

2023 CCDUG: New Functions in IMS, 2020 – to Date

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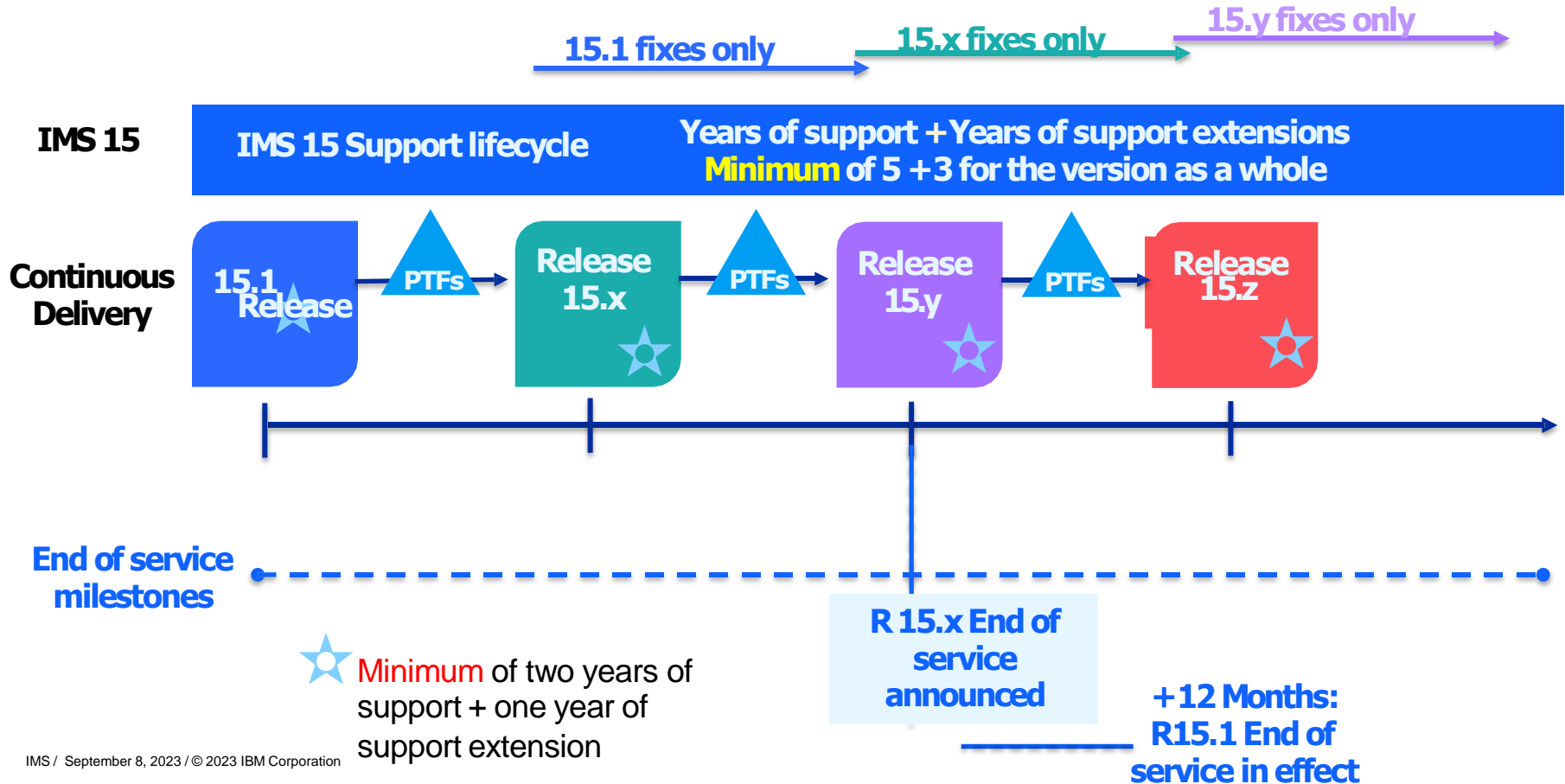
September 18th, 2023



IMS 15 release timelines

IMS Release	GA date	EoS
IMS 15.1	October 31, 2017	
IMS 15.2	March 20, 2020	June 30, 2025
IMS 15.3	June 24, 2022	
IMS 15.4	June 16, 2023	

Continuous delivery lifecycle



Over 70 Enhancements since IMS 15.1 was released.



55+ Specifically on IMS 15

Span all areas of IMS

- TM (OTMA, IMS Connect, ...)
- DB (Encryption, IMS Managed ACBs, DDL, ...)
- Systems (logger, user exits, security. ...)
- Application Enablement (Java, Open DB, UDB, ...)

Covers various aspects of capabilities

- Performance
- Scalability
- Security
- Usability

- Enable zHyperWrite support for OLDS
- Log record read progress message issued at restart
- Parallel DL/I Mode Indicator
- TM RA Transaction Tracking
- Improved OTMA Output Message Processing
- OTMA LUMP Default Allocations and Flood Control Enhancement
- IMS Connect DRDA PassTicket Support
- Control Segment Mapping Support
- ODBM and Driver Support for INIT STATUS GROUPx Call
- Miscellaneous Universal Driver Enhancements
- Protect sensitive data in DEDB data sets
- Change Capture suppress CCTL capture records
- IMS Catalog API HLQ and Staging Directory support

- Simplified startup of SCI, OM and RM
- Improved usability of Logger support of zHyperWrite
- Data Privacy for Diagnostics Support for IMS 64-bit Storage.
- OTMA Performance Enhancement
- OTMA Storage Enhancement
- Reduce storage usage for OTMA TPIPEs
- Passphrase Support for IMS Connect API and Universal Drivers
- Abend Reduction and improved Diagnostics for UDB applications
- REXXIMS MAPDEF Packed Decimal Function Enhancement
- IMS Universal Drivers ArrayResultSet
- Enhancement IMS Universal Drivers ByteBuffer Enhancement
- Allow granular IMPORT of catalog resources
- IMPORT OPTION(NOCHECK)
- Improve IMPORT performance
- Batch DDL Utility Enhancement.

- IMS Support for z/OS Workload Interaction Correlator (zWIC)
- Static Terminal Output Security
- OTMA Lightweight TPIPE
- JDBC Hex and Binary Literal Support
- Protect sensitive data in OSAM data sets (15.2)
- Non-structural Catalog Changes Without an Outage
- CATALOG PURGE UTILITY DBRC Staging Directory Command Support

- IMS Fast Monitor User Exit
- IMS Non-Stop Tran
- Performance Enhancement for IMS TM and Db2 Customers Using RACF
- 31-bit COBOL 64-bit Java Interoperability
- >2048 DEDB Area support
- OSAM Encryption 64-bit Support

- ICON Send-only with Error Protocol
- IMS DB Fence
- IMS Native z/OS DDL Utility (15.3)
- DDL Audit Trail in Readable Format Catalog
- DEDB CDC Exit Parameter
- IMS Catalog API Enhancement for open
- Catalog API (DFS3CATQ) Optionally Exclude Extended Attribute Metadata
- Catalog Library Build Utility GSAM Support
- IMS Compliance Data Externalization for OM and IMS Connect
- IMS JDBC Map Case enhancement

- Non-stop PSB after an application abends in a non-message-driven BMP region
- INQY ENVIRON2 enhancement
- Bypass extent check for DEDB data sets
- IMS Catalog Maintenance utility (DFS3CM00) enhancement
- IMS Data Definition utility (DFS3ID00) DLIBATCH enhancement (15.4)
- RACF PassTicket support for commands from IMS Connect to IMS OM

Where to get more info



IBM IMS Documentation:
<https://www.ibm.com/docs/en/ims/15.4.0?topic=enhancements-ims-enhancement-ptfs>

All products / IBM IMS / 15.4.0 / Change version

Was this topic helpful? Yes No

IMS enhancement PTFs

Last Updated: 2023-06-16

Until a new version of IMS is released, IBM® continues to enhance the most recently released version of IMS. The enhancements, which can include one or more new IMS functions or support for new technologies or products, are released as PTFs.

