IMS 12 Overview

IMS 12 Highlights

Database Management

Full Function Database
- Extended Addressability Support (EAV) Support
- FF Dynamic DB Buffers
- FF DB Storage Enhancement
- Additional FF Enhancements

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

DBRC
- DBRC Enhancements
- Migration/Coexistence

Systems Management

- IMS Repository and Usage for DRD Resources

- IMPORT Command Enhancement

- Logger Enhancements

- Syntax Checker 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

- OTMA Security Enhancements

- APPC/OTMA Synch SQ

- Enhanced CQS Traceability

IMS Version 12

- ***Announced on October 5, 2010***
  - Currently in QPP program
  - General Availability expected in 4Q2011

- ***Hardware Prerequisites***
  - IMS 12 runs only on 64 bit processors running in z/Architecture mode

- ***Minimum Software Prerequisites***
  - z/OS V1R11 (5694-A01)
  - High Level Assembler Toolkit (5696-234), Version 1 Release 5
  - SMP/E V3R5
  - RACF, or ISV equivalent (if security used)
  - IRLM 2.2 (if IRLM used)

- ***Minimum software levels for optional functions:***
  - Parallel RECON Access requires Transactional VSAM
  - Java Dependent Regions require JDK 6.0
  - The IMS Universal Drivers require JDK 6.0
  - EAV support for non-VSAM data sets requires z/OS V1R12

IMS Version 12

- **Miscellaneous Requirements**

  – System-managed CF Duplexing requires CF level 12 and bidirectional CF to CF links

  – Extended Address Volume (EAV) support for non-VSAM data sets requires a DS8000 or DS8700 Storage Subsystem

- **Supported Migrations and Coexistence**

  – IMS 11 to IMS 12

     – Upgrade RECONs from IMS 11 to IMS 12

     – Databases are compatible

     – Application programs are compatible

  – IMS 10 to IMS 12

     – Upgrade RECONs from IMS 10 to IMS 12

     – Databases are compatible

     – Application programs are compatible

IMS 12 Full Function Database Enhancements

Extended Address Volume Support

- Extended Address Volumes have more than 65,520 cylinders
  - Up to 262,668 cylinders; >55,689,379,200 bytes per volume
  - Any data set may reside on the first 65,519 cylinders
  - Only data sets with EAV support may reside on cylinder 65,520 or above

- EAV support for VSAM data sets was added in z/OS V1R10

- EAV support for non-VSAM data sets was added in z/OS V1R12

- Value
  - Supports the placement of more data sets on a single volume
  - Allow users to manage fewer numbers of larger volumes

IMS EAV Support

- **IMS 9, 10 and 11 have EAV Support for VSAM**
  - Database data sets (KSDS and ESDS)
    - Fast Path and full function including HALDB
    - RECONs
  - Requires z/OS V1R10 or later

> IMS 9 APAR PK66704
> IMS 10 APAR PK72530
> IMS 11 APAR PK78388

- **IMS 12 adds EAV support for OSAM and non-VSAM system data sets**
  - IMS OSAM database data sets
  - Restart Data Set (RDS)
  - Message Queue blocks data set, Long and Short Message data set
  - IMS Online Log Data Sets (OLDS), IMS log Write Ahead Data Sets (WADS)
  - IMS SPOOL data sets
  - BPE External Trace Data Sets
  - Requires z/OS V1R12 or later

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

- Eliminates system down time for modifications to buffer pool definitions

- Improves application performance with improved buffer pool specifications

Full Function DB Storage Enhancement

Solution

- Storage for Full Function database pools now obtained in 31- bit virtual, backed by 64-bit real storage for the:

  - DB Work pool
  - DMB pool
  - PSB CSA pool
  - DLI PSB pool
  - PSB Work pool

Value

- Could reduce use of 31-bit fixed real frames, relieves 31-bit real storage constraint

- Customers with large database pools who previously could not page fix these pools due to storage constraints should now be able to page fix due to an increase in available real storage

