DB2 11 for z/OS Migration Overview

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DB2 11 for z/OS Migration Agenda

- Packaging
- Prerequisite Summary & Planning
- Summary of removed & deprecated items
- New / Changed System Parameters
- Summary of migration steps
- Review of incompatibilities

- Migration Process Details
  - Preparations
  - Panels
  - Modes
  - Catalog Evolutions

- Application Compatibility
- RBA / LRSN Expansion
Information in this presentation is kept current on a best effort basis.

You should always refer to current documentation to plan and verify your migration projects.

Documentation used in the MPW presentations and checklists include:

- Announcement Letter 213-376
- Program Directory - GI10-8945-00
- Installation Guide GC19-4056-00
- Silicon Valley Lab guidance
- IBM internal systems
- Field Experience
Diagnosis Guide and Reference
SDSNIVPD library member DSNDR (with PM95206)
DB2 11 for z/OS Packaging

**Base**
- DB2 Base
- IRLM V2R3
- REXX
- MQListener
- IMS Attach
- RACF Auth Exit
- Panels (English / Kanji)
- JDBC / SQLJ / ODBC

**Orderable No-Charge Features**
- z/OS Appl Connectivity to DB2 for z/OS

**Related No-Charge Product**
- DB2 Accessories Suite 5697-Q04
  - See announcement 213-395 for details

**Chargeable Features**
- DB2 QMF V11
  - DB2 QMF Enterprise Edition
  - DB2 QMF Classic Edition
DB2 11 for z/OS Base

- **Components**
  - **Required FMIDs**
    - DB2 Base HDBBB10
    - REXX Language Support
    - MQ Listener
    - Subsystem Initialization HIZBB10
    - IRLM V2R3 HIR2230
    - IMS Attach HIYBB10
    - RACF Authorization Exit HDREB10
  - **Optional FMIDs**
    - ODBC JDBBB17
    - JDBC / SQLJ JDBBB12
    - Kanji panels JDBBB11
DB2 11 for z/OS Optional No Charge Feature

- z/OS Application Connectivity to DB2 for z/OS
  - DB2 Universal Database Driver for z/OS, Java Edition
    - Java Type 4 Driver
IBM DB2 Accessories Suite, V3.1 (5697-Q04)

- V3.1 (Announcement letter 213-395)
  - IBM DB2 Accessories Suite V11 Feature
    - Support for new DB2 Spatial functions
    - Data Studio 4.1
    - JSON Support (II14727)
    - IBM Text Search for DB2 for z/OS
    - Internationalization Components for Unicode (needed for Spatial Support)
    - See Program Directory GI10-8957
  - IBM DB2 Accessories Suite V10 Feature
    - Includes what is in the V11 Accessories Suite
    - Including JSON Support (II14727)
    - See Program Directory GI10-8958
  - IBM DB2 Accessories Suite V9 Feature
    - No JSON support available
DB2 11 for z/OS Chargeable Features

- **DB2 QMF Enterprise Edition**
  - DB2 QMF for TSO / CICS
  - DB2 QMF Analytics for TSO (new)
  - DB2 QMF High Performance Option
  - DB2 QMF for Workstation
  - DB2 QMF for WebSphere

- **DB2 QMF Classic Edition**
  - DB2 QMF for TSO / CICS

- **DB2 QMF v11 and new one-time charge QMF V11 (5697-QMF)**
  - supported with
    - DB2 11 for z/OS
    - DB2 10 for z/OS (all modes) with PM50434
    - DB2 9 for z/OS NFM with PM45482
The Evolution of QMF

30 Years of Innovation
And We Continue to Invest

We started with QMF for TSO/CICS
QMF queries, reports, and procedures are stored in DB2 tables, collectively called the QMF Catalog. This became QMF Classic Edition.

QMF for Windows is released, this would later become the QMF EE workstation component, extending QMF functionality to workstation users, allowing for visual reports and interactive dashboards.

QMF Enterprise Edition further extended these capabilities to users via an ordinary Web browser, allowing even greater access to business critical data.

Today we have QMF for z/OS working with mobile, providing DB2 Analytics Accelerator support, text analytics, predictive analytics, geospatial mapping, and so much more…
QMF for z/OS V11 offers fast, simple connection to a broad spectrum of data sources

QMF pricing is based on the DB2 footprint. This allows it unlimited access to all other sources at no additional cost.

