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Session: B07



## Planning Your Migration to V9 and V8

IDUG® 2007  
North America

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*IBM Silicon Valley Lab*

May 08, 2007 01:40 p.m. – 02:40 p.m.

Platform: DB2 for z/OS



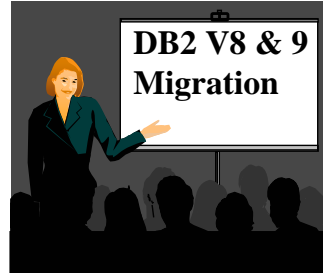
DB2 for z/OS Version 8 and 9 (V8 and V9) have many new features. This presentation will discuss planning to migrate to V8 and V9, preparing to use the new functions. We will focus a bit more on V9 in this presentation. If you are migrating to V8, we will cover the planning points, and some of the V9 planning work is also helpful as you move to V8. We assume that you know DB2 V8 and V9. We'll emphasize process and recommendations from many other customers, with pointers to more information. The content of this session will focus on the tasks of the person who plans or installs DB2. Systems programmers and database administrators generally perform this task, but there is work for all DB2 users.

Special thanks to Bob Perih, Citigroup; Joan Keemle, John Deere and many others for their insights and presentations on migration.

Session numbers (e.g. C07) in this presentation are from this conference or earlier conferences. Many are on the web (see slides 57 – 74).

## Migration Staging

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



GoFurther

The primary stages of migration to a new version are planning, migration and implementation of the new improvements. This presentation will focus on the planning.

The key items are making sure that everyone is educated, with what they need to succeed. A detailed project plan and communication to all involved are crucial for success. Some of the preparation can occur very early, understanding, obtaining and installing the prerequisites. Applications can make needed changes over a longer period to make the process easier and less costly. Plans for monitoring virtual and real storage as well as performance are necessary. An early health check, communication of the needed changes and staging of the work will make the project more successful.

**Key Message: Migrate**

- **V7 end of service June 2008**
- **V9 general availability March 2007**
  - **Requires migration to V8 NFM**
- **IBM Tools V8 & V9 Ready at GA**
  - **Partners ready: BMC, CA, CDB, Compuware, IBI, SEG, ...**
  - **On V7? Migrate to V8 now**
  - **Plan for DB2 9**

The primary messages for our customers today are about migration. V7 has been generally available for six years now, and will be out of service as of June 2008, so V7 and prior customers need to migrate now to stay in service. The formal end of service announcement has been made. V7 customers need to move to V8 as soon as possible. V8 has been generally available for three years. Tools are ready from all vendors for V8. IBM tools were ready for New Function Mode at General Availability for V8 and are ready for DB2 9. Many partners have already announced that they are ready for DB2 9. As customers move to V8, they can do some of the DB2 9 planning, to reduce the effort and stage out the process. DB2 9 migration is only from V8 NFM, and DB2 9 became generally available March 16, 2007.

For detail on migration, see the presentation and resources it points to.

<ftp://ftp.software.ibm.com/software/data/db2zos/SHAREdb2zv9MigrationMiller.pdf>

IBM Information Management tools have been running with DB2 for the past three years. Some changes have been made to DB2 V8 in the service stream, but they are fairly small in number. The small number has helped to keep V8 quality and stability high. There is a lot of information in redbooks, in the library and on the web.

## DB2 for z/OS Version 8 News

- Cross loader with LOBs
- Built in functions ASCII, TIMESTAMPDIF
- DSN1COPY with 1000 OBIDs
- QMF with multirow fetch
- Online Check Index
- z/OS 1.7 up to 7257 extents
- LOAD, UNLOAD with LOBs
- IBM System z9 Integrated Information Processor (zIIP)
- New and updated books: Library refresh Feb. 2007
- Messages, Codes separate books
- Redbooks: SOA, Large Objects, Data Sharing in a Nutshell, Data Integrity, MIDAW performance, Disk & DB2, Design Guidelines for High Performance & Availability, Business Value, Performance Topics, WebSphere, Security & MLS, Disaster Recovery, others updated ...



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- Cross loader with LOBs V7 V8: PQ90263
- Built in functions ASCII, TIMESTAMPDIF V8: PQ95795
- DSN1COPY with 1000 OBIDs V7 V8: PK05758
- QMF with multirow fetch PQ99482
- Online Check Index V8: PQ92749 & PQ96956
- z/OS 1.7 up to 7257 extents V7 V8 PK07590 PK10594
- LOAD, UNLOAD with LOBs V7 V8: PK22910, PK27125, I113767 (LOB service)
- zIIP PK18454, PK19920, PK20487, PK19921, PK26901, PK27578, PK30087, PK30474, PK30548 ; Info APARs I114219 for zIIP, I112836 for parallelism ; DB2PM/DB2PE PK27712 ; Omegamon PK25395, OA15900, OA15899, OA15898
- <http://www.ibm.com/systems/z/ziip/>
- <http://www.ibm.com/servers/eserver/zseries/zos/downloads/#ziip>
- DB2 for z/OS Performance Topics SG24-6465  
<http://www.redbooks.ibm.com/redbooks/pdfs/sg246465.pdf> updated June 2006
- ✓ DB2 for z/OS Data Integrity SG24-7111 also redpaper on disk and DB2  
<http://www.redbooks.ibm.com/redbooks/pdfs/sg246465.pdf> new June 2006
- ✓ Design Guidelines for High Performance and Availability, SG24-7134  
<http://www.redbooks.ibm.com/redbooks/pdfs/sg247134.pdf> update Feb 2006
- ✓ DB2 for z/OS V8 publications update on web new in late February 2006  
<http://www.ibm.com/software/data/db2/zos/v8books.html>
- ✓ Stored Procedure <http://www.redbooks.ibm.com/redbooks/pdfs/sg247083.pdf> updated Feb 2006
- DB2 for z/OS and WebSphere: The Perfect Couple, SG24-6319  
<http://www.redbooks.ibm.com/redbooks/pdfs/sg246319.pdf>
- ✓ Planning for Multilevel Security & Common Criteria (GA22-7509)  
<http://publibz.boulder.ibm.com/epubs/pdf/e0z2e122.pdf>
- ✓ Multilevel Security & DB2 Row-Level Security Revealed, SG24-6480  
<http://www.redbooks.ibm.com/redpieces/pdfs/sg246480.pdf>
- ✓ Ready for Java <http://www.redbooks.ibm.com/redbooks/pdfs/sg246435.pdf>
- ✓ Large Objects <http://www.redbooks.ibm.com/redbooks/pdfs/sg246571.pdf>
- ✓ Cross-Platform SQL Reference V2 Sept 2004  
<http://ibm.com/developerworks/db2/library/techarticle/0206sqlref/0206sqlref.html>

## Worldwide V8 field experience totals

Key Measurement	V8 / V7 Comparison
PMR Volume	✓ V8 LOWER
Field APAR Severity	✓ V8 Severity 1's LOWER
APAR/PMR Ratio	✓ Comparable to V7
APAR Closure Time	✓ V8 QUICKER
PE Rate	✓ V8 LOWER
Multi-System Outages	✓ V8 LOWER

**V8 field experience is better than V7!**

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Now that DB2 V8 has been generally available in the field for about three years, we can provide a comparison with V7 at the same point. For almost all of the key measures, V8 is better. The most important issue for many customers is PEs, and the rate is lower on V8. The PMR volume is lower and the number of field severity 1 problems is lower. V7 was widely regarded as a high quality version, and DB2 V8 field experience is better than V7.

Part of the improvement in overall quality measures is due to more rigorous testing. Some of the improvement is due to the reduced amount of new function added in the service stream. Still these numbers represent the averages, and we know that our customers are not average. These results are highly skewed, so they might not reflect your experience.

The average, median and mode customer submits 0 new APARs that have never been encountered before. We anticipate that the average customer will submit fewer than 10 problems in a year, with questions and some problems that are diagnosed with an existing fix.

### Common Challenges: DB2 for z/OS Migration

- Code page check and correction (V8)
- Current product and tool support
  - Old COBOL or PL/I or tools
- Cleaning up incompatible change
- Real and virtual storage
  - Commit intervals, Calls, ...
- Plan, monitor and manage performance

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These are the key items that every customer should check first, to see the most common items that slow down a migration to V8. We will discuss each of these points in detail on later slides:

- Checking and cleaning up code page issues, if present. DSNTIJP8 provides the information. Run it on every subsystem.
- Related product and tool support requires looking at the documentation, migrating from out-of-service products to the supported levels, and getting the correct releases and service installed. Talk with your vendors soon.
  - Old COBOL or PL/I is a common example of this situation. Compiles need to use current products. Omegamon V4 is needed for V9. See details later in this presentation.
- Cleaning up V8 incompatible changes takes time and a detailed understanding of your shop. Testing is needed.
- Real and virtual storage may improve a little or a lot. Planning is required.
- Plan and monitor performance, as yours can improve substantially or degrade on migration. Be ready to do the needed work.

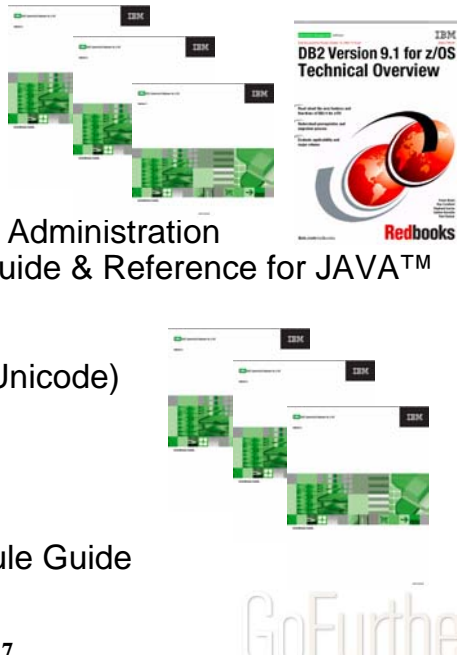


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- ✓ Installation Guide
- ✓ Redbooks
- Data Sharing: Planning and Administration
- Application Programming Guide & Reference for JAVA™
- ✓ Messages
- ✓ Codes
- ✓ Internationalization Guide (Unicode)
- ✓ Administration Guide
- ✓ Performance Guide (V9)
- ✓ Release Guide (V8)
- ✓ Utility Guide and Reference
- RACF Access Control Module Guide
- ...

...



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For installation, you need many books. Some are optional, for example the data sharing book is not needed if you don't use data sharing. If you use data sharing, then part of the install process is in that book. The Java install process is in the Java book. If you use RACF access control, then you need the RACF Access Control Module Guide. You can get most of the books from the DB2 Library web page. The books were updated in February 2007, with some later, so get the latest ones. Some of the Redbooks may be helpful. You may need books from the z/OS Library as well.

<http://www.ibm.com/software/data/db2/zos/v8books.html>

<http://www.ibm.com/servers/eserver/zseries/zos/bkserv/r6pdf/>

<http://www.ibm.com/servers/eserver/zseries/zos/bkserv/r6pdf/mvs.html>

Be sure to use the latest information to save time and problems. Some of the redbooks have been updated or added lately.

## DB2 for z/OS Version Availability Summary

Version	PID	Generally Available	Marketing Withdrawal	End of Service
V3	5685-DB2	Dec. 1993	February 2000	March 2001
V4	5695-DB2	Nov. 1995	Dec. 2000	Dec. 2001
V5	5655-DB2	June 1997	Dec. 2001	Dec. 2002
V6	5645-DB2	June 1999	June 2002	June 2005
V7	5675-DB2	Mar. 2001	<b>Mar. 2007</b>	<b>June 2008</b>
V8	5625-DB2	Mar. 2004		
V9	5635-DB2	<b>March 2007</b>		

All statements regarding the future direction and intent of IBM are subject to change or withdrawal without notice and represent goals and objectives only. This table summarizes the latest versions of DB2. As of March 2007, DB2 V7 has been generally available for six years. DB2 V8 has been generally available for three years. If you are currently running V7, then it's time to plan your migration to V8. I generally think of five years after general availability as the end of practical life for a DB2 release. Migration to V9 is only from DB2 for z/OS V8. There is no ability to skip a version. There are a few customers still running older versions, but the end of service is past. In general, you can expect versions to be in service for five years and end of service to be announced a year in advance.


If you want to search for these products by version number, the PID number is useful. Most large customers are running V8 now. End of service of Version 7 is June 2008, after end of service for all of the operating systems that support processors other than System z or zSeries.