Additional Full Function Database Enhancements

- Status of randomizers and partition selection exit routines
  - Displayed when FF database is Opened/Closed via command

- Additional diagnostic message for abend U3310 for long lock situation
  - Provides information about lock resource holder and timeout victim

- RACF user id is saved in log type 9904 for batch jobs
- DFS0730I message replaces IMS U0080 abend for open/close/EOV errors
- DLI Batch jobs will wait rather than terminate in the event of a Coupling Facility switch
  - Eliminates the U3303 abend in this situation

- HALDB Partition reuse after structure change
  - Reuse of HALDB partition DB names for non-HALDB databases

- Improved use of local DMB numbers to stay within 32,767 limit
  - Reuse of numbers so that a cold start is not required when these numbers reach the maximum

- Message DFS993I (CSA PSB|DLS PSB|PSBM pool too small) is sent to the system console
  - Previous releases that did not have a master terminal (e.g. DBCTL) did not receive the message making it more difficult to determine that a PSB schedule failure was due to insufficient space in one of these pools

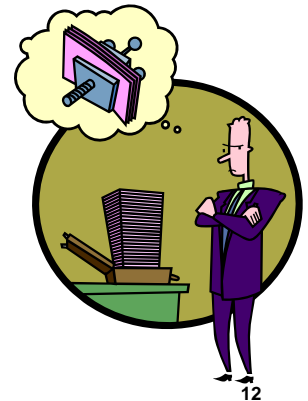# IMS 12 Fast Path Enhancements

Fast Path 64-bit Enhancements

Solution

- Fast Path pools are more dynamic
    - Pools are expanded before buffers are needed
    - Pools may be compressed
    - User may set initial size of pools
- Additional buffers are moved from ECSA to 64-bit storage
    - FLD calls
    - SDEP calls during /ERE and XRF tracking
- QUERY POOL command enhancements
    - Summary statistics available
    - ALL output reformatted

Value

- Smarter use of subpools
- Reduced ECSA usage

Fast Path Data Entry Database (DEDB) Secondary Index Enablement

Solution

- Secondary indexes for DEDBs are maintained by IMS
  - Secondary indexes are full function (HISAM or SHISAM)
  - Multiple HISAM or SHISAM databases may be used for one index
    - Supports very large indexes
  - One index may be built on different fields in a segment
    - e.g. Multiple telephone number fields
- IMS does not build secondary indexes
  - Tool or user program must be used to create them

Value

- Access to DEDB via an alternate key
- Sequential processing via an alternate key or alternate segment type

Fast Path Logging Enhancement

Solution

– Option to log entire segments for REPL calls instead of only changed data

– Database change log records may be used for replication

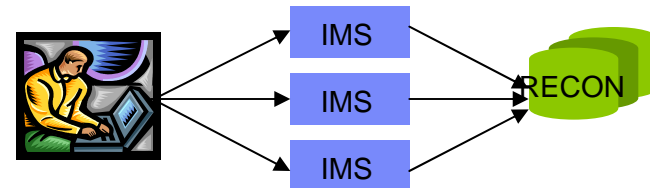– Option to not log DLET and REPL call "before images" with data capture

Value

– Reduced logging options for replication and disaster recovery

IMS 12 Database Recovery Control Enhancements

DBRC Enhancements

Solution

- Output for /RMLIST command entered through the OM API can exceed the previous 32K limitation
  - Output size is restricted by the DBRC private storage available for buffering the output message or OM limitations