The following topics provide an overview of the IMS continuous delivery model and a list of the newest IMS functions.

- [The IMS continuous enhancement process](#)
IMS uses a continuous delivery model to enhance the most recent in-service version of IMS. In the continuous delivery model, as soon as new IMS function or support for new technology is developed and tested, it is immediately released in a PTF.
- [IMS 15.4 Database Manager continuous delivery functions](#)
IMS 15.4 Database Manager functions are delivered using PTFs as part of the IMS continuous delivery enhancement process and allow you to use new enhancements faster and more frequently.
- [IMS 15.4 system continuous delivery functions](#)
IMS 15.4 system functions are delivered using PTFs as part of the IMS continuous delivery enhancement process and allow you to use new enhancements faster and more frequently.
- [IMS 15.4 Transaction Manager continuous delivery functions](#)
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Parent topic:
→ [IMS 15.4 enhancements](#)



All products / IBM IMS / 15.4.0 / Change version

Was this topic helpful? Yes No

IMS 15.4 Database Manager continuous delivery functions

Last Updated: 2023-08-11

IMS 15.4 Database Manager functions are delivered using PTFs as part of the IMS continuous delivery enhancement process and allow you to use new enhancements faster and more frequently.

Table 1. IMS Database Manager continuous delivery enhancements

Function description	APAR, PTF, and release date	IMS version	Applicable for batch environments?	IMS Tools
IMS Data Definition utility (DFS3ID00) DLIBATCH enhancement The IMS Data Definition utility (DFS3ID00) DL/I batch enhancement improves the DFS3ID00 utility, allowing it to be run in a DL/I batch region.	PH51761/ UI91330 June 2023	15.4 and later	No	Not impacted
IMS Catalog Maintenance utility (DFS3CM00) enhancement The IMS Catalog Maintenance utility (DFS3CM00) fixes incorrect entities in the catalog such as header timestamps and PARTYPE values. It can be run in either a DL/I region or a BMP region.	PH47533/UI91647 May 2023	15.1 and later	Yes	Not impacted
Bypass extent check for DEDB data sets This enhancement is added to the available Fast Path options. When enabled, it specifies that	PH26898/UI91084	15.1 and	No	Not impacted

Making your DBAs life easier

- [Protect](#) sensitive data in DEDB data sets
- [Protect sensitive data in OSAM data sets](#)
- [Storage relief](#) with OSAM Encryption 64-bit Support
Improve IMS replication [performance](#) suppressing CCTL capture records
- [Protect](#) replicated data with the IMS DB Fence (15.2)
- [Scale your DBs with >2048 Areas for DEDB](#)
- Non-structural Catalog Changes [Without an Outage](#)
- [Simplify operations](#) by allowing more granular IMPORT of catalog resources
- Improve IMPORT [performance](#)
- [Simplify operations](#) with IMPORT OPTION(NOCHECK)
- [Simplify usage](#) with the IMS Catalog API HLQ and Staging Directory support
- [Simplify usage](#) by allowing up to 30 concurrent catalog opens with the IMS Catalog API
- [Reduce storage](#) needs with Catalog API (DFS3CATQ) Optionally Exclude Extended Attribute Metadata
- [Simplify operations](#) with DBRC Staging Directory Command Support
- Increase [availability](#) with the Catalog Purge Utility mACB BMP Support
- [Improve capability](#) to generate GSAM info with the Catalog Library Build Utility
- [Simplify operations](#) with improved DEDB CDC Exit support in the catalog
- [Simplify operations](#) with the Batch DDL Generation Utility
- [Simplify operations](#) with the IMS Native z/OS DDL Utility (15.3)
- DDL [Audit](#) Trail in Readable Format
- [Improve](#) HSSP and HSRE [performance](#) in some DASD mirroring environments
- [Improve](#) catalog data with the Catalog Maintenance Utility
- [Simplify](#) operations by submitting DDL while IMS is offline (15.4)

Modernize your applications

- [Improve security](#) with IMS Connect DRDA PassTicket Support
- [Improve flexibility](#) Control Segment Mapping Support
[Improve availability](#) ODBM and Driver Support for INIT STATUS GROUPx Call Miscellaneous Universal Driver Enhancements
- [Abend Reduction](#) and [improved Diagnostics](#) for UDB applications
- [Improve flexibility](#) with the IMS Universal Drivers ArrayResultSet Enhancement
- [Improve flexibility](#) with the IMS Universal Drivers ByteBuffer Enhancement
- [Improve flexibility](#) with the JDBC Hex and Binary Literal Support
- [Improve flexibility](#) with [the 31-bit COBOL 64-bit Java Interoperability](#)
- [Improve flexibility with the](#) REXXIMS MAPDEF Packed Decimal Function support
- [Improve flexibility](#) with more information form INQY call
- [Simplify programming](#) with removeInvalidCaseFields support for JDBC map cases



Remove those Transaction Manager constraints

- Add [auditability](#) with TM RA Transaction Tracking
- [Lower response time](#) with improved OTMA Output Message Processing
- Improve [resiliency](#) OTMA LUMP Default Allocations and Flood Control Enhancement
- OTMA [Performance](#) Enhancement
- OTMA [Storage](#) Enhancement
- [Reduce storage](#) usage for OTMA TPIPEs
- OTMA Lightweight Support
- [Passphrase Support](#) for IMS Connect API and Universal Drivers
- ICON Send-only with Error Protocol
- Static Terminal Output [Security](#)

Simplify, secure and improve you IMS system

- Improve hardware [replication performance](#) with zHyperWrite support for OLDS
- Improved [usability](#) of Logger support of zHyperWrite
- Log record read progress message issued at restart
- Parallel DL/I Mode Indicator
- [Simplified](#) startup of SCI, OM and RM
- [Data Privacy](#) for Diagnostics Support
- Improve [serviceability](#) IMS Support for z/OS
- Workload Interaction Correlator (zWIC)
- IMS Fast Monitor User Exit performance improvement
- Improve [availability](#) with IMS Non-Stop Tran support for IFPs
- IMS [Compliance](#) Data Externalization for OM and IMS Connect
- [Performance](#) Enhancement for IMS TM and Db2 Customers Using RACF
- [Improve availability](#) with enhancements to the Non-Discardable Messages exit (DFSNDMX0)
- [Improve security](#) with IMS Connect commands pass ticket support

Database Enhancements



- Protect sensitive data in DEDB data sets
- IMS Change Capture Enhancement - suppress CCTL capture records
- IMS Catalog API HLQ and Staging Directory support

2018

2019

- Allow granular IMPORT of catalog resources
- IMPORT OPTION(NOCHECK)
- Batch DDL Utility Enhancement.

