IMS 12 Overview

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Topics

- IMS Trends and Directions
- IMS V12 Overview
- IMS Enterprise Suite V2.1
IMS Roadmap

- New major version every 2-3 years
  - IMS 10 GA Oct 2007
  - IMS 11 GA Oct, 2009
  - IMS Enterprise Suite 1.1 - Nov 6, 2009
  - IMS 12 GA Oct, 2011
  - IMS Enterprise Suite 2.1 - Oct, 2011

- Support
  - Two current supported field releases
  - N-2 release out of service 1 year after current release GA

- Strategy
  - Simplification
  - Integration
  - Usability
  - Performance
IMS Roadmap …

- IMS 7 – went out of support in September 2005
  - High Availability Large Database – The IMS partitioning solution
  - IMS Java – 1st Step
  - IMS Java – 2nd Step
  - New architecture for better Parallel Sysplex operation management – CSL 1st Step
  - Online Reorganisation without restrictions for HALDB – 1st Step
  - Storing XML in IMS Databases
  - IMS Java – 3rd Step
  - Distributed JDBC access to IMS Databases

- IMS 10 – GA in October 2007 – End of support November 12, 2012
  - Dynamic resource definition
  - Operation management enhancements
  - SOA Connectivity enhancements including IMS async and sync callout capability
  - Extensive use of the Common Service Layer – CSL 2nd Step
- IMS 11 – GA in October 2009
  - IMS Open Database for IMS database access in z/OS IMSPlex or from distributed environments
  - Quiesce function to reduce the complexity in establishing a recovery point for a database
  - Online Reorganisation without restrictions for HALDB – 2nd Step
  - IMS Connect, OTMA enhancements
- IMS 12 – GA in October 2011
  - FP Secondary indices
  - IMS repository

Supported Versions of IMS
The IMS Strategy

- **Do more with less!**
  - Reduce CPU utilization
  - Work in memory (above the bar)
  - Remove expired workload

- **Infrastructure improvements for the Future!**
  - Performance is NOT an option!
  - Capacity - Supporting workload consolidation
  - And also availability, serviceability, security

- **Simplify IMS utilization (management of IMS systems as well as IMS application development)**
  - More intuitive UIs and interfaces to talk to IMS
  - More autonomic IMS Tools
    - Address the changing skills profiles in customers

- **Enhance and simplify integration of IMS assets with SOA and other Web solutions**
  - Support of SOA standards
  - Support of Web 2.0 for lightweight integration and rapid web application assembly
Strategy - Do More with Less and Enhance the Interface

- IMS – lowest cost per transaction DBMS
- IMS DB – less disk space and CPU
- 25% CPU Reduction IMS Connect – V10
- FP 64 bit buffers – V11
- Transaction Expiration – V11
- Up to 25% CPU Reduction for OLR – V11
- zAAP offload for IMS Java, SOAP Gateway, XML converter, IMS TM Resource Adapter
- zAAP on zIIP with z/OS 1.11
- ZIIP offload for request response processing from CF for CQS managed SQ or resource structures – V12
- FF database pools in 31-bit virtual, backed by 64-bit real storage – V12
- CICS threadsafe support to eliminate TCB switches – V12
- Ability to increase logging speed and bandwidth – V12
- Bucket for each new release with MIPS reduction items
Strategy - Simplification

- Challenge: help address the IMS skills availability issues
  - Use industry available Systems Admin and AD skills
  - **Solution: more intuitive UIs and interfaces to talk to IMS**
    - Eclipse based tooling for Application Development
    - SQL support from Java with Open Database – IMS 11
    - More consistency with z/OS, CICS, DB2, Omegamon for IMS for Operational Interfaces

- Challenge: Planned outages and manual tuning
  - **Solution: Greater agility in changing and controlling the IMS environment**
    - Online Reorganization – IMS 9
    - Dynamic Resource Definition – IMS 10
    - Database Quiesce – IMS 11
    - Dynamic allocation of ACBLIB data sets – IMS 11
    - Dynamic Database Buffer Pools – IMS 12
Strategy – Integration

- IMS application modernization
  - The challenge: evolution of “green screen” applications written in 1970-1980’s
    - Need to be accessed from distributed environments
      - Connectivity
      - Coexistence with modern programming languages
    - Solution: renovation versus “rip and replace”
      - IMS Integration Suite – IMS TM Resource Adapter
      - IMS Enterprise Suite SOAP Gateway
        - Target web services implementations
        - Top down, bottom up, meet in the middle

- Interoperability with remote web services
  - Solution:
    - IMS asynchronous and Synchronous Callout
    - Support with both IMS TM Resource Adapter and IMS ES Soap Gateway
Strategy – Integration …

- **Visualize**
  - DLI Model Utility
  - Or IMS ES V2.1 Explorer

- **Analyze**
  - Rational Asset Analyzer (RAA)

- **Develop + Debug + Test**
  - Rational Developer for System z (RDz)

