

The future runs on System z

Planning Your Migration to DB2 9 for z/OS

Roger Miller

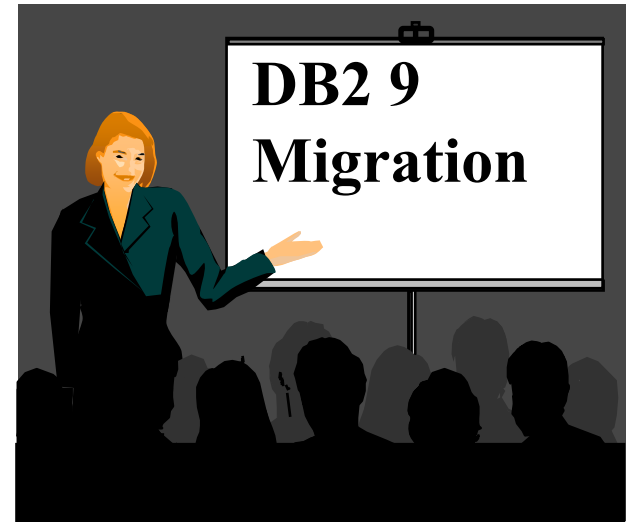
IBM Silicon Valley Lab

Presented by Willie Favero



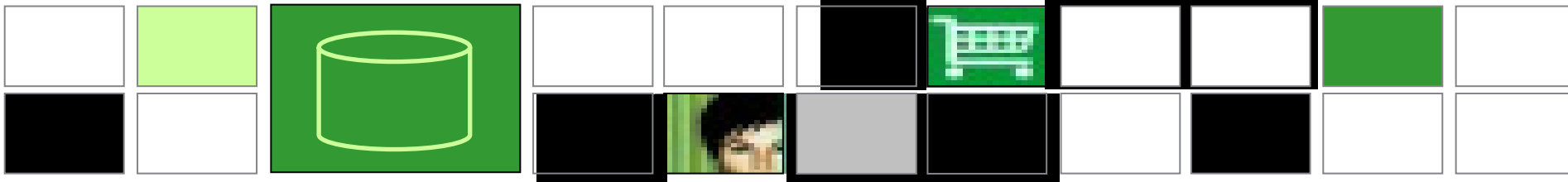
DB2 9 Upgrade Staging

- Planning:
 - Education for planning,Plan to educate
 - Detailed project plan and communications
 - Install prerequisites
 - Find and fix incompatibilities
 - Plan virtual and real storage
 - Plan performance
- Migration: monitoring and tuning
- Implementation
 - Using new improvements to deliver value



Why Upgrade to DB2 9 for z/OS?

- Business needs to save money
 - Reduce CPU time & disk space
 - Improve business agility
 - Service Oriented Architecture
- Application developers need
 - PureXML for a powerful SQL and XML interface to XML data
 - Powerful new SQL enhancements
 - Portability with SQL and data definition compatibility
- Database Administrators need
 - Improve availability and performance
 - More flexible security and easier regulatory compliance
 - Better web application & data warehouse function and performance
 - LOB function, performance, usability

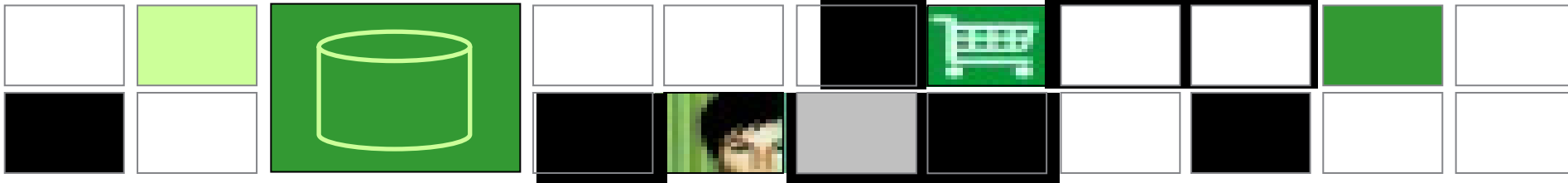


Common Challenges: DB2 for z/OS Upgrade

- Check and correct code pages (V8)
- Current product and tool support
- ~~Old COBOL or PL/I or tools~~ PK91610
- Cleaning up incompatible changes
- Real and virtual storage
 - Commit intervals, Calls, ...
- Plan, monitor and manage performance

Migration to DB2 9 is easier than V7 to V8

- Migration process enhancements: ENFM shorter, CM*
- Much less performance regression:
 - Earlier improvements
 - Bind stability & tools for avoiding access path issues
- CCSIDs and old product issues resolved in V8
- Simpler virtual storage considerations
- Less impact from incompatible changes
- Earlier deliveries from vendors



DB2 9 for z/OS climbing sharply

- **Largest Customers are migrating**
 - **38% of top 100 31% of top 200**
- **How's the quality (comparison to V8)?**
 - **Lower overall PMR volume**
 - **Less Severity 1 APARs**
 - **Lower PE rate**
- **V8:**
 - **100% of the top 100 Customers**
 - **More than 99% of the top 200 Customers**
 - **Better quality than V7**
- **V7 out of service as of June 30, 2008... target V8**

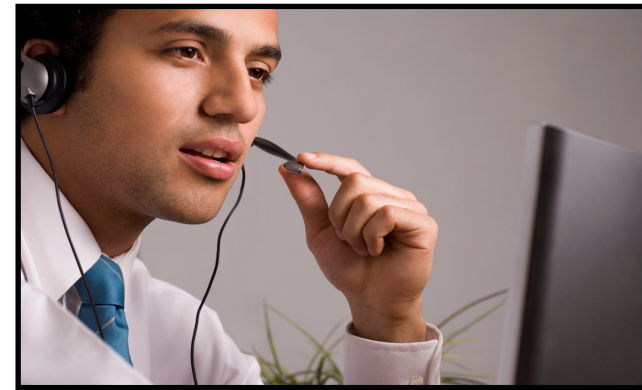


Best Practices/Recommendations

- Start with latest RSU + Identified Hipers
- Leverage CST/RSU process
 - Apply 2 to 3 preventative service drops annually
 - Exploit Enhanced HOLDDATA to be vigilant on HIPERs and PEs
- Use the DB2 9 'Package Stability' function for static SQL
 - Offers access path preserving option. Recovers to prior access path if regression is encountered
 - [PK52523](#) - DB2 Access Path Stability
- Minimize potential query performance issues
 - Use Optimization Service Center to capture SQL statements
 - Run Stats Advisor to generate the recommendation for stats collection
 - Run RUNSTATS to ensure critical stats are collected as recommended by the advisor
- Ensure a PMR is opened prior to migration start

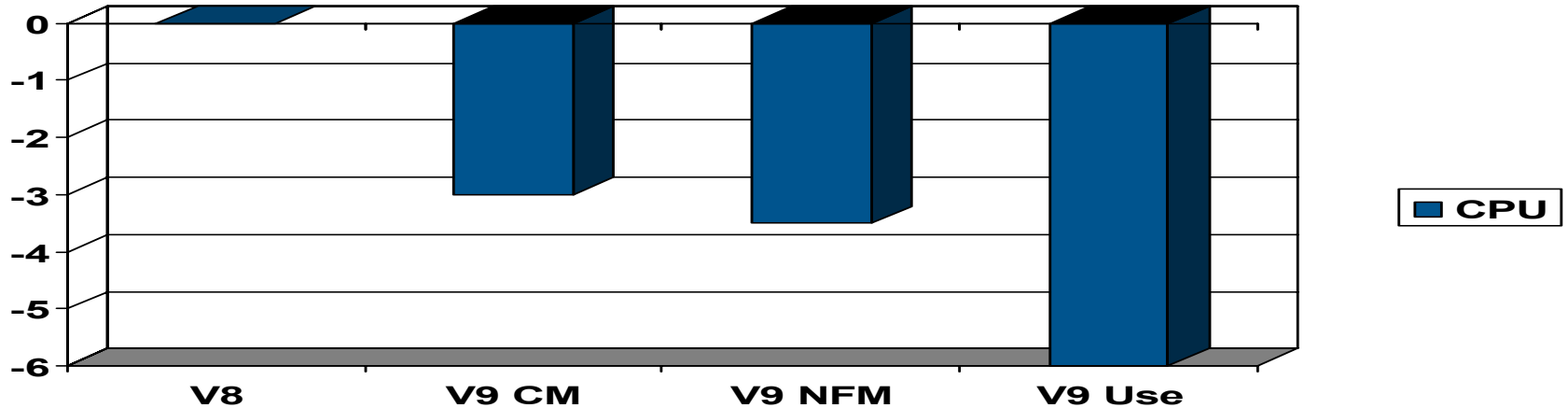
DB2 9 – So where do I go from here?

