S46

Migrating to IMS Version 7

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Abstract

IMS Version 7 provides many enhancements and improvements over previous releases. This session describes migration from IMS Versions 5 and 6 to IMS Version 7. It explains the enhancements in IMS V7 which affect migrations. There is an emphasis on explaining the changes that one is likely to see when operating IMS V7. This includes online system processing and utility execution.

Topics include prerequisite software, changes in IMS packaging, and compatibility with previous releases. Also covered are exit routine compatibility, compatibility considerations for DB2 , CICS, and other IMS releases, the new upgrade process for RECONs, changes potentially required due to DBRC enhancements, DBRC support for database initial loads, changes required with Batch Backout, changes and enhancements for the INQY call, the new TM and MSC Message Routing and Control exit, IMS utility processing with a mixture of inputs from different IMS releases, and support for IMS Version 7 by IMS tools and other IBM products.

Finally, sources of further migration information are given.

Agenda

- **Preparation**
  - Information sources, prerequisites, compatibility, coexistence
  - Migration tasks
- **Installation and Definition**
- **Upgrading the RECONs**
- **Exit Routines**
  - Compatibility
- **Execution**
  - New parameters, new messages, operational changes

Preparation

IMS/ESA V5 (5695-176) was withdrawn from service effective September 30, 2001

IMS V7 Education and Redbooks

IMS Version 7 Product Enhancements class

- Course code CM701
- Three-day class
- Schedule available at www.ibm.com/services/learning/

Product publications:

- Available at www.ibm.com/software/data/ims/sclicense7ims.html

Redbooks

- IMS Version 7 Release Guide, SG24-5753
- IMS Version 7 High Availability Large Database Guide, SG24-5751
- IMS Version 7 and Java Application Programming, SG24-6123
- A DBA's View of IMS Online Recovery Services, SG24-6112

IMS V7 Information on the Web

Available Documents, Flashes, and Presentations

- "IMS Version 7 Migration Tips" document
- "Support for IMS Version 7 by IMS Related Products" flash
- "IMS V7 Presentation"
- "IMS Connect" presentation
- "IMS Java" presentation
- "IMS Version 7 High Availability Large Database (HALDB)" presentation
- "IMS BMPs and Batch (DLI and DBB) Jobs Using DB2 in a Parallel Sysplex" document

These articles may be found at www.ibm.com/support/techdocs/

- Click on "Search All Documents" button
- Click on "Search" button
- Search All Documents for "IMS"

Other information is available from the IMS home page at www.ibm.com/ims/

IMS Java - Reference Materials

- **Java for OS/390**
  - Program Directory (GI10-0614)
  - Information on "http://www.s390.ibm.com/Java"
- **VisualAge for Java, Enterprise Edition for OS/390 (5655-JAV)**
  - Program Directory (GI10-4949)
  - VisualAge for Java Enterprise ToolKit/390 Reference
- **IMS Java**
  - IMS Java User's Guide (SC27-0832)

IMS V7 Migration Information

- **IMS V7 Program Directory**
  - GI10-8334
  - Review PSP Buckets as documented in section 3.0 Program Support
    - Upgrade name is IMS710
- **IMS V7 Installation Volume 1: Installation and Verification**
  - GC26-9429
- **IMS V7 Installation Volume 2: System Definition and Tailoring**
  - GC26-9430
- **IMS Version 7 Migration Tips**
  - www.ibm.com/support/techdocs/atsmastr.nsf/PubAllNum/TD100408

Software Prerequisites for IMS V7

IMS V7 requires:

- OS/390 V2R6 (5647-A01) or later
- DFSMS 1.4 (a base element of OS/390 V2R6)
- IBM High-Level Assembler Release 2 (5696-234)
  - With High-Level Assembler Toolkit feature
    - This feature was not required with previous IMS releases

IMS V7 Transaction Manager feature requires:

- e-Network Communications Server for OS/390 V2R6

IMS Java Prerequisites

- **IMS V7 Transaction Manager**
  - PQ37547, PQ32371, PQ37630
- **OS/390 V2.6 or higher**
  - Java for OS/390 (5655-A46)
- **OS/390 LE Version 1 Release 7**
- **VisualAge Java Enterprise Edition for OS/390 (5655-VAJ)**
  - Provides High Performance Java (HPJ)
- **For DB2 access,**
  - Minimum of DB2 V5 with APAR PQ19814

Support for IMS V7 by IMS Related Products

- **Some IMS related products are supported with IMS V7**
  - Some require maintenance or a new release
  - A table with this list follows
- **Some IMS related products are not supported with IMS V7, but have replacement products which support IMS V7**
  - A table with this list follows

Products Supported with IMS V7

Product Name	Number	Comments
Data Refresher V1	5696-703	
IBM File Manager for z/OS and OS/390 V2	5655-G75	
IMS Advanced ACBGEN V1	5655-E05	
IMS ADF Tool Pak	5655-A21	
IMS Application Development Facility (ADF) V2	5665-348	
IMS Batch Terminal Simulator V2	5655-A14	Requires PQ33522
IMS Command Control Facility	5655-F40	
IMS Connect	5655-E51	
IMS Database Control Suite V2.1	5655-F76	
IMS Data Base Integrity Control Facility V7	5697-F61	
IMS Database Repair Facility V1	5655-E03	Includes HALDB support
IMS DataPropagator V2R2	5696-705	HALDB requires PQ30286
IMS DataPropagator V3	5655-E52	
IMS DEDB Fast Recovery V2	5655-E32	
IMS Dynamic Resource Control Facility	5697-D14	Requires release 2
IMS ETO Support V1	5697-D68	Withdrawn from marketing
IMS ETO Support V2	5655-E12	

Products Supported with IMS V7 (cont.)

Product Name	Number	Comments
IMS Fast Path Basic Tools V1	5655-E30	
IMS Fast Path Online Tools V1	5655-E31	
IMS Fast Path Online Tools V2	5655-F78	
IMS Hardware Data Compression - Extended V1	5655-085	Withdrawn from marketing; Requires PQ30953
IMS Hardware Data Compression - Extended V2	5655-E02	
IMS High Performance Change Accumulation	5655-F59	
IMS High Performance Load V1	5655-E07	Includes HALDB support
IMS High Performance Pointer Checker V1	5655-E09	Includes HALDB support
IMS High Performance Prefix Resolution V1	5655-E08	
IMS High Performance Sysgen Tools	5655-F43	
IMS High Performance Unload V1	5655-E06	Includes HALDB support
IMS Image Copy Extensions	5655-E10	Includes HALDB support
IMS Index Builder V2	5655-E24	Includes HALDB support
IMS Library Management Utilities V1	5655-E04	Includes HALDB support
IMS MFS Reversal Utilities	5655-F45	
IMS Network Compression Facility	5655-E41	
IMS Online Recovery Service	5655-E50	Includes HALDB support

Products Supported with IMS V7 (cont.)