To see current DB2 availability notices, start at [ibm.com/software/db2zos](http://ibm.com/software/db2zos)  
Click on Support, then on Product Life Cycle.  
[ibm.com/software/data/db2/zos/support/plc/](http://ibm.com/software/data/db2/zos/support/plc/)



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## z/OS Support Summary



	z9	z990	z890	z900	z800	G5/G6 Multiprise® 3000	End of Service	Coexists with	Ship Date
1.4	x	x	x	x	x	x	<b>3/07</b>	1.7	9/02
1.5	x	x	x	x	x	x	<b>3/07</b>	1.8	3/04
1.6	x	x	x	x	x		<b>9/07</b>	1.8	9/04
1.7	x	x	x	x	x		9/08*	1.9	9/05
1.8	x	x	x	x	x		9/09*	1.10	9/06

\*Planned

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z/OS V1.8 was announced and became available in September 2006. 1.8 is required for some V9 function. Watch for 1.9 this fall.

**z/OS 1.6 is not orderable after October 2006 and will be out of service September 2007. 1.4 and 1.5 are out of service as of March 2007.**

Only service-supported releases can coexist in the same sysplex

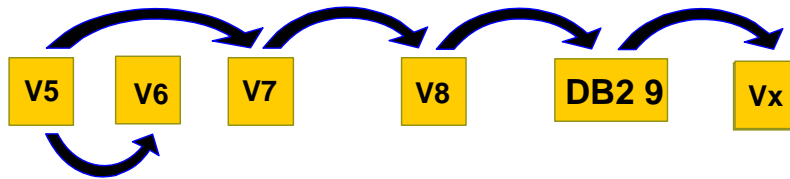
\* All statements regarding IBM future direction and intent are subject to change or withdrawal without notice, and represents goals and objectives only.

This chart notes the support for z/OS with various processors.

Note the z/OS end of service dates as well. End of service for z/OS 1.3 was March 2005. Check the latest information by going to the z/OS web page, then to Support and then to the z/OS marketing and service announce, availability, and withdrawal dates

[http://www.ibm.com/servers/eserver/zseries/zos/support/zos\\_eos\\_dates.html](http://www.ibm.com/servers/eserver/zseries/zos/support/zos_eos_dates.html)

## Migration Paths



Migrate one release at a time V7 to V8 to DB2 9

Includes fallback & Data Sharing Coexistence

V8 SPE PQ48486 required

V9 SPE PK11129, PK33664, PK39850, ...

What functions do you need? Where are you now?

When do you need it?

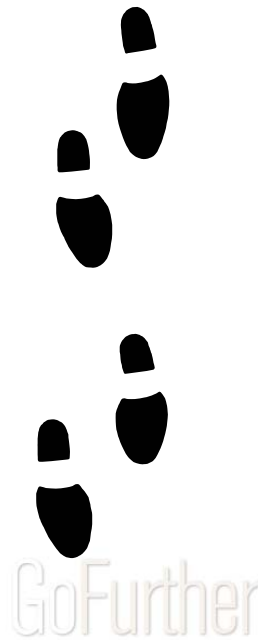
Migration, fallback and coexistence with the ability to skip a release from V5 to V7 allows many possibilities. Do not plan to skip other versions. V8 migration is only from V7. If you want to migrate from V5 or V6 to V8, then first migrate to V7 and stabilize there for three to six months, then take the next step. Plan to migrate to V9 only from V8 and to have z/OS V1.7 or later. Some V9 items require z/OS 1.8.

For many customers, the decision is in the details and the timing. Consider where you are now for DB2 Version, z/OS and other software. What must migrate first?

Customers often need some specific functions. The timing of the need and the timing when a customer considers migration to a new release will often determine the choice.

## Staged Migration process

- **Test with New Install & Migrate (sandbox)**
- **Migrate to new release in Compat Mode (1 – 2 months)**
- **New Function Mode (NFM)**
  - Enable New Function Mode (minutes)
  - Move into NFM
- **Deliver value. Take advantage of new function.**



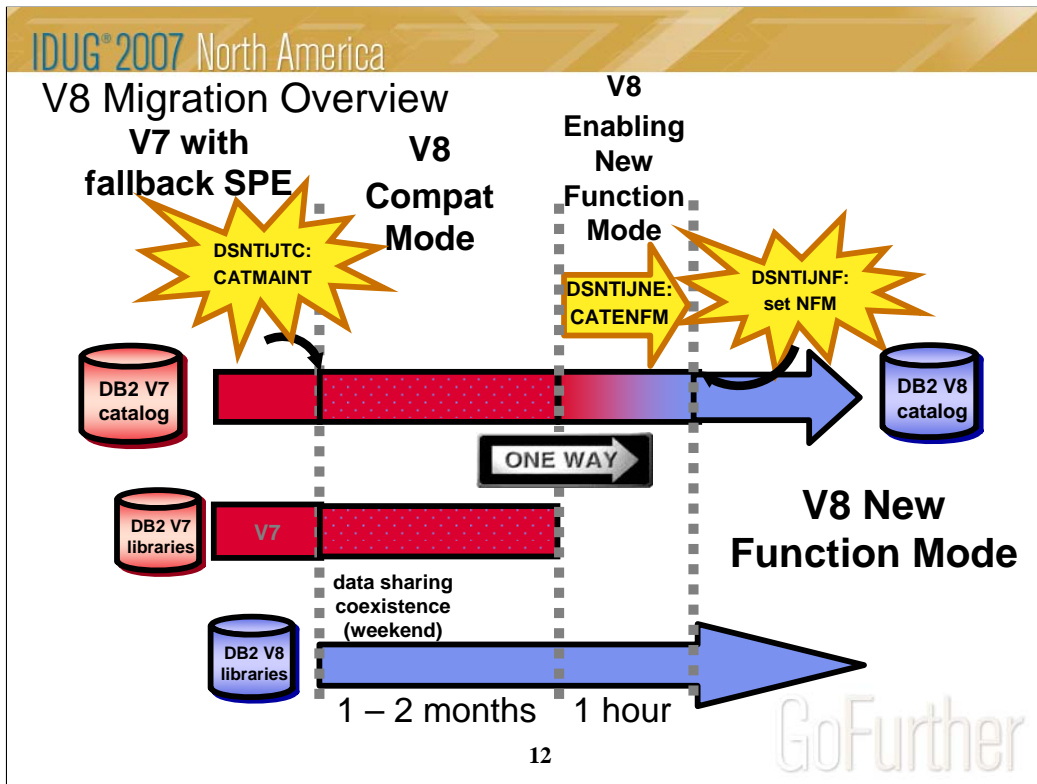
The process of migration will take four major steps.

Use a new install or a migration on a separate subsystem and practice migration there. Test the function you want to use. This will ensure that you are ready to move forward.

Migrate to the new release in Compatibility Mode (CM). You are using the new code but almost no new function. Compat mode is NOT no new function mode. The primary objective is making the full migration smooth, so we prefer to avoid problems, but if they can't be avoided, then CM is much better than NFM

The third step is a few minutes for Enabling New Function Mode (ENFM), typically a one hour process, moving directly to the next, New Function Mode or NFM.

After you are running New Function Mode (NFM), then one or more projects are used to deliver the value of V8 or 9, improving performance, availability and new capabilities in SQL, XML and utilities.

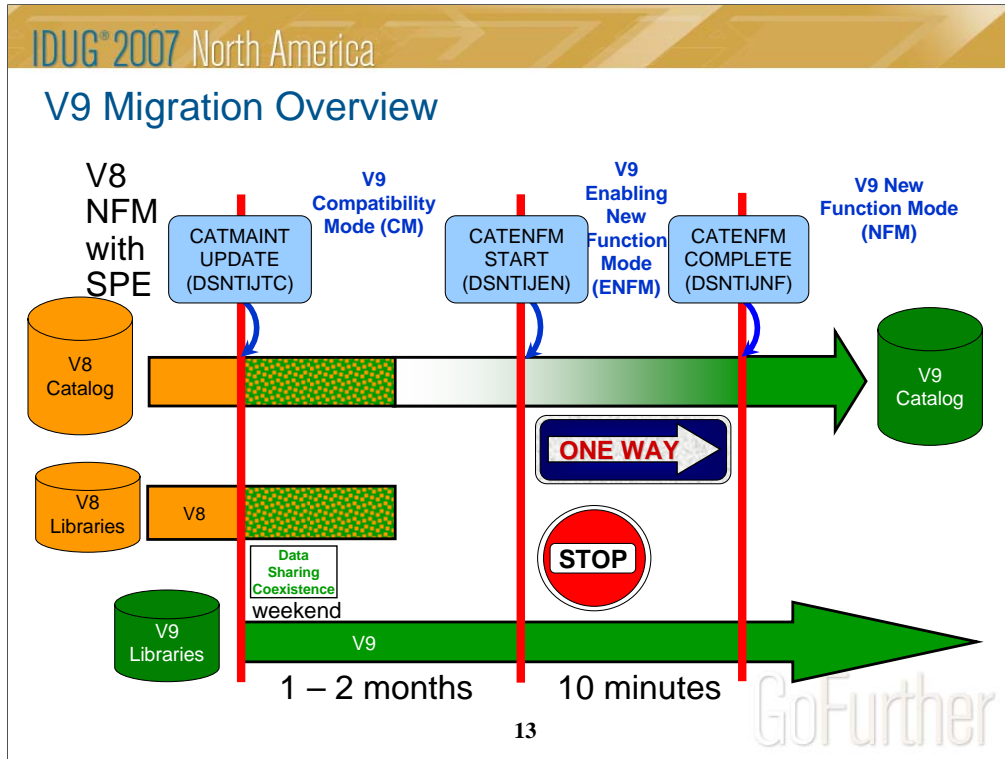


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This is an overview of the V8 migration process. There are two steps which modify the catalog, CATMAINT to change into Compatibility Mode (CM), and also CATENFM for Enabling New Function Mode (ENFM), which contains the major catalog changes to long names and Unicode, using a technique of an online (read only or shrlevel reference) reorg. The V9 migration process is similar.

Keep the time for data sharing coexistence fairly short, such as over a weekend or one week. Compatibility mode will often be one or two months, but is not used for some vendors, such as SAP. Once you move to ENFM, you don't go back to CM or to V7. ENFM will generally be on the order of an hour (5 GB catalog size). Then you turn the switch and are taking advantage of New Function Mode, NFM.

How long should you stay in CM? Generally after more than one or two months, you have adjusted to the improved access paths, storage changes and improved utilities, so that fallback is not feasible. At that point, moving forward to NFM can eliminate some of the restrictions and operational problems. You are running almost exactly the same code, so problems in NFM are generally in new function, found in test.



The time line is not to scale. Customers should spend only a few minutes in ENFM and then move immediately to NFM.

The ONE WAY situation is a bit simpler, with more opportunity to drop back. There are two modes to denote drop back processes. You can drop back from NFM to ENFM as before, but the label for the drop back mode is now ENFM\*. It is also possible to drop back from ENFM or NFM to CM\*, but not to V8 or to coexistence.

## V9 Modes – An Overview

**CM “Compatibility” Mode** - This is the DB2 mode DB2 V9 migrated from V8 and is started for the first time. It will still be in CM when migration job DSNTIJTC has completed. Very little new function can be executed in CM. Data sharing systems can have V8 and V9 members in this mode, called coexistence. Coexistence should be very short, such as a weekend or a week. DB2 can only migrate to CM from V8 NFM. This mode is not so much compatibility, as the ability to fall back. We try to move most (but not all) problems for migration from NFM to CM, so that fallback can be used, if necessary.

**ENFM Enabling New Function Mode** - This mode is entered when CATENFM START is executed (the first step of job DSNTIJEN). DB2 remains in this mode until all the enabling functions are completed. Data sharing systems can only have V9 members in this mode.

**NFM New Function Mode** - This mode is entered when CATENFM COMPLETE is executed (the only step of job DSNTIJNF). This mode indicates that all catalog changes are complete and new function can be used.