- No need to fear DB2 9 migration; but be cautious & thoughtful
 - Ensure good planning, staying reasonably current on preventative service and application regression testing
 - Follow best practices/recommendations
 - PMR opened
 - Trends are improving!
- Procedural upgrade easier
- Every customer experience is different
- Compared to V8?
 - Lower overall PMR volume
 - Less Severity 1 APARs
 - Lower PE rate
 - Lower HIPER rate



DB2 9 z10, z9, z890 & z990

Performance scenario

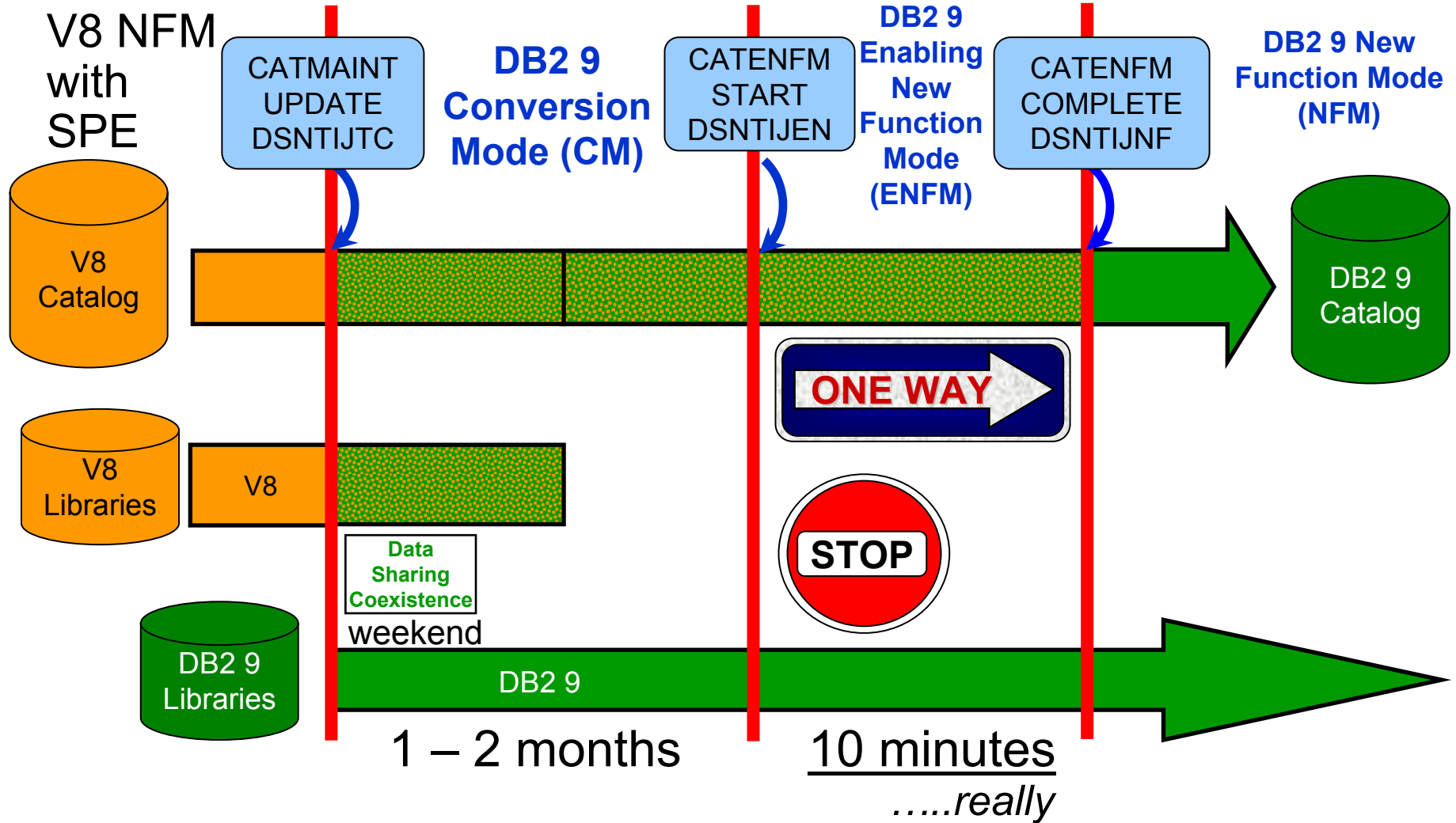


Utilities
Histogram statistics
REBIND
DSNZPARMS

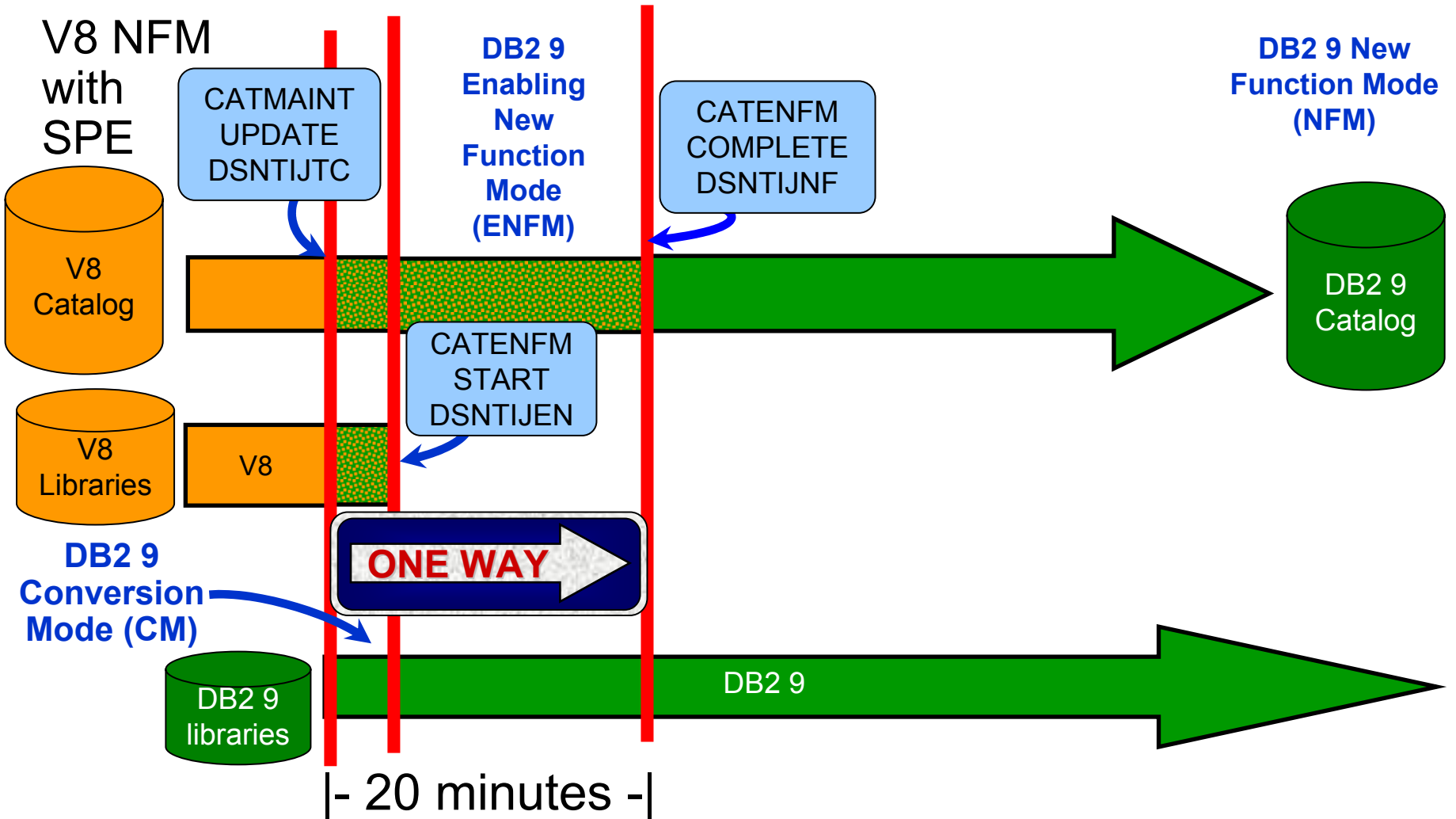
DB design adjustments
Index improvements
application changes
native SQL procedures
SQL adjustments

Your situation will vary. Less CPU is better.
z800 and z900 expect +5% to +10% CPU

DB2 9 Migration Timeline



DB2 9 Migration Alternative → Straight Through to NFM



What works in Conversion Mode?

- Logging improvements
- DSN1COMP index compression estimate
- Larger prefetch, write and preformat quantities
- LOB performance other than LOB lock avoidance
- Command enhancements: REFRESH, DISPLAY, START, STOP, & MODIFY TRACE qualifications and ACCESS DATABASE
- Virtual storage use above the 2 GB bar DDF & EDMPOOL (when bound)
- Package BIND stability (PLANMGMT & EXCHANGE)
- Optimization improvements (when bound)
- Optimization Service Center & Optimization Expert (work with V8 if PTFs are applied)
- Most utility enhancements and CPU reductions (see next slide)

DB2 9 Utilities: Conversion Mode versus New Function Mode

Utility enhancements available in both CM and NFM are:

- CPU reductions
- Parallel unload, reload and log apply processing by the REORG utility
- Removal of the BUILD2 phase for REORG at the partition level
- Log Phase addition for REORG SHRLEVEL REFERENCE PART
- REORG SHRLEVEL REFERENCE for LOB table spaces
- CHECK INDEX SHRLEVEL REFERENCE with Parallelism
- Histogram Statistics for RUNSTATS
- CHECK LOB SHRLEVEL CHANGE
- CHECK DATA SHRLEVEL CHANGE
- REPAIR LOCATE SHRLEVEL CHANGE
- REBUILD INDEX SHRLEVEL CHANGE
- MODIFY RECOVERY support for the RETAIN option
- Object level recovery from a system-level backup by the RECOVER Utility
- BACKUP SYSTEM & RESTORE SYSTEM system-level backups to tape
- Skipping locked rows for transaction updates by the UNLOAD Utility
- TEMPLATE switching support based on size for image copy datasets

Other utility enhancements are only available for DB2 9 NFM, such as...