Product Name	Number	Comments
IMS Parallel Reorganization V2	5655-F74	
IMS Partition Support Product V2	5697-D85	Requires release 2
IMS Performance Analyzer V2	5697-F02	Withdrawn from marketing
IMS Performance Analyzer V3	5655-E15	
IMS Program Restart Facility V1	5697-F18	Withdrawn from marketing; Requires PQ37047
IMS Program Restart Facility V2	5655-E14	
IMS Queue Control Facility	5697-E99	
IMS Recovery Saver V1	5655-A68	Withdrawn from marketing; Requires PQ33423
IMS Recovery Saver V2	5655-E16	
IMS Sequential Randomizer Generator V1	5655-E11	
IMS Workload Router	5697-B87	Requires release 2
IMS Year 2000 Exit Tool	5697-E04	Requires release 2
OS/VS DB/DC Data Dictionary V1R6	5740-XXF	HALDB requires PQ30394
System Automation for OS/390 IMS Automation Feature	5645-005	Requires OW40685
Tivoli Decision Support for OS/390	5698-TD9	Requires release 5

Products Requiring Replacements for IMS V7

Product Name	Product Number	Replacement Product	Product Number
IMS Database Control Suite	5697-D15	IMS Database Control Suite V2.1	5655-F76
IMS Data Base Integrity Control Facility V6	5697-B92	IMS Data Base Integrity Control Facility V7	5697-F61
IMS Data Stream Tuner	5697-D69	IMS Network Compression Facility	5655-E41
IMS DBT - DEDB Pointer Checker	5685-093	IMS Fast Path Basic Tools V1	5655-E30
IMS DBT - DEDB Tuning Aid	5685-093	IMS Fast Path Basic Tools V1	5655-E30
IMS DBT - DEDB Unload/Load	5685-093	IMS Fast Path Basic Tools V1	5655-E30
IMS DBT - Fast ACBGEN	5685-093	IMS Advanced ACBGEN V1	5655-E05
IMS DBT - Fast Prefix Resolution	5685-093	IMS High Performance Prefix Resolution V1	5655-E08
IMS DBT - Fast Reorganization Reload	5685-093	IMS High Performance Load V1	5655-E07
IMS DBT - High Speed Sequential Retrieval	5685-093	IMS High Performance Unload V1	5655-E06

Products Requiring Replacements for IMS V7

Product Name	Product Number	Replacement Product	Product Number
IMS DBT - Library Management Utilities	5685-093	IMS Library Management Utilities V1	5655-E04
IMS DBT - Sequential DAM Optimizer	5685-093	IMS Sequential Randomizer Generator V1	5655-E11
IMS DBT - Space Management Utilities	5685-093	IMS High Performance Pointer Checker V1	5655-E09
IMS DBT - VSAM Zapper	5685-093	IMS Database Repair Facility V1	5655-E03
IMS DEDB Fast Recovery	5655-109	IMS DEDB Fast Recovery V2	5655-E32
IMS Index Builder	5697-C33	IMS Index Builder V2	5655-E24
IMS Message Requeuer V3	5655-136	IMS Queue Control Facility	5697-E99
IMS/ESA Partition Support Product V1	5697-A06	IMS/ESA Partition Support Product V2	5697-D85
Parallel Change Accumulation for IMS	5697-E32	IMS High Performance Change Accumulation	5655-F59
Parallel Reorganization for IMS	5697-D13	IMS Parallel Reorganization V2	5655-F74
Tivoli Performance Reporter for OS/390	5695-101	Tivoli Decision Support for OS/390 Release 5	5698-TD9

IMS Version 7 Features

IMS V7 Features

- Database Manager
- Transaction Manager
- Extended Terminal Option (ETO)
  - Transaction Manager is a prerequisite
- Recovery Level Tracking (RSR)
- Database Level Tracking (RSR)
  - Recovery Level Tracking is a prerequisite

Same as IMS V6

IMS V7 Compatibility with Other Products

- **DB2 - IMS V7 may be connected to:**
  - DB2 V4, V5, V6, or V7
- **CICS DBCTL - IMS V7 may provide DBCTL services to:**
  - CICS/ESA V4 or CICS Transaction Server for OS/390 V1 or V2
- **ISC (Intersystem Communications) - IMS V7 ISC may connect to:**
  - IMS V7, V6, and V5
  - CICS/ESA V4 and CICS Tran. Server for OS/390 V1 or V2
  - User-written software
- **MSC (Multiple Systems Coupling) - IMS V7 MSC may connect to:**
  - IMS V7, V6, or V5

Migration from Previous IMS Releases

- **Migration is supported from:**
  - IMS V6 (5655-158)
  - IMS V5 (5695-176)
  - IMS/ESA Year 2000 Local DL/I (V4.9 PRPQ)) (5799-GBA)
- **Users of IMS V5 or V4.9 may migrate directly to IMS V7**

Migration Tasks

Migration Tasks:

- Apply coexistence maintenance to existing IMS systems
  - MSC, DBRC, RSR, Shared Queues
- Install IMS V7
- Upgrade RECONs to IMS V7
  - IMS V6 systems do not have to be terminated during upgrade process
  - IMS V5 may not execute during the upgrade process
- IMS System Definition
- ACBGEN
- Possible upgrade to IMS tools and related products
- Possible modifications to procedures or jobs
  - These will be explained later in this presentation
- Testing as you deem appropriate

Migration Path Overview

- **This is a simple migration path**
  - Same tasks as previous IMS release-to-release migrations
  - Application programs continue to work without any change or recompile
  - Databases do not have to be changed, upgraded, reorged, imaged copied, etc.