Structured Data Sources
- MySQL
- Teradata
- Oracle
- Informix
- IBM DB2 for iSeries
- IBM DB2 for z/OS
- SolidDB
- IMS
- IBM PureData
- IBM DB2 for LUW

Unstructured Data Sources
- zSQL
- Cloudant
- BigInsights
- Hadoop
- z/OS
- Web Access – HTTP data

Cloudant
Hadoop
Hadoop
Sun JDBC-ODBC bridge data sources such as Excel and text files etc.
<table>
<thead>
<tr>
<th>QMF for z/OS v11 - capability highlights</th>
</tr>
</thead>
<tbody>
<tr>
<td>✓ Graphical queries, reports</td>
</tr>
<tr>
<td>✓ Dashboards and KPIs</td>
</tr>
<tr>
<td>✓ Advanced analytic functions and analysis</td>
</tr>
<tr>
<td>✓ JDBC access to any RDBMS</td>
</tr>
<tr>
<td>✓ Spatial data access</td>
</tr>
<tr>
<td>✓ Multi-dimensional analysis</td>
</tr>
<tr>
<td>✓ Operational Business Intelligence (e.g. access to IMS, Adabas, IDMS)</td>
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<tr>
<td>✓ Big Data</td>
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<tr>
<td>✓ Heterogeneous database access</td>
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<tr>
<td>✓ Federated data</td>
</tr>
<tr>
<td>✓ Scheduling for automation</td>
</tr>
<tr>
<td>✓ Virtual data sources (e.g. use queries as input vs SAVE DATA)</td>
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<tr>
<td>✓ Superlative support of the IBM DB2 Analytics Accelerator</td>
</tr>
<tr>
<td>✓ Mobile device support</td>
</tr>
<tr>
<td>✓ Full DB2 11 for z/OS support (temporal data, etc.)</td>
</tr>
</tbody>
</table>
Prerequisite Summary & Planning ...

- **PID 5615-DB2**
  - FMIDs HDBBB10, HIYBB10, HIZBB10, HIR2230, HDREB10

- **z/Architecture (z10 and subsequent 64-bit z/Architecture Processors)**

- **z/OS 1.13 or above**
  - Data Sharing: CF Level 12, with 13 or 14 recommended
  - GBP Enhancements require CFLEVEL 17 or higher

- **DB2 LUW / Connect / Data Server Driver / JDBC / ODBC**
  - Any in-support IBM Information Managements clients / drivers
  - V10.5 FP2 advised for new features
  - See the Program Directory for more details (ex DB2 for z/OS client to DB2 LUW server)

- **Migrate from**
  - DB2 10 for z/OS NFM
  - With Fallback SPE PM31841
    - With associated coreqs & prerequisites
    - Reassemble DSNHDECP module
    - See Informational APARs II14660/II14745 (Migration), II14730 / II14732 (Client & DDF)

- **Establish performance baselines**
Prerequisite Summary & Planning ...

- **Check / correct incompatibilities**
  - Run a current V10 DSNTIJPB pre-migration job (PM94057)
    - Same as V11 DSNTIJPM
    - Check maintenance for currency
  - Release Incompatibilities documented in:
    - Installation Guide
    - Application Programming and SQL Guide

- **Check programming language requirements**
  - DSNHPC7 included in the base for older COBOL and PL/I
  - See the Program Directory

- **IBM InfoSphere Data Replication (IIDR) 10.2.1**
- **IBM DB2 Analytics Accelerator V4**
- **IBM DB2 Tools Compatibility**
Prerequisite Summary & Planning ...

- **Configure a minimum of (IEASYSxx):**
  - 1TB of contiguous shared private per DB2 – HVSHARE
    - Default is 510TB
  - 6GB of contiguous shared extended private per DB2 – HVCOMMON
    - Same as DB2 10
    - Default 66GB

- **No significant storage usage differences**
  - OnDemand Buffer Pool allocation from DB2 10 was removed
    - This likely does not represent a storage requirement
    - VPSIZE will be allocated when Buffer Pool is allocated
  - Early testing indicates 0 – 5% additional memory dependent on query workload
    - Consider 10% cushion for potential growth with less behaved workloads

- **SMS managed catalog and directory**
  - This was a requirement for DB2 10
    - Data Class attributes of
      - Extended Format
      - Extended Addressability
  - New areas of the Cat / Dir moved under SMS management during migration to 11
  - Additional migrated areas REORGed after V10 ENFM would also have been converted
  - **DSNTIJSS** provided as a sample for configuration
Prerequisite Summary & Planning ...