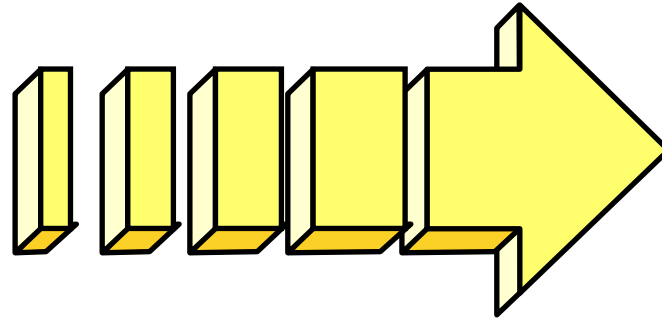
- LBI (large Block Interface) support for sequential datasets on tape
- Recover to Point in Time (PIT) with consistency (defaults as new behavior)
- Clones effectively provide LOAD REPLACE SHRLEVEL CHANGE
- Online Load (LOAD RESUME YES SHRLEVEL CHANGE) without logging using NOT LOGGED

Migration Planning Workshop

- Understand breadth of features in DB2 for z/OS
- Bring together a toolbox of resources for your migration planning
- Explain the current migration process
- Bring a project focus to migration
- Remain relevant through GA life of the product
- Updated with field experiences



Pre-migration Activity ...



- Find problems with incompatibilities
 - It is important to look at these now because many have actions that you must address before migrating.
 - Get the complete list from the Installation Guide (Get the latest from the web).
 - Use V8 job DSNTIJP9 APAR PK31841, PK45981, PK61841, PK65772, PK73081

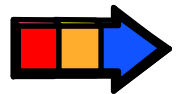
Install Prerequisite Software

- Prerequisites and Functional Needs

- ✓ All products need to be at proper maintenance level (prior DB2 release too)

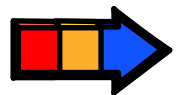
Migration & Fallback SPE APARs PK11129, PK33664, PK39850, PK38799, PK44884

- ◆ Ensure that you apply all hiper APARS, PE fixes
- ◆ Use the DB2 Program Directories, the Installation Guide, PSP (preventative service planning), web & Info APAR **II14401 II14464**

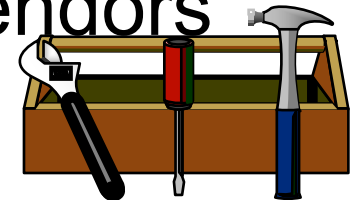
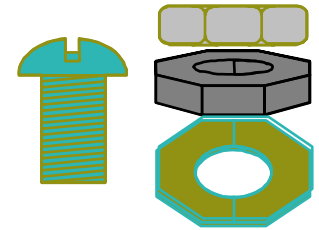


◆ Other software ...Talk to your Vendors

- ◆ z/OS R7 R8 R9



◆ Job DSNTIJPM or DSNTIJP9



DB2 9 Incompatibilities

- **Installation Guide for details**
 - **Chapter 2. Preparing your system to install or migrate DB2**
 - **Changes to DB2 that might impact your migration to DB2 9 conversion mode**
 - Application and SQL release incompatibilities
 - Utility release incompatibilities
 - Command release incompatibilities
 - Storage release incompatibilities
 - Other release incompatibilities
 - Functions that are no longer supported
 - Functions that are deprecated
 - Preparing a data sharing group or distributed environment for migration
 - **Chapter 5. Installing or migrating DB2**
 - **Migrating your DB2 subsystem to new-function mode**
 - **Implications of converting to DB2 9 new-function mode**
- **Application Programming and SQL front**
 - **Application and SQL release incompatibilities**

DB2 9 Removed Function

- DB2-managed stored procedures → WLM-managed SPs
- Create simple table space → create segmented or partition by growth
- Temp databases & table spaces → work files
- Very old plans and packages (V3 and before) → REBIND
- AIV Extender → Content Management
- Text, Net Search Extenders → new text search
- Net.Data → WebSphere, REXX, command line proc., ...
- DB2 Estimator → capacity planning products
- Visual Explain → Optimization Service Center, Data Studio
- Old JDBC / SQLJ driver → Current driver
- Java stored procedures → non-resettable JVMs
- Online help → Information Center
- Parameters removed RELCURHL, DBPROTCL, STORPROC, ...

DB2 9 Deprecated Function

- Private protocol → DRDA (help in DSNTDP2DP, PK64045)
 - Plans containing DBRMs → packages PK62876
 - ACQUIRE(ALLOCATE) → ACQUIRE(USE)
 - XML Extender → XML type
 - Old Plan table formats → DB2 V8 or 9 format (59 columns)
 - DB2 MQ XML user-defined functions and stored procedures → XML functions
 - DB2 Management Clients feature (DB2 Administration Server, Control Center, & Development Center) → IBM Data Studio application & administration services
 - msys for Setup DB2 Customization Center → install panels
 - BookManager use for DB2 publications → Info Center, pdf
-
- Simple table spaces → segmented or partitioned by growth

DB2 9 migration process changes, APARs

- Enterprise PL/I change JCL error DSNTEP2 PK63659
- Rebind required for V3 and earlier plans & packages
- Best process is rebind all in CM or NFM, top 10% in CM
 - Highly recommended to rebind all V8 and below
- PDSE **IS** required for SDSNLOAD. PDSE service needed.
- Premigration job DSNTIJP9 APAR PK31841 ..PK61841
- SPE PK11129, PK33664, PK39850, PK38799, PK44884
- Info APARs: Install **II14401**, **II14464**, DDF II14203, XML **II14426**, Unicode II13048 & II13049, zIIP II14219, DFSORT II14047, II14213 & II13495, Performance II13579, Storage II10817, Parallel II12836, LOBs II14334, DSNUTILS sec. id. II13133, Coprocessor II13782, PDSE II14067, II14255, II14403 ...

DB2 9 default and process changes

- BIND ISOLATION defaults to CS. Query catalog RR
 - Not changed for distributed, REBIND
- BIND CURRENTDATA defaults to NO. Query Yes.
 - Not changed for REBIND
- DB2-managed data set secondary extent allocation default YES, even for migration
- Work files → much more 32K space needed, avoid small files
- Varying length data change row format PK78958, PK78959
- DB2 disables DATA CAPTURE CHANGES for SYSROUTINES during migration (DSNTIJTC) and SYSPACKSTMT during ENFM (DSNTIJEN) PK72214
- Need to find and complete or delete incomplete definitions
- Online REORG processes change
- Configure shared virtual storage (128 GB for each DB2)

Old COBOL?

- ✓ Understand the options DB2 CICS V3
 - ➔ Compiler and Run-Time Migration Guide
 - ➔ No compiles OS/VS COBOL or VS COBOL II CICS V3 also
 - ➔ Run Old COBOL modules
- ✓ Set strategy & plan for Enterprise COBOL V4
 - ➔ Use V8 precompiler?, NEWFUN(NO)?
- ✓ Plan staging and Migrate

Old PL/I?

- ✓ Understand the options
 - ➔ Compiler and Run-Time Migration Guide
 - ➔ Run Old PL/I modules
- ✓ Set strategy & plan for Enterprise PL/I V3.7
 - ✓ Support requires at least V3.4 now
 - ➔ Use V8 precompiler?, NEWFUN(NO)?
- ✓ Plan staging and Migrate

DFSORT and DB2 for z/OS Utilities Suite

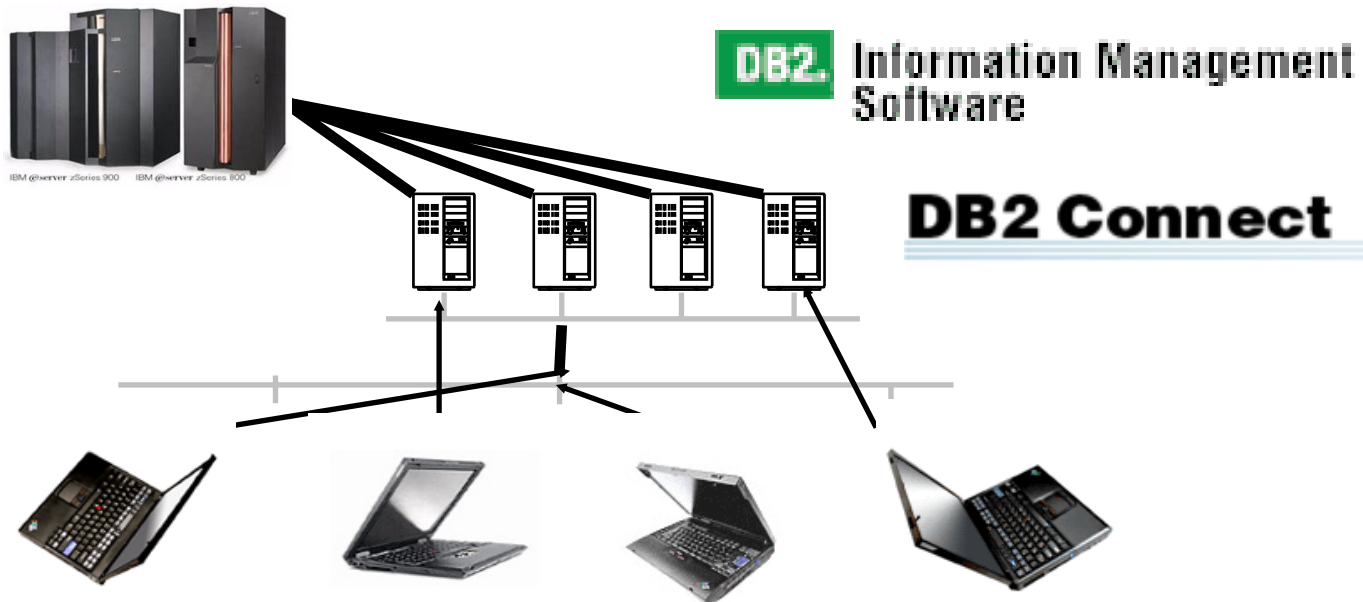
- V8 removed prerequisite for external sort product
- V8 only uses DFSORT: SORT, MERGE functions only
- Sort 32K page & improve reliability & performance
- DFSORT is part of standard z/OS install
- DB2 for z/OS Utilities Suite has license to use DFSORT when invoked by Utilities
- Must have access to DFSORT R14 plus APAR PQ68263 applied. See Info APARs II14047, II14213 & II13495
- DB2 9 requires APAR PQ92594
- z/OS 1.10 DFSORT PARMLIB changes requires PK59399
- Must update DB2 space statistics for sort space

