

Simplifying the administration of IMS, including catalog management

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Agenda

Web browser interface vs ISPF

Catalog management

Keeping databases healthy

User interfaces: Web browser vs ISPF

Pain points

for IMS DBAs, system programmers and system administrators

New staff learn faster with a graphical interface

- ISPF menus are limited in the amount of data they can show in one view
- Navigation in ISPF must be learned, not always intuitive

Some DBAs and system programmers prefer ISPF

- Familiar and fast

Continue to need functions in both

IMS Explorer for Development is Eclipse-based

- Requires installation of and continued updates to software on the user's workstation or laptop
- Organizations continue to tighten workstation and laptop security
- Lacks support for Multi-Factor Authentication (MFA)
- IMS DBAs and system programmers and administrators are often not authorized to install software on local workstations and generally have no need for Eclipse
 - Application developers often need Eclipse for their tasks

Solution

A web browser user interface to some IMS and IMS Tools functions

Zowe-based

Shared infrastructure with other IBM and non-IBM products

Graphical user interface with no requirement to install code on your workstation or laptop

IBM carbon design

Target users or personas

- Database administrators
- System programmers and administrators
- Will continue to evolve to support these users

What about IMS Explorer for Development?

- Target user or persona is application developer
- Will continue to evolve to support application developer requirements

The UI: IBM Unified Experience for z/OS

- Zowe desktop application
 - Zowe desktop is a web browser interface
- Single integrated user interface for IMS and Db2
- Currently supports these products and components:
 - IBM Db2 Administration Foundation
 - IBM Db2 DevOps Experience
 - IBM IMS Administration Foundation
- Functions activated based on products installed
- Supports Multi-factor Authentication (MFA)

Packaging and delivery

IMS Tools Base for z/OS

Existing no-charge product

Must be ordered and entitled on Shopz like other z/OS software

Traditionally contains

- Infrastructure components for IBM IMS Tools database related solution packs
- IMS Hardware Data Compression Extended
- Batch utility to report and delete RM resource structures

New V1.7

Announced: 26 July 2022

Available: 29 July 2022

New component added for web browser interface:
IMS Administration Foundation for z/OS

IBM IMS Tools Base V1.7 – Related components

Db2 Administration Foundation for z/OS (5698-ADF)

Db2 DevOps Experience for z/OS (5698-DEX)

New FMID HAFN170

IMS Administration Foundation for z/OS

PTF UI90630 required for Zowe V2

PTF UI93094 required for MFA support

Existing FMID HAHN160

Updated to HAHN170

- IMS Tools Knowledge Base
- Policy Services
- Distributed Access Infrastructure
- Autonomics Director

IMS Tools Base for z/OS V1.7 (5655-V93)

\$0 License, \$0 S&S

IBM Unified Management Server for z/OS
(5698-UM1) \$0 License, \$0 S&S

- V1.1 with PTFs UI81668 & UI82463
- V1.2: MFA support: APAR PH55944, PTF UI93091

Zowe

\$0 License, S&S is no-cost when used only with
IBM products

- Zowe V1.26 or later
- Zowe V2.3 or later (V2.5 recommended)
- IBM Z Distribution for Zowe V1 (5698-ZWE)
with PTFs U001996 & U001997 or later
- IBM Z Distribution of Zowe V2
with PTFs U002051 and U002052, or later

Required for IMS and IMS Tools web UI

Related products sharing the user interface

www.ibm.com/support/pages/fix-list-ibm-z-distribution-zowe

Administration functions included at no charge

IMS SQL processor

IMS type-1 and type-2 commands

Refresh capability in all views

IMSplex properties and components

IMS properties and components

IMS Connect properties, related client connections, and OTMA and ODBM datastores

Properties and status of IMS resources

- Programs and PSBs: related databases, routing codes and transactions
- Routing codes: related programs
- Transactions: related databases, programs and routing codes
- Databases and DBDs: related programs

Web UI: Exploring IMS components

IBM Unified Experience for z/OS

Dashboard / BLFQ1

🏠

🔍

🔄

IMS components

- ▶ BLFB8
- ▶ BLFN8
- ▶ BLFN9
- ▼ BLFQ1
 - 🔗 IFQ1 DSGROUP
 - 📄 IFQ1
 - 📄 IFQ2
 - 🔗 IFQ1HWS
 - 🔗 IFQ2HWSX
- ▶ BLFQ3
- ▶ BLFQ8