- Enhancements to 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

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

DBRC Migration/Coexistence

Solution

- Provide support for migration and coexistence from IMS 10 and 11 to IMS 12
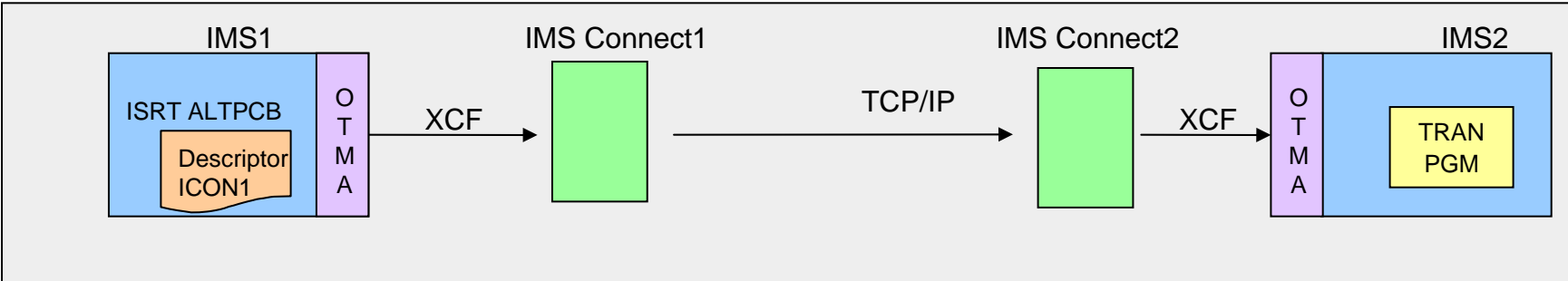- All database records are read during upgrade of the RECON data set to IMS 12

Value

- Ease migration to IMS 12

IMS 12 Transaction Management and Connectivity Enhancements
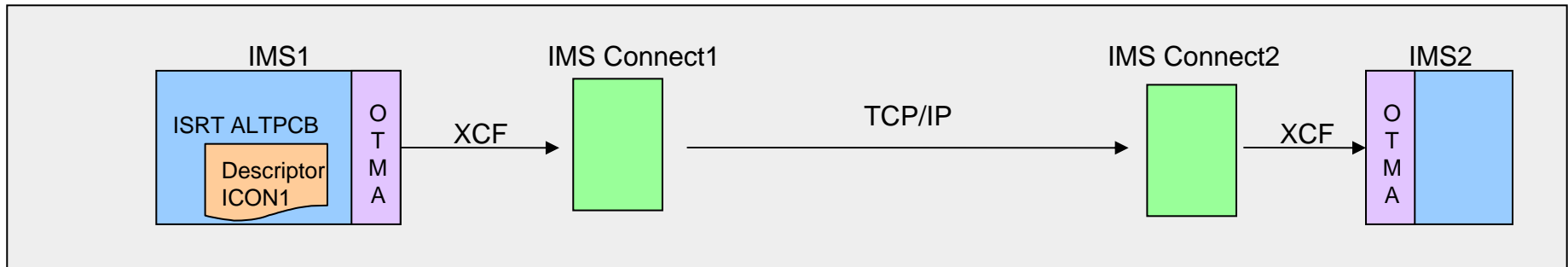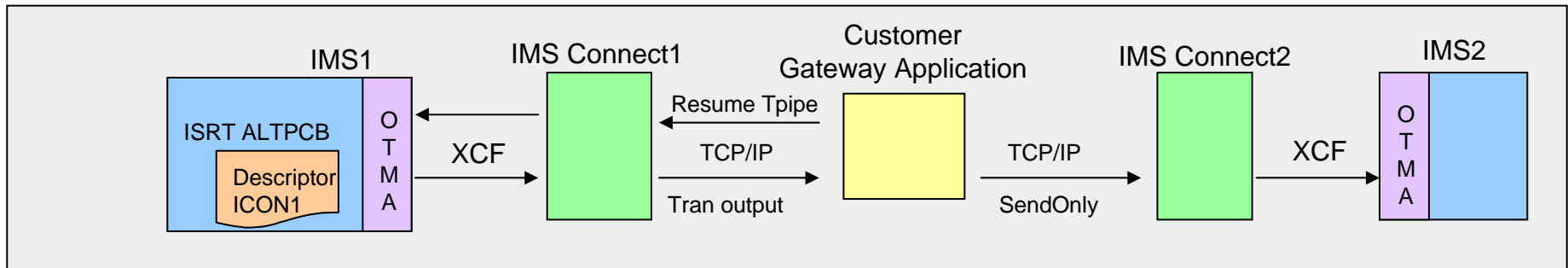
Asynchronous IMS to IMS TCP/IP Messages