DB2 9 requires DB2 Connect 9 FP1

Recommended level is latest 9.7 fixpack

- ✓ Performance & Scalability
- ✓ Improved Application Availability
- ✓ Innovative manageability
- ✓ Programmer productivity

DB2 Connect V8.2
out of service
April 30, 2009



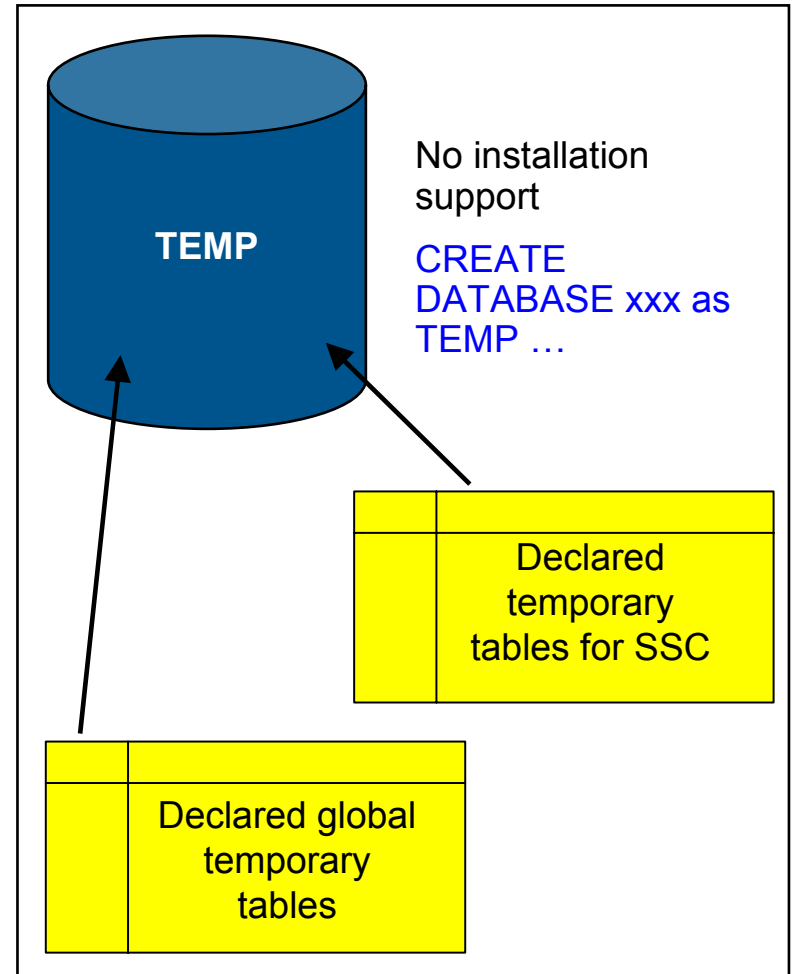
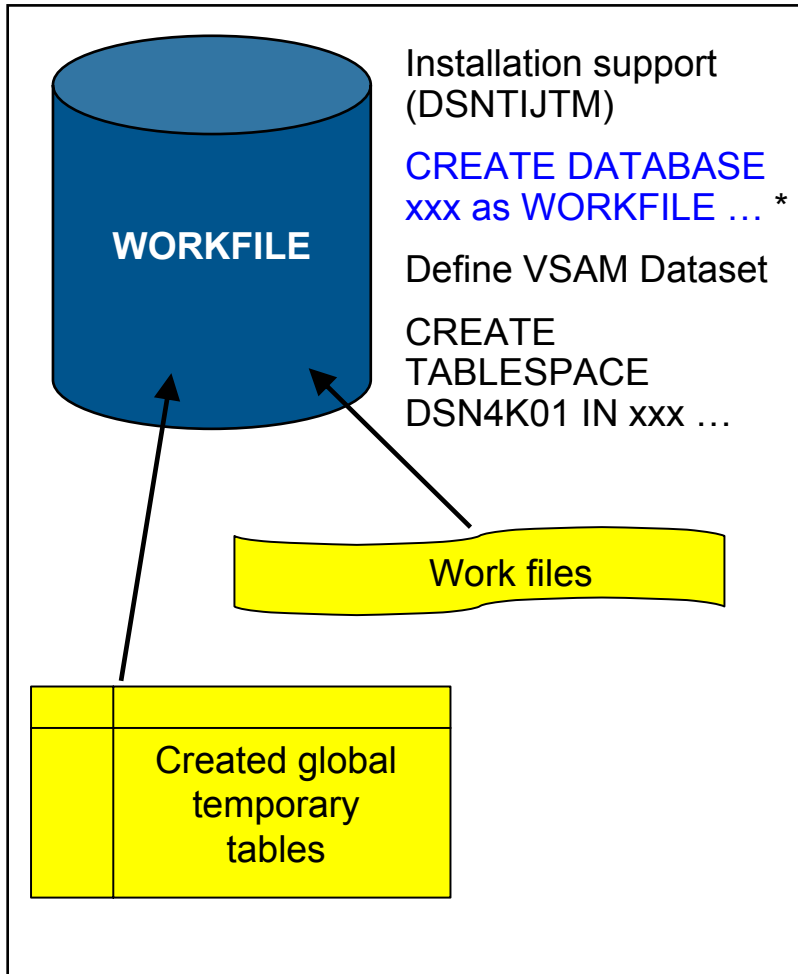
DB2 9 Post GA Deliveries APAR PKxxxxx

- BIND package stability changes PK52522, PK52523
- BIND change to convert plans with DBRMs to packages PK62876
- BIND private protocol help PK64045
- Text search server Accessories Suite 1.2
- New XML function & performance (next pages) II14426
- Incremental FlashCopy PK41001, z/OS 1.8 APAR OA17314
- Trusted context enhancements PK44617, PK47579
- New storage class Zparm for online CHECK utilities PK41711
(Needed when PPRC is used)
- ALTER TABLE ALTER COLUMN DROP DEFAULT PK56392
- Allow RESTORE SYSTEM without log truncation PK51979
- Spatial phase II PK51020, PK54451, ...
- LOAD COPYDICTIONARY PK63324, PK63325
- Protocol(3) without data sharing group quiesce PK62027

DB2 9 Post GA Deliveries APAR PKxxxxx

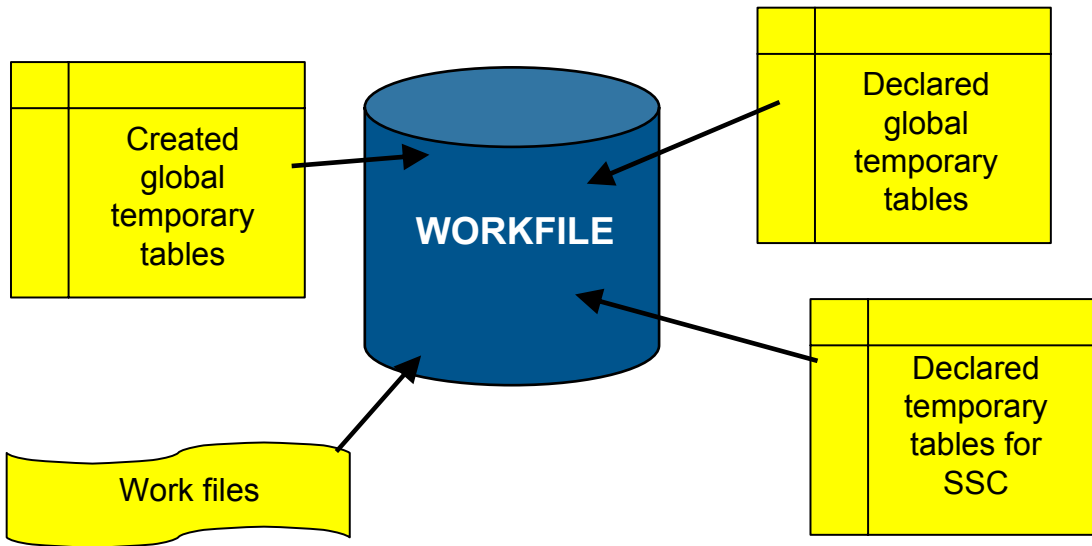
- PK62161 add rows to accounting & statistics
- PK75643 parameter OPTIOWGT default to enable
- PK62178 default 10,000 maximum implicit DB
- PK70060 work file allocation
- PK70269 USS pipes for LOAD
- PK78958 PK78959 PK87348 RRF & compressed table spaces
- PK80925 -ACCESS command wildcards
- PK79228 PK79327 parameter group attach like V8
- PK72214 install stop change data capture
- PK49348 REOPT(AUTO) change
- PK85068 migrate plan tables to Unicode, current format
- PK80375 compress package directory table space SPT01