Release Coexistence and Fallback

Coexistence with previous releases:

- IMS databases may be shared between IMS V7, V6, and V5
- IMS V7 database recovery utilities accept inputs generated by previous releases
  - Image Copies
  - Change Accumulations
  - Logs
- IMS V7 RECONs may be used by IMS V6 and V5

Fallback support

- A system may fallback to a previous release after upgrade to IMS V7
  - IMS V7 RECONs are used
  - Database recoveries use IMS V7 utilities

Utility Coexistence

Change Accumulation utility (DFSUCUM0)

- IMS V7 utility accepts logs and change accums from IMS V5, V6, and V7
- IMS V5 and V6 utilities do not accept logs or change accums from IMS V7

Database Recovery utility (DFSURDB0)

- IMS V7 utility accepts image copies, HISAM unloads, logs, and change accums from IMS V5, V6, and V7
- IMS V5 and V6 utilities do not accept image copies, HISAM unloads, logs, or change accums from IMS V7

IMS Online Recovery Service (ORS)

- Accepts image copies, HISAM unloads, and logs from IMS V5, V6, and V7
- Accepts change accums from IMS V7 only

Utility Coexistence

Batch Backout utility (DFSBBO00)

- IMS V7 utility accepts logs only from IMS V7
- IMS V5 and V6 utilities do not accept logs from IMS V7

Log Archive utility (DFSUARC0)

- IMS V7 utility accepts logs only from IMS V7
- IMS V5 and V6 utilities do not accept logs from IMS V7

Log Recovery utility (DFSULTR0)

- IMS V7 utility accepts logs only from IMS V7
- IMS V5 and V6 utilities do not accept logs from IMS V7

Log Record Changes

Log records have been modified and added

- User written programs may need to be modified
  - ILOGREC macro may be assembled for guidance

    ```
    ILOGREC RECID=ALL
    ```

  - For guidance on macros for Fast Path log records see Log Records section of SYS-System Service Aids chapter in IMS V7 Diagnosis Guide and Ref.
- Products which read logs may need to be updated

Sync point log records are archived to RLDS

- New in IMS V7
- Added to support ORS Point-in-Time recovery

Coexistence/Compatibility APARs

IMS V6 APARs

- DBRC RECONs - PQ27643
- MSC, Message Requeuer, or Queue Control Facility - PQ27555
- ACBGEN - PQ37363
- Shared Queues with Asynchronous OTMA/APPC - PQ29879

IMS V5 APARs

- DBRC RECONs - PQ27640
- MSC, Message Requeuer, or Queue Control Facility - PQ04333 and PQ27553
- ACBGEN - PQ37653
- FP DEDB SDEPs - PQ17938, PQ13214, PQ09402, and PN91450

ACBGEN PSB Compatibility

- **IMS V7 requires ACBs generated by IMS V7 ACBGEN**
  - IMS V6 requires ACBs generated by IMS V6 ACBGEN
  - IMS V5 requires ACBs generated by IMS V5 ACBGEN
- **IMS V7 accepts PSBs and DBDs generated by any previous release**
- **IMS V5 and V6 ACBGEN will accept PSBs generated by IMS V7**
  - Requires APARs PQ37363 (V6), PQ37653 (V5)

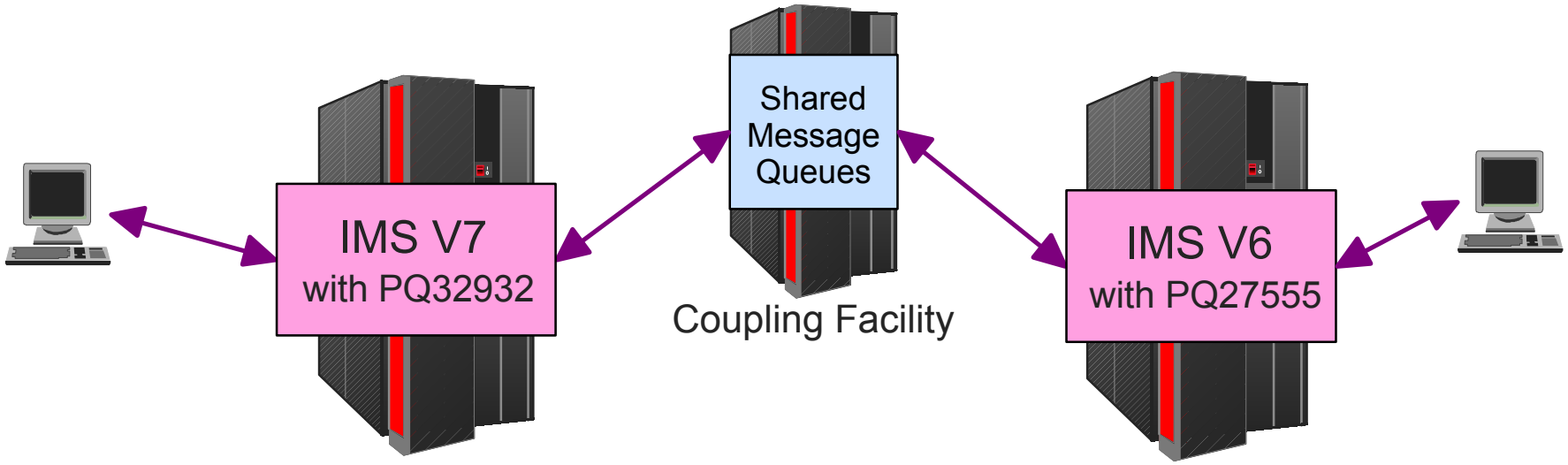
Coexistence: MSC, QCF, and Shared Queues

APARs: PQ32932 (V7), PQ27555 (V6), PQ27553(V5)

- Needed if messages are sent between V5/V6 and V7 systems using:
  - MSC
  - Queue Control Facility (QCF) product
    - Replacement product for Message Requeuer
  - Shared Queues