- Reestablish V10 IVP to test DB2 11 before NFM
  - PI13612 should be applied for COBOL 5 support

- Assess ISV Requirements / Readiness
  - Tools and applications (Check your IBM DB2 Tools)
  - Some vendors may add instructions for migration and / or require maintenance

- Assess the training requirements for your organization

- PDSEs required for SDSNLOAD, SDSNLOD2, ADSNLOAD, ADSNLOD2
  - Same as V10

- Establish a project team and project plan
  - Review the Installation Guide checklists and MPW Project Framework
  - Consider Single Version Charging when building your plan
Prerequisite Summary & Planning

- Develop conversion and coexistence goals
  - How did your V10 test plans work?
  - Reuse and improve upon your experiences

- Migration occurs in three familiar phases
  - Conversion Mode (CM)
    - Data Sharing may see an X mode during coexistence
  - Enable New Function Mode (ENFM)
  - New Function Mode (NFM)

- Use the proactive PMR process
  - This is to notify IBM DB2 Support of your up coming migration activity
    - It is typically routed to the DB2 Duty Manager on call for that time
    - If problems occur during the migration, open a new Sev 1 PMR / SR

- REBIND / REGENERATE while in CM
  - Use REBIND Plan Management (Package / Bind Stability)
    - Consider FREEing Original Packages to establish a new DB2 10 back up
  - Consider:
    - **REBIND ... EXPLAIN (YES) ... APREUSE(WARN or ERROR)**
    - **REBIND ... EXPLAIN (YES) ... APCOMPARE(WARN or ERROR)**
DB2 11 for z/OS Migration Modes / NFM Decisions

• Fallback SPE applied and incompatibilities mitigated.

V10 Catalog

V11 CM Catalog

V11 Catalog

V11 Catalog

APPLCOMPAT

Expanded

RBA/LRSN

Optional
Removed Features Summary

- No pre-V9 bound Packages
  - Require REBIND, including PLANMGMNT copies
- Password protection of Active / Archive Logs
- Previous NEWFUN values
- DB2 Supplied Routines
  - SYSPROC.DSNAEXP
  - AMI based DB2 MQ Functions
  - See JPB/JPM report
- Sysplex Query Parallelism
- DSN1CHKR
Deprecated Features Summary

- EXPLAIN tables in a previous release format
  - V9 & V10 format accepted
- DSNUTILS stored procedure
- REORG TABLESPACE SHRLEVEL NONE on a LOB
  - V10 returned RC=0 (without performing the REORG)
  - V11 returns RC=8
- Synonyms
  - Should be using Aliases
- Simple Table Spaces remain deprecated
  - Can not create Simple Table Spaces (since V9)
- See Parameters for more information
New Parameters

- **APPLCOMPAT**
  - Default BIND / REBIND parameter
  - Determines static SQL statement behavior
  - Defaults to V10R1 for migrations and V11R1 for installations
    - Migrations must be V10R1 until NFM

- **AUTHEXIT_CACHEREFRESH**
  - When DSNX@XAC is active and this is set to ALL
    - DB2 listens for RACF signals for User Profile and Resource Access changes
    - Refreshed DB2 cache entries accordingly
  - Not online changeable

- **AUTHEXIT_CHECK (PRIMARY)**
  - Indicates if the Primary Auth ID or the Owner is used for Autobind authorization checking when DSNX@XAC is active
  - “DB2” indicates that DYNAMICRULES drive the authorization ID provided
  - Not online changeable

- **INDEX_CLEANUP_THREADS (10)**
  - Specifies the maximum number of threads for Pseudo-deleted index entry clean up processes
New Parameters ...