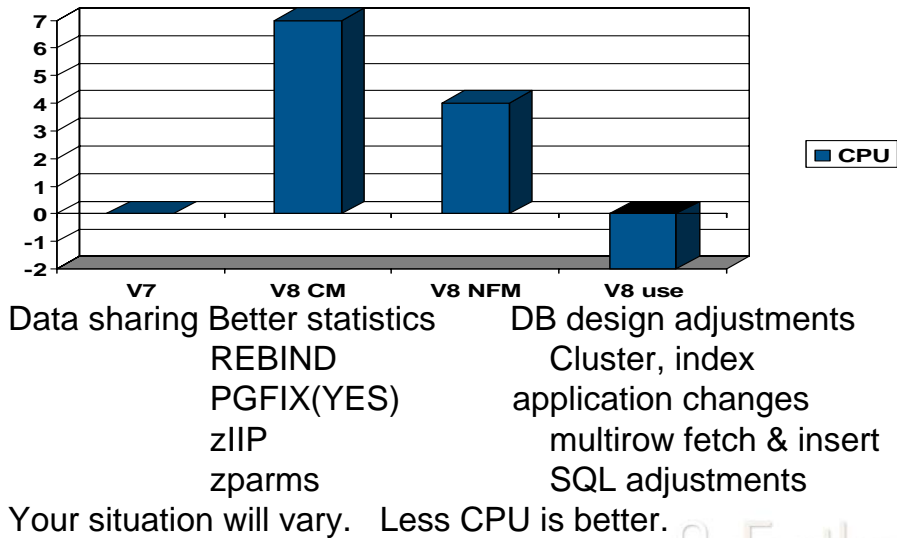
**ENFM\*** This is the same as ENFM but the \* indicates that at one time DB2 was at NFM. Objects that were created when the system was at NFM can still be accessed but no new objects can be created. When the system is in ENFM\* it can not fallback to V8 or coexist with a V8 system.

**CM\*** This is the same as CM but the \* indicates that at one time DB2 was at a higher level. Objects that were created at the higher level can still be accessed. When DB2 is in CM\* it can not fallback to V8 or coexist with a V8 system.

Version 9 builds upon the structure from V8, with the same modes, but clarifying the situation if you drop back after moving to ENFM or NFM. There are two more modes with names CM\* and ENFM\*, and the restrictions are clarified a little more. The process is very similar to the best practice that successful customers have used for years.



V8 best practice performance plan example

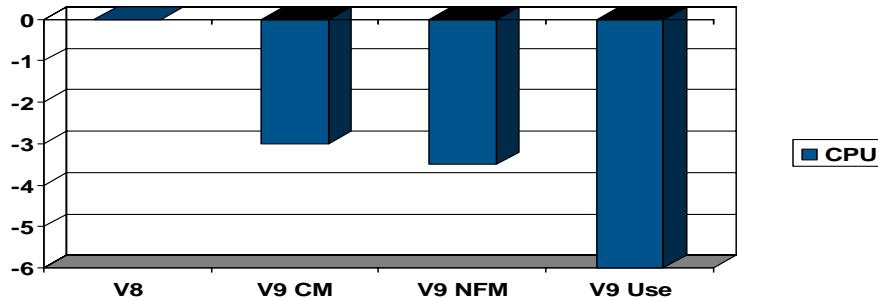


Your situation and mileage will vary, but this is a common shape for a V8 performance plan, starting with zero for the V7 base line. When you move to V8, CPU time generally increases from 5% to 10%, shown here as 7. Start with long term page fix for buffer pools with high numbers of pages read and written. Reorg and collect improved statistics for non-uniform distribution of data on non-indexed columns. The V8 CM performance plan REBINDs the primary packages, and adjusts DSNZPARMS. The CM REBIND process provides most of the improved access paths. Data sharing batching helps in CM. During CM, a zIIP is added if your peak work load includes DRDA SQL, parallel query or LOAD, REORG and REBUILD.

In moving to NFM, some additional DSNZPARMS are adjusted and REBIND all plans and packages. Database designs start taking advantage of new clustering & indexing options, such as NOT PADDED for large varchar indexed columns. After making the design changes, REORG the data; REORG or REBUILD the indexes; get improved statistics & REBIND. The data sharing group is quiesced, and protocol 2 locking is used.

V8 use takes more advantage of the V8 performance improvements: MQTs, DPSI, more not-padded indexes, multi-row Fetch, cursor Update, cursor Delete, & Insert. Use other SQL improvements to reduce V8 CPU, less than V7. The work may grow, but some of the growth uses the zIIP.

DB2 9 z9 & z990 performance plan example



Utilities	DB design adjustments
Histogram statistics	Index improvements
REBIND	application changes
DSNZPARMS	native SQL procedures
	SQL adjustments

Your situation will vary. Less CPU is better.

GoFurther

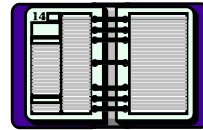
Your situation and mileage will vary, but this is a common shape for a V9 performance plan, starting with zero for the V8 baseline. When you first move to V9, total DB2 CPU time generally decreases from 0% to 10% for z9 and z990 customers, shown here with the first step as -3%. Utility CPU reductions helps immediately. Some work will be about the same (+/-3%). Start with reorgs and collect improved histogram statistics when useful. The V9 CM performance plan REBINDs the primary packages and adjusts DSNZPARMS. The REBIND process can provide most of the improved access paths. On z900 the initial cpu expectation is +5 to +10%, more if there are many columns, so making the adjustments is more important.

In moving to NFM, some additional DSNZPARMS are adjusted and all of the plans and packages are rebound. The V9 use line takes wider advantage of the V9 performance improvements. Database designs start taking advantage of new indexing options, such as compression, index on expression and larger pages. After making the design changes, REORG the data and REORG or REBUILD the indexes, get the improved statistics and REBIND. Native SQL procedures, added use of zIIP, and improved SQL continue the improvements in this phase.

Scenario: Customer mix of DB2 CPU time is 30% in utilities, 70% in SQL access. With 10% improvement for the utilities, we get a -3% net, assuming that SQL is the same as before. With optimization improvements, another -½% improvement shows up in V9 NFM. Then as design adjustments, reorgs and rebinds are performed, we get improvements from varchar improvements, native SQL procedures and improved SQL, another -3%.

## Migration Strategy: Test and Production

- Short time for data sharing coexistence
- One to two months for compatibility mode
  - ▶ Not able to use most new performance
- Short time for enabling new function mode
- Move to new function mode
  - ▶ Stage in new function
- Test to QA to Production
  - ▶ Better controls for not using new function
  - ▶ Still don't want long gap test to production
  - ▶ Vendor support may affect strategy, e.g. NFM certified
  - ▶ Improved granularity, stage by modes

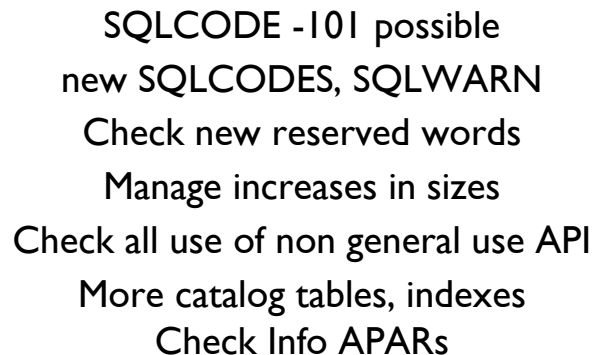


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In the past we have recommended a short time for data sharing coexistence, and that is still true. A short period for ENFM is also recommended highly. Support from vendors may affect the migration staging. One concern for compatibility mode is that most new performance improvements cannot be used, and some regression is possible, as always.

The timing for moving from test to QA to production has more options to consider. There are better controls for not using new function, but a long gap between test and production levels is not advisable. Now you have more granularity in the migration and can move mode by mode. Some customers are migrating both test and production to CM, then changing to NFM in a short time.

## DB2 considerations for any migration



- SQLCODE -101 possible
- new SQLCODES, SQLWARN
- Check new reserved words
- Manage increases in sizes
- Check all use of non general use API
- More catalog tables, indexes
- Check Info APARs

Whenever you move from one release to another, there are some changes to manage. It is possible, but rare to find SQL which processed in the prior release that will not run on the new one. If you have users who test the boundaries, instead of reading the limits, then this is more common. Reserved words are handled in context when possible, but new reserved words can cause problems in SQL that worked on the prior release. Check for APARs. The Info APAR for V9 migration is II12423

Error information changes more frequently, note any dependencies upon error information. There are always new SQLCODEs, and we still find a few applications that do not have tests for other cases. Additional complexity means that storage sizes increase in DB2 & application address spaces.

If you use an interface identified as a Product-Sensitive Programming Interface, it must be checked. If it's not in the books, then it's not an interface.



- DB2 V7 has Unicode support. CCSIDs must be defined now (APAR PQ89018, PQ97373).
- DB2 V8 depends on Unicode support, parses in Unicode, even in compatibility mode. DB2 will not start without Unicode services.
- Check your SQL on catalog, instrumentation
- Some restrictions lifted, but incompatible order
  - ▶ Some range predicates may be affected
- Web & IDUG Solutions Journal

Unicode support began with some Java use in V5, but was expanded a lot in V7. Making sure that CCSIDs are accurate became more important in V7, and APARs were added to require definition of EBCDIC and ASCII CCSIDs and to check emulator CCSIDs to provide a warning, PQ89018. PQ97373 allows multiple SPUFI plans and CCSIDs. In V8, the CCSIDs are crucial. Everyone uses Unicode. DB2 requires Unicode services and the needed conversions in order to start.

There are very substantial improvements to Unicode tables in V8, but there are some incompatible changes, such as the ordering of the rows. In some cases, the SQL will need to be changed, for example range predicates like `columna > 'A'` and `columna < '9'`.

<http://www.ibm.com/software/data/db2/zos/pdf/ccmstr.pdf>

<ftp://ftp.software.ibm.com/software/db2storedprocedure/db2zos390/techdocs/unicodep1.pdf>

<ftp://ftp.software.ibm.com/software/db2storedprocedure/db2zos390/techdocs/unicodep2.pdf>

<ftp://ftp.software.ibm.com/software/db2storedprocedure/db2zos390/techdocs/OA9.pdf>

## Install Unicode



UNI=xx in IEASYSxx at IPL

SET UNI=xx after IPL          DISPLAY UNI

See CUNISM6 in SYS1.SAMPLIB

DB2 Internationalization Guide

*Support for Unicode: Using Conversion Services*

Information APARs II13048 and II13049

Default creates 39 MB Unicode image

- Resolved in z/OS 1.7

GoFurther

The default with APAR OA04069, if you don't have a customized Unicode image, is very large, about 39 MB of fixed real storage, as reported by customers, so you need to configure the correct conversions. Then the storage is likely to be closer to 5 MB. Check the current status of the conversion environment. Enter DISPLAY UNI,ALL

To get information on the size of the active image loaded to the conversion environment, use the DISPLAY UNI command. Enter DISPLAY UNI,STORAGE

*Support for Unicode: Using Conversion Services, SA22-7649.*

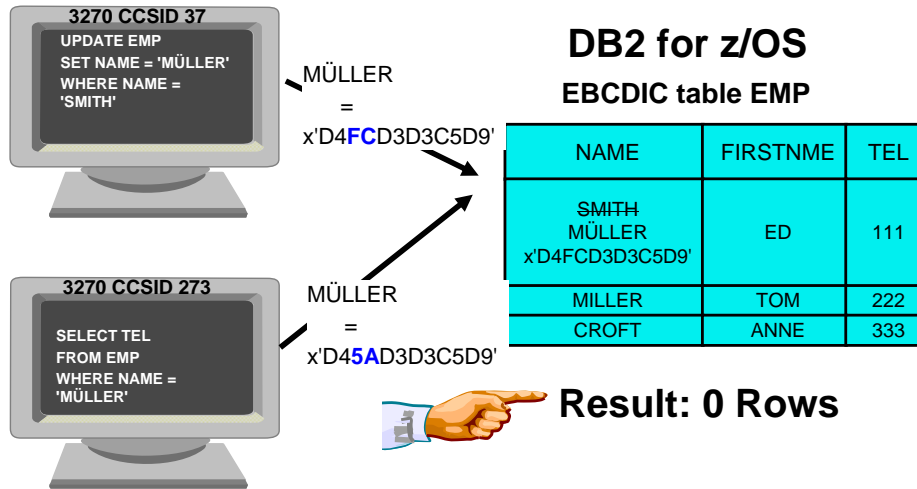
<http://publibz.boulder.ibm.com/epubs/pdf/iea2un40.pdf>

For additional information on setup, read Information APARs II13048, and II13049, and go to:

<http://www.ibm.com/servers/eserver/zseries/zos/bkserv/r6pdf/>



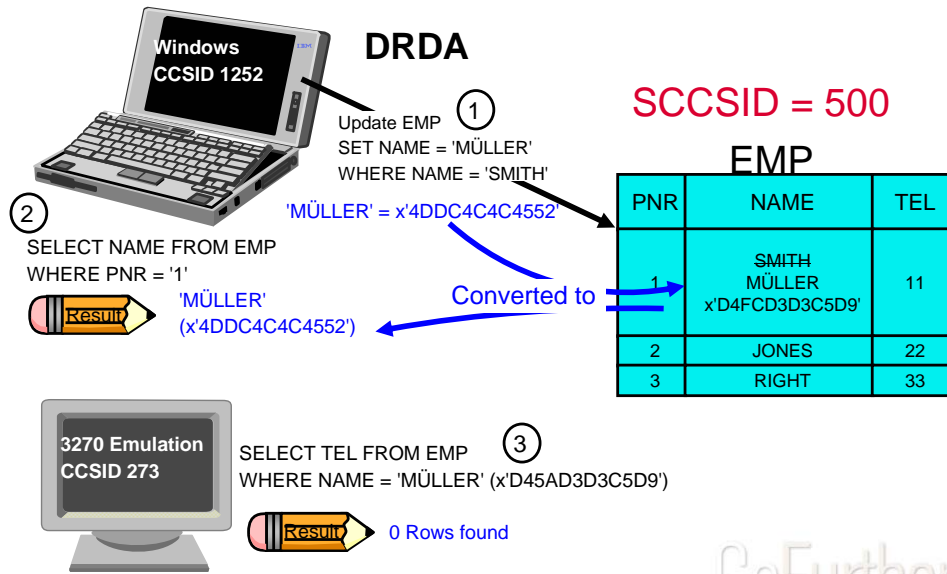
How characters are stored



This page shows the type of problem that was possible long before DB2 existed. Two terminals with different encodings for the characters are used. One inserts or updates data into a file or table. An inquiry using the other terminal and searches for the name, but the information is not found, since the character has a different representation.