- Protect sensitive data in OSAM data sets
- Non-structural Catalog Changes Without an Outage
- Catalog Purge Utility mACB Support
- DBRC Staging Directory Command Support

2020

- >2048 Areas for DEDB
- OSAM Encryption 64-bit Support

2021

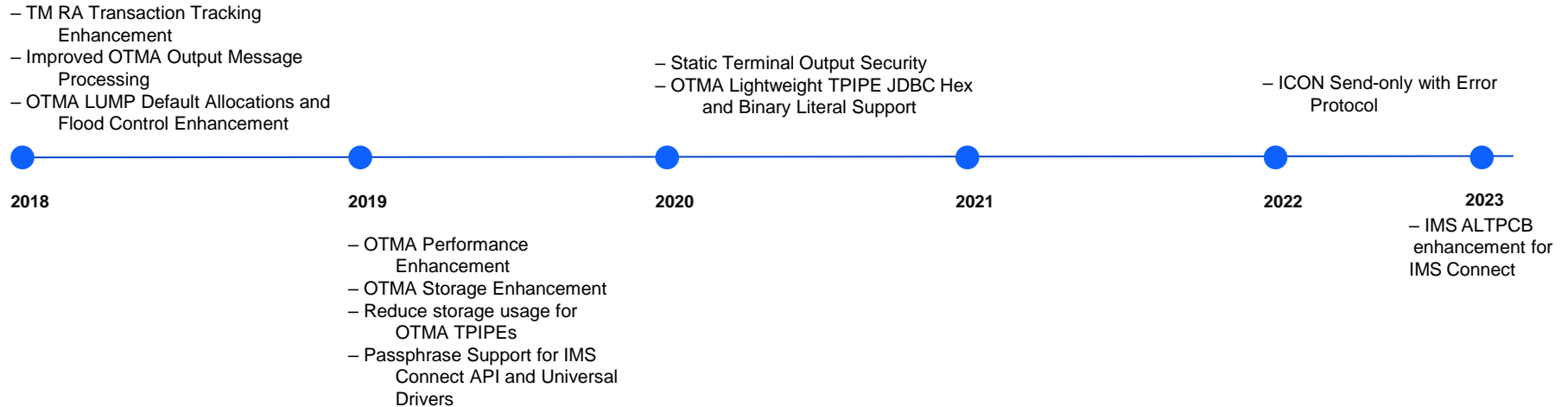
- IMS DB Fence
- IMS Native z/OS DDL Utility
- DDL Audit Trail in Readable Format
- Catalog DEDB CDC Exit Parameter
- IMS Catalog API Enhancement (30 open
- Catalog API (DFS3CATQ) Optionally Exclude Extended Attribute Metadata
- Catalog Library Build Utility GSAM Support

2022

- zDDL DLIBATCH Utility
- Catalog Maintenance Utility

2023

TM Enhancements



Application Modernization



- IMS Connect DRDA PassTicket Support
- Control Segment Mapping Support
- ODBM and Driver Support for INIT STATUS GROUPx Call
- Miscellaneous Universal Driver Enhancements

- JDBC Hex and Binary Literal Support

2018

2019

2020

2021

2022

2023

- Abend Reduction and improved Diagnostics for UDB applications
- REXXIMS MAPDEF Packed Decimal Function Enhancement
- IMS Universal Drivers ResultSet Enhancement
- IMS Universal Drivers ByteBuffer Enhancement

- *31-bit COBOL 64-bit Java Interoperability*

- IMS JDBC Map Case Enhancement

System Enhancements



Skldjakljd

- Enable zHyperWrite support for OLDS
- Log record read progress message issued at restart
- Parallel DL/I Mode Indicator

- IMS Support for z/OS Workload Interaction Correlator (zWIC)

- IBM Z Compliance Support

2018

2019

2020

2021

2022

2023

- Simplified startup of SCI, OM and RM
- Improved usability of Logger support of zHyperWrite
- Data Privacy for Diagnostics Support

- IMS Fast Monitor User Exit
- IMS Non-Stop Tran

Security



Your data is important. We continue to enhance our authentication protocols, audit trail, and encryption support

– TM RA Transaction Tracking Enhancement

– IMS Connect DRDA PassTicket Support

– Protect sensitive data in DEDB data sets

– Static Terminal Output Security

– Protect sensitive data in OSAM data sets

– DDL Audit Trail in Readable Format

– IBM Z Compliance Support

2018

2019

2020

2021

2022

2023

– Data Privacy for Diagnostics Support for IMS 64-bit Storage.

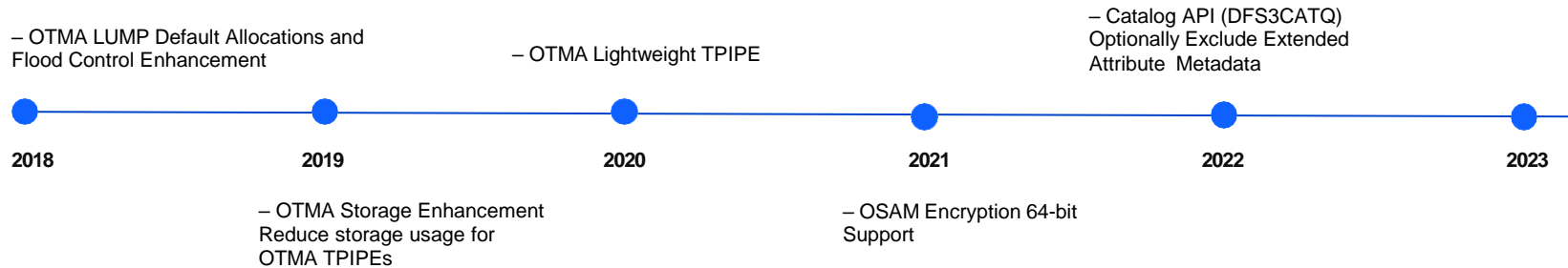
– OSAM Encryption 64-bit Support

– ICON commands pass ticket support

Scalability



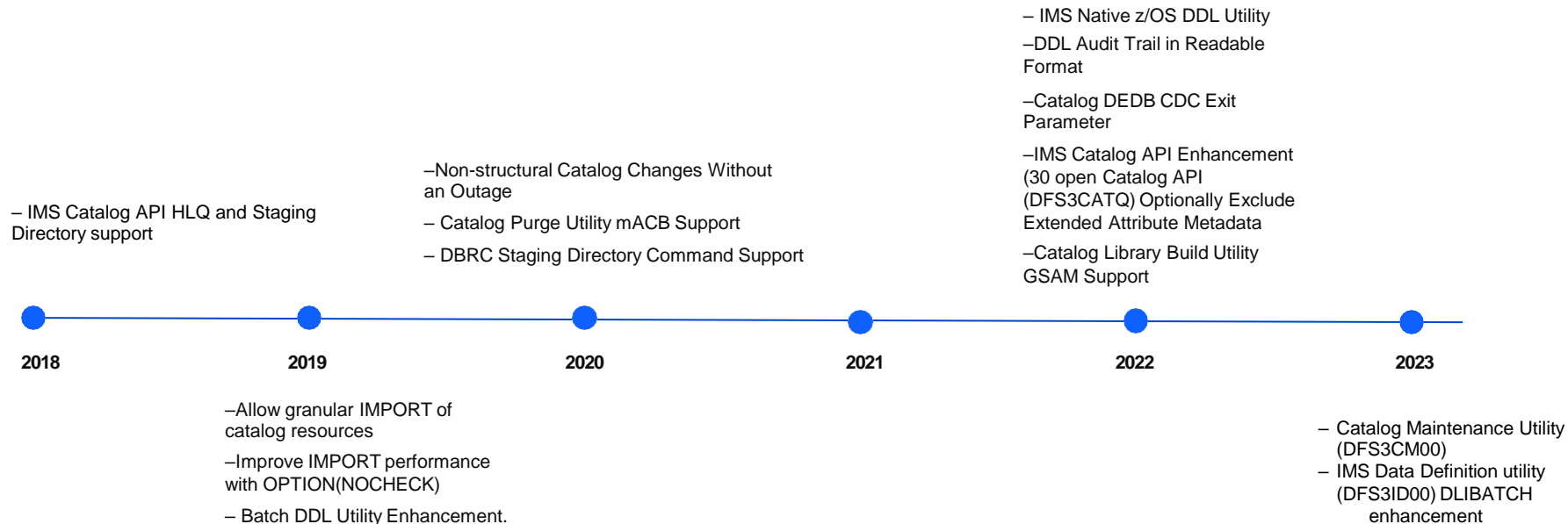
IMS has a continual focus on removing impediments to grow your workload.
Enhancements remove bottlenecks and reduce storage constraints