- **LIKE_BLANK_INSIGNIFICANT (NO)**
  - YES strips trailing blanks before comparison

- **MAXCONQN / MAXCONQW (OFF)**
  - Monitors the Connection queue depth (N) and time (W)
  - Also added to 10

- **MAXSORT_IN_MEMORY (CLIST calculation or 1000)**
  - Max allocated storage (KB) for a query with an:
    - ORDER BY or
    - GROUP BY

- **OBJECT_CREATE_FORMAT**
  - Default BASIC for migration and EXTENDED for installation
  - Indicates if new Table Spaces and Indexes should be created with 6 byte or 10 byte RBA / LRSN support

- **PARAMDEG_DPSI (0 or PARAMDEG)**
  - Maximum degree of parallelism for a DPSI
  - 0 – 254, DISABLE
  - 1, Child tasks are worked one at a time
  - DISABLE, DPSI will not drive parallelism
New Parameters ...

- **PARAMDEG_UTIL (0, or no constraint)**
  - Max parallel subtasks for some utilities
    - REORG TABLESPACE
    - REBUILD INDEX
    - CHECK INDEX
    - UNLOAD
    - LOAD
    - 0 - 32767

- **PCTFREE_UPD (0)**
  - Default for the PCTFREE FOR UPDATE clause of CREATE / ALTER TABLESPACE
  - Reserved from INSERTs
  - AUTO, 0 - 99

- **PKGREL_COMMIT (YES)**
  - Indicates default behavior for “breaking in” on persistent threads bound with RELEASE(DEALLOCATE)
  - PM95929 needed with V11 Early Code
    - PM96001 toleration / PM96004 enablement
New Parameters ...

- **REORG_DROP_PBG_PARTS (DISABLE)**
  - ENABLE; removes empty trailing Parts when REORG is run:
    - As a Full Table Space REORG
    - On a PBG
    - That is not organized by hash
  - Includes LOB spaces and Aux indexes

- **REORG_MAPPING_DATABASE (Implicit Database)**
  - The default database for automatic mapping tables for
  - REORG TABLESPACE SHRLEVEL CHANGE

- **REORG_IGNORE_FREESPACE (NO)**
  - YES ignores PCTFREE and FREEPAGE for REORG TABLESPACE of PBGs
  - Returned to V10 as well

- **REORG_LIST_PROCESSING (PARALLEL)**
  - Defaults REORG TABLESPACE default to the PARALLEL YES option
  - SERIAL defaults to PARALLEL NO

- **REORG_PART_SORT_NPSI (AUTO)**
  - Indicates that REORG TABLESPACE PART is to determine when it’s most effective to sort the entire NPSI(s)
  - Also in V10
New Parameters …

- **STATFDBK_SCOPE (ALL)**
  - Scope of SQL statement for which DB2 provide statistics recommendations
  - DYNAMIC, STATIC, and NONE are other options

- **TEMPLATE_TIME (UTC)**
  - Default TIME option for a Template
  - LOCAL or UTC

- **UTILITY_OBJECT_CONVERSION (NONE)**
  - Control of the RBALRSN_CONVERSION keyword in utilities
  - BASIC, EXTENDED, NOBASIC (Utility uses EXTENDED)

- **WFSTGUSE_AGENT_THRESHOLD (0)**
  - Warning threshold percentage of work file available to a single agent
  - Off by default, 0 – 100
  - WFDBSEP=YES, applies to both Temporary and Sort work file space

- **WFSTGUSE_SYSTEM_THRESHOLD (90)**
  - Warning threshold percentage of work file used by all
  - 0 (OFF) – 100
  - WFDBSEP=YES, applies to both Temporary and Sort work file space
### Deprecated / Removed Parameters

**Deprecated**
- PRIVATE_PROTOCOL
- CACHE_DEP_TRACK_STOR_LIM
- DPSEGSZ

**Removed**
- ASSIST
- COORDNTR
- DISABSCL
- DISALLOW_DEFAULT_COLLID
- MSVGP
- MSVGP2
- OJPERFEH
- OPTIOPIN
- OPTIOWGT
- OPTIXIO
- PTCDIO
- RETVLCFK
- SEQCACH
- SEQPRES
- SMSDCFL
- SMSDCIX
- STATCLUS
- CHARSET
Parameters Default & Maximum Changes

- **Default**
  - DESCSTAT
    - Is now the default for a new BIND/REBIND PACKAGE...
    - DESCSTAT keyword when there is no existing value
  - REORG_PART_SORT_NPSI
    - Changed from NO to AUTO
    - Also added to DSNTIP62
  - SUBQ_MIDX
    - Changed from DISABLE to ENABLE