Temporary Space - The DB2 V8 Picture



* Only in a data sharing environment – in non-data sharing syntax is `CREATE DATABASE DSNDB07`

Temporary Space - The DB2 9 Picture



Installation and migration support
(REXX program called by DSNTIJTM)

```
CREATE DATABASE xxx as WORKFILE;
```

```
DSNTWFG DB41 DB2ADM xxx +
        3 10 16 BP0 SYSDEFLT +
        1 20 16 BP32K SYSDEFLT
```

- Declared Global Temporary Tables and Static Scrollable Cursors now use the WORKFILE database instead of the TEMP database
- Uses DB2-managed (instead of user-managed) storage in SYSDEFLT storage group
- Segmented table space organization (user-defined SEGSIZE or default of 16)
- 4KB and 32KB page sizes only – no 8KB or 16KB

Planning For Converged TEMP Space

- more changes coming

- Migration from DB2 V8
 - To reclaim TEMP database storage, You must drop the TEMP database and reallocate the storage
 - Recommendation: Do not drop the TEMP database until you are sure that you will not return be falling back to V8, to avoid having to recreate it after fallback
- New installation panel for work file database definitions (DSNTIP9)
 - In migration mode, if you specify non-zero values
 - Migration job DSNTIJTM will create additional DB2-managed WORKFILE table spaces in the SYSDEFLT storage group → new REXX program DSNTWFG
 - DSNTWFG does not include the existing work file table spaces
- Recommendation: Keep 'DSVCI' default ZPARM YES to allow DB2 to match VSAM CI size to table space page size
- Ensure you have 32KB WORKFILE table spaces for Declared Global Temporary Tables and Static Scrollable Cursors
 - Much more 32KB space is needed in DB2 9
- Careful of secondary extents in some workfiles - PK70060

DB2 Developer Workbench → Data Studio → Optim Studio

before

IBM DB2 Developer Workbench V9.1

- SQL Query Editor
- SQLJ Editor
- SQL Builder
- XQuery Builder
- SQL Routine Debugger
- Java Routine Debugger
- XML Editor
- XML Schema Editor
- Data Management
- Visual Explain
- Project Management

***Data Studio is a full replacement of
DB2 Developer Workbench
plus much more***

- **DB2 for Linux, Unix, Windows v8.x, v9.1.x, v9.5**
- **DB2 for z/OS v7, v8, 9**
- **DB2 for i v5r2, v5r3, v5r4, v6**
- **Informix Dynamic Server (IDS) v9.x, v10.x, v11**

now

IBM Data Studio

- Integrated Query Editor – SQL + XQuery
 - SQLJ Editor
 - SQL Builder
 - XQuery Builder
 - SQL Routine Debugger
 - Java Routine Debugger
 - XML Editor
 - XML Schema Editor
 - Data Management
 - Visual Explain
 - Project Management
-
- ER Diagramming
 - Data Distribution Viewer
 - Object Management
 - Browse & Update Statistics
 - Security Access Control
 - Connection Management integration with Kerberos and LDAP
 - Data Web Services
 - IDS Server Support
 - Health Monitoring DB2 for LUW 9.5 and DB2 z/OS v9

Service Best Practice

Use Consolidated Service Test
 Recommended Service
 Cross product tested levels Best
 practice for service: two or
 three per year

<http://www.ibm.com/servers/eserver/zseries/zos/servicetst/mission.html>

II14401 & II14464 install service

Consolidated Service Test and the RSU

The Consolidated Service Test Mission

Our mission is to provide a consolidated, tested, and recommended set of service for z/OS and key subsystems on a quarterly basis with published results. This means that when you order your current service deliverable ([ShopzSeries](#)) you'll **receive and install** one recommended service package with a tested level of service for all these products.

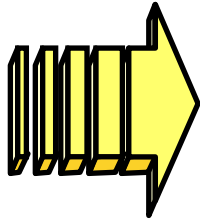
How we do our testing

We test in a customer-like production sysplex environment in an IBM test lab and are continuously improving our CST test environment. We run 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. As we test, we observe how each product runs and how they interact in this environment. We report problems to the IBM Support Center. We have the following FMIDs installed on our systems. For more information about our environment, see our [CST Quarterly Report](#).

We have a quarterly CST test cycle:

- Provide recommended service package
- Publish quarterly report
- Run in high stress environment
- Run recovery tests
- Install service from prior quarter
- Run existing workloads
- Plan new test scenarios

Premigration Activity ... Manage Performance



Prepare to manage performance

- Save accounting reports
- Save critical access paths
 - ▶ Be sure you have **PLAN_TABLE** access paths & **DSN_STATEMENT_TABLE** & **DSN_FUNCTION_TABLE** for critical applications (or Visual Explain reports).
 - ▶ Run **EXPLAIN** on queries before migrating.
 - ▶ Add new columns to **PLAN_TABLE**
- Differentiate by plans & packages

To REBIND or not to REBIND

- **WHEN? is the question**
 - ▶ When to take the chance of access path regression
 - ▶ For the potential benefits of improved performance & memory
- **When migrating? Test Before**
 - ▶ Parallel individual binds
 - ▶ More disruptive, longer
- **Incrementally or later**
 - ▶ More potential for problem calls
 - ▶ Resolution could be more difficult



Package or Bind Stability APAR PK52523

- Old access paths for a package retained at REBIND
REBIND PACKAGE (HRCOLL.SALPKG)
PLANMGMT(BASIC | EXTENDED)
 - BASIC retains 2 copies: Current and Previous
 - EXTENDED retains 3 copies: Current, Previous, Original
 - PLANMGMT new subsystem parameter
 - Can provide default for command options
- Fallback to an older access path
REBIND PACKAGE (HRCOLL.SALPKG)
SWITCH(PREVIOUS | ORIGINAL)
 - Conceptually, this can do a “ROLLBACK” of a prior REBIND

Package or BIND Stability PK52523

- At REBIND, save old copies of packages
 - Catalog tables
 - Directory (SPT01 table space)
- Two flavors
 - BASIC and EXTENDED
 - REBIND options
 - Default new DSNZPARM
- REBIND PACKAGE ...
 - PLANMGMT (BASIC) 2 copies: Current & Previous
 - PLANMGMT (EXTENDED) 3: Current, Previous, & Original
- Most bind options can be changed at REBIND.
- REBIND PACKAGE ...
 - SWITCH(PREVIOUS)
Switch between current & previous
 - SWITCH(ORIGINAL)
Switch between current & original
- FREE PACKAGE ...
 - SCOPE(ALL) – Free package completely
 - SCOPE(INACTIVE) – Free old copies
- Each copy invalidated separately
- Cost of stability
 - 2-3 X size in SPT01
 - 30% CPU overhead for REBIND
 - No impact on statement runtime processing, fast switch

Convert plans with DBRMs to packages

- Convert from DBRMs in PLAN to packages
 - Specify the collection id for the packages
 - REBIND plan option: COLLID
 - Default collection id
 - DSN_DEFAULT_COLLID_planname
 - Able to specify plan name, list of plans, *
- APAR PK62876 - PTF UK43291 DB2 9
- See new book on packages SG24-7688 chapter 4

Information Management software

Shell Document for Review Document ID: 2009-0-07 pm

IBM
SG24-7688-00

DB2 9 for z/OS: Packages Revisited

Learn all about packages, collections,
plans

Manage local and remote
packages

Understand and maintain
access plan stability



How much room will you gain in DBM1 A/S?

It depends. For DB2 9,

Estimate 10% to 15%

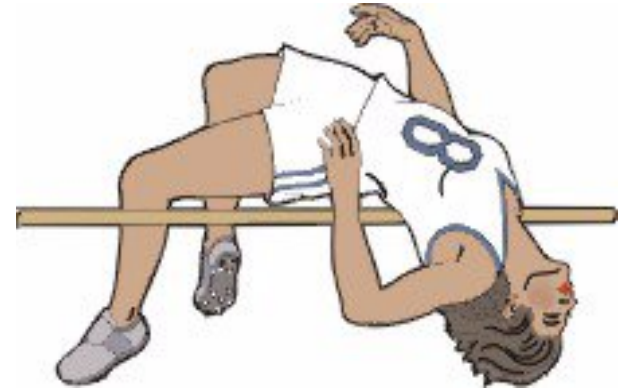
5 EDM pools

REBIND needed for savings

DDF - shared memory

Above the bar shared virtual storage required

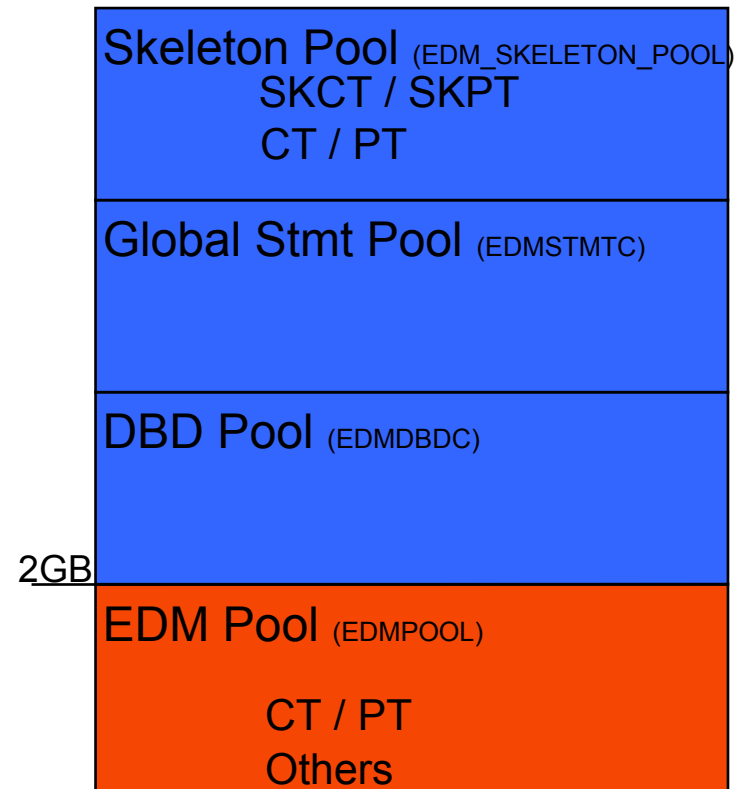
You need to calculate, monitor and manage



DB2 9 64 Bit Evolution (Virtual Storage Relief)

Virtual Storage Constraint is still an important issue for many DB2 customers.