The characters that are usually problematical are the accented characters or special characters, such as brackets and braces.

When does conversion occur?

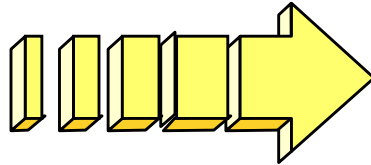


With distributed processing in DB2 V2.3, another option was provided, with customers specifying a CCSID for the DB2 subsystem. When the data came from a different encoding, such as the ASCII from Unix or Windows, then the characters were converted to the CCSID of the DB2 subsystem.

Additional options were added in DB2 V5, V7 and V8 for new encodings and specifications of characters. Languages added the ability to handle Unicode, UTF-16.

We also added several changes to be sure that CCSIDs are correct, with queries in the premigration jobs, install changes, and checking in SPUFI (PQ89018 and PQ97373).

## Premigration Activity

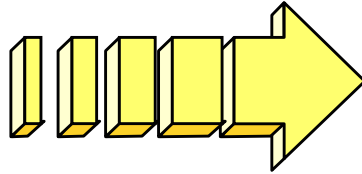


- ✓ Install prerequisite software & service
- ✓ Adjust for incompatibilities (DSNTIJPM)
- ✓ Identify unsupported objects
- ✓ Check new and changed parameters
- ✓ Save critical performance & access path info.
- ✓ Take backup copies

Before you start the SMP/E process you will want to look into the disk storage requirements.

Be sure you have installed all of the proper maintenance on DB2 V7 BEFORE you start to migrate, especially the APARs for migration and toleration of fallback from Version 8 (PQ48486). Get the list of APARs or PTFs from that APAR or from the Info APAR.

The following foils and notes address each one of these points in more detail. Allow for plenty of time in your schedule to address these items. Your migration will run much more smoothly if you do.



- 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 V7 job: DSNTIJP8      APAR PQ84421 ...
  - ▶ New V8 job DSNTIJP9      APAR PK31841

Read these pages of the DB2 Installation Guide carefully. Many items need to be addressed before migration. Check the items several times, including just before running CATMAINT.

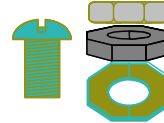
General REBIND advice: When to REBIND depends upon complexity of the SQL, how well tuned the statements are, and your experiences with improvements & regression. For simple cases, a rule of thumb is that the statistics need to change by 10% or 20% or cross a key threshold to make a difference in the access path.

Real Time Statistics address when to run REORG, RUNSTATS & COPY. Read Administration Guide. Some rules of thumb & threshold techniques discussed in the book may be useful for REBINDs. One of the best times for RUNSTATS & REBIND is after REORG. If you update statistics & the differences are large or cross a boundary, then REBIND is more likely to make a difference. Statistics history tables may help in the decision. After REBIND, check access path & processing estimates.

## Install Prerequisite Software

- Prerequisites and Functional Needs

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



- ◆ Migration & Fallback SPE APAR PQ48486 PK11129
    - ◆ Ensure that you apply all hiper APARS, PE fixes
    - ◆ Use the DB2 Program Directory, the Installation Guide, PSP (preventative service planning), web & Info APAR II13695 V9 II12423



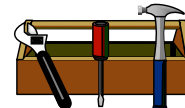
- ◆ Other software ...Talk to your Vendors

- ◆ z/OS R3 R4 R5 R6 R7 R8



- ◆ Unicode Check CCSIDs, emulators

- ◆ Job DSNTIJPM or DSNTIJP8 or DSNTIJP9



You need to know what functions will be used first. Many functions have additional prerequisites. Read the section of Release Guide carefully to see if you need to upgrade other software. The most successful policy is to keep software at similar levels. z/OS should be current & in service. Some functions need later releases. Note the need for Unicode services. Check Info APARs II13048 & II13049 for Unicode, plus the DB2 Internationalization Guide and z/OS Unicode Services book. z/OS V1R7 is minimum for DB2 V9.

IBM & other vendor software must be checked for levels required & needed for the function you want. Some APARs require vendor changes. Contact your vendors.

Program Directories:

<http://www.ibm.com/software/data/db2/zos/library.html>

V8 <http://publibfp.boulder.ibm.com/epubs/pdf/i1085664.pdf>

V9

## System z9 Integrated Information Processor (zIIP) H02

- New specialty engine for the System z9 mainframe designed to help:
  - Customers integrate data across the enterprise
  - Improve resource optimization and lower the cost of ownership for eligible data serving workloads
- z/OS manages & directs work between the general purpose processor and the zIIP
  - Number of zIIPs per IBM System z9 not to exceed number of standard processors
  - No changes anticipated to DB2 applications
  - No IBM software charges on the zIIP – consistent with other specialty engines
- DB2 for z/OS V8 first IBM exploiter of zIIP
  - System z9 EC or z9 BC
  - z/OS 1.6 or later (with PTFs)
  - DB2 for z/OS V8 or V9 (with APARs)
- [ibm.com/systems/z/ziip/](http://ibm.com/systems/z/ziip/)



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The zIIP is designed so that a program can work with z/OS to have all or a portion of its enclave Service Request Block (SRB) work directed to the zIIP. The above types of DB2 V8 work are those executing in enclave SRBs, of which portions can be sent to the zIIP. Not all of this work will be run on zIIP. z/OS will direct the work between the general processor and the zIIP. The zIIP is designed so a software program can work with z/OS to dispatch workloads to the zIIP with no anticipated changes to the application – only changes in z/OS and DB2.

IBM DB2 for z/OS version 8 will be the first IBM software able to take advantage of the zIIP. Initially, the following workloads can benefit:

- SQL processing of DRDA network-connected applications over TCP/IP: These DRDA applications include ERP (e.g. SAP), CRM (Siebel), or business intelligence and are expected to provide the primary benefit to customers. Stored procedures and UDFs run under TCBs, so they are not generally eligible, except for the call, commit and result set processing. V9 remote native SQL Procedure Language is eligible for zIIP processing.
- BI application query processing using large parallel query capabilities (including star schema, but other work too); and
- Functions of DB2 LOAD, REORG and REBUILD utilities that perform index structure maintenance. For more, see <http://www.ibm.com/systems/z/ziip/>



## Getting ready for V8



- Migrate to DB2 for z/OS V7
- Migrate to z/OS 1.6 or later (1.7 soon)
  - WLM goal mode required
  - DB2 requires z/OS Unicode services
  - Some functions need z/OS V1R5, R6, R7
- zSeries, z/Architecture 64 bit mode
- Migrate to IBM COBOL V3.4 PL/I V3.6
- IMS V9, V8, V7, CICS TS V3, V2.3
- Details in Program Directory

Migration is only from DB2 V7, so migrate to DB2 V7, if you are not there. Move to a supported z/OS release, minimally 1.6, but end of service is Sept. 2007.

When you migrate to z/OS 1.3 or later, WLM compatibility mode is not supported. Some of the function will require later versions, so moving to 1.4 will be better for many customers. End of service for 1.3 was March 2005, and you need to be current, so migrate to 1.6 or later, depending upon the functions you need.

DB2 is a 64-bit virtual application, so the bi-modal accommodation that allows z/OS on zSeries to run in 31 bit mode will not be able to run DB2 for z/OS V8.

Old COBOL compilers (OS/VS COBOL & VS COBOL II) will not be able to be used with the V8 precompiler. Migrate to current IBM Enterprise COBOL compilers. Old COBOL load modules continue to run (under LE for support). COBOL V2 is now out of support, as is Enterprise COBOL V3R3. End of support for Enterprise COBOL and PL/I V3R3 is April and September 2007. Get current software for other products, including IMS and CICS. I recommend CICS V3.

## Version 9 incompatibilities

### ➤ See details in the Installation Guide

- Chapter 8. Migrating the DB2 subsystem to compatibility mode
  - Changes to DB2 that might impact your migration to Version 9.1 compatibility 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
    - Data sharing group or distributed environment migration

### ➤ Application Programming and SQL front

- Application and SQL release incompatibilities

For detailed product dependencies and incompatibility descriptions, see

- Application Programming and SQL Guide (APSG)
- Installation Guide
- Program Directories
- Web page for V9 books (coming soon):

<http://www.ibm.com/software/data/db2/zos/v9books.html>

The Installation Guide section is about 18 pages long. Some of the items expected to be the most common are noted here, but your database administrators and application programmers should review the full list, as some practice might be common at your shop.

Application programmers should review the entire section in the APSG, about 9 pages long, with the primary changes that are anticipated to require changes.

The following slides have the highlights.

## Version 9 removed function

- DB2-managed stored procedures → WLM-managed SPs
- AIV Extender → Content Management
- Text, Net Search Extenders → new text search
- Net.Data → WebSphere, REXX, CLP, ...
- DB2 Estimator → capacity planning products
- Old JDBC / SQLJ driver → Current driver
- Create simple table space → segmented partition by growth
- Online help → Information Center
- Very old plans and packages (V4 and before) → REBIND

DB2 V9.1 for z/OS supports migration only from V8. Customers not yet running V8 should plan to migrate to DB2 for z/OS, V8 as preparation for migration to V9.1. IBM added many data server capabilities in DB2 V9.1 for z/OS and reduced or removed support for some functions: AIV Extender is removed. Text Extender is removed. Net Search Extender is removed. Net.data, which was stabilized at the V7 level, is removed. WebSphere is the strategic IBM solution for delivering DB2 data to Web applications. DB2 Estimator, available via Web download for DB2 V8, will not be provided for DB2 V9.1 for z/OS.

DB2-managed stored procedure support is removed. Workload Manager (WLM) managed stored procedure address spaces is the strategic solution for stored procedure support. Simple table space creation support is removed. DB2 V9.1 for z/OS no longer implicitly creates simple table spaces nor allows customers to create simple table spaces. However, DB2 V9.1 for z/OS continues to support simple table spaces created in previous versions.

The Online help facility is replaced, replaced by the Information Management Software for z/OS Solutions Information Center (Information Center). JDBC/SQLJ Driver for OS/390 and z/OS support is removed. All Java application programs and Java routines that are currently written to work with the JDBC/SQLJ Driver for OS/390 and z/OS need to be modified to work with the IBM DB2 Driver for JDBC and SQLJ (formerly known as the DB2 Universal JDBC Driver). Java stored procedures no longer run in resettable JVMs.

Plans and packages must be rebound on V9 to benefit from optimizer enhancements. Plans & packages DB2 V4 & before, will be automatically rebound when accessed by DB2 V9. See the Installation Guide section "Functions that are no longer supported" for more information and additional items.

### Version 9 deprecated function

- XML Extender → new XML type
- Loading DSNHDECP directly → new interface
- DB2 MQ XML user-defined functions and stored procedures → new XML functions
- msys for Setup DB2 Customization Center → install panels
- DB2 Management Clients feature, which includes DB2 Administration Server, DB2 Control Center, and DB2 Development Center → new administration services
- Private protocol → DRDA
- Simple table spaces → segmented or partitioned by growth

The above features are still included in DB2 9 and may be dropped from future versions. Note the direction indicated to the right of the arrows, as these are the functions provided to replace the existing function. If you are using any of these functions, you are advised to move to the new function.

See the Installation Guide section, “Functions that are deprecated” and the announcement material for more information on these changes.