- **Maximum**
  - DSMAX
    - From 100,000 to 200,000
  - EDM_SKELETON_POOL
    - From 2097152 to 4194304
  - EDMDBDC
    - From 2097152 to 4194304
  - EDMSTMTC
    - From 1048576 to 4194304
  - MAXKEEPD
    - From 65535 to 204800
Release Incompatibilities Aren’t Just for DBAs

- Application and SQL release incompatibilities
- Utility release incompatibilities
- Command release incompatibilities
- Storage release incompatibilities
- Other release incompatibilities

Release incompatibilities can change over time. Ensure that current documentation is reviewed when constructing your plan.
Application Incompatibilities

- **ASUTIME** may be applied differently for dynamic statements of nested routines in NFM
  - SQLCODE -905 returned is limit for nested routine is exceeded
  - Previously had to exceed the top level package limit

- **Packages requiring rebind**
  - Previously to V9
  - Dependent on changed catalog tables

- **ODBC LIMITEDDBLOCKFETCH** is default in NFM
  - Default to ENABLED in NFM
Application Incompatibilities ...

- **XML**
  - XPath fewer XPath processing errors due to:
    - Predicate filtering before operations that could be invalid
      - Example: division by 0
    - Castable expressions avoiding incompatible data types
  - Implicit XML Document nodes
    - The XMLDOCUMENT function is not needed to avoid SQLCODE -20345

- **Client Information Special Register expansion**

- **ALTER Limit Key**
  - Now a Pending Alter for PBRs and Table Partitioned Classic
  - Not allowed with Immediate ALTERs
Application Incompatibilities …

- **SYSPUBLIC Schema**
  - Used for Public Aliases and cannot be in the SQL Path for Routines
  - SYSPUBLIC (and SESSION) should not be Schema Names

- **SYSIBMADM Schema**
  - Schema for administrative Global Variables (GET_ARCHIVE)
  - Added to CURRENT PATH in V11 NFM / V11R1

- **CAST(string AS TIMESTAMP)**
  - String input is interpreted as a TIMESTAMP string representation in V11 NFM / V11R1
  - Previously 8 bytes were considered a Store Clock value and 13 bytes a GENERATE_UNIQUE value.
    - ‘1/1/2013’ (8 bytes) returned year 2034.
    - Corrected in NFM / V11R1, but GENERATE_UNIQUE returns -180 (use TIMESTAMP BIF instead)

- **Check:**
  - New Reserved Words
  - Changed Messages
  - Changed SQLCODEEs
Utility Incompatibilities

- **REBUILD INDEX, COPY, and RECOVER parallelism**
  - May increase in CM, governed by the PARALLEL or PARAMDEG_UTIL parameters

- **REORG**
  - TABLESPACE / INDEX: DRAIN defaults to ALL (was WRITERS)
  - TABLESPACE: NOPAD is the default for
    - UNLOAD EXTERNAL or
    - DISCARD

- **REORG on LOB w/ SHRLEVEL NONE**
  - Will now return RC=8
Utility Incompatibilities …

- **The RECOVER RBA/LRSN Expansion**
  - TOLOGPOINT, TORBA, RESTOREBEFORE accept 6 or 10 byte format

- **DSNACCOX**
  - The Ratio-of-space-allocated-to-used is now turned off by default (-1)
    - Was 2.0
    - XML & LOB spaces now accepted
    - Now checks DBET states
    - CHKLVL 8, a new row is not inserted of an object already has a recommendation

- **ALTER Limit Key**
  - Now a Pending Alter for PBRs and table-controlled Classic partitioning table spaces
  - REORG SHRLEVEL NONE and LOAD REPLACE will not materialize
    - Must be Online REORG
Command & Storage Incompatibilities

- **Command**
  - DISPLAY UTILITY
    - Now includes date / time of job submission
  - DISPLAY THREAD
    - Shows expanded RBA / LRSN

- **Storage**
  - HVSHARE minimum is now 1 TB
    - Was 128 GB
Other Incompatibilities

- **IVP**
  - ADMIN_INFO_SYSPARM used instead of DSNWZP
  - DSNTEJ6Z

- **Log Capture Exit Routine**
  - Must be invoked in 64 bit mode
  - Buffers are moved above the bar into key 0 protected common storage
  - Uses 64 bit pointers