BLFQ1 IMSplex

Overview

Online resources

DBDs and PSBs

Command

Online resources

Databases

112

Details

Programs

150

Details

Routing codes

6

Details

Transactions

84

Details

DBDs and PSBs

DBD

37

Details

PSB

71

Details

IMSplex members (16)

Filter table

Member name	Status	Responding member	Member type	Member subtype	Job name	Version
IFQ1	🟢 READY,ACTIVE	IFQ1OM	📄 IMS	DBDC	IFQ1CTL	15.2.0
IFQ1CQS	🟢 READY,ACTIVE	IFQ1OM	📄 CQS		IFQ1CQS	2.0.0
IFQ1HWS	🟢 ACTIVE	IFQ1OM	🔗 HWS		IFQ1HWS	15.2.0

Improved administration enabled with additional IBM IMS Tools

Historical trends of sensor data for

- Databases
- DEDB areas
- HALDB partitions

Autonomics related to reorganizations and recovery

- Policy services
- Resource exceptions

Requires one or more of

- IMS Fast Path Solution Pack
- IMS Database Solution Pack (for online reorgs)
- IMS Database Utility Solution (for offline reorgs)
- IMS Recovery Solution Pack

DBD maps with source statements

PCB maps with source statements

Combined PCB-DBD maps

PSB and logical DBD cross references

Requires IMS Library Integrity Utilities

Or any IMS Tools solution pack which contains it:

- IMS Fast Path Solution Pack
- IMS Database Solution Pack (for online reorgs)
- IMS Database Utility Solution (for offline reorgs)


Web UI: Browsing DBD map and source


IBM Unified Experience for z/OS

Dashboard / BLFQ8 / IFQ8 DSGROUP / AUTODB

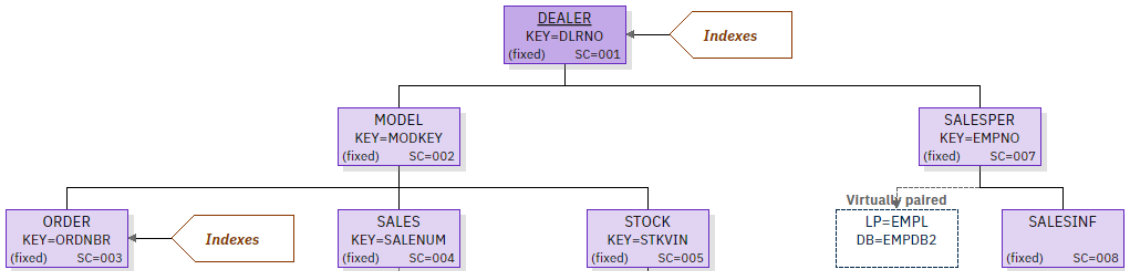
AUTODB HDAM DBD DB

Overview Properties DBD map Cross reference Statistics Reports Exceptions

Segment properties and fields 



DBD map



```
graph TD; DEALER["DEALER<br/>KEY=DLRNO<br/>(fixed) SC=001"] --> MODEL["MODEL<br/>KEY=MODKEY<br/>(fixed) SC=002"]; DEALER --> SALESPER["SALESPER<br/>KEY=EMPNO<br/>(fixed) SC=007"]; MODEL --> ORDER["ORDER<br/>KEY=ORDNBR<br/>(fixed) SC=003"]; MODEL --> SALES["SALES<br/>KEY=SALENUM<br/>(fixed) SC=004"]; MODEL --> STOCK["STOCK<br/>KEY=STKVIN<br/>(fixed) SC=005"]; SALESPER --> LP["LP=EMPL<br/>DB=EMPDB2<br/>Virtually paired"]; SALESPER --> SALESINF["SALESINF<br/>(fixed) SC=008"];
```

DEALER segment properties

Segment code	Length	Edit/compression	Format	Data set group
001	61 bytes (fixed)		Fixed length	1