- **IMS applications may send messages via TCP/IP to other IMS systems**
  - Message is sent with ISRT call using ALT-PCB
    - OTMA destination descriptor or DFSYDRU0 exit routine selects destination
  - Message invokes IMS transaction on receiving IMS system

IMS1		IMS Connect1		IMS Connect2		IMS2
ISRT ALTPCB Descriptor ICON1	O T M A	→ XCF →	TCP/IP →		→ XCF →	O T M A	TRAN PGM

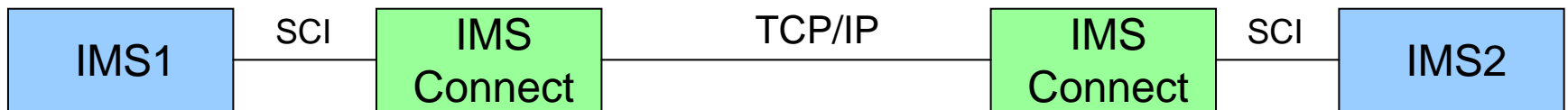# Asynchronous IMS to IMS TCP/IP Messages …

- **Value**
  - Eliminates need for customer RYO gateway application to receive output message and send it to the other IMS

Multiple Systems Coupling (MSC) TCP/IP Links

- Support for MSC communications over TCP/IP
  - New MSPLINK type
  - Uses IMS Connect for TCP/IP connectivity
  - Supports operational compatibility with other link types (CTC, MTM, VTAM)
    - Starting, stopping, updating, displaying, and assigning resources
  - TCP/IP generic name support
    - Similar to VTAM Generic Resources

| IMS1 | SCI | IMS Connect | TCP/IP | IMS Connect | SCI | IMS2 |

- Value
  - Expect greater bandwidth than VTAM
  - Allows installations to standardize on TCP/IP

IMS Connect Type-2 Commands

Solution

- Type-2 Commands may be used with IMS Connect

- Commands are issued from OM client

  - TSO SPOC, IMS Control Center, REXX SPOC API, Batch SPOC

- New Type-2 commands for IMS Connect resources

  - QUERY IMSCON   and UPDATE IMSCON

  - IMS Connect Resources

    - Datastore, Link, Port, Alias, Converter, etc.

- Can coexist with the previous WTOR and z/OS Modify commands

  - All functionality is included in the type-2 commands

Value

- IMS and IMS Connect may be controlled from a single point of control

- One command may receive consolidated output from multiple IMS Connects

Additional IMS Connect Enhancements

Solution

- Ability to refresh XML converters 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) ACK NoWait for RYO clients
- Partial read status – new client connection status indicating read/wait
- Load modules for IMS-provided exits – no need to assemble/bind

Value

- Enable customers to use IMS Connect more easily while providing better performance and diagnostics

Enhanced OTMA Security

Solution

– One RACF ACEE for the same userid is created and cached for all of the OTMA clients
– 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
– Earlier notification of OTMA clients when IMS is terminating
– Higher IMS availability for applications

Enhanced APPC/OTMA Synchronous Shared Queues

Solution

- Provide option to use MVS Cross Coupling Facility (XCF) for communication instead of RRS between Shared Queues Front-End and Back-End systems
  - IMS is the sync point manager rather than RRS
  - AOS= parameter specifies new options to use XCF
  - New AOSLOG= parameter to request 6701 log record
- Remove RRS dependency for APPC's synchronous conversation and OTMA's Commit Mode 1 (send-then-commit) with sync level of NONE or CONFIRM