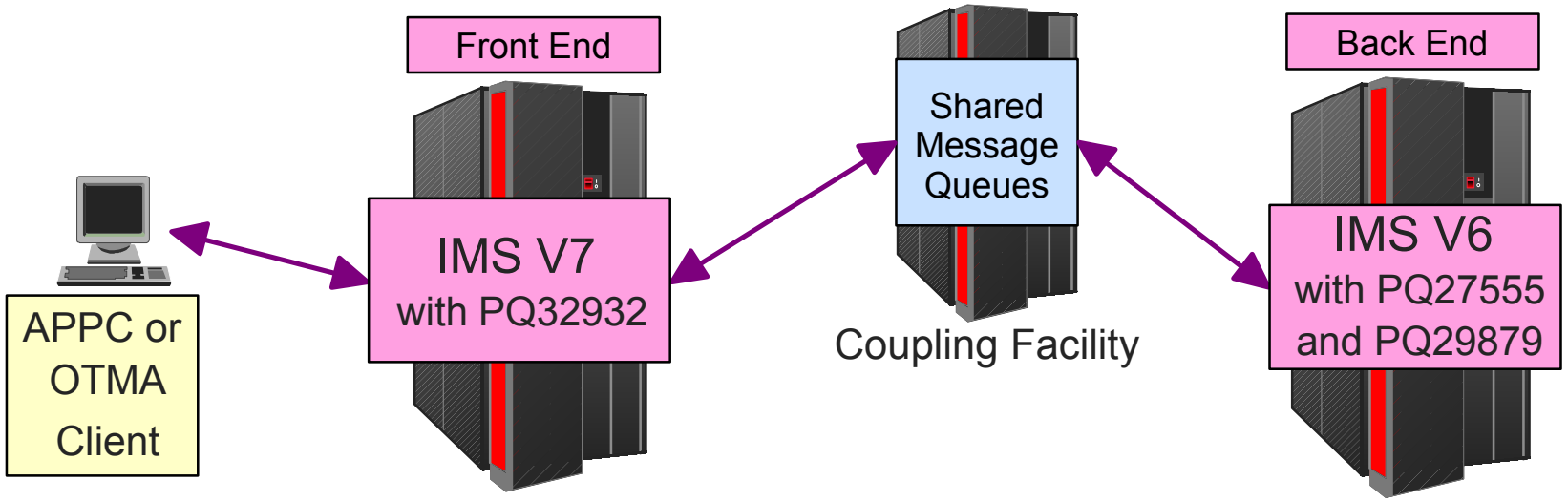
Shared Queues with IMS V6 and V7

- **Shared Queues group can consist of IMS V6 and V7 systems.**
  - Requires PQ32932 for IMS V7
    and
  - Requires PQ27555 for IMS V6



Asynch. APPC/OTMA with Shared Queues

- **IMS V7 supports asynchronous APPC/OTMA messages being processed by a back-end shared queues system**
- **Additional coexistence APAR for IMS V6: PQ29879**
  - Allows a back-end V6 system to process an asynchronous request and send reply back to V7 front-end
  - If front-end is V6, message must still be processed on front-end



Remote Site Recovery (RSR)

IMS V7 at Remote Site with IMS V5 or V6 at Active Site

- Requires PQ32693 for IMS V7
  - Allows an IMS V7 at the remote tracking site to process log records from active site running IMS at V6 or V5

IMS V7 at Active Site with IMS V5 or V6 at Remote Site

- Not allowed
  - Log records created by an active IMS V7 system are rejected by a tracking IMS running at IMS V6 or V5

IMS V6 or V5 for Isolated Log Sender (ILS) at Active Site with IMS V7 Subsystem

- Not allowed
  - Log records created by an active IMS V7 system are rejected by an ILS running at IMS V6 or V5

Remote Site Recovery (RSR)

Migration choices:

- Migrate all IMS systems involved in RSR to IMS V7
  - Disable RSR during migration
- Migrate in stages
  - Migrate RSR tracking system to IMS V7 before or at the same time as migrating the Isolated Log Sender (ILS)
  - Migrate ILS before or at the same time as the active IMS subsystems

Installation and Definition

IMS PSP Buckets

See IMS PSP buckets

- Upgrade name: IMS710
- Subset entries:
  - CHG/INDEX
    - Used to reference changes in entire upgrade
  - HMK7700/GA
  - JMK7701/GA
  - JMK7702/GA
  - JMK7703/GA
  - JMK7704/GA
  - JMK7705/GA
  - JMK7708/GA
  - HIR2101/0036
  - HALDB
    - Contains HALDB pub updates

See 3.0 Program Support section in Program Directory for further information on PSP buckets. Also, check with the IBM Support Center or IBMLink for latest information.

- Cross product dependencies sections make maintenance and product level recommendations for other products. Check these!

ServerPac PSP Buckets

- **If installing IMS using ServerPac, review ServerPac PSP buckets**
  - Upgrade name for OS/390:OS390Rn where n is release level
    - Example: OS390R10
  - Upgrade name for z/OS: ZOSVnRm where n is version and m is release level
    - Example: ZOSV1R1
  - Subset entry name: SERVERPAC

Ordering PSP Buckets

- **Use IBMLink PSP function**

  or

- **Call IBM Service**
  - USA: 1-800-237-5511
  - Outside USA:
    - See: http://techsupport.services.ibm.com/guides/handbook.html
    - Select "IBM/Tivoli contacts" from "Software Support Handbook" menu

IMS Information Item for Maintenance

- **See II08928 before installing or any maintenance upgrade**
  - Information item
  - Updated for IMS V7

Product Number and FMIDs

- IMS V7 Product Number: 5655-B01

FMID	Feature Description
HMK7700	System Services
JMK7701	Database Manager
JMK7702	Transaction Manager
JMK7703	Extended Terminal Option (ETO)
JMK7704	Recovery Level Tracking (RSR)
JMK7705	Database Level Tracking (RSR)
JMK7708	IMS Java
HIR2101	IRLM 2.1

IMS Data Set Names

- **Adherence of IMS data sets to the OS/390 naming standards**
  - Distribution Library: ADFS prefix
  - Target Library: SDFS prefix
- **Migration**
  - Impact lessened through the use of Install/IVP
  - User jobs need to be updated with new data set names

IMS Data Sets

Consolidation of IMS source libraries

- Single set of source libraries - ADFSSRC

Consolidation of the IMS macro libraries

- Single set of MACRO libraries
  - Distribution library: ADFSMAC
  - Target library: SDFSMAC
- DFSJCLIN copies ADFSMAC to SDFSMAC
- Macros from all features moved into System Services base feature
  - Reduces possibility of service failure due to missing macros from different features

Macro Library Changes

IMSGEN Macro

- MACLIB= no longer used
  - If specified, warning message issued in Stage 1 processing

Custom processes may need to be changed

- Sysgen does not build macro target library
  - Formerly built IMS.MACLIB
  - DFSJCLIN builds macro target library (SDFSMAC)
- SMPMTS no longer contains IMS macros
  - May affect customization done to SYSLIB concatenations in sysgen related jobs

Macro Library Changes

- **IMS no longer supplies its own Concept-14 macros**
  - IF, ELSE, CASE, etc.
- Uses High-Level Assembler Toolkit version of these macros
  - This is reason for Toolkit prerequisite

IMS IVP Data Sets

IVP Data Sets

Former DistLib Name	Former TargetLib Name	V7 DistLib Name	V7 TargetLib Name
DFSCLSTA	DFSCLST	ADFSCLST	SDFSCLST
DFSEXECA	DFSEXEC	ADFSEXEC	SDFSEXEC
DFSISRCA	DFSISRC	ADFSISRC	SDFSISRC
DFSRTRMA	DFSRTRM	ADFSRTRM	SDFSRTRM
DFSMLIBA	DFSMLIB	ADFSMLIB	SDFSMLIB
DFSPLIBA	DFSPLIB	ADFSPLIB	SDFSPLIB
DFSSLIBA	DFSSLIB	ADFSSLIB	SDFSSLIB
DFSTLIBA	DFSTLIB	ADFSTLIB	SDFSTLIB