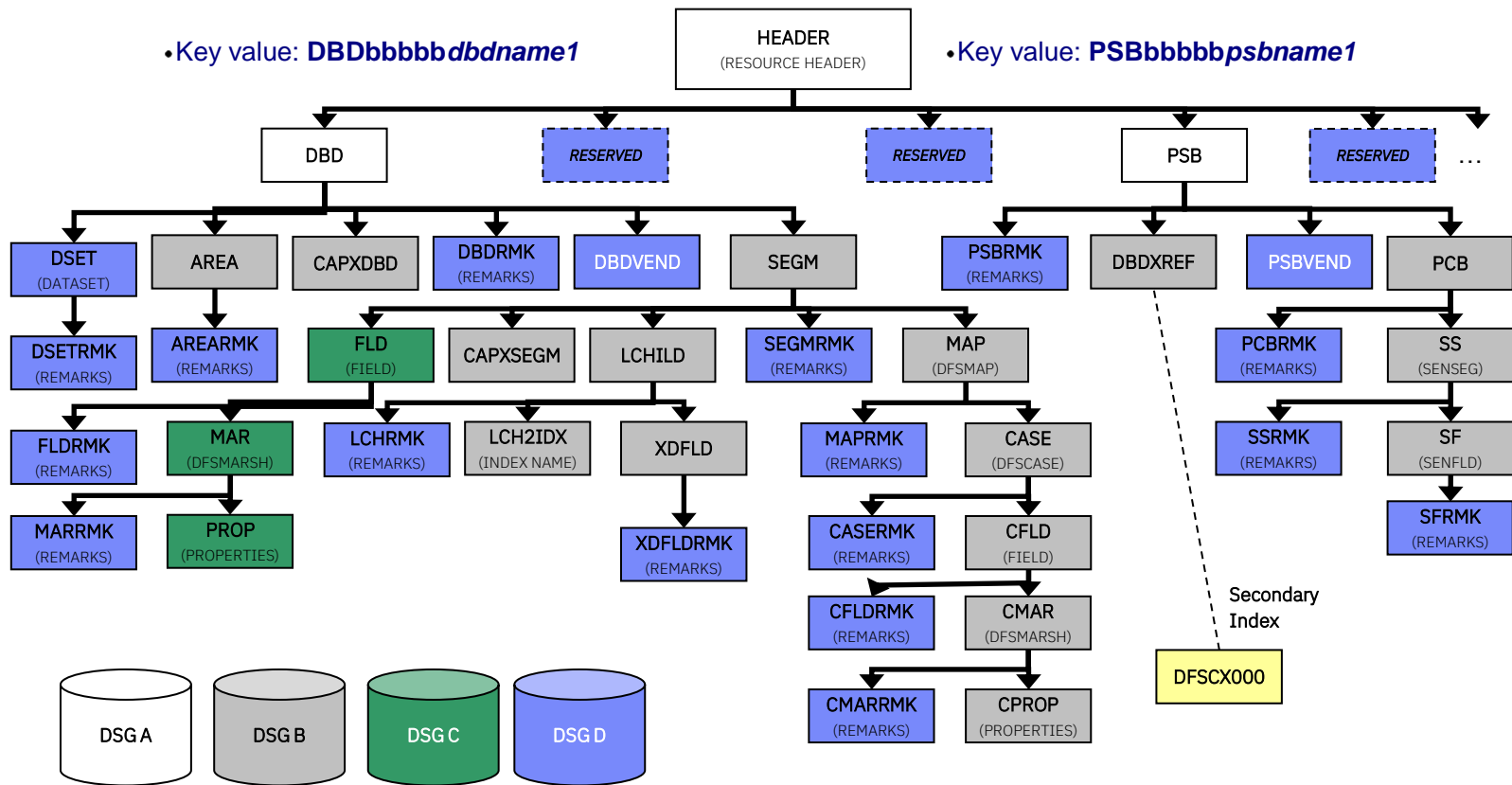
Field names

Field name	Start	Bytes
DLRNO	1	4
DLRNAME	5	30
CITY	35	10



Catalog use and management with IMS Administration Foundation and IMS Administration Tool

Physical IMS catalog structure



Migrating to IMS catalog: Loading resources

IMS Explorer for Development

Import with copybook function

- Include and update IMS segments within a DBD with schema from:
 - COBOL copybooks
 - PL/1 includes
- Interactive
- One at a time

IMS Administration Tool

Bulk copy

- Export PSBs and/or DBDs from ABCLIB into data sets
 - Catalog not required on source system
- Import data sets into IMS catalog
 - From same IMS system or another IMS system

Options

- Replace or create an IMS directory database, or
- Add records to an existing IMS directory
- Include copybooks