- EDMPOOL Changes:
 - V8 – DBD storage moved above 2GB bar.
 - DB2 9 – SKCT, SKPT, some CT, PT storage moved above 2 GB bar.
 - DB2 9 approx. 60% reduction in EDMPOOL size observed for lab workloads
- Other changes:
 - Some storage acquired for distributed applications moved above 2GB bar.
 - Control blocks for table spaces and RTS move above the bar.
 - DSC statement text moved above the bar
 - SAP tests have shown almost 300 MB reduction in virtual storage below 2 GB bar

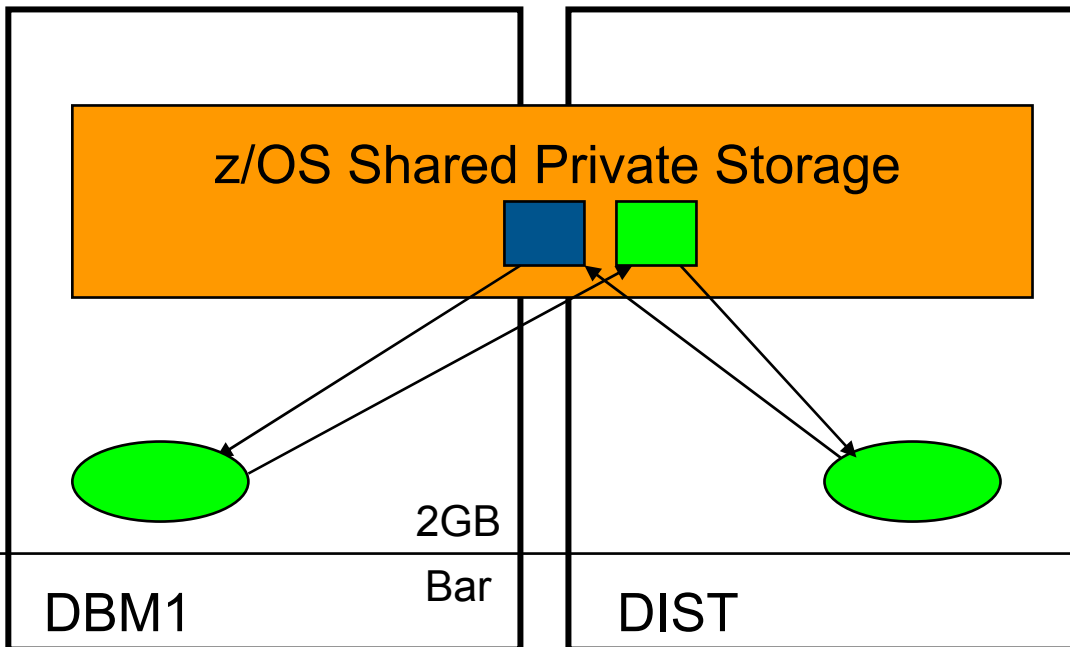


IFCID 217: detailed DBM1 virtual storage health

IFCID 225: consolidated DBM1 virtual storage health

64-bit DDF – Shared Private with DBM1

- DDF address space runs in 64-bit addressing mode
 - Shared 64-bit memory object avoids cross memory moves between DBM1 and DDF and improves performance



- Shared memory: new virtual storage type allowing multiple address spaces to share storage.
- Similar to ECSA – always addressable, avoids AR and XM moves.
- Different from ECSA – only available to those address spaces registering with z/OS to share this storage.
- Reduces data formatting and data movement
- Reduces virtual storage
 - It exists once, instead of in each address space

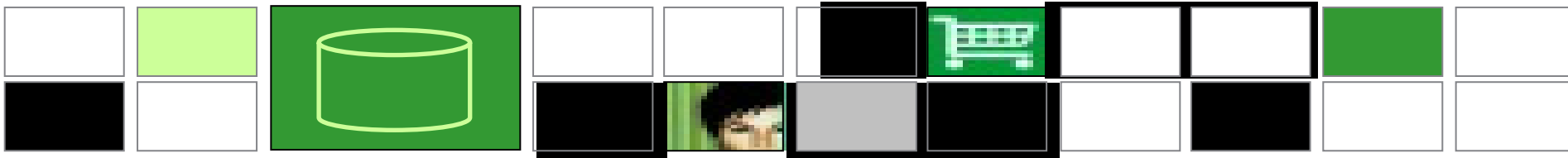
Migration - Data Sharing Group

- ▶ V8 and 9 CM members in group for short time (coexistence)
- ▶ **MUST** apply fallback SPE to all members first
- ▶ First member migrated must be successful before migrating other members
 - Run CATMAINT only for the first member
- ▶ Use Data Sharing book for migration
- ▶ Migrate all members before using new function
- ▶ Restrict execution of packages & plans bound on new version to migrated members
- ~~▶ Group quiesce in DB2 9 NFM for locking protocol 3 (LOBs)~~
- ▶ CFLEVEL 16, 15, 14, 13, 12 for best performance



Next phase: Use the new function

- Reduce CPU time
- Save disk space
- Service Oriented Architecture
- Productivity for applications & administrators
 - PureXML & Data Studio
 - SQL & LOBs
 - Portability via SQL & data definition compatibility
- Improve availability
- More flexible security
- Easier regulatory compliance
- Web applications
- Data warehouse function and performance



Customer Experiences



- **Customer experiences say pay attention to:**
 - **Read the web, books, Info APARs, PSP**
 - **Have a plan that includes performance**
 - **Run premigration job DSNTIJPM**
 - **Use V8 DSNTIJP9 job**
 - **On every subsystem**
 - **Current maintenance for DB2, z/OS & CF**
 - **Get the latest books: library, red books, ...**



R 7 7 20

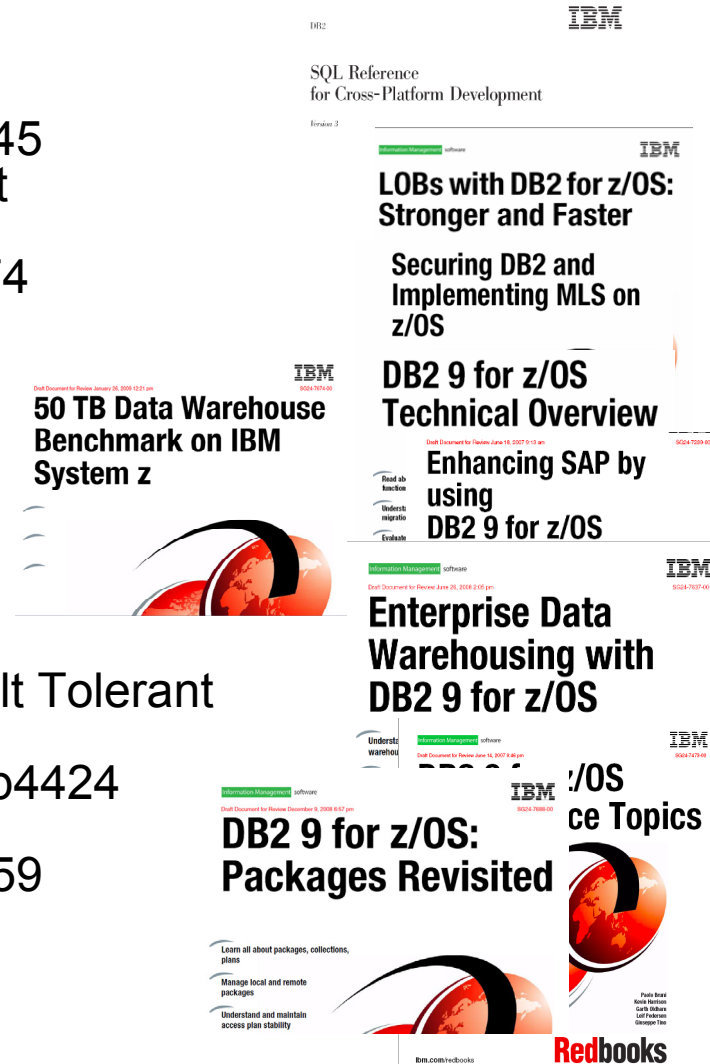
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<http://publib.boulder.ibm.com/infocenter/imzic/>

- ✓ Administration Guide
- ✓ Data Sharing: Planning and Administration
- ✓ Performance Guide
- ✓ Utility Guide and Reference
- ✓ Application Programming Guide & Reference
- ✓ Application Programming Guide & Reference for JAVA™
- ✓ ODBC, Spatial, ...
- ✓ Redbooks
- ✓ Installation Guide
- ✓ RACF Access Control Module Guide
- ✓ Messages
- ✓ Codes