- **Trace Records**
  - Any IFCIDS that have RBA or LRSN values are expanded to 10 bytes in CM
  - In most cases these fields are moved so other offsets are not impacted
    - IFCID 0204 is an exception (DDF Partner Cold Start)

- **Client Information in messages**
  - Expands in CM changing the length of several messages
  - User ID, Workstation Name, Application Name, Accounting Information
Migration Process

- Preparations
- Customization / Tailoring
- Migration
  - Before CM
  - Migration to CM
  - Fallback to V10
  - Remigration to CM
  - Conversion to ENFM
  - Conversion to NFM
  - Application Compatibility
  - Extended RBA / LRSN
- Testing

Note: These steps will iterate for each DB2 subsystem you need to migrate
Application Compatibility

- Allows applications to continue experiencing SQL DML & XML behavior from a previous release (DB2 10)
  - APPLCOMPAT ZParm
    - Must be V10R1 until NFM
  - Migrations default to the migrate-from release (V10R1)
  - Installations default to the migrate-to release (V11R1)

- DDL and DCL is *not* fenced by APPLCOMPAT

- This includes new functions, not just changes to existing behavior

- May not be possible when conforming to SQL standards
Application Compatibility ...

- **Similar limited capability in DB2 10**
  - BIF_COMPATIBILITY
  - DDF_COMPATIBILITY (Disabled when APPLCOMPAT set to (V11R1) via PM94719

- **Static SQL is governed by the Package APPLCOMPAT**
  - Cannot bind with V11R1 until NFM

- **Dynamic SQL is governed by the:**
  - CURRENT APPLICATION COMPATIBILITY
  - Which defaults to the Package APPLCOMPAT if not SET

- **Once in NFM:**
  - CURRENT APPLICATION COMPATIBILITY can be set to either level
  - RE/BIND PACKAGE can choose either level
Application Compatibility ...

- **BIND / REBIND (TRIGGER) ... APPLCOMPAT Defaults**
  - Must be V10R1 until NFM
    - V11R1 before NFM returns error
  - During REBIND, if already rebound with a compatibility level
    - Defaults to this level
    - Including Autobind
  - If BINDind, or not yet set, defaults to APPLCOMPAT ZParm

- **CREATE / ALTER PROCEDURE /FUNCTION**
  - Same rules as BIND / REBIND

- **On DB2I defaults panels for**
  - BIND: DSNEBP10
  - REBIND: DSNEBP11
Application Compatibility ...

- **CURRENT APPLICATION COMPATIBILITY**
  - Defaults to the Package RE/BIND
  - If not rebound, defaults to the ZParm
  - SET this Special Register overrides all
    - Must be in NFM to SET this register

- **IFCID 239**
  - Indicates Packages using a function that changes in DB2 11
  - Field QPACINCOMPAT
  - See SDSNMACS(0SNDQ5PAC) for mapping

- **IFCID 366/376**
  - Records indicate SQL using the V10 code path which is different from the V11 code path
  - Use these in CM to identify programs needing review
  - 376 is new in V11 and is a roll up of activity reported in 366
    - Attempts once per dynamic and static statement (bound V10 or later)
    - Once per Plan, Package, Statement # bound prior to V10
  - See SDSNMACS(0SNDQ5W05) for detailed description
**Application Compatibility ...**

<table>
<thead>
<tr>
<th>10 NFM</th>
<th>11 CM</th>
<th>11 ENFM</th>
<th>11 NFM</th>
</tr>
</thead>
<tbody>
<tr>
<td>• ZParm V10R1</td>
<td>• Same as CM</td>
<td>• ZParm</td>
<td>• Z Parm</td>
</tr>
<tr>
<td>- Can set to V11R1 but will not operate that way</td>
<td>• BIND/REBIND</td>
<td>- V10R1 or V11R1</td>
<td>- V10R1/V11R1 available</td>
</tr>
<tr>
<td>• BIND/REBIND</td>
<td>• BIND</td>
<td>- Defaults to ZParm</td>
<td>- Defaults to previous Catalog value first</td>
</tr>
<tr>
<td>- Must be V10R1</td>
<td>• REBIND &amp; Autobind</td>
<td>- ZParm second</td>
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</tr>
<tr>
<td>• CREATE/ALTER</td>
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<td>• SET CAC* available</td>
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<tr>
<td>- Must be V10R1</td>
<td>• V10R1 or V11R1</td>
<td>• V10R1 or V11R1</td>
<td>- Require V11R1</td>
</tr>
<tr>
<td>• SET CAC* not available</td>
<td></td>
<td>• New features</td>
<td></td>
</tr>
<tr>
<td>• IFCID 239/366/376</td>
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*CAC = CURRENT APPLICATION COMPATIBILITY*
**RBA / LRSN Expansion**