Rollback capability

- Automated backup of objects in target data set before import

Migrating to and Managing IMS catalog: Comparing resources

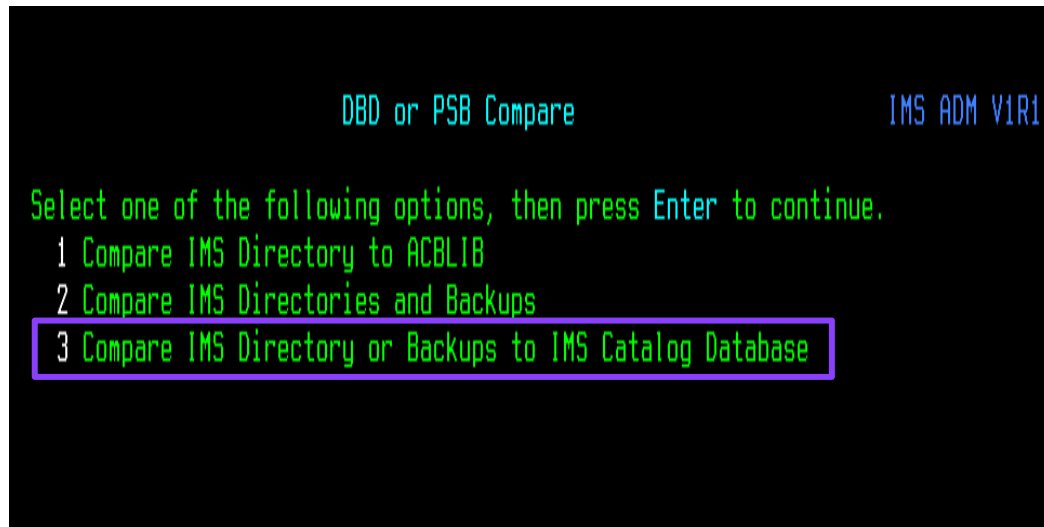
Validate consistency of resource objects

- Within same IMS subsystem
- Between IMS subsystems

Compare DBD and PSB resources

- Between IMS catalog (directory) and IMS ACB library
- Between Active or Staging Directory and Active, Inactive, or Staging ACBLIB or to a specific ACBLIB data set
- Between IMS Directory datasets (Active to Staging)

Differences highlighted to simplify identification and assist in analysis



Managing IMS catalog: Backup and recovery

Backup function

- Automatically takes a backup of IMS Directory data sets and BSDS after successful IMPORT DEFN command issued
- Retains multiple generations of backups
- No manual intervention required
- IMS subsystem(s) unaffected by the backup
- Allows you to manually create a backup (outside of an IMPORT DEFN command), if needed
- Can specify SMS class of backup data sets

Restore function

- Restores the IMS Directory data sets and BSDS from a backup generation
- IMS subsystems do not need to be down
 - No impact to IMS online system
- Useful if the Directory/BSDS gets corrupted or becomes inaccessible
- Assists in reverting a DBD/PSB IMPORT to an earlier version

Making the IMS catalog your asset: Issuing SQL

The screenshot shows the IBM Unified Experience for z/OS SQL interface. The top navigation bar includes a hamburger menu, the text "IBM Unified Experience for z/OS", and a help icon. Below the navigation bar, the breadcrumb "Dashboard / SQL" is visible. The main content area is titled "SQL" and contains two tabs: "New SQL statements" (active) and "Recent statements".

Annotations with arrows point to the following elements:

- Enter PSB name and statements:** Points to the "PSB name" field, which contains the text "DFSIVP37".
- Write a new statement or select a statement from Recent statements:** Points to the SQL statement editor area.
- Select a Connection:** Points to the "Connection" dropdown menu, which is set to "IFQ3 (IFQ3)".
- Select a Data sharing group:** Points to the "Data sharing group" dropdown menu, which is set to "IFQ3 DSGROUP".

The SQL statement editor contains the following code:

```
1 -- Insert a new record in the phonebook database
2 SELECT * FROM PHONEAP.PHONEBOOK;
3 INSERT INTO PHONEAP.PHONEBOOK (LASTNAME, FIRSTNAME, EXTENSION, ZIPCODE) VALUES ('MyLast', 'MyFirst', '9-222-1111', 'D11/R0');
4 SELECT * FROM PHONEAP.PHONEBOOK;
5
```

A "Run" button is located at the bottom right of the interface.