Embracing the Catalog



The IMS catalog and DDL are key to the future strategic directions for IMS. Many enhancements to make their usage is more intuitive and usable have been implemented. And more to come.



Log record read progress message issued at restart

IMS restart is changed to issue new message DFS5055I to indicate log read progress to help analyze restart problems. This message contains the log sequence number of the previously read log record. DFS5055I is issued in the following cases:

- When first starting to read the log for normal and emergency restart pass
- When reading the log from the beginning again for emergency restart pass 2
- Every 30 seconds thereafter to indicate progress (if restart takes longer than 30 seconds)
- When the log read process is complete for pass 1 and for emergency restart, when log read process is complete for pass 2

IMS Continuous Delivery: APAR PH01551(10/2018)

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Improves IMS serviceability by providing information on log record read progress during restart.



As an IMS **system programmer**, I want an IMS restart message that indicates log read progress, to help determine whether IMS restart is hung or looping.



Simplified startup of SCI, OM and RM

IMS starts the Common Service Layer address spaces Structure Call Interface (SCI), Operations Manager (OM) and Resource Manager (RM) address spaces automatically when the procedures are defined to IMS.

The DFSCGxxx proclib member and DFSDFxxx proclib member COMMON_SERVICE_LAYER section adds support of RMPROC=*rmproc* parameter, in order to allow the user to specify an RM procedure for IMS to start RM

IMS Continuous Delivery: APAR PH04044 (1/2019)



Simplifies startup of CSL address spaces



As an IMS **system programmer**, I can set up IMS to start all CSL regions automatically.

IMS Support for z/OS Workload Interaction Correlator (zWIC)

- z/OS Workload Interaction Correlator is delivered via **z/OS APAR OA57165**. zWIC gathers statistics from participating applications and generates SMF type 98 records
- With APAR PH15062, IMS becomes a participating application and registers with zWIC during initialization.
- If registration succeeds, IMS delivers statistics to zWIC through an SMF exit, BPENTX00.
 - MPP regions and JMP regions record elapsed time and CPU time, both standard and zIIP, for each normally completed transaction.
 - SMF then logs type 98 records with subtype 1025 to record these statistic.
 - New macro DFSSR98A maps the type 98 subtype 1025 record content. DFSSR98A is also used by the zWIC Navigator in the generation of graphical reports.
- If registration fails, message DFS7431I is issued.

IMS Continuous Delivery: APAR PH15062 (6/2020)



Enhanced performance analysis and anomaly detection



A **DBA/SysProg/L2** person can reduce the time to identify and resolve an anomaly based on unified workload insights across the entire OS stack without any additional staff or specialized skills.

Performance Enhancement for IMS TM and Db2 Customers Using RACF

- Introduces new optional keyword RLA= has been added to the SSM proclib member for Db2 subsystem.
- The accepted parameter is Y or N
 - When RLA=Y is specified for a Db2 entry in SSM= proclib member, the region level ACEE is passed to Db2 at ESS Signon if there is no ESAF_SIGNON_ACEE present and no TCB level ACEE present. This function is disabled by default. RLA= is a keyword-only parameter. It cannot be specified as a positional parameter.



Improved performance



A **system programmer** can make RACF calls at a region level for IMS transactions being sent to Db2 thus allowing for improved performance.

IMS Continuous Delivery: APAR PH33024 (6/2021)

IMS Non-Stop Tran

- DFSNDMX0 has been enhanced to support the message driven IFP regions operation.
- NDMTRNST is the transaction status flag
 - The allowed values that can be specified for NDMTRNST for IFP regions can any number 1 through 7.
 - However, if NDMTRNST=4 (PSTOP) is specified and transaction is defined as Fast-Path exclusive, it will be ignored and the transaction status will be set to STOP.
 - The recommended value for NDMTRNST is 1 which enables the Do not stop Transaction and Program. For both return code 0 and 4, the Transaction and Program will not be stopped..
- To enable calling the NDMX exit for IFP regions, code the new optional parameter and keyword, NDMX_CALLED_FOR=(IFP(Y)), on the USER_EXITS section of the DFSDFxxx member.
 - New optional keywords (MPR, JMP, BMP, IFP) to choose if the exits of type NDMX are called when an application ABENDs occurs in one of these specific dependent regions.

IMS Continuous Delivery: APAR PH31457 (8/2021)



Improved exit support



Enhances DFSNDMX0 exit to support the message driven IFP regions operation.

IMS Compliance Data Externalization for OM and IMS Connect

- Most compliance data for the IMS control region is already accessible to auditing programs in non-OCO control blocks.
- BPE-based address spaces compliance data may be in OCO mapped control blocks
- New non-OCO control blocks have been created to contain consolidated compliance data
- **IMS Connect and OM will provide this compliance data**
- Allows IBM zSecure to collect the data
- Products like IBM Security zSecure Suite can collect this data and provide it in a form that can be consumed by the IBM Z Security and Compliance Center (zSCC)



Improved **auditability** of IMS compliance related configuration data



A security professional can now review compliance data from IMS Connect and IMS Operation Manager.

Improved OTMA Output Message Processing

- Enhancement introduces new IMS ITASK under the member TCB for processing acknowledgement messages from clients
- **New ITASK allows acknowledgement messages to be processed faster** especially when the member ITASK is busy processing other work



Alleviate processing **delays** with enhanced message **processing**



Applications with heavy CM0 or CM1 processing will have reduced potential for TPIPE or IMS Region hang

New IMS Fast Monitor User Exit

- The IMS Fast Monitor User Exit FASTMON provides access to the IMS Monitor data. The FASTMON exit is called during IMS initialization, IMS termination, and at IMS monitor call points for registered SLOG codes, regardless whether the IMS Monitor is on or off.
- The FASTMON user exit provides a similar exit point as the IMSMON user exit. However, the FASTMON exit is optimized to minimize performance overhead, in exchange for certain functional restrictions. The FASTMON user exit:
 - Has a simple register interface for the WRITE call
 - Is not refreshable
 - Cannot use user exit callable services
- All defined FASTMON user exits are called whenever the IMS monitor module DFSMNTR0 is invoked for a monitor event when any FASTMON or IMSMON user exit has registered interest for the specific SLOG code.