- **Modernize**
  - IMS SOA Integration Suite / IMS Enterprise Suite + RDz

- **IMS Data**

- **COBOL Application**

- **Web Application**
Strategy – Integration …

- **IMS Java**
  - JMPs and JBPs traditionally run in IMS Java Dependent Regions
  - Supports Java and Cobol interoperability
  - Challenge: access from Cobol to Java within an IMS MPRE
  - **Solution:** IMS APARs for V10, V11 and base support for IMS V12
    - Ability for Cobol to call Java in an IMS MPR
      - Supports a persistent JVM in MPP/BMP/IFP regions

- **Open integration to IMS databases**
  - Challenge: direct and simple access to IMS database resources
  - **Solution:** IMS Open DB with ODBM (V11)
    - Provides an industry standard mechanism (Distributed Relational Database Architecture - DRDA) that can access IMS databases from z/OS and distributed environments
  - **Solution:** The IMS Universal Drivers
    - Support a JDBC – SQL call interface to IMS DB
      - Metadata generation and testing with the IMS Enterprise Suite V2.1 Explorer
And even Beyond

- Solutions that take advantage of OPEN DB
  - Cognos
  - Optim Data Studio
  - Data Source Explorer (with RDz, RAD),
  - IMS Explorer
  - Hibernate
  - SQL Squirrel
  - … and any product that supports a standard JDBC driver interface

- Other database solutions
  - InfoSphere Classic Replication Server
    - IMS Replication
  - InfoSphere Classic Data Event Publisher (CDC)
  - InfoSphere Classic Federation Server
  - InfoSphere Optim Data Growth Solutions for z/OS with Classic Federation for IMS
  - InfoSphere Guardium
    - Data encryption for DB2 and IMS
    - Change Data Capture for IMS
IMS 12 Overview
IMS Version 12

- **Announced on October 4, 2011**
  - Announcement letter 211-365
  - General Availability October 28, 2011

- **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 Version 12 ...

- Detailed results of internal performance tests
- Environment, functions tested, MIPS and throughput results

Available for download at
- www.ibm.com/ims

IMS 12 Overview
IMS 12 Highlights

Database Management

- Full Function Database
  - Extended Addressability Support (EAV) Support
  - FF Dynamic DB Buffers
  - FF DB Storage Enhancement
- Fast Path
  - FP Buffer Manager 64 bit Enhancements
  - FP DEDB Secondary Index Enablement
  - Additional FP Enhancements
- DBRC
  - DBRC Enhancements
  - Migration/Coexistence
- CICS Threadsafe Support

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 Enterprise Suite V2.1

- IMS ES Soap Gateway
- IMS ES Connect APIs for Java and C
- IMS ES DLIModel Utility Plug-In
- IMS Explorer
- IMS ES Java Message Service (JMS) API
IMS 12 DB and DBRC Enhancements
Extended Address Volume Support

Solution

- DS8000 or DS8700 Storage Subsystem
- 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 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
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
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
CICS Threadsafe Support

Solution

- CICS 4.2 adds support for threadsafe IMS database calls with IMS 12
- Eliminates TCB switches for IMS database calls
  - Without threadsafe support, IMS call must be done under an IMS TCB
    - Requires switch from CICS QR TCB to IMS TCB and back to CICS QR TCB
    - If application is running under an OPEN TCB, it also requires a switch from OPEN TCB to QR TCB and back from QR TCB to OPEN TCB
  - With threadsafe support, IMS call may be done under a CICS OPEN TCB
    - No TCB switch
    - CICS has multiple OPEN TCBs
      - Multiple DLI calls may be done in parallel under CICS OPEN TCBs
  - Enhancement applies to both EXEC DLI and CALL DLI
- Requires IMS 12 APAR PM31420

Value

- Lower CPU use
- Increased throughput
CICS Threadsafe Support …

**Threadsafe Support**

- OPEN TCB
  - EXEC CICS
    - process CICS cmd
  - EXEC SQL
    - process DB2 call
  - EXEC DLI
  - …

- QR TCB
  - switch

- IMS TCB
  - process IMS call
  - switch

**With Threadsafe Support**

- OPEN TCB
  - EXEC CICS
    - process CICS cmd
  - EXEC SQL
    - process DB2 call
  - EXEC DLI
    - process IMS call
  - …
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

- Value
  - Leverages the use of TCP/IP between IMS systems
  - 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

- 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
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
IBM IMS Tools
IMS Tools Information

- Some products may require updates
  - Contact your vendors for information on requirements
  - IBM has a web site with consolidated information about requirements for IBM IMS tools with IMS 12
    - http://tinyurl.com/br8y2o7

Key:
- **NS** = Not Supported
  The product does not function properly on IMS V12.
- **T** = Tolerate
  Allows the product to execute as it did on a previous release of IMS, but does not utilize any of the new IMS V12 functions.
- **E** = Exploit
  The product utilizes the new functions and features available in IMS V12.

Note: If a prior release of a product is not listed in the matrix, it is not supported on IMS V12. New products that have been released after this matrix was published, contact your IBM Sales Representative for IMS V12 compatibility.