Making the IMS catalog your asset: SQL results

PSB name	DFSIVP37		
Statement	INSERT INTO PHONEAP.PHONEBOOK (LASTNAME, FIRSTNAME, EXTENSION, ZIPCODE) VALUES ('MyLast', 'MyFirst', '9-222-1111', 'D11/R0')	Result set	2
Results	SQL QUERY RAN SUCCESSFULLY, SQL CODE IS 0, SQL STATE IS 00000, 1 ROW(S) AFFECTED		
PSB name	DFSIVP37		
Query	SELECT * FROM PHONEAP.PHONEBOOK	Result set	3
Results	SQL QUERY RAN SUCCESSFULLY, SQL CODE IS 0, SQL STATE IS 00000		
	LASTNAME	FIRSTNAME	EXTENSION
1	LAST6	FIRST6	8-111-6666
2	LAST1	FIRST1	8-111-1111
3	MyLast	MyFirst	9-222-1111
4	LAST2	FIRST2	8-111-2222
5	LAST3	FIRST3	8-111-3333
6	LAST5	FIRST5	8-111-5555
	ZIPCODE		
	D03/R0		
	D01/R0		
	D11/R0		
	D01/R0		
	D01/R0		
	D02/R0		

Switch result set

Query results are displayed in table format

Useful SQL statements: Some examples

Find all DBDs that are HIDAM and VSAM

```
SELECT  
HEADER_RHDRSEQ, OSACC, ACCESS FROM  
DFSCAT00.DBD  
WHERE ACCESS = 'HIDAM' AND OSACC = 'VSAM';
```

Find all PSBs that reference DBD DFSCD000

```
SELECT * FROM DFSCAT00.PCB  
WHERE IMSNAME= 'DFSCD000';
```

Find all versions of DBD IVPDB1

```
SELECT  
HEADER_RHDRSEQ, ACCESS, OSACC, TSVERS, VERSION  
FROM DFSCAT00.DBD  
WHERE HEADER_RHDRSEQ='DBD IVPDB1';
```

Find all logical databases

```
SELECT * FROM DFSCAT00.DBD  
WHERE ACCESS = 'LOGICAL' ;
```

Making the IMS catalog your asset: Cross references

When updating a database, identify what IMS programs are affected

DBD to PSB Cross Referencing

- Which DBDs are used by a PSB
- Which PSBs access a DBD

AUTODB

HDAM

DBD

DB

Overview

Properties

DBD map

Cross reference

Statistics

Reports

E

Related PSBs

Related logical DBDs

Index DBDs

Name	Compiler language	Timestamp	IMS version	Referenced DBDs
AUTPSBAL	Assembler	2021-11-25 20:56:01.09	15	1

Managing the IMS catalog as a database: Space utilization

Monitor key metrics regarding catalog database

- Allocated extents of the database data set
- IMS space limit (maximum data set size that is limited by IMS)
- Allocated space of the database data set (bytes)
- Used space (bytes)
- Ratio of used space to IMS space limit (%)
- Ratio of used space to allocated space (%)

IMS Catalog Database Space Usage:		
Partition Name	Grp	Data Set Name
DFSCD01	A	IMS.IFA1.DFSCD000.A00001
DFSCD01	B	IMS.IFA1.DFSCD000.B00001
DFSCD01	C	IMS.IFA1.DFSCD000.C00001
DFSCD01	D	IMS.IFA1.DFSCD000.D00001

IMS Administration Tool

Alloc Exts(#)	IMS Size Limit(B)	Alloc Space(B)	Used Space(B)	IMS Limit Used(%)	Alloc Used(%)
1	4G	5.63M	720.00K	0%	13%
1	4G	5.63M	1.41M	0%	25%
1	4G	5.63M	4.22M	0%	75%
1	4G	5.63M	720.00K	0%	13%

Managing the IMS catalog as a database: Impact analysis

View PSB and DBD reports

- Number of PSBs and DBDs
- Average size of PSBs and DBDs
- Sizes of individual PSBs and DBDs

Help you understand

- How much space is needed to add one or more objects
- How much space is needed to add copybook data for one or more objects

IMS Administration Tool

PSB Instance Information:

All PSB Instances		Multiple Instance PSBs				Obsolete PSB Instance	
PSB Instance	Average Size(Bytes)	PSB Number	PSB with Multi. Instances	Ave. Num of Instances	Highest Num Instances	Obsolete Instance	Average Size(Bytes)
343	2214.7	280	18	1.2	18	56	1354.1

Managing the IMS catalog as a database: Obsolete instances

As DBA's or application programmers add or alter resources, instances become obsolete over time

- Every 'ACBGEN' will result in a new version of the DBD or PSB being added to the IMS Catalog database
- Is a database resource still needed?