IMS Continuous Delivery: APAR PH24963 (7/2021)



Improved performance



A **system programmer** can use vendor tools for monitoring IMS with minimal performance impact.

Reduce storage usage for OTMA TPIPEs

New OTMA Lightweight TPIPEs are being introduced:

- Optional capability that can reduce storage used for TPIPEs
 - up to 72% for TPIPEs created for shared queues back-end processing
 - up to 21% for TPIPEs created IMS callout, reroute, timeout, or unsolicited output in non-SQ environment
- Reduces likelihood of rejecting new messages due to storage constraints during high volume conditions



Reduces time to activate DBD and/or PSB changes in IMS Managed ACB environment



An **end-user** of IMS can submit mobile transactions without getting a rejection due to the OTMA TPIPE flood.

OTMA Storage Enhancement

OTMA was enhanced so that the LUMP storage needed for CM0 IOPCB output will be reduced based on the actual output message size instead of a fixed 38K buffer size.



Improve efficiency with enhanced storage management



Applications using OTMA processing will use less IMS LUMP storage and handle storage management more effectively.

OTMA Lightweight TPIPE

- OTMA lightweight TPIPE function is added to reduce the amount of storage that is needed for each TPIPE, by dynamically allocating the associated ITASKs only when needed.
- By reducing the storage requirement, the back-end IMS in a shared-queues environment can support more TPIPES and avoid reaching the TPIPE flood limit quickly. It also benefits IMS in a non-shared-queues environment by only allocating TPIPE related storage that is needed.
- Function can be enabled by specifying LITETP=YES in the DFSYDT PROCLIB.

IMS Continuous Delivery: APAR PH17832 (03/2020)



Improve efficiency with enhanced storage management



An end-user of IMS can submit mobile transactions without getting a rejection due to the OTMA TPIPE flood

Static Terminal Output Security

- The new STATICOUTSEC= startup parameter allows IMS users to configure IMS to achieve transaction output security for static VTAM terminals without the need for coding user exists, specifically the Physical Terminal Output Edit exit (DFSCTT00 or equivalent).
- STATICOUTSEC= is a new optional keyword in the DFSDCxxx Proclib member. Valid parameter values are ALL, NO, and SREQ
- IMS will automatically discard transaction output messages if the transaction was initiated by a different User ID based on option

IMS Continuous Delivery: APAR PH24997 (6/2020)



Improved security of terminal output messages



A system programmer can ensure that static terminal output messages are only seen by the user who initiated the transaction in order to be compliant with security audits.



ICON Send-only with Error Protocol

- IMS Connect adds a new send-only with error protocol that behaves like the existing send-only protocol, except if an error occurs in IMS Connect, IMS Connect will return an error message back to the client.
- The IMS Connect API support for send-only with error protocol is provided in APAR PH44550. This APAR includes fixes to send-only protocol bug that was returning error messages to client for errors that occur in IMS Connect.

IMS Continuous Delivery: APAR PH41890 (7/2022)



Adds new **resiliency** options



A **system programmer** can view return codes sent from IMS Connect for failed transactions that used the SendOnlyprotocol thus enabling them to quickly diagnose the root cause of transaction failures (Infra, ICON Send).

Passphrase Support for IMS Connect API and Universal Drivers

- An IMS Connect DRDA, Roll-your-own (RYO) and Connect API client can enter a passphrase of up to 100 characters.

IMS Continuous Delivery: APAR PH14651 (7/2019)



Aligns with modern **security** standards



An IMS Connect client can enter a password of 1-8 characters or a passphrase of 9-100 characters enabling IMS customers to be compliant with security audits.



IMS Connect DRDA PassTicket Support

- Allows IMS Connect DRDA Clients to pass in a PassTicket instead of a password for user authentication in IMS Connect for accessing IMS DB through ODBM.
- SQL batch utility enhanced to leverage PassTicket

IMS Continuous Delivery: APAR PI99040

APAR PH02135 (9/2018)

IMS Connect Extensions APAR PH01608



Improved security of user authentication information



As an IMS Connect **DRDA client application**, I want to use a PassTicket for user authentication in IMS Connect to avoid the security exposure of passing in a clear password

ODBM and Driver Support for INIT STATUS GROUPx Call

- ODBM and IMS DB Universal JDBC Driver Support will issue an implicit ODBM INIT STATUS GROUP call at APSB time. Status codes, instead of abend/exception, are returned for an unavailable database.

IMS Continuous Delivery: [APAR PH00366 \(core\)](#)

[APAR PH02698 \(Java\) \(7/2018\)](#)



Alleviate application **failures**



A Java **application programmer** can issue INIT STATUS GROUPx DL/I call over type-4 connections to avoid error conditions that can occur when a database is unavailable

JDBC Hex and Binary Literal Support

- Provides hex and binary literal support in SQL queries running against IMS Universal Drivers
- Use hex and binary literals in INSERT, UPDATE, SELECT, DELETE statements to directly use bytes as parameter values
 - Examples of supported literal formats:
 - Binary: 0b00000100, b'00000100', B'00000100'
 - Hex: 0xF1F1F1, x'F1F1F1', X'F1F1F1'
- Example queries:
 - `SELECT * FROM TABLE WHERE HEX_VALUE = 0xF1F2 and HEX_VALUE3 = x'F1F1' and HEX_VALUE4 = X'F2F1'`
 - `SELECT * FROM TABLE WHERE BIN_VALUE = 0b00000100 and BIN_VALUE3 = b'00000100' and BIN_VALUE4 = B'00000100'`

IMS Continuous Delivery: APAR PH25586 (9/2020)



Extend application agility



An **application developer**, can use standard SQL to specify hex and binary literal values in application or tooling without the need to use custom code.

31-bit COBOL 64-bit Java Interoperability

- A new option, JVM=3164, is added to support LE 31-64 bit interoperability.
- When this option is specified, a 64-bit Java Virtual Machine (JVM) is loaded so that 31-bit COBOL code can interoperate with 64 bit Java code.
- This is in contrast to the existing JVM=31 (for a purely 31 bit LE environment that supports 31-bit COBOL and 31-bit Java) and JVM=64 (for a purely 64-bit LE environment that supports 64-bit Java).

IMS Continuous Delivery: APAR PH37140 (11/2021)



Augment your COBOL applications with Java **w/o storage constraints**



An IMS **application developer** can extend existing 31-bit COBOL applications that run in IMS (MPP, BMP, IFP regions) to make static subroutine calls to 64-bit Java code to expand memory and process more data without a full rewrite

COBOL & Java Interoperability

Existing support

What is COBOL and Java interoperability?

- One 31-bit Language Environment (LE) created by the dependent region to run the COBOL code and the Java code
- Customers have been leveraging this interoperability support to reuse assets and modernize their applications
- But customers need 64-bit Java support

31-bit Java enabled dependent region (JVM=31)
(JMP, JBP, MPR, BMP, IFP)

Language Environment (LE)

31-bit LE Enclave

COBOL code

31-bit JVM

Java code

Active code path:
this OR this

IMS app interface
DFSLI

IMS DLI calls

External
Subsystem
(MQ, Db2...)



