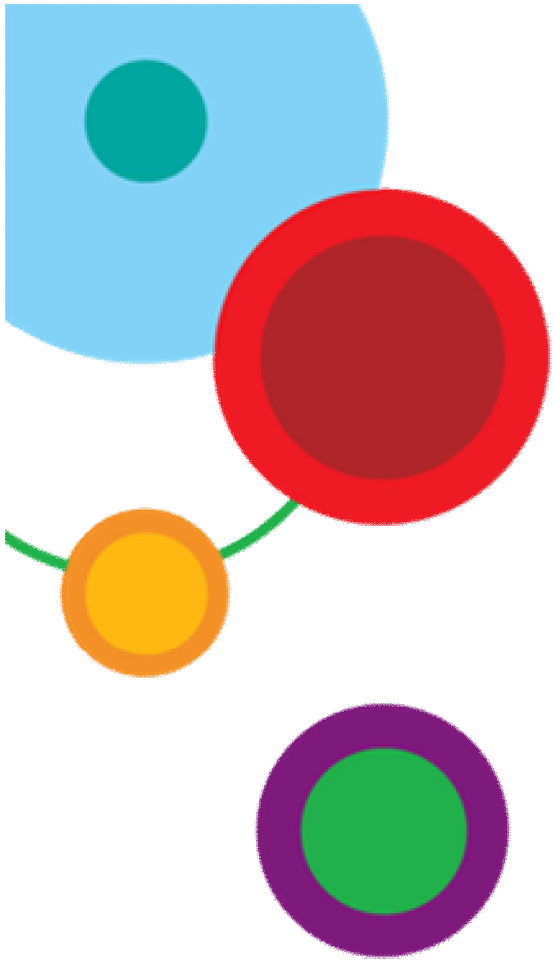
Solution

- Preserve structure events trace entries by separating and categorizing trace data into new trace tables
  - Structure Event trace table (SEVT) - all of the structure events except the overflow events.
  - Structure Overflow trace table (OFLW) – all overflow events
- Increase the size of the trace records to boost trace data storage capacity.

Value

- Improve diagnostics for certain Shared Message Queue structure related problems





IMS 12 Prerequisites

IMS 12 Hardware Requirements

- 64-bit Processors capable of running z/OS 1.11 and that support the Long Displacement Facility of the z/Architecture
  - ESA mode is not supported by IMS 11 or 12
  - For a list of z/Series machines see:
    - www.ibm.com/systems/z/hardware/
    - Note: z900 systems must be at the GA2 level (microcode level 3G or later) to enable the Long Displacement Facility.

- Sysplex Data Sharing (including Data Caching and VSO Data Sharing)
  - Coupling Facility (CF) level 9, or later

- Shared Queues and Shared EMH support
  - Coupling Facility level 9 or later
  - System-managed CF Duplexing
    - CF level 12, or later and bidirectional CF to CF links

- Extended Address Volume (EAV) support for non-VSAM data sets
  - DS8000 or DS8700

- For additional line item requirement information see the IMS 12 Release Planning information at www.ibm.com/ims

IMS 12 Software Requirements

- IMS 12 Minimum Release Levels
  - z/OS V1R11 (5694-A01) with DFSMSdfp (a base element of z/OS 1.11)
    - RACF (included in separately orderable SecureWay Security Server), or equivalent, if security is used
    - High Level Assembler Toolkit Release 5 (5696-234), a separately orderable feature of z/OS
    - IRLM 2.2 or IRLM 2.3 (included in IMS 12)

- Other prerequisites for *optional* line items:
  - Java Dependent Regions requires JDK 6.0
  - EAV support for non-VSAM datasets requires z/OS V1R12
  - Additional function requirement information is provided in the IMS 12 Release Planning Information at www.ibm.com/ims

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