Catalog purge utility in IMS

View multiple instances of a resource

Perform catalog maintenance

- Find and purge specific obsolete resources to free space
- Reorganize catalog database (online or offline) to reduce fragmentation

IMS Administration Tool

Find and delete obsolete DBD/PSB instances from IMS catalog

Filter on obsolete instances

PSB Detail Report

Row 38 from 283

Command ==> PAGE

Scroll ==>

Primary Command: S - Sort F - Filter Obsoleted

C - Clear Obsoleted Filtering D - Delete All Obsoleted

Line Command: V - View PSB statement source D - Delete Obsoleted

PSB Filter . . . * (eg: psbname1, ps*, or *) IMSID: IFA1

S	PSB Name	Size in IMS Catalog(B)	Status	Generation	Date	Time
—	ADI21PAR	2586	ACTIVE		2020/12/07	15:45:16
—	AFFCH	1294	ACTIVE		2021/07/19	12:23:44
—	AFFCH	1024	OBSOLETE		2021/07/19	12:23:43
—	AFFJC	1294	ACTIVE		2020/02/25	08:38:54
—	AFFJM	1294	ACTIVE		2020/02/25	08:38:54
—	AFFLB	1294	ACTIVE		2020/04/17	09:43:46

Delete all obsolete instances displayed or delete specific instances

Adding partitions to a database, including IMS catalog

Why?

- Frequent updates to a certain range of database records

ANALYZEPART function

- Simulates HALDB partition settings to determine the effective partition settings while the database is offline
 - Alternatively use an unload file as input
- Can include
 - Consolidation of partitions
 - Splitting one partition into multiple using number of partitions
 - Splitting partitions into other partitions using key sizes
 - Splitting all partitions into other partitions using partition size

Adjusting partitions of a database, including IMS catalog

MAINTAIN function

- Consolidate, split, reorganize, add or delete single partitions
 - Without rebuilding PSINDEXes
 - Can be performed while the database is offline or online
 - » IMS Online Reorganization Facility is required for online support
 - [Can run against multiple partitions of the same database in parallel](#)
- Can use batch-mode method (Batch JCL) or ISPF interface

Record DBD and PSB changes

Logging changes to DBD and PSB source

- Capture and log DBD and PSB source before and after changes
- Store in an audit log (z/OS system logger) or data sets
- View changes

View a map of IMS catalog database

- Generate hierarchical maps of IMS databases
- Based on DBDs
- Includes DBD and PSB details
- Supports mapping of the IMS catalog database



Keeping IMS databases healthy and efficient

Managing IMS databases: Autonomics

Sensors

Gathering database statistics at regular intervals for your environment (space utilization, fragmentation, recovery readiness, and optimization)

Policies

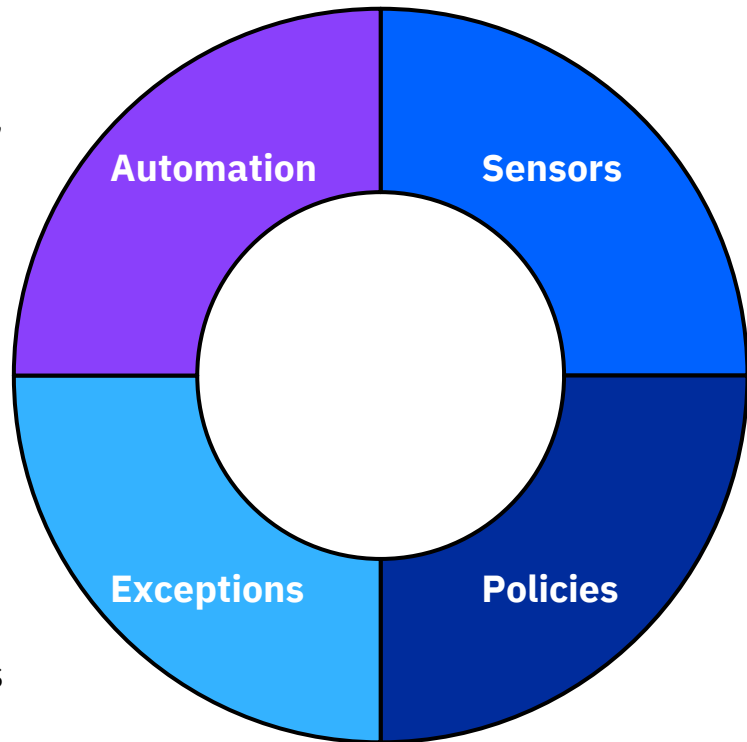
IBM and user-defined policies and thresholds to determine when exceptions should be triggered