<table>
<thead>
<tr>
<th>IMS Tools</th>
<th>V10</th>
<th>V11</th>
<th>V12 Support</th>
<th>Comments</th>
<th>PTF number(s)</th>
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<tbody>
<tr>
<td>Data Encryption</td>
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IMS Tools - Highlights

- New IMS Tools Solution Packs

<table>
<thead>
<tr>
<th>&gt; Database Solution Pack</th>
<th>&gt; Recovery Solution Pack</th>
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<tr>
<td>&gt; Fast Path Solution Pack</td>
<td>&gt; Tools Base</td>
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<tr>
<td>&gt; Performance Solution Pack</td>
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</tbody>
</table>

- Solutions

  - In general, IBM will support the latest stand-alone version of every tool as well as their Solution Pack counterpart if one exists
    - Special circumstances not withstanding
  - Latest versions of TOSI, Generic Exits, IMS Tools Knowledge Base, and HD Compression Extended are only supported in the IMS Tools Base for z/OS.
  - Fast Path Secondary Index creation tool is included in FP Solution Pack
Other Tooling

- Rational Developer for System z
- IMS Enterprise Suite V2.1
Rational Tooling

- **Rational Developer for z**
  - Common development environment for COBOL, PL/I, C/C++, and Java

![Image of Rational Developer for zOS](image.png)

- **LPEX Editor ISPF LPEX etc**
- **Remote zOS JES**
- **MVS files TSO Emulator**
- **Program Outline**
- **zOS Project**
- **Errors, Warnings, etc**
- **Error list in Problems view**
Rational Tooling …

- IMS-Specific RDz capabilities
  - IMS Code Snippets: 6 categories for adding IMS COBOL code to zLPEX Editor
  - Snippets are organized by category, and can be dragged and dropped onto a code insertion point.
  - Users can develop and share their own snippets to the view

Categories of IMS Snippets:

- IMS Transaction Management for COBOL
- IMS Database Management for COBOL
- IMS DB System Services for COBOL
- IMS TM System Services for COBOL
- IMS Application Interface Masks for COBOL
- IMS DL/I Function Codes for COBOL
A set of components that support open integration technologies
  - Enhanced from V1.1
  - Support IMS 10, 11, and 12
    - Some capabilities such as those that support Open DB require IMS 11 or later

  - Program number: **5655-T62**
    - Available for no fee to IMS license holders

  - Release notes for V 2.1:
    http://www-01.ibm.com/support/docview.wss?rs=81&uid=swg27022166/
    or
    http://tinyurl.com/7y3px39
IMS Enterprise Suite V 2.1…

- IMS Enterprise Suite Connect APIs for C/C++ and Java
  - Simplifies application development for stand-alone, user-written IMS Connect clients

- IMS Enterprise Suite SOAP Gateway
  - Provides a solution for integrating IMS assets in an SOA environment that supports:
    - Exposing an IMS application as a web service
    - Calling out to a web service from an IMS application
    - Emitting business event data to an event processing engine

- IMS Enterprise Suite Java Message Service (JMS) API
  - Supports synchronous callout request to external services from within an IMS Java message processing (JMP) or Java batch processing (JBP) application

- IMS Enterprise Suite DLIModel utility plug-in (eclipse-based)
  - Translates IMS source files into reliable, application-independent metadata that can be used for Java application development

- IMS Enterprise Suite Explorer for Development
  - **New** capability that enhances the functionality previously provided only in the DLIModel utility plug-in
IMS Enterprise Suite V 2.1 …

- **IMS Explorer**
  - Previously available only as a technical preview
  - An Eclipse-based graphical tool
    - Simplifies IMS application development tasks such as updating DBD and PSB source
  - Graphical editor
    - Displays IMS segment hierarchy and database structure
    - Used to display and create PSBs
    - Used to display, edit and add fields in DBDs
    - Generates DBD and PSB source
IMS Enterprise Suite V2.1 …

- IMS Enterprise Suite – IMS Explorer …
  - IMS database structures
IMS Enterprise Suite V2.1 …

- IMS Enterprise Suite – IMS Explorer …
  - PSB and PCB definitions
IMS Enterprise Suite V2.1 …

- IMS Explorer – Support for JDBC/SQL calls to IMS DB

Graphically-driven editors to display and update IMS program and database definitions.

Graphical interface to easily access and manipulate IMS data using standard SQL.

Generate SQL to access IMS data.

See database relationships.

Change DBD and PSB definitions.
Additional Information
IMS 12 Information

- **IMS 12 Announcement Letter 211-365**

- **IMS 12 Article in IBMSystems Magazine**

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

- Just released!
- Discusses all IMS 12 capabilities from a user perspective
- Draft available for free download at http://www.redbooks.ibm.com
An Introduction to IMS – Second Edition

- Updated to include IMS 10, IMS 11 and IMS 12 functions
- Available for pre-order
- Will ship December 2011
Summary

IMS continues to invest in innovation and

- Modernize Application Interoperation/Integration by
  - Standardizing tools/interfaces to speed deployment

- Streamline Installation/Management by
  - Simplifying Interfaces to ease operations
  - Heightening availability and increasing Productivity

- Enable Efficient Growth by
  - Alleviating bottlenecks
  - Reducing costs
  - Optimizing performance and resilience