[http://www.ibm.com/common/ssi/rep\\_ca/8/897/ENUS206-098/ENUS206-098.PDF](http://www.ibm.com/common/ssi/rep_ca/8/897/ENUS206-098/ENUS206-098.PDF)

## Version 9 migration process changes, APARs

- Rebind required for V4 and earlier plans & packages
- Best process is rebind all in 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
- SPE PK11129, PK33664, PK39850,
- Info APARs: Install II12423, Unicode II13048 & II13049, DFSORT II14047, II14213 & II13495, DDF II14203, zIIP II14219, Performance II13579, Storage II10817, Parallel II12836, LOBs II13767, DSNUTILS sec. id. II13133, Coprocessor II13782, PDSE II14067, ...

Plans and packages must be rebound on V9 to benefit from optimizer enhancements. DB2 V4 and earlier plans & packages will be automatically rebound when accessed by DB2 V9. A much better process is to rebind all plans on the new version. If there is not adequate time to rebind in V9 CM, see if you can rebind the most frequently accessed packages. If any plans have not been bound on V8, rebind them.

PDSE is documented as required on V8, but some customers noted that a PDS could be used (as long as the largest load module remained under 16MB). The PDSE is the only option for V9, as there are program objects and larger load modules.

The premigration job DSNTIJPM on V9 is shipped as DSNTIJP9 in APAR PK31841 for V8. Running this job on every subsystem helps find the work needed before migration. The SPE for DB2 V9 is PK11129 and PK33664 on V8. Get all the service in this chain.

There are many useful information APARs. These are the ones I use the most. For secondary ids used with DSNUTILS, read II13133.

## Version 9 default and process changes

- Changes to defaults
  - BIND ISOLATION defaults to CS
    - Not changed for distributed, REBIND
  - BIND CURRENTDATA defaults to NO
    - Not changed for REBIND
  - DB2-managed data set secondary extent allocation default YES, even for migration
  - Varying length data changes row format
  - Online REORG processes change
  - Configure shared virtual storage (128 GB for each DB2)

The default value for bind option CURRENTDATA changes from YES to NO for the BIND PLAN and the BIND PACKAGE subcommands, as well as the CREATE TRIGGER for trigger packages, and the CREATE PROCEDURE and the ALTER PROCEDURE ADD VERSION SQL statements for SQL PL procedure packages. CURRENTDATA NO is the best option for performance. The default value for bind option ISOLATION is changed from RR to CS for the BIND PLAN and the remote BIND PACKAGE subcommands. For the BIND PACKAGE subcommand, the current default (plan value) stays. The default change does not apply to distributed. Although you can specify DBPROTOCOL(PRIVATE) for the DBPROTOCOL parameter of the BIND option, DB2 issues a new warning. All BIND statements for plans and packages that are bound during the installation or migration process specify the ISOLATION parameter explicitly, except for routines that do not fetch data. The current settings are maintained for compatibility.

DB2-managed data set secondary extent allocation default setting is YES and is changed by installation CLIST from NO to YES. In migration mode, the input migration value for this field is overridden to YES, so you need to reset it to NO if you want to continue to disable secondary extent optimization.

Even in CM, the REORG or LOAD REPLACE utility automatically converts table spaces to a new reordered row format (RRF) if there is no VALIDPROC or EDITPROC. If you use the REORG SHRLEVEL CHANGE utility, you might need to change your operating procedures if you run concurrent REORG TABLESPACE SHRLEVEL CHANGE PART x on the same table space. Configure 128 GB of shared virtual storage for each DB2 subsystem on the MVS image for memory shared between DB2 DDF and DBM1.



## V9 Prerequisites: See Program Directories

- **Processor requirements:**
  - Processor that supports z/Architecture, including IBM System z9, zSeries z990, z890, z900, z800
  - DB2 9 will generally require increased real storage for a workload compared to DB2 V8
- **Base Software Requirements:**
  - z/OS V1.7
    - DFSMS Version 1 Release 7
    - Language Environment Base Services
    - z/OS Version 1 Release 7 Security Server (RACF)
  - IRLM V2.2
  - z/OS Unicode Services and appropriate conversion definitions
  - DB2 Utilities Suite or equivalent function

These prerequisites apply whether you are migrating or installing. The best source for current information is the Program Directory. Be sure that the products are in support by checking on the web.

This is the first slide of several noting the primary prerequisites for DB2 9. The System z processors are required, with no changes from those needed by V8, although performance is better with the later processors. These are the base needs for DB2 9. The following slides note the optional and functional requirements.

IRLM V2.2 comes with DB2 9. Some of the basic operation of a DBMS is provided by utility functions, such as backup, recovery, reorganization, loading and unloading data, gathering statistics and checking data, indexes and large objects. You should ensure that these functions are provided either by ordering DB2 Utilities Suite for z/OS, Version 9, (5655-N97), or by obtaining equivalent function elsewhere.

### V9 Prerequisites: Current software

- Migrate only from DB2 V8 in NFM
- DB2 for Linux, UNIX, Windows V9.1 FP1 or V8.1 FP13 (V8.2 FP6 is the same as V8.1 FP13)
- DB2 Connect V9.1 FP1 or V8.1 FP13
- IMS V10, V9, V8
- CICS V3.1, V2.3
- Enterprise COBOL V3.4
- Enterprise PL/I V3.4 Move to V3.6
- IBM Tivoli OMEGAMON XE for DB2 Performance Expert on z/OS, V4 or Performance Monitor, PK36297

These are the primary changes in levels for DB2 9 over those in DB2 V8. Current products are required, and some of the product levels needed by DB2 V8 are now out of service. The general rule is to stay within the service interval for all products if you want service.

The DB2 for LUW and DB2 Connect levels need fixpaks to function correctly. Fixpak 2 has just delivered, and some customers will need those fixes.

If you are not on current levels of COBOL, move to V3.4, as all others are out of service as of April 2007. If you are not on current levels of PL/I, move to V3.6, as all levels before V3.4 go out of service this year or earlier.

The Omegamon level needed is V4, with APAR PK36297 to support new function. The older V3, DB2 PM and DB2 PE products do not support DB2 9.

V9 Prerequisites: z/OS 1.8 for:

- RACF Access Control Module and roles
- RACF user-mapping plug-in Enterprise Identity Mapping
- Coprocessor with C or C++
- Volume-based BACKUP and RESTORE enhancements

- RACF SAF User-mapping plug-in Enterprise Identity Mapping (EIM) requires z/OS V1.8 with trusted context. See redbook SG24-6480-01 appendix C for more detail on EIM.

- For full RACF support of roles (not limited to ownership checks for roles only), RACF Access Control Module (DSNXRXAC) requires z/OS V1.8.

- The C and C++ compilers which come with z/OS 1.8 are required to use the DB2 coprocessor, instead of the precompiler for application development.

- See the next page for volume-based BACKUP and RESTORE.

## V9 Requirements for Dependent Functions

- Volume based utilities require:
  - z/OS 1.8
  - DFSMSHsm 1.8
  - DFSMSdss 1.8
  - FlashCopy Version 2
- Group Bufferpool Batching:
  - CF level 15 or 14 recommended when using System Managed Duplexing for lock or SCA structures
  - CF level 13 recommended for castout and lock table cleanup enhancements
  - CF level 12

These are highlights only, not a complete list!

See Program Directories.

z/OS V1.8, DFSMSHsm, DFSMSdss and FlashCopy V2 is required for V9 function in System level Utilities: BACKUP SYSTEM, RESTORE SYSTEM, and RECOVER. z/OS V1.7, DFSMSHsm, DFSMSdss and FlashCopy V2 is needed for System level utilities: BACKUP SYSTEM and RESTORE SYSTEM (if you cannot currently satisfy one or more of the preceding program requirements you can use V8 DB2 functions in the BACKUP SYSTEM and RESTORE SYSTEM utilities.

z/OS V1.7, DFSMSdss (and FlashCopy V2 is highly recommended, although not technically required, for performance reasons) for Utilities: CHECK INDEX, CHECK DATA, and CHECK LOB.

Use the latest Coupling Facility (CF) level for the best performance. CF level 14 is recommended when using System Managed Duplexing for lock or SCA structures. Coupling Facility (CF) level 13 is recommended for castout enhancement and lock table clean up enhancement. Coupling Facility (CF) level 12 is required for Group Bufferpool (GBP) Batching.

## V9 Functional Software Requirements

- WebSphere Application Server for z/OS V6.1 for trusted context
- WebSphere MQ for z/OS V6.1 or 5.3.1
- z/OS XML System Services (z/OS XML) & SDK5
- Java SDK1.4.2
- DB2 QMF components of DB2 9 for z/OS
- ... details in Program Directories on the web

If you use WebSphere Application Server for z/OS, trusted contexts require V6.1.

IBM WebSphere MQ V5.3.1 or later is required for MQListener.

XML System Services (XMLSS). XMLSS requires either z/OS V1.8 or z/OS Version V1.7 with APAR OA16303. In addition, use of XML schemas requires 31-bit SDK for z/OS, Java 2 Technology Edition, Version 5 (5655-N98) (SDK5)

IBM SDK for z/OS, Java 2 Technology Edition, Version 1.4 (SDK1.4.2) is required for Application Execution: Applications or stored procedures written in Java, such as those using the JDBC or SQLJ interfaces to DB2.

**IDUG® 2007 North America**

## Today's IBM DB2 Tools for z/OS & Multiplatform Product Portfolio

<p><b>Utilities Management</b></p> <ul style="list-style-type: none"> <li>• DB2 Utilities Suite</li> <li>• DB2 Automation Tool</li> <li>• DB2 Automation Toolkit SAP Edition</li> <li>• DB2 Cloning Tool</li> <li>• DB2 High Performance Unload</li> </ul>	<p><b>Database Administration</b></p> <ul style="list-style-type: none"> <li>• DB2 Administration Tool</li> <li>• DB2 Object Comparison Tool</li> <li>• Data Encryption for DB2 and IMS</li> <li>• DB2 Thread Expert</li> <li>• DB2 Storage Management Utility</li> <li>• DB2 Administration Toolkit SAP Edition</li> <li>• DB2 Audit Management Expert</li> <li>• DB2 Change Management Expert</li> </ul>	<p><b>Performance Management</b></p> <ul style="list-style-type: none"> <li>• OMEGAMON XE DB2 Performance Expert</li> <li>• OMEGAMON XE DB2 Performance Monitor</li> <li>• DB2 Buffer Pool Analyzer</li> <li>• DB2 Query Monitor</li> <li>• DB2 SQL Performance Analyzer</li> <li>• DB2 Performance Toolkit SAP Edition</li> <li>• DB2 Performance Expert</li> </ul>
<p><b>Information Integration</b></p> <ul style="list-style-type: none"> <li>• WebSphere Classic Data Event Publisher</li> <li>• WebSphere Classic Federation Server</li> <li>• WebSphere Classic Replication Server</li> <li>• WebSphere Data Event Publisher</li> <li>• WebSphere DataStage</li> <li>• WebSphere QualityStage</li> <li>• WebSphere Replication Server</li> </ul>	<p><b>Recovery Management</b></p> <ul style="list-style-type: none"> <li>• Application Recovery Tool for IMS and DB2 Databases</li> <li>• DB2 Archive Log Accelerator</li> <li>• DB2 Change Accumulation Tool</li> <li>• DB2 Log Analysis Tool</li> <li>• DB2 Object Restore Tool</li> <li>• DB2 Recovery Expert</li> </ul>	<p><b>Application Management</b></p> <ul style="list-style-type: none"> <li>• DB2 Path Checker</li> <li>• DB2 Bind Manager</li> <li>• DB2 Data Archive Expert</li> <li>• DB2 Table Editor</li> <li>• DB2 Web Query Tool</li> <li>• DB2 Test Database Generator</li> </ul>

**Day 1 V9 Support !**

Available on zSeries  
Available on zSeries and multiplatforms (LUW)  
Currently available only on multiplatforms (LUW)

<http://www.ibm.com/support/docview.wss?rs=434&context=SSZJXP&dc=D600&uid=swg21256800>

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IBM offers a broad portfolio of DB2 Tools for z/OS across numerous functional categories. We continue to fulfill our commitment to provide new tools and enhanced function to meet your requirements. new Tools-- DB2 Recovery Expert for z/OS and DB2 Cloning Tool for z/OS.. We enhanced DB2 SQL Performance Analyzer to include Easy Explain functionality and to integrate with the OMEGAMON XE DB2 performance tools that were announced in 2005 along another new tool, DB2 Thread Expert . In addition we have provided new releases for 8 tools to increase the value their bring to your DB2 environment – these include DB2 Query Monitor, DB2 Log Analysis Tool, DB2 Data Archive Expert, and DB2 Test Database Generator. We also continue to grow our portfolio of multiplatform tools that support DB2 in the Linux UNIX and Windows environments. The newest entry, DB2 Change Management Expert, was announced in June 2006. All DB2 Tools exploit Version 8. IBM tools make the same commitment to support V9.