Exceptions

Triggering notifications and automation when sensors exceed policy thresholds

Automation

Recommending and taking corrective actions based on exceptions



Managing IMS databases: Autonomics

Collect sensor data via

- Normal database maintenance tasks
- Scheduling or ad-hoc requests

Must specify databases for which sensor data is collected

[Wildcards now supported](#)

Recovery sensors indicate when assets are not available to meet RTO and/or RPO

Reorganization sensors indicate when a database will benefit from a reorganization

- Perform the reorganization (consume MSUs) when it will add value
- Skip the reorganization (save MSUs) when it will not add value

Image copy and/or unload may be required even if reorganization is skipped

[New option: Always perform image copy](#)

[New option: Always unload the database](#)

IMS Tools Base and Solution Packs

APARs PH38517, PH41941
PTFs UI76962, UI78614

Autonomics: View databases with exceptions

See exceptions based on severity, **IMS Tools Policy Type**, and DBD, Area, or Partition

IBM Unified Experience for z/OS

Dashboard / Databases with exceptions

Databases with exceptions

- ▼ Critical
 - AUTODB (IFQ1 DSGROUP)
 - AUTODB (IFQ8 DSGROUP)
 - DEDBJN23 (IFQ1 DSGROUP)
 - DFSCD000 (BLFN9)
 - DFSCD000 (IFQ1 DSGROUP)
 - DFSCD000 (IFQ3 DSGROUP)
 - DFSCD000 (IFQ8 DSGROUP)
 - DFSCX000 (BLFN9)
 - DFSCX000 (IFQ1 DSGROUP)
 - DFSCX000 (IFQ3 DSGROUP)
 - DFSCX000 (IFQ8 DSGROUP)
 - DI21PART (IFQ1 DSGROUP)
 - DI21PART (IFQ3 DSGROUP)
 - DPHS5300 (IFQ1 DSGROUP)
 - EMPPDB2 (IFQ8 DSGROUP)
- ▼ Data sharing groups without exceptions
 - BLFN8

Overview

Filter table

Name	Area or Partition	Data sharing group	REORG	RECOVERY
AUTODB		IFQ1 DSGROUP	⊗ Critical	⊗ Critical
AUTODB		IFQ8 DSGROUP	⊗ Critical	⊗ Critical
^ DEDBJN23		IFQ1 DSGROUP	⊗ Critical	✓ No exceptions
	DB23AR0		⊗ Critical	✓ No exceptions
	DB23AR5		⊗ Critical	✓ No exceptions
▼ DFSCD000		BLFN9	⚠ Warning	⊗ Critical
▼ DFSCD000		IFQ1 DSGROUP	⚠ Warning	⊗ Critical

Click a **tree node** or **link** to its exceptions

IMS Administration Foundation

Autonomics: View exceptions for a database

[Dashboard](#) / [BLFQ1](#) / [IFQ1 DSGROUP](#) / [AUTODB](#)




AUTODB

HDAM


DBD

DB





- ▼  Databases with exceptions


▼  Critical

 AUTODB (IFQ1 DSGROUP)



 AUTODB (IFQ8 DSGROUP)

 DEDBJN23 (IFQ1 DSGROUP)

 DFSCD000 (IFN9 DSGROUP)

 DFSCD000 (IFQ1 DSGROUP)

DFSCD000 (IFQ3DSG (CATALOG
WITH ACBLIB))

 DFSCD000 (IFQ8 DSGROUP) DFSCX000 (IFN9 DSGROUP)

DESCY000 (TEAM DSCGROUP)