IMS Data Sets

IMS Data Sets

Former DistLib Name	Former TargetLib Name	V7 DistLib Name	V7 TargetLib Name
GENLIB	SMPMTS	ADFSMAC	SDFSMAC
GENLIBA	MACLIB/SMPMTS	ADFSMAC	SDFSMAC
GENLIBB	MACLIB/SMPMTS	ADFSMAC	SDFSMAC
LOAD	-	ADFSLOAD	-
DBSOURCE	-	ADFSSRC	-
SVSOURCE	-	ADFSSRC	-
TMSOURCE	-	ADFSSRC	-
-	**RESLIB**	-	**SDFSRESL**
DBOPTSRC	-	ADFSOPSC	-
SVOPTSRC	-	ADFSOPSC	-

Installation

- **INSTALL/IVP supports three distribution media:**
  - CBPDO
  - ServerPac
  - Product Package (ISD) - IBM Software Distribution
- **Reduction in system definition dependency**
  - More than 1000 modules moved from sysgen to DFSJCLIN
  - Features install using RECEIVE/APPLY/ACCEPT
    - IRLM 2.1, RSR DLT and RLT

IMS Java Install

- **IVP Panels involving SMP are not included for IMS Java**
  - Installation JCL is used
  - See Program Directory for instructions

➡ **WARNING: Install Job DFSJALLC is incorrect**

  - ADFSJLIB DD statement has incorrect DSN
    - Should point to distribution high level prefix, not target high level prefix
      - "&TARGPRE..ADFSJLIB" should be changed to "&DLIBPRE..ADFSJLIB"

- **IMS Java uses SMPLTS data set (load temporary storage)**
  - Defined as PDSE
    - See informational APAR II12221
      - Contains tips that are useful for support of unmanaged HFS and PDSE for those unfamiliar with the process

IMS Dump Formatter

APAR PQ34343 / UQ41467

- New option: EDA (enhanced dump analysis)
  - Supports Boolean arguments for better serviceability, e.g. finding a control block offset with a specific hex value quickly in a dump
- Make sure this is applied to your systems
  - Advantageous for IMS service support when using remote viewing capability

Upgrading the RECONs

Upgrading RECONs

- **Apply compatibility maintenance to IMS V5 and/or IMS V6**
  - If you plan on using IMS V7 RECONs with earlier release
    or
  - If you want capability to fallback to IMS V5 or V6 after using IMS V7
- **Compatibility APARs**
  - Allow previous releases to use IMS V7 RECONs
  - IMS V5 - PQ27640
  - IMS V6 - PQ27643
- **Review information APAR II12095 for RECON migration information**

Upgrading IMS V5 RECONs

- **Must use the IMS V7 RECON Upgrade utility (DSPURU00)**
  - Must allocate new RECON data sets
    - Key size of RECONs changes
  - RECONs must be SHARECTL before the upgrade
  - Time History Table (THT) must be maintained while IMS V5 uses RECONs
  - See Chapter 7 of the IMS V7 *DBRC Guide and Reference*

Upgrading IMS V6 RECONs

Use the IMS V7 DBRC utility (DSPURX00)

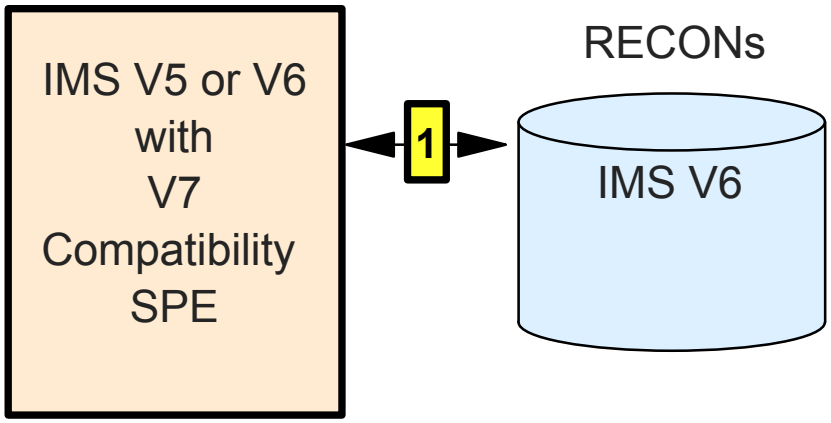
- New DBRC command keyword

  ```
  CHANGE.RECON UPGRADE
  ```

- Must use batch execution of the utility
  - Cannot use online /RMC command
- May upgrade while RECONs are in use by systems with compatibility APAR applied

Concurrent Upgrade of RECONs

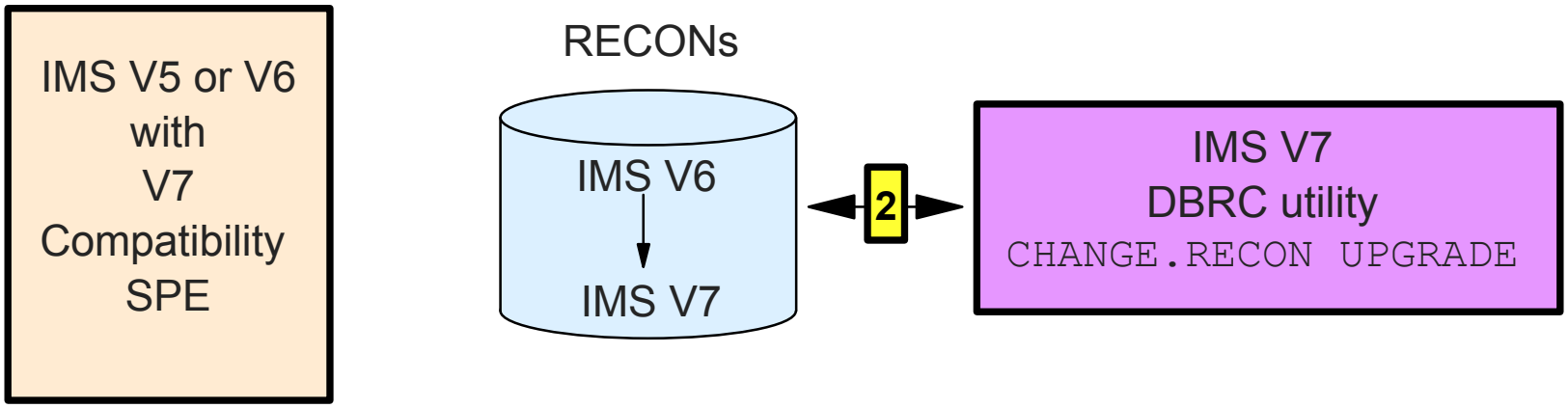
- **IMS V6 RECONs may be upgraded to V7 without terminating IMS**
  - Step 1:
    - IMS V5 and/or V6 online, batch, and/or utility accessing RECONs