COBOL & Java Interoperability

New support

Better application modernization support

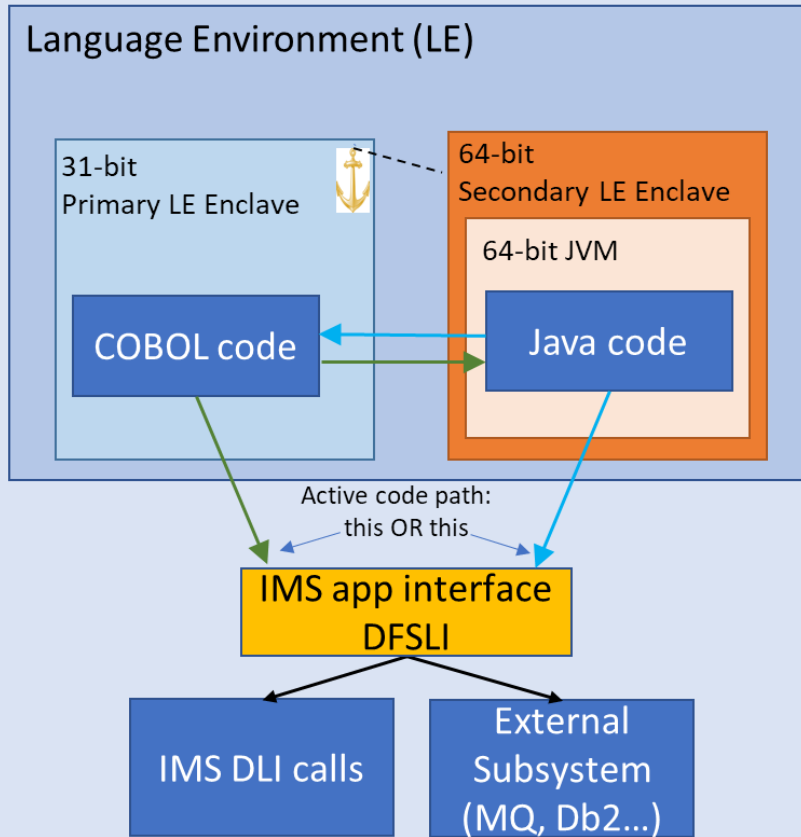
- Customers can now leverage the IMS dependent regions' support for 31-bit COBOL and 64-bit Java interoperability

Two Language Environments:

- One primary 31-bit LE to run the COBOL code
- One secondary 64-bit LE to run the Java code

Support possible because of the features added by LE, COBOL, and Java

64-bit Java enabled dependent region (JVM=3164)
(JMP, JBP, MPR, BMP, IFP)



COBOL & Java Interoperability

Activation

1. Install the **APAR maintenance** that provides the support: IMS(APARs PH37140 and PH47438), LE(latest maintenance), COBOL(latest maintenance), and Java SDK(V8.0.6.36 (latest FixPack)).
2. Update the dependent region's JCL to include the startup parameter **JVM=3164** and add the **SDFSJLIB** to the STEPLIB concatenation.
3. Configure the dependent region to access the latest 64-bit Java 8 SDK
 - LIBPATH= in DFSJVMEV or STDENV DD

```
//      PROC SOUT=A,RGN=56K,SYS2=,
//          CL1=001,CL2=000,CL3=000,CL4=000,
//          OPT=N,OVL=0,SPIE=0,VALCK=0,TLIM=00,
//          PCB=000,PRLD=,STIMER=,SOD=,DBLDL=,
//          NBA=,OBA=,IMSID=,AGN=,VSFX=,VFREE=,
//          SSM=,PREINIT=,ALTID=,PWFI=N,
//          APARM=,LOCKMAX=,APPLFE=,ENVIRON=,
//          JVMOPMAS=,PARDLI=,JVM=3164
// *
// REGION EXEC PGM=DFSRR00,REGION=&RGN,
//          TIME=1440,DPRTY=(12,0),
//          PARM=(MSG,&CL1&CL2&CL3&CL4,
//          &OPT&OVL&SPIE&VALCK&TLIM&PCB,
//          &PRLD,&STIMER,&SOD,&DBLDL,&NBA,
//          &OBA,&IMSID,&AGN,&VSFX,&VFREE,
//          &SSM,&PREINIT,&ALTID,&PWFI,
//          '&APARM',&LOCKMAX,&APPLFE,
//          &ENVIRON,&JVMOPMAS,&PARDLI,&JVM)
// *
// STEPLIB DD DSN=IMS.&SYS2.PGMLIB,DISP=SHR
//          DD DSN=IMS.&SYS2.SDFSJLIB,DISP=SHR
//          DD DSN=IMS.&SYS2.SDFSRESL,DISP=SHR
```

```
*****
HLQ.PROCLIB(DFSJVMEV)
*****
LIBPATH=/tmp:>
javahome/J8.0_64/lib/s390x/j9vm:>
```

New IMPORT option to reduce processing time

- Adds new OPTION(NOCHECK) to IMPORT DEFN SOURCE(CATALOG) command
- Adds support to import database resources with database non-structural changes built using DFS3UACB utility with BLDPSB=NO or DDL that do not include their associated PSBs for the databases in staging directory.
- Adds support to import database resources with database structural changes to have at least one associated PSBs to be included in staging directory when not all PSBs are needed to be rebuilt.
- Adds support to import database resources with database structural changes to bypass catalog directory scan for associated PSBs for the changed databases.

Meant to be used if user **KNOWS** that there is no need to pull in related resources that are not in staging directory.

IMS 15 Continuous Delivery: APAR PH09142 (8/2019)



Reduces time to activate DBD and/or PSB changes in IMS Managed ACB environment



A **Sysprog** or **DBA** can import DBD changes without importing all referencing PSBs in IMS with the IMPORT DEFN command.

Allow granular IMPORT of catalog resources

- The IMPORT DEFN SOURCE (CATALOG) command is enhanced allow IMPORT of specific resources
- New NAME option
IMPORT DEFN SOURCE (CATALOG) NAME(namelist)
- Will only IMPORT the identified pending resources and their associated resources.

IMS Continuous Delivery: APAR PI83433(9/2019)



Reduces time to activate DBD and/or PSB changes in IMS Managed ACB environment



A **Sysprog** or **DBA** can activate specific pending changes in IMS with the IMPORT DEFN command without the need to activate ALL pending changes.

Batch DDL Utility Enhancement

Batch Utility DDL Generator

- Ability to generate DDL CREATE statements:
 - From existing PSB or DBD Source
 - From an existing IMS Catalog

IMS Continuous Delivery: APAR PH02397 (1/2019)



Ease automation of DDL generation of IMS database



A **DBA** can generate DDL from DBD or PSB source or information in the IMS catalog using a batch utility on Z in addition to an UI client

Non-structural Catalog Changes Without an Outage

- Provides DATATYPE=changes to certain fields in the IMS catalog without any outages in a Managed ACB environment
- Changes to IMS Catalog
- DATATYPE=CHAR to DATATYPE=BINARY for the following fields:
 - HEADER segment: ACTTS & PNDTS fields
- DATATYPE=TIMESTAMP to DATATYPE=CHAR for the following fields:
 - HEADER segment: PACTTS, PPNDTS fields
 - DBD segment: TSVERS field
 - PSB segment: TSVERS field
 - PCB segment: DBDTS field
 - DBDXREF segment: TSVERS field

IMS Continuous Delivery: APAR PH14668 (6/2020)



Implement catalog changes **without an outage**



A **sysprog** or **DBA** can implement non-structural changes to the IMS Catalog without an outage in an IMS Managed ACBs environment.