See the tools web site for the release levels and APARs needed for DB2 V9.

## Old COBOL?

- ✓ Understand the options DB2 V8 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 V3.4
  - ➔ Use V7 precompiler?, V8 NEWFUN(NO)?
- ✓ Plan staging and Migrate

DB2 V8 supports current Enterprise COBOL V3.4 now. Older compilers are no longer supported. OS/VS COBOL has been out of support since 1994. VS COBOL II support ended in 2001. Only LE runtime is supported. End of support for Enterprise COBOL V3.2 was October 2005, so your target should be V3.4

<http://www.ibm.com/servers/eserver/zseries/zos/le/history/cobmvs.html>

The key resource is the COBOL Migration Guide, GC27-1409. Here is where to get it from the web:

<http://www.ibm.com/software/awdtools/cobol/zos/library/>

<http://publibfp.boulder.ibm.com/epubs/pdf/igy3mg10.pdf>

Key questions and guidance are in the first chapter. Most customers will stage migration. Do you have Enterprise COBOL V3.2 or V3.3 now? Is that the release developers use? Old load modules are not a problem with V8. Precompiling is the challenge, so if new development and changes to old programs switch to the new compiler, then that is a possible migration strategy.

DB2 generates COBOL code that we expect to fail on the old compilers, although we have not tested. DB2 uses Unicode in V8, and the old compilers do not handle it, or some other constants. Programs that use the V8 precompiler or coprocessor require current Enterprise COBOL V3.4.

[http://www.ibm.com/support/docview.wss?rs=64&context=SSEPEK&dc=DB520&q1=cobol&uid=swg21166881&loc=en\\_US&cs=utf-8&lang=en](http://www.ibm.com/support/docview.wss?rs=64&context=SSEPEK&dc=DB520&q1=cobol&uid=swg21166881&loc=en_US&cs=utf-8&lang=en)



## Old PL/I?

- ✓ Understand the options
  - ➔ Compiler and Run-Time Migration Guide
  - ➔ Run Old PL/I modules
- ✓ Set strategy & plan for Enterprise PL/I V3.6
  - ✓ Support requires V3.4 now
  - ➔ Use V7 precompiler?, V8 NEWFUN(NO)?
- ✓ Plan staging and Migrate

DB2 for z/OS supports only current PL/I compilers. Every compiler prior to V3.4 is out of service in 2007, including OS PL/I V2.3, IBM PL/I for MVS™ & VM V1R1.1, V2, and V3R1 to R3.

<http://www.ibm.com/servers/eserver/zseries/zos/le/history/plimvs.html>

The Program Directory lists compilers you can use for **PL/I**:

The key resource is the Enterprise PL/I for z/OS Compiler and Run-Time Migration Guide *Version 3 Release 3*, GC27-1458-02. Get it from the web:

<http://www.ibm.com/software/awdtools/pli/plimvs/support/>

<http://publibfp.boulder.ibm.com/epubs/pdf/ibm3m101.pdf>

There are some basic choices to make. Key questions and guidance are in the first chapter. Most customers will stage migration to new compilers to improve programmer productivity and avoid migration costs. Do you have Enterprise PL/I V3.2 or V3.3 now? Is that the release developers use? Old load modules are not a problem with V8. Precompiling is the challenge, so if new development and changes to old programs switch to the new compiler, this migration strategy improves costs and productivity.

[http://www.ibm.com/support/docview.wss?rs=64&context=SSEPEK&dc=DB520&q1=cobol&uid=swg21191789&loc=en\\_US&cs=utf-8&lang=en](http://www.ibm.com/support/docview.wss?rs=64&context=SSEPEK&dc=DB520&q1=cobol&uid=swg21191789&loc=en_US&cs=utf-8&lang=en)

## DFSORT and DB2 for z/OS Utilities Suite V8 and V9

- V8 removes 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
- V9 requires APAR PQ92594
- Must update DB2 space statistics for sort space

The requirement for an external sort package has been removed. That is to say you do not need a DFSORT license for use by DB2 for z/OS Utilities Suite Version 8. The base DB2 for z/OS has never needed sort. If you use DFSORT for other purposes, then you do need a DFSORT license. You must update the DB2 space statistics to accurately reflect the data volumes in order for DFSORT to accurately allocate space. This support was delivered by [APAR PQ68263 \(PTF UQ90054\)](#) on RSU 0312. In fact, with the delivery of [APAR PK04076 \(UK03983\)](#), MSGDSNU1640I will be issued when the utility is unable to locate DFSORT code at APAR PQ68263 maintenance level. So DFSORT is mandatory and you have to use it for the utilities. However, there is good news. You already have DFSORT installed. You may not be using it, but it is there. DFSORT is always shipped and installed with z/OS. However, no license is required for the DB2 utilities to use DFSORT. The only action a customer must take is to add the DFSORT load libraries to link list after the OEM sort libraries or add a steplib/joblib to the DB2 utilities batch JCL. DB2 for z/OS Version 8 has a license to use DFSORT so the customer does not need a license for any external sort product. Again, MSGDSNU1640I will be issued when the utility is unable to locate DFSORT code. However, no non-DB2 task can use DFSORT without being licensed. Use of DFSORT other than by DB2 would require a license. Maintenance for DFSORT is shipped with z/OS. If a customer has problems with DB2's use of DFSORT, they would open an ETR with DB2 Level 2 Support no different that they would do today for any other DB2 related issue. The DB2 Version 8 requirement for DFSORT R14 or above is described in the following publications:

[URL for informational APAR II14047 describing DB2's use of DFSORT](#)

DB2 Version 8 Installation Guide (GC18-7418) ( All V8 manuals can be found at <http://www.ibm.com/software/data/db2/zos/v8books.html> )

DB2 for z/OS Version 8: Everything You Wanted to Know... and More (SG24-6079)

([Download from IBM RedBook web site](#))

[DB2 v8 Program Directory](#)

<http://www.elink.ibm.com/public/applications/publications/cgibin/pbi.cgi?CTY=US&FNC=SRX&PBL=GI10-8566-03#>

DFSORT and DB2 for z/OS Utilities Suite V8 ...

- If DFSORT installed as primary sort package and multiple versions of DFSORT exist, place DFSORT R14 plus APAR PQ68263 first in system search order.
- If DFSORT NOT installed as primary sort package, DFSORT R14 plus APAR PQ68263 must be accessible via
  - DFSORT SORTLPA library added to LPALST and SICELINK library added to LNKLST
  - DFSORT libraries SICELINK and SORTLPA added to LNKLST
  - DFSORT libraries SICELINK and SORTLPA added to STEPLIB DD
  - DFSORT modules in private library equivalent to one of the above
- New users of DFSORT should not use defaults. Set global options SIZE=MAX, TMAXLIM=16M, DSA=32M up to 128M...
- Use following link for further tuning advice:  
<http://www.storage.ibm.com/software/sort/mvs/tuning/online/srtmldi.html>

If DFSORT installed as primary sort package and multiple versions of DFSORT exist, place DFSORT R14 plus APAR PQ68263 first in system search order.

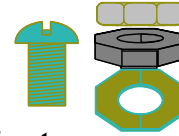
If DFSORT NOT installed as primary sort package, DFSORT R14 plus APAR PQ68263 must be accessible via

- DFSORT SORTLPA library is added to the LPALST and SICELINK library is added to the LNKLST, or
- DFSORT libraries SICELINK and SORTLPA, in that order, are added to the LNKLST, or
- DFSORT libraries SICELINK and SORTLPA, in that order, are added to the JOBLIB or STEPLIB DD statement, or
- DFSORT modules are in a private library that is equivalent to one of the above configurations.

New users of DFSORT should not run with defaults. Set global options like SIZE=MAX, TMAXLIM=16M and DSA=32M up to 128M... Use the following link for further tuning advice:

<http://www.storage.ibm.com/software/sort/mvs/tuning/online/srtmldi.html>

## Install Prerequisite Software



- **Functional Requirements for identified features and functions e.g. DB2 Connect, clients**

- ✓ See What's New in DB2? And Release Guide
- ✓ Program Directory for Details

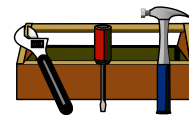
- **Service Level: IBM Consolidated Service Test**



- **Plan for more frequent service**

- ✓ More current releases = more frequent
- ✓ Refresh service level quarterly

- **Prepare to manage performance**



GoFurther

IBM and other vendor software must be checked for levels required and needed for the function you want. Some APARs require vendor changes. Plan to use V8.2 fixpak 10 or later for DB2 Connect. If you want the DRDA encryption support, then you need V8.2 (fixpak 7A) or later. Version 7.2 end of service was September 2004. While DB2 V8 worked for some customers with DB2 Connect V7.2 (fixpak 12, 13 or 14), most of the improvements only deliver with V8.1.4 or fixpak 4 or later. I recommend getting to fixpak 10. Also see the web:

[ibm.com/software/data/db2/db2connect/](http://ibm.com/software/data/db2/db2connect/)

<http://www.ibm.com/software/data/db2/udb/support/downloadv8.html>

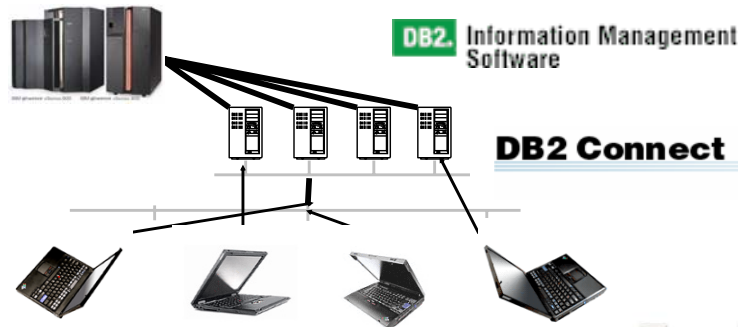
Use IBM Consolidated Service Test levels to help provide a well tested set of products at a recommended service level.

[ibm.com/servers/eserver/zseries/zos/servicetst/](http://ibm.com/servers/eserver/zseries/zos/servicetst/)

Customers who are relatively current on service encounter fewer problems overall. Refreshing the service level each quarter makes it easier to avoid encountering old problems.

DB2 Connect Version 8.1: Fixpak 13 now, minimum 10  
 DB2 9 requires V9 FP1 or V8.1 FP13

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



DB2 Connect V8.1 FP13 is the same as V8.2 FP6. If your DB2 Connect is a minimum of V8 FP10, then migration to DB2 for z/OS V8 will generally work, but some customers find they need later fixes. If you are moving to DB2 9 for z/OS, then the minimum level is DB2 Connect 9 FP1 or DB2 V8 FP13. If you are not at the minimum levels, then it's time to migrate to the most current level you can. If you have the license, that would be DB2 9 fixpak 2 today. Otherwise that would be DB2 8 fixpak 14, also known as DB2 8.2 fixpak 7 at times. If you get current now, then migration to DB2 9 for z/OS will not encounter the same problem. So if a client is down level, then get it migrated to current.

If you have a specific set of problems, then you can check the fixpak levels to see where those problems are resolved. But then you still need to test to make sure that the problem is resolved without introducing any new ones. Later fixpaks generally resolve a lot more problems. If you are migrating, find a good one and move to that level. Running with code that is out of support or missing a few thousand fixes is problematical. DB2 Connect V7 is not supported, and generally does not work well. We don't generally separate CM from NFM on our discussions of fixpaks. Some new function can be used even in CM, and that includes using multirow operations for DRDA, for an example. See the web for fixpak information.

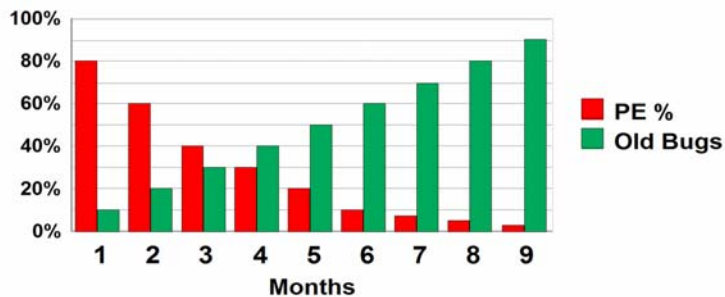
<http://www.ibm.com/support/docview.wss?rs=56&uid=swg27007053>

<http://www.ibm.com/support/docview.wss?rs=71&uid=swg21255572>

<http://www.ibm.com/support/docview.wss?rs=71&uid=swg21256235>

## How current should we be?

- Stay reasonably current with DB2 releases & fixes
  - V7 & V8 migration help improvements, APARs
- Balance for severities. Use Consolidated Service Test.
  - ▶ Potential PTF in Error or PE: Enhanced HoldData
  - ▶ Problems encountered instead of avoided
  - ▶ Business constraints and work load



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Go further

Choosing service timing requires judgement, not simple rules. The best practice for service means an understanding of your business drivers and constraints. These scales are not the same. Timing for moving preventive service into production is a careful balance between potential problems caused by PTFs containing an error (PEs) & potential problems avoided by applying the maintenance sooner. About 70% of PEs are found within four months after the PTF is closed. Currently, about 6 PEs are found every month across all versions. Green bars reflect the percentage of PEs yet to be found. Systems programming work load & availability of windows for installing service can affect timing.