DB2 9 in **IBM Redbooks** Publications

1. DB2 9 Technical Overview SG24-7330
2. DB2 9 Performance Topics SG24-7473
3. DB2 9 Stored Procedures SG24-7604
4. Index Compression with DB2 9 for z/OS redp4345
5. SQL Reference for Cross-Platform Development
6. Enterprise Database Warehouse, SG24-7637
7. 50 TB Data Warehouse on System z, SG24-7674
8. DB2 9 Optimization Service Center SG24-7421
9. LOBs with DB2 for z/OS SG24-7270
10. Deploying SOA Solutions SG24-7663
11. Enhancing SAP - DB2 9 SG24-7239
12. SAP Application on Linux z SG24-6847
13. Best practices SAP BI - DB2 9 SG24-6489-01
14. Data Sharing in a Nutshell, SG24-7322
15. Securing DB2 & MLS z/OS SG24-6480-01
16. Data Sharing: Distributed Load Balancing & Fault Tolerant Configuration redp4449
17. Considerations on Small & Large Packages redp4424
18. Backup and Recovery Considerations redp4452
19. Powering SOA with IBM Data Servers SG24-7259
20. Packages Revisited, SG24-7688
21. Data Studio V2.1 Web Services redp4510
22. Ready to Access Solid-State Drives redp4537
23. Distributed Architecture, SG24-6952



Main DB2 for z/OS Web Page

<http://www.ibm.com/software/db2zos>

- Technical resources
- Events
- Support
- V8, DB2 9
- Developer Domain
- DB2 Magazine
- zIIP
- Tools

DB2 for z/OS
Features and benefits
System requirements
Library
Technical resources
Success stories
News
How to buy
Events
Training and certification
Services
Support

Related links

- [Warranty info](#)
- [Product Accessibility Information](#)

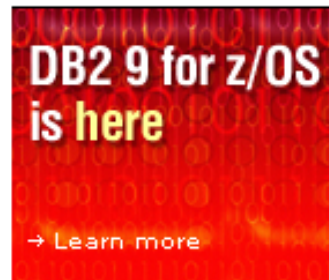
DB2 for z/OS

Overview of DB2 9 for z/OS, editions, tools and components

[+ Add to My interests](#)

Overview

DB2 for z/OS, the most robust and cost effective data server for your environment.



Proven market leader in availability, scalability and reliability. It is optimized for SOA, CRM and data warehousing to drive your mission critical business requirements.

- Maximizes data availability by reducing planned and unplanned downtime DB2 for z/OS remains a leader in continuous availability with unique improvements such as online schema evolution, including the ability to add partitions and change data definitions with ALTER statements, online unload and replace, and improved backup and recovery utilities
- [Data serving](#) with IBM's mainframe and DB2 for z/OS helps you reduce cost and complexity in your IT infrastructure, simplify compliance, and leverage your core asset - your data

Learn more

- [Features & benefits](#)
- [System requirements](#)
- [Product library](#)

Trials and Demos

- [Demo](#)
- [Demo](#)

Use and maintain

- [Product support](#)
- [Information center](#)
- [Product documentation](#)
- [Support downloads](#)
- [Training and certification](#)
- [Developer resources](#)

DB2 for z/OS Lifecycle

<http://www.ibm.com/software/data/db2/support/db2zos/>

- DB2 for z/OS
- Features and benefits
- System requirements
- Library
- Technical resources
- Success stories
- News
- How to buy
- Events
- Training and certification
- Services
- Support

DB2 for z/OS Support

Overview

Welcome to DB2 for z/OS support, your technical resource. Use the support task navigator to find the information you need.

Search DB2 for z/OS support

Your focused search in DB2 for z/OS support can be found on the results page. You can also access advanced options in the support task navigator.

Enter search terms

Flash 29 Dec, 2008: Introducing DSNTSPMP level 1.1

Flash 22 Dec, 2008: Optimization Service Center for DB2 Version 1.1 Fixpack 6 available now

Flash 25 Sep, 2008: URGENT: Effects of Daylight Saving Time on your systems and applications

[\[View all Flashes\]](#)

Additional support links

Stay up to date

- [RSS feeds of support content](#)
- [Request e-mail updates](#)

Support tools

- [Product Support Lifecycle](#)
- [IBM Support Assistant](#)
- [Software Support Toolbar](#)
- [Software Support Handbook](#)

Related software

- WebSphere®
- CICS®
- DB2 Connect™
- DB2 for z/OS®
- DB2 for Linux™

Related hardware

- IBM TotalStorage
- IBM System z

IBM Software Support Lifecycle

Product support lifecycle

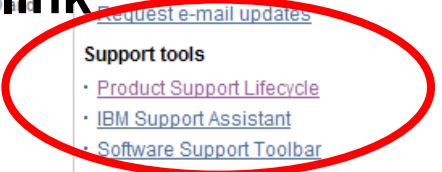
The announcement letter dates below are US only. Information for other country announcements is located [here](#).

[Subscribe via RSS to Product Support Lifecycle site updates](#)

Product name/comments	Version/ Rel./Mod.	PID/ License type/ Policy type ¹	General availability ² / End of marketing/ End of support	Last updated
DB2 for z/OS	9.1	5635-DB2 ICA S	GA: 16-Mar-2007,207-041 EOM: EOS:	06-Mar-2007
DB2 for z/OS	8.1	5625-DB2 ICA S	GA: 26-Mar-2004,204-029 EOM: 08-Sep-2009,908-280 EOS:	18-Dec-2008
DB2 for OS/390	6.1	5645-DB2 ICA S	GA: 30-Jun-1998,299-154 EOM: 04-Dec-2001,901-307 EOS: 30-Jun-2005,904-021	30-Jan-2007
DB2 for OS/390	5.1	5655-DB2 ICA S	GA: 27-Jun-1997,297-146 EOM: 31-Dec-2001,901-184 EOS: 31-Dec-2002,901-202	30-Jan-2007
DB2 for OS/390 and z/OS	7.1	5675-DB2 ICA S	GA: 30-Mar-2001,201-054 EOM: 05-Mar-2007,906-254 EOS: 30-Jun-2008,907-023	07-Feb-2007

Comments: Replacement: DB2 for z/OS V8 (5625-DB2)

Click the
"Product
Support
Lifecycle" link



DB2 Support Page

<http://www.ibm.com/software/db2zos/support.html>

Technotes
(FAQs)

Presentations

White papers

Redbooks

 new books

APARs, CST

- DB2 for z/OS
- Features and benefits
- System requirements
- Library
- Success stories
- News
- How to buy
- Events
- Training and certification
- Services
- Support

Software > Information Management > DB2 Product Family >

DB2 for z/OS

Product support

Primary support resources

Flash 2 May, 2007: [How can I redeploy an SQL stored procedure without rebuilding it?](#)

Flash 1 Nov, 2006: [URGENT: Effects of Daylight Saving Time changes on your systems and applications](#)

Flash 21 Jul, 2006: [IBM Software Support Toolbar](#)

[\[View all Flashes\]](#)

Solve a problem

- [Forums and newsgroups](#)
- [Featured documents](#)
- [Technotes](#) | [APARs](#)

Search Support (this product)

Enter terms, error code or APAR #

Software > Information Management > DB2 Product Family >

Support & downloads

DB2 for z/OS

Features and benefits

System requirements

Library

Technical resources

Success stories

News

How to buy

Events

Training and certification

Services

Support

Functions available in conversion mode vs. new-function mode

Technote (FAQ)

This document applies only to the following language version(s):
English

Question

Which new functions work only in DB2 9 for z/OS new-function mode (NFM), and which new functions also work in conversion mode (CM, previously called compatibility mode)?

Answer

The short answer

New functions are available only in new-function mode, unless explicitly stated otherwise in the product documentation. A few general exceptions exist for utilities and for optimization.

Where is this information documented?

This general guidance is stated in the information center (http://publib.boulder.ibm.com/infocenter/dzichelp/v2r2/topic/com.ibm.db29.doc.inst/db2z_relincompatassumptions), and in a statement at the beginning of each PDF book, with some specific exceptions. For most information, the guidance is that the function is not supported in conversion mode unless noted. For utilities and optimization, the function is available in conversion mode unless noted. The functions available in conversion mode (CM), conversion mode* (CM*), enabling-new-function mode (ENFM), and enabling-new-function mode* (ENFM*) are

Related software

- WebSphere
- CICS
- IMS
- DB2 Connect
- z/OS
- Linux on IBM System z

Info APARs II14401 II14464

- Support & downloads
- DB2 for z/OS
- Features and benefits
- System requirements
- Library
- Technical resources
- Success stories
- News
- How to buy
- Events
- Training and certification
- Services
- Support

II14401: DB2 V8 MIGRATION/FALLBACK INFOAPAR TO/FROM DB2 V9

APAR status
INTRAN

Error description

5740XYR00 R910
DB2 V8 MIGRATION/FALLBACK INFOAPAR TO/FROM DB2 V9
FOLLOWING PTFs ARE FOR DB2 V9 MIGRATION:
(Updated on Oct/4/2008)

PK11129/UK90008 (PE) (F610)
Toleration of fallback from DB2 Version 9 (R910). In a Data
Sharing environment, required for coexistence of V8R1 and
V9R1

Related software

DB2 9 Technical Resources page

<http://www.ibm.com/support/docview.wss?rs=64&uid=swg27011656>

•Download 30 PDF books

•Access html books

•DB2 new  June 2009

•Program Directories

•Information Center

- Support & downloads
- DB2 for z/OS
- Features and benefits
- System requirements
- Library
- Technical resources
- Success stories
- News
- How to buy
- Events
- Training and certification
- Services
- Support

Related software

- WebSphere
- CICS
- IMS
- DB2 Connect
- z/OS
- Linux on IBM System z

Related hardware

- IBM TotalStorage
- IBM System z

Related solutions

- DB2 and IMS Tools
- Java on OS390 and z/OS
- DB2 for Linux

Related services

- IBM Consolidated Service Test

DB2 for z/OS - Technical Resources

Product documentation

Abstract

Here is your complete DB2 for z/OS information resource! Here you can find DB2 for z/OS technical information, information about related tools, and valuable technical tips.