Value

- Improve performance and simplify the syncpoint process by using XCF

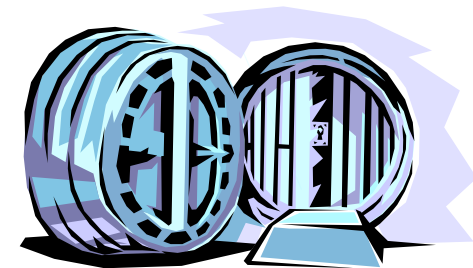# IMS 12 Systems Management Enhancements

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

Solution

- Simplifies IMSplex DRD resource management
- Provides a single centralized store for the DRD resource definitions
  - Usage of IMS repository is optional, DRD users can continue to use Resource Definition Data Set (RDDS) instead of the repository
- Allows DRD resource definition changes to be made in repository and rolled to one or more active IMS systems

Value

- Simplified management of DRD resource definitions
- Eliminates the need for managing multiple Resource Definition Data Sets (RDDS) for each IMS

Import Command Enhancement

Solution

– IMPORT command may be used to update resources

- Previously, IMPORT was not allowed for existing resources
  - Updates required deletion then IMPORT
- IMS 12 allows IMPORT for existing resources
  - OPTION(UPDATE) must be included in command
  - Resource is updated if it already exists

Value

– Usability of IMPORT and DRD is enhanced

Logger Enhancements

Solution

- Extended Format support for OLDS and SLDS
  - Allows OLDS and SLDS to be striped
- OLDS buffers may be in 64-bit virtual storage
- WADS management changed to be more efficient
  - Track groups no longer used
  - WADS written in simple wrap-around fashion

Value

- Increased logging speed and bandwidth
- Reduced ECSA usage
- Smaller WADS
- Better use of storage system cache by WADS

IMS 12 Additional Information

IMS 12 Information

➢ *IMS 12 Announcement Letter 210-315*

    ➢ *http://www-01.ibm.com/common/ssi/cgi-bin/ssialias?subtype=ca&infotype=an&appname=iSource&supplier=897&letternum=ENUS210-315*
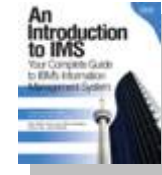
➢ *IMS 12 Article in IBMSystems Magazine*

    ➢ *http://www.ibmsystemsmag.com/mainframe/IMS_v12/34748p1.aspx*

➢ *IMS 12 Info Center & Release Planning (GC19-3019)*

    ➢ http://publib.boulder.ibm.com/infocenter/dzichelp/v2r2/topic/com.ibm.ims12.doc/imshome_v12.htm

IMS Information and Education

- "*An Introduction to IMS*" book available
- New IMS Redbook available
  - IMS Version 11 Technical Overview SG24-7807 at http://www.redbooks.ibm.com/abstracts/sg247807.html
  - IMS Version 11 Open Database SG24-7856 at http://www.redbooks.ibm.com/abstracts/sg247856.html
- IMS Family Website: www.ibm.com/ims
  - IMS education schedule
  - Presentations, papers, newsletters, fact sheets, announce letters, redbooks
  - Schedule of seminars, webcasts and conferences
  - **IOD Oct 24-28, 2010 Las Vegas**
- Information center - enables search across IMS, DB2 and Tools documentation
- Additional technical support info at *www.ibm.com/support/techdocs* (search on IMS)
- Migration, skills transfer, customized offerings at *ibmdds@us.ibm.com*

Data Management Communities for IMS

➢ Data Management Community – share and interact on all Data Management topics with peers around the world

❖ www.ibm.com/software/data/management/community.html

➢ IMS Community – share and interact with IMS peers around the world

❖ http://www-01.ibm.com/software/data/ims/community/

➢ IMS Regional User Groups – find a meeting near you

❖ www.ibm.com/software/data/ims/usergroups.html

➢ IMS Application Development Forum

❖ www.ibm.com/developerworks/forums/forum.jspa?forumID=1632

➢ Information Champions – recognizes individuals who have made the most outstanding contributions to the Information Management community

❖ www.ibm.com/software/data/champion

➢ Rational Cafes – for host application programming languages

❖ www.ibm.com/software/rational/cafe/index.jspa

➢ COBOL Cafe – IMS Hub for application programmers

❖ www.ibm.com/software/rational/cafe/community/cobol/ims?view=overview