I recommend upgrading service levels four times a year. Use current CST recommended service level, all service plus a two to four month later level for hipers & PE fixes. Stage that level through development systems & production. Match your levels with CST, across operating system & key subsystems. Enhanced HoldData provides a much faster way to discover missing hipers and PEs without fixes.

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

<http://service.boulder.ibm.com/390holddata/390holddata.html>



## Service Best Practice

## 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>

**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
- Run new test scenarios

The Consolidated Service Test provides a way to leverage more IBM testing and experience from many customers across a much broader set of products, including z/OS, IMS, CICS, DB2, WebSphere and many tools. This technique is working for very large, very small and in between customers. If you don't have an extensive test suite - like most customers, then this technique can help a lot in reducing research and finding a stable service level.

Installing two or three CST levels a year means more current service, but not too current. If you want a process that has proven track record for success and can reduce your work, then look at the CST. Use current CST recommended service level: all service plus a two to four month later level for hipers & PE fixes. Stage that level through development systems & production. Match your levels with CST, across operating system & key subsystems. Enhanced HoldData provides a much faster way to discover missing hipers and PEs without fixes.



Premigration Activity ... *Manage Performance C07*

1210, 1211, 1226, 1228, 1269, 1270,  
1330, 1332, 1363, 1364, 1598, 1641,  
1642, 1818, 1819, 1864, 1869, 2348,  
2461, 2682, 2704, 2705, web



## 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

GoFurther

Save critical access paths & accounting data! Changes can cause unwanted access path changes. Identify important queries, plans & packages. Be sure plan tables contain access paths & costs. ALTER current plan tables to add new columns. EXPLAIN REBIND may change access paths, so extract plans & run EXPLAIN under a different application or program name.

Keep accounting reports for crucial queries & applications. If you have a problem & send in long accounting reports & explain data, we find the issue quickly. If you don't have data, then we guess.

Monitoring & managing are more difficult with few plans. Never ending threads & plan reuse accumulate EDMPOOL & working storage. Each COMMIT needs package accounting. Recycle threads. Finding unused packages & cleaning up mistakes are difficult unless ownership is known. Performance monitoring may require analyzing everything in a CICS region instead of just one plan. Plan is a required short name. Package name is optional, long, multipart and not always easy to find. Best practice is to differentiate by plan within a CICS region, having at least 5 to 20 plans within a region. You can work faster & make changes on a more granular basis.

## Parameter Default Changes

- Better defaults for install – consider improving yours
- Describe for static V8 set to yes
- Log apply storage in V8 is 100

Panel	Field	Parameter	Version 7 default value	Version 8 default value
DSNTIP7	USER LOB VALUE STORAGE	LOBVALA	2048	10240
DSNTIPE	MAX USERS	CTHREAD	70	200
	MAX REMOTE ACTIVE	MAXDBAT	64	200
	MAX REMOTE CONNECTED	CONDBAT	64	10000
	MAX TSO CONNECT	IDFORE	40	50
	MAX BATCH CONNECT	IDBACK	20	50
DSNTIPN	DDF/RRSAF ACCUM	ACCUMACC	NO	10
DSNTIP8	CACHE DYNAMIC SQL	CACHEDYN	NO	YES
DSNTIPP	PLAN AUTH CACHE	AUTHCACH	1024	3072
DSNTIPL	LOG APPLY STORAGE	LOGAPSTG	0	100
	CHECKPOINT FREQ	CHKFREQ	50000	500000
DSNTIPA	BLOCK SIZE	BLKSIZE	28672	24576
DSNTIPR	DDF THREADS	CMTSTAT	ACTIVE	INACTIVE
	IDLE THREAD TIMEOUT	IDTHTOIN	0	120
	EXTENDED SECURITY	EXTSEC	NO	YES
DSNTIP5	TCP/IP KEEPALIVE	TCPKPALV	ENABLE	120
DSNTIPC	MAXIMUM OPEN DATA SETS	DSMAX	3000	10000
	EDMPOOL STORAGE SIZE	EDMPOOL	7312	32768 <sup>1</sup>

Note:  
<sup>1</sup> The installation CLIST calculates the default value for the EDMPOOL parameter.

A number of defaults for DSNZPARM settings have changed in V8 because of 64-bit virtual storage constraint relief or to improve the default setting. See the topic Changed default values for subsystem parameters in the Installation Guide or Release Guide.

DESCRIBE WITH STATIC is now YES in V8. This can lead to increase disk space requirement for SPT01 and increased EDM Pool resource consumption. It is difficult to provide a ballpark estimate of overhead. A guesstimate would be about 15% increase overall. This would be gradual, as you rebind your migrated packages. You can see the effect on an individual package by looking at the AVGSIZE field in SYSPACKAGE. Unfortunately, there is not a number-of-sections column. You could get that information by doing a query on SYSPACKSTMT, to determine the number of statements there for this package.

Log apply storage is often set to 10, which is too low. This is needed for fast log apply during recovery. Also, Backup/Restore System needs it for 4x better performance. Fast Log Apply storage can make a significant improvement in the elapsed time performed of DB2 log based forward recover, LPL/GRECP recovery and the new RESTORE SYSTEM utility. Up to 4x improvement has been observed. This storage is allocated in DBM1 address above the 16MB line and below the 2GB bar, but only as and when required and then freed.

## Practice Three Rs of DB2

- **REORG**
  - ▶ Real time statistics
  - ▶ Performance, space
- **RUNSTATS**
  - ▶ After significant change
- **REBIND**
- **Recheck**
  - ▶ Explain and run time performance
  - ▶ **MODIFY, COPY**



This practice starts with the basics, but performing the three Rs effectively can avoid a wide range of problems. In other cases, they are the steps needed to resolve a problem. These steps are needed to keep clustering effective, maintain free space, avoid index splits, keep sequential prefetch performance high, ... Using real time statistics to drive the process is being used more and more.

After the REORG is completed or during the process, gather the updated statistics. Balance the cost of gathering the information with the improved information for optimization. Improved statistics can mean improved access paths – ones that were not available before.

Using the improved information means using dynamic SQL or rebinding. After the rebind, checking the explains and the run time performance for regression can avoid problems. Do you want to rebind only in NFM or do you rebind some packages in CM too. How long will you be in CM? The longer the period, the more you will want or need to rebind in CM.

## To REBIND or not to REBIND

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



GoFurther

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To rebind or not to rebind, "When?" is the question: Whether 'tis nobler in the mind to suffer the slings and arrows of outrageous access paths, Or to take arms against a sea of troubles, And by rebinding, end them? To die: to sleep; No more; and by a sleep to say we end the heart-ache and the thousand natural shocks that old plans are heir to. 'tis a consummation devoutly to be wished To die, to sleep. To sleep: perchance to dream: ay, there's the rub; For in that sleep of death what dreams may come when plans have shuffled off this mortal coil, must give us pause: There's the respect that makes calamity of so long life for old plans and packages; [Apologies to the Bard and to Hamlet 3.1.]

The question is not whether to REBIND, but rather when to REBIND. Planned rebinds avoid surprises. A fix may need to rebind everything. Performance gains in a new version often occur at REBIND. When you rebind, performance is

1. Same: Most common case is plus or minus 5%, which is usually ignored
2. Worse: Least common, but usual regression causes are new access path or increased parallelism. If you compare prior plan, then you can find most problems easily. If you wait until a BIND occurs, analysis is more difficult; you are less likely to have all of the performance & plan data. Use a tool or compare estimates in DSN\_STATEMENT\_TABLE PROCSU or PROCMS to find problems.
3. Better: Many of the V8 performance improvements only occur if you bind. Some SQL is likely to benefit from optimization improvements, such as index use, joins, subquery transformations or UNION improvements. When you find a problem - errors or performance - the fix is often to REBIND. Best practice for migration is to test binds before migration & bind at migration time (comparing before and after). Use a tool for comparison and the task is simpler, but simple comparisons of cost estimates catch most problems.

## Plan to REBIND plans and packages

**Old plans and packages have more to gain and less to lose, in general**

**Compat mode – how long?**

- ▶ Most optimizations included
- ▶ Rebind key packages at least

**New function mode**

- ▶ Adjust database design, applications
  - ▶ Clustering, NOT PADDED indexes, DPSI
  - ▶ IS NOT DISTINCT predicate, MQT
  - ▶ Multirow fetch & insert
  - ▶ Unicode DBRM
- ▶ Rebind all plans and packages (may stage)



Best practice for migration is to test binds before migration & bind at migration time (comparing before and after). Use a tool for comparison and the task is simpler, but simple comparisons of cost estimates catch most problems. There are a number of good tools on the market.

For the best chance of improvements with the lowest risk of regression, rebind the oldest plans and packages. If there was a problem that resulted in a plan or package error, then the only way to resolve the issue is to rebind (or free and bind).

Since most of the improvements in optimization are already functional in Compat Mode, most customers bind the key packages and plans during compat mode. If compat mode is a very short period, or you do not need the improvements, then you might wait for new function mode to rebind. If you stay in compat mode for a long time, then you will want to rebind more of the packages and plans.

In new function mode, all of the optimization improvements can be made. Often you will want to look at performance challenges for your customer and see how they can be resolved. Can you use materialized query tables for improved resources and response times? Can you take advantage of the new clustering techniques? Will the not padded indexes improve performance (generally longer columns with wide variation)? Can a DPSI be used? But don't try to change existing global indexes into DPSIs, in general. If you have nullable columns and have comparisons that treat nulls as equal, the improved access path using the IS NOT DISTINCT predicate can make a big difference. If an application or two that fetches large numbers of rows can be changed to use multirow fetch or multirow insert (especially a distributed or CICS application), then there will be a huge difference in performance.

How much room will you get in DBM1? webinar

It depends.

Any virtual pools?

Buffer pool control blocks

Castout pool

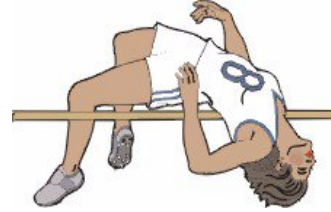
EDM DBDs pool, Sort Pool

RID Pool, compression dictionaries

V9: 5 EDM pools, Dynamic Stmt., DDF

V8 Growth in thread storage

You need to calculate, monitor and manage



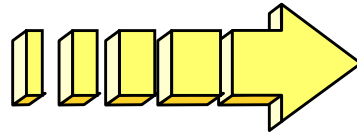
Some customers get big improvements in virtual storage, but others get very little. If you use little or no compression, have already minimized sort pools, RID pools, castout (no data sharing) and have moved the dynamic statement cache and buffers to data spaces, then the usable storage can shrink. With the new sizes and options in V8, some of the space grows. On the other hand, in about 80% of the cases we looked at, there are some virtual buffer pools left or substantial savings are available from the buffer pool control blocks (estimate 5% of data space and hiperspace buffer pools), data sharing castout, DBDs, sort pool, RID pool (estimate 90%), and compression dictionaries.

You need to do the calculations, monitor and manage storage in V8 & 9. The V9 improvements are generally about 10% to 15% more storage moved out from below the bar, with two more parts of the EDMPOOL, some of dynamic statement cache, and use of 64 bit storage for the DDF address space, with some above-the-bar storage shared with the DBM1 address space.

<http://www.ibm.com/software/data/db2/zos/events.html>

<http://www.ibm.com/software/os/zseries/telecon/15nov/>



Premigration Activity (*continued*)

Deprecated  
Functions

- **Going, going, but not gone in V8 or V9**
- **Convert from private protocol to DRDA**
  - ▶ **Bind parameter - DBPROTOCOL**
  - ▶ **BIND packages at remote locations**
  - ▶ **Governor changes: plan to package**
  - ▶ **Install panel for default DBPROTOCOL**
- **Selective partition locking LOCKPART**
- **DB2-managed stored procedures (gone in V9)**

DRDA support for three part names has been provided for many years.