- **DB2 10 and prior used a 6 byte (Basic) RBA / LRSN**
  - Some customers have had to take RBA action to keep systems running
    - RBA reset
      - Manual recovery action to reset
    - Bring up new data sharing members
  - Represents 256 TBs of logging space
  - Messaging (DSNJ032I) and system actions
    - F000 0000 0000 warning threshold surfaces at log switch & restart
    - FFFF 0000 0000 critical threshold, DB2 will only run ACCESS(MAINT)
  - The LRSN also has a limit in Year 2042 if there’s no DELTA RBA
  - STORCLK is 8 bytes, and therefore LRSN spin can occur
RBA / LRSN Expansion ...

- **DB2 11 offers the option to convert to a 10 byte RBA / LRSN**
  - Almost 4 Billion times the logging space
  - RBA extended with high-end (left) 4 bytes
    - Extended value represents 1 YB of logging space (1 YB = 1 Trillion TBs)
  - LRSN
    - 1 byte on high-end
    - 3 bytes on the low-end
    - Adding 30,000 years of logging
  - Conversion is optional if not nearing the 6 byte limit
    - However, DB2 11 uses 10 bytes internally and converts to 6 on writes
  - Convert earlier than required to:
    - Avoid internal conversions
    - Resolve LRSN spin conditions
    - Disabling Data Sharing requires 10 byte RBA/LRSN for surviving members
Project Planning Summary

- Treat your DB2 migration as “the” project and don’t shortcut the “Planning” part.
- Create a cross-discipline team
- Educate the team
- Allow for the unknown
  - PMRs
  - Testing problems
- Make sure that you don’t plan yourself into a corner
  - Any close timeframes to holidays, major company events, etc. should be avoided
- Plan regular status meetings
  - Keep your IBM team informed
- Consider opening a proactive PMR for major migration milestones to inform IBM support.
Proactive PMR

- Use your normal support process to open a PMR
- Use the description to briefly describe what environment is being migrated and to which mode
- Provide good contact information
  - Several names and contact numbers
- If the problem is serious, ask to be transferred to a Duty Manager
Consolidated Service Test RSU ...

- CST is provided: "AS IS"
- CST does not remove the need to do your own testing
- Free offering to customers
- CST testing is done at an IBM test lab simulating a customer-like production sysplex environment in an IBM test lab with batch and data-sharing applications that exploit and stress the latest functions with up to two levels of subsystems on three levels of z/OS systems. The key products specifically tested in CST include

- CICS Transaction Gateway for z/OS
- CICS Transaction Server for z/OS
- DB2 for z/OS
- DB2 Connect
- Geographically Dispersed Parallel Sysplex (GDPS/PPRC)
- IMS

- IRLM
- JAVA
- WebSphere Application Server for z/OS
- WebSphere MQ for z/OS
- z/OS
eServer zSeries AD Tools
- IBM DB2 and IMS Tools
- IBM Tivoli
Consolidated Service Test RSU Benefits ...

- Better testing of maintenance by each of the products in customer-like parallel sysplex environment
- Recommendation for RSU identified by product experts
- Maintenance recommended after successful testing for at least one month
- Allows for consistent maintenance recommendations across the z/OS and OS/390 platform products
- Testing is performed in addition to existing testing programs and does not replace any current testing performed by the products.
- E-mail sent to you when we've completed testing of a new RSU service package.
Migration Summary

- Run checks against your V10 system
- Review documentation
- Resolve / research inconsistencies and release incompatible changes
- Establish a Project Plan and Project Team
- Assess new features & training plans
- Complete any prerequisite projects
- Collect Performance Baselines

- Establish Test Plans
- Determine Conversion & Coexistence (data sharing) goals
- Determine your Application Compatibility and RBA Expansion plans
- Keep your IBM team informed
Thank You