Concurrent Upgrade of RECONs

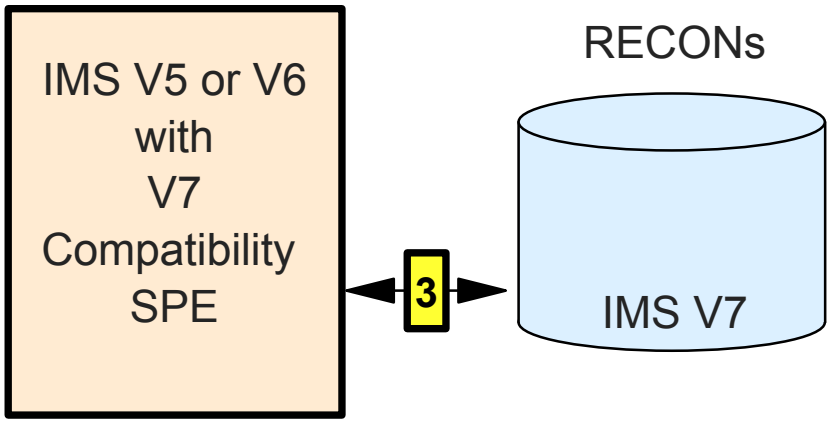
IMS V6 RECONs may be upgraded to V7 without terminating IMS

- Step 2:
  - IMS V5 and/or V6 online, batch, and/or utility continue execution
  - DBRC utility upgrades RECONs



Concurrent Upgrade of RECONs

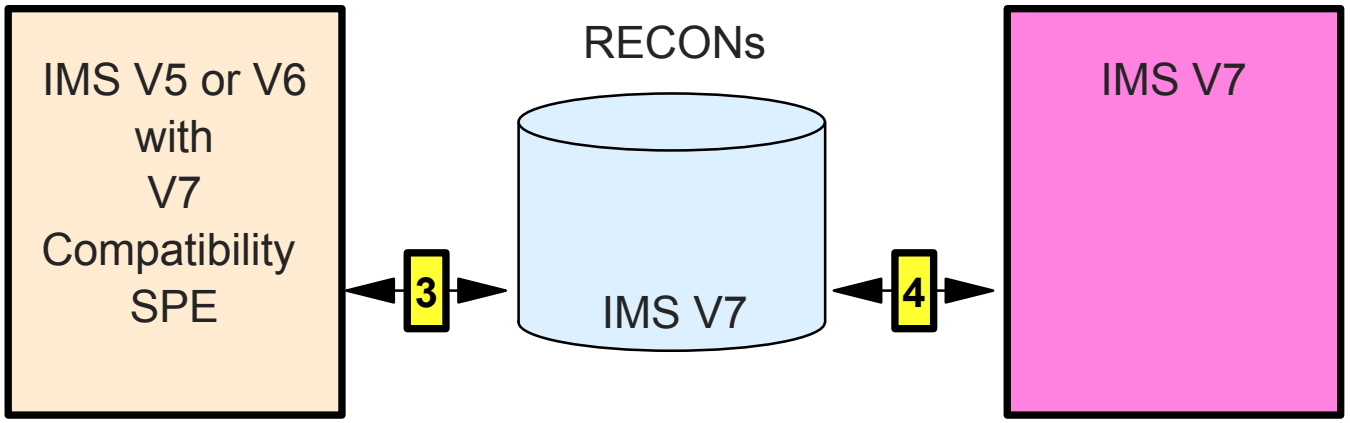
- **IMS V6 RECONs are upgraded to V7 without terminating IMS**
  - Step 3:
    - IMS V5 and/or V6 online, batch, and/or utility continue execution



Concurrent Upgrade of RECONs

IMS V6 RECONs are upgraded to V7 without terminating IMS

- Step 4
  - IMS V5 and/or V6 online, batch, and/or utility continue execution
  - IMS V7 online, batch, and/or utility may begin



Concurrent Upgrade of RECONs

- **RECONs are reserved during upgrade**
  - RECON requests from online, batch, and utilities wait
- **Upgrade should be fairly quick**
  - Around a minute, maybe less
  - Depends on number of records in RECONs
  - Upgrade a copy of RECONs to determine how long yours will take
- **Recommendations:**
  - Eliminate online RECON requests during upgrade
    - Switch online logs before upgrade
    - Don't /DBR, /DBD, /START, or /STOP databases during upgrade
  - Best time to upgrade is during steady state
    - For example, peak online processing period

Exit Routines

New Exit Routines

- **HALDB Partition Selection exit routines (optional)**
- **TM and MSC Message Routing and Control User exit routine (DFSMSCE0) (optional)**
  - New routing capabilities
  - New user message prefix capability
    - Visible to all invocations of exit routine, but not to application programs
  - Consolidation of other message exit routines
  - A future release will remove support for DFSCMPR0, DFSCMTR0, DFSCMLR0, DFSCMLR1, and DFSNPRT0

Migration Considerations for DFSMSCE0

- **TM and MSC Message Routing and Control User Exit combines and replaces:**
  - Terminal Routing Exit (DFSCMTR0)
  - Input Message Routing Exit (DFSNPRT0)
  - Link Receive Routing Exit routines (DFSCMLR0/DFSCMLR1)
  - Program Routing Exit (DFSCMPR0)

Migration Considerations for DFSMSCE0

- **Exit receives control based on defined entry points:**
  - INIT - Invoked at IMS initialization
  - TERM - Invoked at IMS termination
- **(TR) Transaction routing entry points:**
  - TRBTAM - first segment of message from BTAM devices, system console
  - TRVTAM - first segment of message from VTAM devices
  - TRAPPC - at conversation allocation, prior to receipt of data
  - TROTMA - at transaction receipt, prior to receipt of data
- **(LR) Link receive routing entry points** (messages received on an MSC link):
  - LRTRAN - destination on the receiving system is a local transaction
  - LRLTERM - destination on the receiving system is a local LTERM
  - LRDIR - direct route message is received for a local transaction/LTERM
  - LRINT - on an intermediate IMS, destination is for another remote IMS
- **(PR) Program routing entry points:**
  - PRCHNG - application program issues a CHNG call to a modifiable PCB
  - PRISRT - application program issues ISRT call for the first segment of a modifiable or non-modifiable PCB, or an IOPCB