< Properties

DBD map

Cross reference

Statistics

Reports

Exceptions

Exceptions (5)

Related statistics charts



Last evaluation

2022-06-15 14:15:17

Severity	Exception	Domain
🔴 Critical	Limited availability of data set extents	REORG
🔴 Critical	At least one data set needs an image copy	RECOVERY
🔴 Critical	At least one data set needs an image copy	RECOVERY
🔴 Critical	One or more data sets do not belong to any CAGRP	RECOVERY
🟡 Severe	Excessive number of extensively scattered segments	REORG

Reviewing relevant information for DBD exceptions

IBM Unified Experience for z/OS

Dashboard / BLFQ1 / IFQ1 DSGROUP / DPHS5300

DPHS5300 PHIDAM DBD

Overview Properties DBD map Cross reference Statistics Reports Exceptions

Exceptions (6) Partitions with exceptions DPHS53D x Related statistics charts Last evaluation 2022-05-09 10:05:55

Action REORG is recommended for DPHS53A in data sharing group IFQ1DSG. BBE2910I x

Action REORG is recommended for DPHS53B in data sharing group IFQ1DSG. BBE2910I x

Action REORG is recommended for DPHS53D in data sharing group IFQ1DSG. BBE2910I x

Severity	Area or Partition	Exception	Domain
Critical	DPHS53D	Excessive free space fragmentation in one or more data sets	REORG
Warning	DPHS53D	Excessive number of extensively scattered segments	REORG

Description The fragmentation of free space in DPHS53D has increased.
Data sets DPHS53DA, DPHS53DC
Recommended actions A reorganization is recommended.

Usable IMS free space DPHS53DA

Unusable IMS free space DPHS53DA

Usable IMS free space DPHS53DC

Unusable IMS free space DPHS53DC

Link to IBM Documentation of the recommended action to see the detailed instructions

Click an **exception** to see the description and related charts at the bottom

Click a **related chart** to see the larger chart on **Statistics** tab. You can review trends based on date range and relevant charts for other sensor data.

Summary

IMS Tools support for new IMS releases and functions

What PTFs do I need for my IBM IMS Tools to run on IMS V15.2, V15.3 or V15.4?

IMS V15 Compatibility:

<https://www.ibm.com/support/pages/node/6997599>

I need to get ready for IMS Managed ACBs

IMS Tools Support for Managed ACBs:

www.ibm.com/support/docview.wss?uid=ibm10731745

I have OSAM databases and am considering converting them to linear data sets

- For data set encryption
- To take advantage of Media Manager, including zIIP offload in my IBM IMS Tools

IMS Tools Support for Encryption:

www.ibm.com/support/docview.wss?uid=swg22009341

Summary

Come to the [hands-on lab](#)!

- Tuesday, 2:00pm

IMS is [50+ years old](#)

- No need to manage it like you did in 1970's
- Modernize
- Get ready for the [next generation](#) of IMS system programmers and DBAs

Today's IMS system programmers and DBAs need both

- Traditional ISPF
- Web UI

[IMS Catalog](#) and IMS [Managed ACBs](#) are real

Be ready and understand how

- How you can benefit from them
- Where they impact your existing day to day tasks
- What new tasks you need to understand and perform

References

IMS Tools website

www.ibm.com/it-infrastructure/z/ims/tools

IBM Z Software Newsletter, Operations and Management

<http://ibm.biz/zITSMNewsletterSubscribe>

IMS listserv

<http://imslistserv.bmc.com>

IMS Fundamentals videos:

https://mediacenter.ibm.com/playlist/dedicated/122579632/1_b56rpdpt/1_jy8lv5f5

IMS Tools Videos on IBM MediaCenter

ibm.biz/ims-tools-mediacenter

IMS new functions

www.ibm.com/docs/en/ims/15.3.0?topic=enhancements-ims-enhancement-ptfs

IMS Tools support for Data Set Encryption

www.ibm.com/support/pages/ibm-ims-tools-and-data-set-encryption-support

IMS Tools Product Documentation

www.ibm.com/support/docview.wss?uid=swg27020942

IMS Tools new functions

www.ibm.com/support/docview.wss?uid=swg22015506

IMS Tools support for IMS V15

www.ibm.com/support/docview.wss?uid=swg22009341

IMS Tools support for Managed ACBs

www.ibm.com/support/docview.wss?uid=ibm10731745

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