CATALOG PURGE UTILITY

- Enhances the Purge Utility (DFS3PU10) to allow the purging of non-active and non-pending instances from the Catalog while **IMS is online**.
- Active and Pending instances can only be deleted when IMS is offline. If the DFS3PU10 attempts to purge an active or pending instance, it will be rejected with message DFS4550W.
- We intend to delete active and pending instances from the Catalog using DDL.

IMS Continuous Delivery: APAR PI84828 (8/2020)



Implement catalog changes **without an outage**



A **sysprog** or **DBA** can purge instances from the catalog while IMS is online.

DBRC Staging Directory Command Support

- Provides ability to register a new database with DBRC and verify changes before importing changes to the active directory.
- New mutually exclusive keywords ACTIVE and STAGING have been added to the following commands so Managed ACB users can use either the staging directory or the active directory:

CHANGE.PART CHANGE.DBDS

INIT.DBDS INIT.DB

INIT.PART NOTIFY.REORG

IMS Continuous Delivery: [APAR PH17441 \(06/2020\)](#)



Ability to verify new or **changed database definitions** prior to general use



An IMS Professional will be able to define and validate database changes before they are hardened with an IMPORT.

IMS Catalog API Enhancement

The DFS3CATQ API is enhanced to allow access to more than one IMS directory at a time.

- The catalog API is enhanced to support up to 36 concurrent FUNCTION=OPEN requests
 - The FUNCTION=OPEN requests will change the fourth character of the DD name prefix to locate a DD that is not in use. If DD name is not in use, it will be used by that request until the corresponding FUNCTION=CLOSE is issued
- Thirty-six attempts using a character from ranges A-Z and 0-9 will be attempted. If allocation is unsuccessful, the FUNCTION=OPEN requests will end with return code x'00000024' and reason code x'0000002C'



Simplify access to IMS metadata in the catalog thru enhanced catalog API capabilities



A **sysprog** or **DBA** can retrieve DBDs and PSBs from two IMS's directories and staging within the same LPAR.

IMS Continuous Delivery: APAR PH25400. (03/2022)

DDL Audit Trail in Readable Format

- With this enhancement, an IMS professional (Database Administrator or IMS system programmer) or a Security auditor can view what resource changes were made via DDL, by whom and when, in an easily readable form.



Simplifies auditing of DDL activity



A **security auditor** can collect required audit information from SMF records related to changes made to IMS metadata using DDL from any supported method of input using standard tooling.

IMS Native z/OS DDL Utility

- Use the IMS Data Definition utility (DFS3ID00) to submit Data Definition Language (DDL) SQL statements natively without the need of IMS Connect and ODBM address spaces.
- The IMS Data Definition utility runs as BMP region.
- To run the IMS Data Definition utility the following prerequisites must be met: 1. IMS 15.3 or later 2. The IMS management of ACBs is enabled 3. 64-bit virtual storage



Simplify your DDL processing as well as **gain** potential **performance** improvements



An IMS **DBA** can submit DDL without requiring ODBM & IMS Connect implementation (DDL, Native z/OS Utility)

Catalog API (DFS3CATQ) Optionally Exclude Extended Attribute Metadata

- An ISV can use the IMS Catalog API to retrieve DBD information without extended attribute metadata.
- IMS Catalog API is enhanced not to return the extended attribute table if a new parameter specified.
 - If the vendor section table is in the extended attribute table, only the vendor section table is returned.



Can **reduce storage** needs in applications use the catalog API



An **application program** can reduce storage requirements by using an API to retrieve DBD information from the catalog without including non-runtime metadata.

Retrieve DEDB Change capture EXIT defs from DFS3LU00 or DFS3CATQ

- DEDB change Capture Definitions could not be extracted properly from the catalog directory.
- ACBGEN moved DEDB capture information into the PSB entries.
 - This means the same is true for the directory entries
- DFS3CATQ reads the directory to extract DB info and cannot build DEDB DBDLIB format data with change capture definitions
- Likewise, DFS3LU00 cannot produce DBDLIB nor DBD source information properly
- Added change capture information to the DB ACBLIB data
- DDL and Populate will ensure this information also is stored in the directory and catalog.
- DFS3CATQ and DFS3LU00 can properly produce DBDLIB and DBD source with the change capture data for DEDBs

IMS 15 Continuous Delivery: APAR PH18652 (07/2022)



Expand what data can be extracted from the catalog



A **DBA** can use IMS capabilities to rebuild IMS DBD source from the IMS catalog and get the change capture options included.

Protect sensitive data in OSAM data sets

z/OS Data Set Encryption Support of IMS OSAM DBs

- IMS is enhanced to enable z/OS data set encryption capabilities on OSAM DBs
 - New OSAM Linear Data Set support
- Can use OLR to convert HALDBs using OSAM with sequential data sets to OSAM using Linear data sets
- Can use OLR to encrypt OSAM Linear data sets
- Unload/Reload or an alternate tool is required for non-HALDB or HALDBs that are not OLR capable

Available in IMS 15.2



Easily encrypt IMS OSAM DB data at rest to **protect sensitive data** using z/OS data set encryption



An IMS **System Programmer** or **DBA** I can easily enable z/OS data set encryption on DBs using OSAM access to protect sensitive data without an outage.

OSAM Encryption 64-bit Support

- Modifies the OSAM Media Manager requests so that Media Manager supports 64-bit addresses.
- Parameters were added to the Media Manager requests to tell Media Manager to **allocate its internal Media Manager Interface Blocks (MMIBs) and Extent Description Blocks (EDBs) in 64-bit storage.**
- The address of the MMIB is returned to IMS on the Media Manager CONNECT request and must be passed as input on subsequent Media Manager calls.
- All modules that reference the MMIB were changed to support a 64-bit address and to switch to AMODE 64 when referencing and updating the MMIB.
- Enhances the OSAM LDS data set formatting logic to format one cylinder at a time, as needed, in the IMS online environment.

IMS 15 Continuous Delivery: APAR PH21283 (02/2021)



Relieves 31-bit storage constraints



An IMS **System Programmer** or **DBA** I can easily enable z/OS data set encryption on DBs using OSAM access to protect sensitive data without an outage.

Catalog Library Build Utility GSAM Support

- IMS Catalog Library Builder Utility (DFS3LU00) is enhanced to create GSAM database descriptors (DBD) and program specification blocks that contain GSAM PCBs and sources of them



Expands the list of resource that can be extracted from the IMS Catalog



An IMS Professional (**DBA**) will be able to generate resource definitions containing GSAM databases that are stored in the IMS Catalog.

DEDBGT2K Areas

- Enables Fast Path users to define up to 9999 AREAs under a DEDB which used to be limited to 2048 AREAs.
- With this enhancement, clients can grow a single DEDB database to roughly 40 terabytes of data vs the previous limit of roughly 8.1 terabytes of data.



Ability to **manage larger workloads**



An **IMS professional** can manage larger workloads for their applications by creating 5x larger Fast Path databases

IMS DB Fence

- In a replication environment, it is possible that an unintentional update can happen at a standby site making the data inconsistent with the active site.
- This enhancement provides a way to prevent unexpected updates to occur to a given DB by only allowing selective users to make updates at the standby site.
- A new key word RREPL (Read-or-Replication only) is added to determine the result of an update being made to a database or AREA.
- If updates are prevented a new STATUS CODE RR can be returned or a U3303 ABEND can occur based on user preference

IMS 15 Continuous Delivery: APAR PH26604 (1/2022)



Ability to ensure stand-by is **not compromised**



An **IMS professional** will be able to prevent updates to the replicated databases at the stand-by site, except by permitted applications.