Migration Considerations for DFSMSCE0

- **No capabilities have been removed**
- **New capabilities added and many restrictions removed**
- **Can mix and match old exits and new exit in IMS V7**
  - If any DFSMSCE0 terminal routing entry is coded
    - TRBTAM, TRVTAM, TRAPPC, TROTMA
    - Then DFSCMTR0/DFSNPRT0 will not be called
  - If any DFSMSCE0 link receive entry is coded
    - LRTRAN, LRLTERM, LRDIR, LRINT
    - Then DFSCMLR0/DFSCMLR1 will not be called
  - If any DFSMSCE0 program routing entry is coded
    - PRCHNG, PRISRT
    - Then DFSCMPR0 will not be called
  - You can replace old exit routines one at a time

Migration Considerations for DFSMSCE0

Sample DFSMSCE0 exit routine is provided

- Contains samples of all routing options
- Explains module entry interface
- Has figures showing message flows in various environments
  - Single IMS, MSC environment, shared queues, etc.
- Has information to convert from the old exits
  - DFSCMTR0/DFSNPRT0, DFSCMLR0, DFSCMPR0
- Cross reference chart for IMS SCD to MSC SCD
  - MSC fields moved from ISCD to DFSMSCD

Migration Considerations for DFSMSCE0

New user prefix follows the message wherever it goes

- Including IMS V5/V6 systems
  - Via MSC links, and IMS 6.1 shared queues systems in the same shared queues group
- PQ27553 (V5) / PQ27555 (V6)
  - Prefix will be presented to DFSMSCE0 exit if message returns
- Consider sizes of message queue LRECL
  - IMS MSG Prefix cannot span Qbuffer LRECL
  - See MSGQUEUE macro in IMS Installation Vol. 2

DFSMSCE0 Migration Summary

- **Not required with initial migration to IMS V7**
  - We recommend a migration to DFSMSCE0 while on IMS V7
- **Excellent sample is provided**
- **Old exit routines may be replaced one at a time**
- **If new user prefix is used, ensure message queue LRECL is large enough for it**

Exit Routines with New Capabilities

Exit routines with additional information or capabilities

- Logoff (DFSLGFX0) and Signoff (DFSSGFX0) exit routines
  - IMS V7 adds capability to reset significant status of terminal in Fast Path response mode
- Queue Space Notification (DFSQSPC0) exit routine
  - IMS V7 informs routine if a conversational transaction destination is stopped

Exit Routines with New Capabilities

Exit routines with additional information or capabilities

- Build Security Environment (DFSBSEX0)
  - USERID passed to exit routine
- Exit routines with access to USERID indicator
  - DFSAOE00 DFSBSEX0 DFSCCMD0
    DFSCTRN0 DFSCTSE0 DFSCTTO0
    DFSLUEE0 DFSNDMX0 DFSREXXU
    DFSNPRT0 DFSMSCE0

RECON I/O Exit Routine

RECON I/O Exit routine (DSPCEXT0)

- Receives V7 format records after upgrade
  - IMS V6 or V5 exit routine receives V7 format
  - During concurrent upgrade, exit routine receives V6 format before upgrade and V7 format after upgrade

Logon and Logoff Exit Routines

- Logon (DFSLGNX0) and Logoff (DFSLGFX0) exit routines
  - Available with IMS TM feature
    - Previous releases required ETO feature for these exits
  - Example use of exit:
    - Logon exit routine could sign on user without separate sign on input
      - Sign on data could be passed as user data in the logon

Execution

CPLOG Parameter

- **System checkpoint frequency set by CPLOG on system definition IMSCTF macro**
  - CPLOG=number of log records
    - Default in previous releases was 1000 - never recommended
    - Default in IMS V7 is 500,000 - reasonable value
- **IMS V7 allows override at execution time**
  - CPLOG=nnn execution parameter
- **IMS V7 allows online change and display of CPLOG**
  - /CHANGE CPLOG nnn
  - /DISPLAY CPLOG
- **Recommendation:**
  - Use IMSCTF value you specified with V6 or V5 if frequency was OK

New IMS Online Startup Message

IMS displays system parameters at startup

- Displayed on the system console and written to the job log
- Example of IMS system parms displayed in DFS1929I

```
DFS1929I ************************************************IMS1
DFS1929I * IMS SYSTEM PARAMETERS ACTIVE FOR THIS EXECUTION: *IMS1
DFS1929I *    ALOT            = 1440                        *IMS1
DFS1929I *    AOIP            = 2047M                       *IMS1
      ...
DFS1929I *    CPLOG           = 500000                      *IMS1
DFS1929I *    CRC             = ¢                           *IMS1
DFS1929I *    DLINM           = DLIKHTAM                    *IMS1
DFS1929I *    DLIPSB          = 163840                      *IMS1
      ...
DFS1929I *    PASSWD1         = ********                    *IMS1
      ...
DFS1929I *    USERVAR         =                             *IMS1
DFS1929I *    WKAP            = 40960                       *IMS1
DFS1929I *    YEAR4           = N                           *IMS1
DFS1929I ************************************************IMS1
```

Control Region Resource Manager

- **Ensures that all subordinate address spaces are properly shutdown**
  - *Even if* the control region terminates without resource cleanup
- **Loaded during IMS control region initialization**
  - Utilizes the MVS service RESMGR
  - Runs in the Master Scheduler address space
- **Receives control at IMS control region address space termination**
  - Checks to see if DLISAS and DBRC have terminated properly
    - Abnormally terminates any surviving DLISAS or DBRC region
    - Issues a message to alert the operator

Control Region Resource Manager

New message

```
DFS0799E rgntype REGION jobname BEING TERMINATED AT CONTROL
REGION END OF MEMORY
```

Recommended actions when message is received:

- Check for other problems in the system
  - Storage shortage or resource-related problems
  - May require an IPL

Very Large RECON Record Warnings

- **IMS issues messages when RECON record becomes large**
  - IMS V7 has additional warning message
  - IMS V7 allows user specified thresholds for messages
  - These capabilities provide additional options for reaction by automation

Very Large RECON Record Warnings

Previous releases of IMS

- Issue DSP0287W when PRILOG nears the maximum record size
  - Based on room to hold only 3 more data set entries each with 16 volumes

```
DSP0287W *WARNING* PRILOG RECORD LENGTH CRITICAL
```

- Terminates IMS (U0071 abend) when archives would cause PRILOG to exceed maximum record size

```
DSP0287I OLDS SWITCH PROCESSING TERMINATED PRILOG
    RECORD LENGTH CRITICAL
```

Very Large RECON Record Warnings

- **User controls warning messages with new IMS V7 parameters for CHANGE.RECON**

`LOGALERT(dsnum,volnum)`

  - If PRILOG record no longer has space for dsnum data set entries with volnum volumes each, IMS issues message DSP0287W