Content

To support recent enhancements to the DB2 for z/OS Library page, the DB2 for z/OS technical information has a new address on the Web. **Please update your bookmarks!**

Information center topics

➔ Information Management Software for z/OS Solutions Information Center

Search topics across all information for DB2 for z/OS, IMS, and DB2 and IMS Tools, including QMF. The Information Management Software for z/OS Solutions Information Center is the primary source for the information about DB2 for z/OS.

Search the information center topics

As part of IBM's ongoing effort to improve your information experience, we are optimizing the information delivered with the DB2 for z/OS product for viewing in the information center. [Learn more.](#)

Technical information by version

➔ DB2 Version 9.1 for z/OS

➔ DB2 for z/OS Version 8

[Home](#) | [Products](#) | [Services & industry solutions](#) | [Support & downloads](#) | [My IBM](#)

[Software](#) > [Information Management](#) >

IBM DB2 and IMS Tools

Library

News

How to buy

Events

Training and certification

Services

Support

- My support
- Submit & track problems
- How to buy software support
- Help
- Site tours
- Feedback

DB2 Data Management Tools and DB2 for z/OS V9.1 Compatibility

Flash (Alert)

Abstract
This table provides the minimum maintenance required for DB2® Tools to support DB2 for z/OS V9.1.

Content
Key:

- **NS = Not Supported**
The product does not function properly on DB2 V9.
- **T = Tolerate**
Allows the product to execute as it did on a previous release of DB2 but does not utilize any of the new DB2 V9 functions.
- **E = Exploit**
The product utilizes the new functions and features available in DB2 V9.

NOTE: If the product is not listed in the matrix, it is not supported on DB2 V9. For new products that have been released after this matrix was published contact your IBM Sales Representative for DB2 V9 compatibility.

DB2 Tools	VRM	DB2 V9 Support			Comments
		NS	T	E	
Application Recovery Tool	1.2.0			X	PK33728
Data Encryption	1.1.0			X	No PTF necessary
DB2 Administration Tool	7.2.0			X	No PTF necessary
	7.1.0	X			
DB2 Administration Toolkit for z/OS SAP Edition	2.1.0			X	No PTF necessary
	1.1.0	X			
DB2 Archive Log Accelerator	2.2.0			X	PK38148(See * below)

Document information

Product categories

Software

Data & Information Management

Database Tools & Utilities

DB2 and IMS Tools

Operating system(s):

z/OS

Software version:

9.1.0

Reference #:

1256800

IBM Group:

Software Group

Modified date:

2007-03-16

Select language ▼

Translate →

Related software

- DB2
- IMS
- DB2 QMF
- CICS Tools

Installable option

<http://www.ibm.com/support/docview.wss?rs=865&uid=pub1sk5t737700>

<http://publib.boulder.ibm.com/infocenter/imzic/>

The screenshot shows the IBM DB2 Version 9.1 for z/OS information center page. The page has a navigation bar with links for Home, Products, Services & solutions, Support & downloads, and My account. Below the navigation bar is a search box and a search scope dropdown set to 'All topics'. The main content area is titled 'DB2 Version 9.1 for z/OS' and contains a welcome message, a table of contents, and several sections of links.

Contents

- Information center home
- DB2 Version 9.1 for z/OS
 - DB2 overview
 - Planning for DB2
 - Installing and migrating DB2
 - DB2 administration
 - Monitoring and tuning DB2 performance
 - Programming for DB2
 - Troubleshooting for DB2
 - DB2 reference information
- DB2 UDB for z/OS Version 8
- IBM DB2 Tools
- DB2 QMF Version 9
- DB2 QMF Version 8
- IMS Version 10
- IMS Version 9
- IMS Version 8
- IBM IMS Tools
- Troubleshooting and support
- Glossary
- ibm.com: About IBM - Privacy - Contact

DB2 Version 9.1 for z/OS information

Welcome to the DB2® Version 9.1 for z/OS® (DB2 for z/OS) information, where you can find topics that you need to use DB2 for z/OS. By using this information, you can install or migrate to Version 9.1 of DB2 for z/OS, develop and run application programs, and administer and operate DB2 databases and subsystems.

The information in these topics comes from DB2 for z/OS product books. You can view a [table that shows the correspondence between the books and the information center topics](#).

Resources

- Getting started**
 - Planning for Version 9.1
- News and events**
 - News about DB2 for z/OS
 - Upcoming DB2 for z/OS events
- Programming with DB2**
 - Application programming and SQL
 - Programming for DRDA
 - Programming for Java™
 - Programming for ODBC
 - Programming for XML with DB2
- IBM® Information Management training**
 - DB2 for z/OS training
 - Professional certification
- General product information**
 - DB2 for z/OS home page
 - DB2 for z/OS Examples Trading Post
 - Terminology and citations
 - Accessibility for DB2
- DB2 administration**
 - Administration
 - Data sharing
 - Performance monitoring and tuning
- Related information**
 - developerWorks®
 - IBM Redbooks™
 - IBM Publications Center
 - IBM Information Centers

Support and assistance

- Send feedback
- Searching for messages and codes
- DB2 for z/OS Support
- DB2 for z/OS technical resource center
- Services for DB2 for z/OS
- DB2 for z/OS downloads
- Information Management Business Partner Solutions
- IBM Global Solutions directory

Using the information center

- Navigating
- Searching
- Setting bookmarks and printing
- Viewing information in different languages

DB2 for z/OS Information Center: Cool features

- Optimized for Google search: easily get to DB2 for z/OS information from Google
- Browser search plug-in available: search the information center from your browser's search box, anywhere on the web
- Integrated search for messages, APARs, PTFs, Redbooks
- Filter to see only the products you use
- RSS feeds for automatic notification of updates
- Three new Flash tours with tips for using the information center
- Links to related product information and community resources

Tips for using the information center

The screenshot shows the IBM Information Center interface for DB2 Version 9.1 for z/OS. The interface includes a search bar at the top right, a navigation menu on the left, and a main content area. The callouts are as follows:

- 1: Search bar
- 2: Search scope dropdown
- 3: Search button
- 4: Search results view toggle
- 5: Bookmark icon
- 6: Navigation icons
- 7: PDF link icon
- 8: Print icon
- 9: Filter icon
- 10: Filter dropdown
- 11: Search within IBM.com icon

- 1 You can perform simple and complex searches. You can search for exact words or phrases, and search with wildcards and Boolean operators. Searches are not case sensitive.
- 2 Narrow a search by clicking **Search scope**. In the Select Search Scope window, you can specify the name of your search list and the topics to search.
- 3 Synchronize the Topics view and the Contents view so that the displayed topic is highlighted in the Contents view.
- 4 Turn off and on the highlighting that displays in search results.
- 5 Bookmark a topic in your browser.
- 6 Navigate between the topics that you previously viewed.
- 7 Link to the same content in PDF.
- 8 Toggle between the Contents view and the Search Results view.
- 9 Print or search the current topic or its subtopics.
- 10 Set a filter to limit the topic titles that are displayed in the Contents view.
- 11 Search within IBM.com.

Resources:

- DB2 for z/OS information center:
<http://publib.boulder.ibm.com/infocenter/imzic>
- Launch page for the Flash tours:
<http://publib.boulder.ibm.com/infocenter/imzic/topic/com.ibm.dzic.doc/dzicviewlet.htm>
- Search for APARs and PTFs from the information center:
<http://publib.boulder.ibm.com/infocenter/imzic/topic/com.ibm.support.dzic.doc/html/search.html>
- Internal download for the installable information center:
<http://ibmurl.hursley.ibm.com/9UP>
- Printable flyer (2-sided/color):
ftp://ftp.software.ibm.com/software/data/db2/zos/info/DZIC_2009.pdf
- Browser search plugin for the information center:
http://publib.boulder.ibm.com/infocenter/dzichelp/v2r2/topic/com.ibm.dzic.doc/additional_search.html

More information: hours of education

COBOL and DB2 V8 multirow fetch, insert

<http://www.ibm.com/support/docview.wss?&uid=swg27012149>

<http://www.ibm.com/support/docview.wss?&uid=swg27012160>

DB2 9 education from BetaWorks

XML <http://www.ibm.com/support/docview.wss?&uid=swg27012156>

SQL <http://www.ibm.com/support/docview.wss?&uid=swg27012157>

Clones <http://www.ibm.com/support/docview.wss?&uid=swg27012150>

Scalability <http://www.ibm.com/support/docview.wss?&uid=swg27012151>

Data sharing <http://www.ibm.com/support/docview.wss?&uid=swg27012152>

Availability <http://www.ibm.com/support/docview.wss?&uid=swg27012153>

Security <http://www.ibm.com/support/docview.wss?&uid=swg27012155>

Data fmt <http://www.ibm.com/support/docview.wss?&uid=swg27012158>

Install <http://www.ibm.com/support/docview.wss?&uid=swg27012181>

Log detail <http://www.ibm.com/support/docview.wss?&uid=swg27012154>