Recent Continuous Delivery Enhancements

RACF PassTicket support for commands from IMS Connect to IMS OM

- In IMS 15.4, IMS Connect (ICON) clients can use RACF® PassTicket authentication to issue commands to IMS Operations Manager (OM) for more secured connections.
- Clients are responsible for generating the PassTickets and setting it in the command request message by issuing the `TmlInteraction.setRacfPassword()` method.
- Clients must also specify the application name by issuing `TmlInteraction.setRacfAppName()`.



Simply and improve security with PassTicket support

IMS Continuous Delivery: APAR PH51844(7/2023)



An IMS programmer and Sysprog can enable can professional can protect commands from IMS Connect to OM using RACF PassTicket support

IMS Data Definition utility (DFS3ID00) DLIBATCH enhancement

- DFS3ID00 is enhanced to run under a DL/I batch region
- Will stage the updates in the catalog as pending changes
- Can autoactivate the resource changes if no IMSs are active
- **Requires IMS 15.4**



Ability to submit IMS DDL using an offline utility

IMS Release 15.4. (06/2023)



An IMS database administrator can submit DDL to modify resource definitions in the catalog while IMS is offline

INQY Enhancement for new information

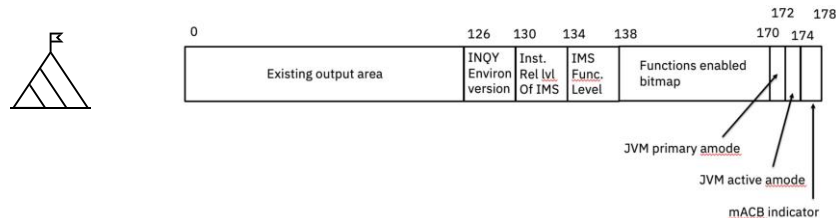
Enhances the IMS DL/I INQY call **with new ENVIRON2 option** to provide more IMS environmental data to the application

- Returns an integer value representing the address mode of the JVM for primary and active addressing modes requested for an IMS dependent region.
 - 0 indicates that no JVM was requested
 - 31 indicates that a 31-bit JVM was requested
 - 64 indicates that a 64-bit JVM was requested
- Indicates whether the program is running in a Managed ACBs environment.
- Includes the IMS installed release level, IMS function level, IMS function bitmap, and a version number for the INQY ENVIRON2 output in the output returned by INQY ENVIRON2



Get more IMS system information from the INQY call

IMS Continuous Delivery: APAR PH45098 (2/2023)



An IMS application programmer can interrogate information about the Java environment, the catalog environment and the IMS level using the INQY call.

IMS JDBC Map Case Enhancement

- Adds the ability to remove case fields that are not determined by control fields in the WHERE clause from the result set.
 - A new connection property enables this feature.
- Only supports use of the equal sign (=) operator in the WHERE clause.
 - If other operators are used, no case fields are removed from the returned result set.
- To use this feature, set the connection property `removeInvalidCaseFields` to true



Ability to get only the data you want in your JDBC result set.

IMS Continuous Delivery: APAR PH48054 (1/2023)



An IMS application developer can simplify their application by using the `removeInvalidCaseFields` connection property to remove unnecessary data from the result.

IMS ALTPCB enhancement for IMS Connect

An ALTPCB output initiated by an IMS Connect **CM0 send-receive** transaction will be delivered to the inputting IMS Connect client

No need for RESUME TPIPE

Message level of Datastore level activation



Simplify modernization efforts to convert to TCP/IP protocols.

IMS Continuous Delivery: APAR PH39434 (11/2022)
APAR PH39438 (11/2022)



An application developer can migrate their applications off an SNA architecture to a modern TCP/IP architecture without making any application changes.

IMS Catalog Maintenance utility (DFS3CM00) enhancement

- A new utility which will be enhanced over time to address any data maintenance needs for the IMS Catalog
- This could be
 - moving data into new fields to support larger data
 - Fixing or adding missing data that was incorrectly populated in the past
 - Adding new data to support new enhancements
 - The first delivery fixes incorrect entities in the catalog such as header timestamps and PARTYPE values.
 - It can be run in either a DL/I region or a BMP region.



Ability to remedy inconsistencies in the IMS catalog database

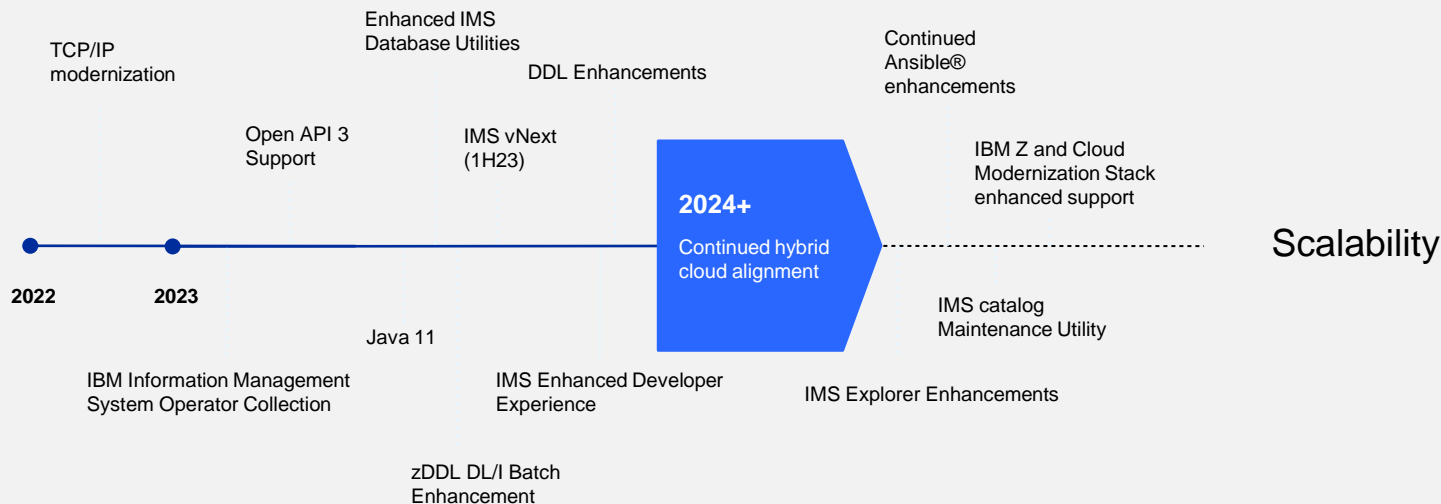
IMS Continuous Delivery: APAR PH47533(5/2023)



An IMS system programmer can fix inconsistencies in the IMS catalog running a single utility while the catalog is still in use.

Futures

IMS. Confidence now. Confidence in the future.



The background is a deep blue with a complex, abstract pattern. It features numerous thin, curved lines that flow from the top and bottom edges towards the center, creating a sense of depth and movement. Faint, repeating binary code (0s and 1s) is visible in the upper left and right corners, adding a technological or digital theme to the design.

Thank You