`SIZALERT(dsnum,volnum,percent)`

  - If PRILOG record no longer has space for dsnum data set entries with volnum volumes each, IMS issues message DSP0387W
  - If any RECON record's size exceeds percent of RECON RECORDSIZE, IMS issues message DSP0007I

Very Large RECON Record Warnings

Messages:

- SIZALERT for dsnum,volnum exceeded:

```
DSP0387W WARNING: rrrrrrr SIZE ALERT
DSP0387W RECORD LENGTH = llllll, pp% OF RECORDSIZE SSSSSS
DSP0387W SSID = iiiiiiii STARTIME = tttttttt
```

- LOGALERT for PRILOG record

```
DSP0287W *WARNING* PRILOG RECORD LENGTH CRITICAL
```

- SIZALERT for percent exceeded:

```
DSP0007I RECORD LENGTH APPROACHING RECON MAXIMUM
DSP0007I RECORD LENGTH = llllll pp% of RECORDSIZE ssssss
  formatted record key
```

Very Large RECON Record Warnings

Recommendations:

- Set **volnum** parameters to typical number of volumes per archive
  - Default is 16
- Set **dsnum** in SIZALERT larger than **dsnum** in LOGALERT
  - Make DSP0387W an early warning message
    - Default is 15
  - Make DSP0287W a more critical warning message
    - Default is 3

DBRC Database Initial Load Support

- **IMS V7 DBRC requires Image Copy after initial load**
  - 'Image Copy Needed' flag set
    - Prevents updates which cannot be recovered
  - Image Copy required before any update may be done
- **Initial load with previous releases:**
  - User could update database without taking an Image Copy
  - Subsequent GENJCL.RECOV could fail due to lack of Image Copy
    - Database could not be recovered!

DBRC Database Initial Load - Migration

- **If databases are "initialized" with job steps such as:**
  1. ISRT one record with PROCOPT=L
     - High key record if HDAM
  2. DLET the record
  3. Image Copy
- **Then, IMS V7 will require new step before DLET step**
  - Must turn off 'IC Needed' flag which is set by load
    - Could move Image Copy step before DLET step
      or
    - Could issue DBRC command to turn off 'IC Needed' flag before DLET step

```
CHANGE.DBDS DBD(name) DDN(name) ICOFF
```

Registration of Existing Database Data Set

New Image Copy Recommended Flag in RECONs

- Set when DBDS is registered (INIT.DBDS)
  - Useful for databases registered after they have been loaded
- Message sent to MVS console when database is authorized for update before taking Image Copy

```
DSP0089I AN IMAGE COPY IS RECOMMENDED FOR
DBD=dbdname DDN/AREA=ddn or area name
```

  - ➢ No action required
- Flag turned off by
  - Image Copy
  - NOTIFY.IC
  - NOTIFY.UIC
  - CHANGE.DBDS ICOFF

Batch Backout Performance Improvements

Backout of batch jobs

- Saves log records on forward pass
- Does not read backwards
- The READBACK statement may be used. If so:
  - Log records are not saved during forward pass
  - Read backwards is performed

Backout of online and batch

- Uses data spaces when address space memory is exhausted

Batch Backout Performance - Migration

- **The READBACK statement should be used when**
  - The use of data spaces is limited
    and
  - Batch Backout requires more memory than is available in the address space

  Example: Long running batch update job without checkpoints

Batch Backout Log Verification

- **Batch Backout for prior releases verified the entire log DSN**
- **IMS V7 honors DBRC RECON CHECK17 specification**
  - CHECK17 - checks only the last 17 characters
    - Lessened integrity with IMS V7
  - CHECK44 - checks the entire name of each log data set
  - NOCHECK - checks the entire name of each log data set
- **Migration impact**
  - Check setting of the RECON option before migrating
    - CHECK44 is recommended
    - CHECK17 is the default, but should not be used
      - Default for historical reasons

GENMAX and RECOVPD

- **IMS V7 does not increment GENMAX to satisfy RECOVPD**
  - GENMAX is number of image copies to keep for database data set
  - RECOVPD is number of days to keep image copies
- **Previous releases of IMS incremented GENMAX to satisfy RECOVPD**
  - Example:
    - GENMAX=3, RECOVPD=14
    - If we take 4 image copies in 14 days, GENMAX is incremented to 4
    - IMS continues to keep 4 image copies, even when we take only 3 in 14 days
- **Many installations have jobs to reset GENMAX to desired value**
  - These jobs may be eliminated with IMS V7

USERID Clarification

New indicator associated with the userid field

- Defines userid field's content:
  - User id, PSB name, LTERM name, or other
- Allows IMS application programs/exits to determine if a user was signed on at the time a transaction was entered
- Indicator byte added to:
  - IOPCB
  - INQY ENVIRON and INQY NULL data output
  - Exit parameter list
    - DFSAOE00 DFSBSEX0 DFSCCMD0 DFSCTRN0 DFSCTSE0 DFSCTTO0 DFSLUEE0 DFSNDMX0 DFSREXXU
      DFSNPRT0 and DFSMSCE0 (through DFSMSGRT parmlist)

Userid Clarification - Migration

IOPCB format

- USERID indicator byte added to end of mask

➢ No changes required for existing programs

INQY ENVIRON call

- I/O area size increased for USERID and indicator
  - Increased from 140 to 152 bytes
- If I/O area is not large enough,
  - 'AG' status code returned in IOPCB
  - Return code x'100' and reason code x'C' set in AIB

➢ Application program may be changed to accept this set of conditions
or

➢ Size of I/O area may be increased

Userid Clarification - Migration

- **INQY null calls for APPC and OTMA**
  - Previously reserved byte used for USERID indicator
  - ➢ No changes required for existing program
- **Exit routines**
  - Indicator added to control blocks/parameter lists in a reserved field or at the end
  - ➢ No changes required for existing routines
- **APPC and security portions of message prefix expanded**

ACBGEN Execution Times

- **IMS V7 does not regenerate PSBs for some changes in DBDs**
  - Includes changes in HDAM randomization parameters and exit routine names
  - Previous releases regenerated all PSBs which referenced a changed DBD for all DBD changes
  - ACBGEN times may be considerably shorter
- **Enhancement does not apply when PSB=ALL is specified**
  - All PSBs are generated
  - PSB=ALL required for migration to IMS V7
    - Builds ACBLIB

Summary

- **Migration is similar to previous IMS release-to-release migrations**
- **Preparation**
  - Sources of information on functions, prerequisites, compatibility, coexistence
- **Installation and Definition**
  - Some changes in names and processes
- **New Process for Upgrading the RECONs**
- **Exit Routine Compatibility**
- **Execution**
  - New parameters, new messages, operational changes

RETURN TO INDEX