Bind parameter DBPROTOCOL enables application programs that use three-part names for remote access to use DRDA protocol. The parameter is gone in V9, with DRDA as the default.

Private Protocol can no longer use type 2 inactive threads. Specify a non-zero value for MAXTYPE 1 to use type 1 inactive threads. DRDA is needed for V4 - V8 enhancements, TCP/IP and new data types. Rebind your applications with the DBPROTOCOL option set to DRDA.

Existing applications can be converted from private protocol to DRDA. BIND at remote sites instead of dynamic.

Rebind with the DBPROTOCOL parameter

Change the governing row in the RLST at the server, from a "governs by plan" to "governs by package".



## Migration - data sharing group B12, B13

- ▶ Supports V7 & V8 COMPAT or V8 and V9 COMPAT members within a group for a 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
- ▶ Using Data Sharing book for migration
- ▶ Migrate all members before using new function
- ▶ Restrict execution of packages & plans bound on new version to migrated members
- ▶ Change all catalog bufferpools in group for ENFM (V8)
- ▶ Group quiesce in V8 NFM for new locking protocol 2
- ▶ CFLEVEL 12, 13, 14 for best performance



GoFurther

Remember to work with new V8 function only on a group that has migrated to V8 NFM. Therefore, it is best to migrate all of your members and test with existing applications before implementing any new features or functions.

If you have multiple releases in a group for more than a week, then you need to have much better controls in place and be able to test your processes more thoroughly.

Persistent structure size changes, group attach improvements, restart light and enhanced constraint management are more complex if multiple releases are involved.

The minimum CFLEVEL is to have a level that is in service. Most data sharing customers will want to be at CFLEVEL 14, 13 or 12. There is quite a bit of information about CFLEVEL on the web:

<http://www.ibm.com/servers/eserver/zseries/psocftable.html>

Get the detailed steps from the Installation Guide & Data Sharing: Planning & Administration.

## Customer Experiences C05



- **Customer experiences say pay attention to:**
  - **Read the web, books, Info APARs, PSP**
  - **Have a plan that includes performance**
  - **Run premigration job DSNTIJP**
    - **Run it early, Use V7 DSNTIJP8 job**
    - **Use V8 DSNTIJP9 job**
    - **Resolve CCSID use on V7 as soon as possible**
  - **Understand Unicode parsing, catalog, instrumentation**
  - **Current maintenance for DB2, z/OS & CF**
  - **Get the latest books: library, red books, ...**



Most of these were mentioned before. They are mentioned again because other customers missed them. Many customer problems dealt with items on the foil titled Premigration Action. Run the premigration job. Check CATMAINT messages.

Programmers must add colons for all host variables. Make sure DBAs understand the new authorizations and meaning of schema names. Check for release dependent objects on fallback or coexistence.

Having current service & books saves time & avoids problems.

Check other early customer experiences here and later.

<ftp://ftp.software.ibm.com/software/data/db2zos/A01jc.pdf>

*@business is the game. Play to win.*

**Plan to win. Work the web.**

- ✓ **Planning, education & reading**
  - ✓ **Testing for your unique techniques**
  - ✓ **Performance & Storage Monitoring**
  - ✓ **Service Level: stay reasonably current**
- = Successful migration**

GoFurther

How do you win at e-business?

For installing and migrating, the key points are taking the time to plan, being sure that you have the education, reading and research time so that all of the steps are covered.

Use the information on the web to get quick answers. Call us or e-mail when that's not enough.

Then be sure to test. Have your performance and storage monitoring plans in place.

The service levels make a big difference, and you need to find the right balance.

If you plan to win, e-business is a fun game.



RTFW is the acronym for Read the Friendly Web. Let's take a short walk on the wild, wild web. The problem with the web is not too little information, but rather too much information. The experience is a bit like trying to take a drink from a fire hose. So I'd like to help a bit by narrowing the search with the twenty five cent tour of a few of my favorite DB2 web sites. A lot more information has been added in the past month or two, with many new books and web pages.

Let's start with the DB2 family. I'll generally show the short form or alias of the URL, omitting http://

Here are some tips for avoiding the 404. You don't need www in front of ibm.com in most situations. There is often something after www, such as the -306 in www-306 when you get the URL back from the browser. Remove the hyphen and number when you save the URL, since that number changes more quickly than the rest of the URL.

IDUG® 2007 North America  
**Main DB2 for z/OS Web Page**  
[ibm.com/software/db2zos](http://ibm.com/software/db2zos)

- Library (books)
- Events
- Education
- Services
- Support
- V8, V9
- Developer Domain
- DB2 Magazine
- Z9 zIIP
- Tools

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This is the main DB2 for z/OS web page. You can get to the other DB2 for z/OS pages from here, so I often call this my home page. This page changes frequently, so look at the highlighted NEW items. Do you want to look in a DB2 book? Click on Library to see books on DB2 and QMF Version 8 (about 40), Version 7, 6 or even 5. V6 and V5 are out of service. You can check the latest changes by looking at the Information Updates or go to the Information Center. From this page, you can look for conferences (Events), specific classes (Education), or services. If you want to see the latest on DB2 9 or DB2 Version 8, click on the DB2 9 or the V8 link. If your primary concern is application development, the Developer Domain is for you. DB2 Magazine covers a broad range of topics about DB2. The latest machines System z9, z990 and z890 are on the System z page. Click DB2 and IMS Tools to see the wide range of help we provide.

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## DB2 9 for z/OS Web Page

[ibm.com/software/db2zos/db2zosv91.html](http://ibm.com/software/db2zos/db2zosv91.html)

Home | Products | Services & solutions | Support & downloads | My account

Software > Information Management > DB2 Product Family

**DB2 UDB for z/OS**  
**DB2 for z/OS**  
 IBM DB2 Version 9.1 for z/OS

**Information Management software**

**Web Events**  
 → Webcast: Coming Attractions in DB2 V9.1 for z/OS

**Related IBM Sites**  
 → IBM System z servers  
 → DB2 Utilities Suite  
 → DB2 and IMS Tools  
 → Resources for developers  
 → IBM System z9 zIIP

**Other Versions**  
 → DB2 UDB for z/OS Version 8  
 → DB2 UDB for z/OS and OS/390 Version 7  
 → Summary of Availability

**Realize the business value of your information**

DB2 9 for z/OS beta program is [happening now!](#)

DB2 9 for z/OS expands the value delivered to your business by the industry-leading IBM mainframe data server through innovations in key areas:

- Business insight innovations
- Cost savings through optimized innovations
- Business resiliency innovations

Selected features that deliver these valuable benefits to your business include:

- Rich hybrid data server support for both relational and pureXML™ storage, with the necessary services to support both data structures.
- New data types (DECFLOAT, BIGINT, and VARBINARY)
- Native SQL procedural language.
- Improved security with roles, trusted context, and new encryption functions
- Extensions of DB2 for z/OS V8 capabilities to make changes to the data.
- Enhancements to large object support and performance.
- Volume-based copy and recover
- Refinements to the DB2 industry-leading optimization
- QMF interface design changes that provide on demand access to data, reports, and interactive visual solutions with optional Web browser
- Enablement for [IBM System z Integrated Information Processors](#)

**Related software**

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

**Related solutions**

- DB2 and IMS Tools
- Java™ on z/OS and OS/390
- DB2 for Linux

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Go further

This is the new DB2 V9.1 for z/OS web page. Watch this page for the latest information on this new version of DB2. As DB2 becomes generally available in March, this page will have a lot of changes.



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IBM  
LOBs with DB2 for z/OS:  
Stronger and Faster

## DB2 9 for z/OS References

Main DB2 for z/OS web page: <http://www.ibm.com/software/db2zos/>

DB2 9 for z/OS main page: <http://www.ibm.com/software/data/db2/zos/db2zosv91.html>

Overview presentation, webcast & foils with notes: <http://www.ibm.com/software/os/zseries/webcast/18may/>  
<ftp://ftp.software.ibm.com/software/data/db2zos/DB2V9zOS.pdf>

Redbooks including DB2 9:

- Powering SOA with IBM Data Servers <http://www.redbooks.ibm.com/abstracts/SG247259.html?Open>
- LOBs with DB2 for z/OS: Stronger & Faster <http://www.redbooks.ibm.com/abstracts/SG247270.html?Open>
- Securing DB2 & MLS z/OS, SG24-6480-01 <http://www.redbooks.ibm.com/abstracts/sq246480.html>
- V9 Technical Overview, SG24-7330, later for this and next books
- Enhancing SAP - DB2 9 for z/OS, SG24-7239
- V9 Performance Topics,
- V9 Optimization Service Center,

Detailed presentations: Start on Events page <http://www.ibm.com/software/data/db2/zos/events.html>

Click on Presentations from previous conferences. Sort results by date - newest first.

Access ftp site directly: <ftp://ftp.software.ibm.com/software/data/db2zos/>

About 15 of more than 200 presentations that address V9.

Presentations from IOD conference, IDUG, Share, ... See notes below for more detail.

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GoFurther

Main DB2 for z/OS web page: pointers to most of the following: <http://www.ibm.com/software/data/db2/zos/index.html>

DB2 9 for z/OS main page: <http://www.ibm.com/software/data/db2/zos/db2zosv91.html>

Overview presentation, webcast and foils with notes: <http://www.ibm.com/software/os/zseries/webcast/18may/>  
<ftp://ftp.software.ibm.com/software/data/db2zos/DB2V9zOS.pdf>

#### Redbooks:

SOA book includes overview of V9 XML <http://www.redbooks.ibm.com/abstracts/SG247259.html?Open>

LOBs book includes V9 <http://www.redbooks.ibm.com/abstracts/SG247270.html?Open>

Coming: SG24-6480-01 security, SG24-7330 V9 overview, V9 Performance Topics, V9 Optimization Service Center

#### Detailed presentations:

Start on the Events page <http://www.ibm.com/software/data/db2/zos/events.html>

Click on Presentations from previous conferences. Sort results by date - newest first. Some require registration.

[http://www.ibm.com/support/docview.wss?rs=64&context=SSEPEK&dc=DA400&q1=presentation&uid=swg27008769&loc=en\\_US&cs=utf-8&lang=en](http://www.ibm.com/support/docview.wss?rs=64&context=SSEPEK&dc=DA400&q1=presentation&uid=swg27008769&loc=en_US&cs=utf-8&lang=en)

[http://www.ibm.com/support/docview.wss?rs=64&context=SSEPEK&dc=DA400&q1=presentation&uid=swg27008767&loc=en\\_US&cs=utf-8&lang=en](http://www.ibm.com/support/docview.wss?rs=64&context=SSEPEK&dc=DA400&q1=presentation&uid=swg27008767&loc=en_US&cs=utf-8&lang=en)

[http://www.ibm.com/support/docview.wss?rs=64&context=SSEPEK&dc=DA400&q1=presentation&uid=swg27008766&loc=en\\_US&cs=utf-8&lang=en](http://www.ibm.com/support/docview.wss?rs=64&context=SSEPEK&dc=DA400&q1=presentation&uid=swg27008766&loc=en_US&cs=utf-8&lang=en)

[http://www.ibm.com/support/docview.wss?rs=64&context=SSEPEK&dc=DA400&q1=presentation&uid=swg27008743&loc=en\\_US&cs=utf-8&lang=en](http://www.ibm.com/support/docview.wss?rs=64&context=SSEPEK&dc=DA400&q1=presentation&uid=swg27008743&loc=en_US&cs=utf-8&lang=en)

Access the ftp site directly: <ftp://ftp.software.ibm.com/software/data/db2zos/>

IOD2559DB29ClonesLyle.pdf	V9 clone tables
IOD1851DB2v9onlineUtilitiesHartmann.pdf	V9 utilities
IOD1855DB2v9designHartmann.pdf	V9 applicationdesign
IOD1869DB2zOSv9performPreShibamiya.pdf	V9 performance preview
IOD1819PurcellV9.pdf	V9 optimization
IOD1730DB2v9xmlZhang.pdf	V9 XML
IOD1729aDB2v9backuprecoveryTeng.pdf	V9 backup and recovery
IOD1641DB2V9autoQueryTuningFuh.pdf	V9 Optimization Service Center part 1
IOD1642DB2v9autoQueryTuningFuh.pdf	V9 Optimization Service Center part 2
IOD1450aDB2v9SAPHrle.pdf	V9 for ERP and SAP
IOD1438db2v9LOBsWeihrach.pdf	V9 LOBs
IOD1345DB2zOSmigrationg.pdf	V8 & V9 migration
IOD1166DB2v9zOSbeyondCotner.pdf	V9 overview
DB2V9forzOS.pdf	V9 overview
DB2V9zOS.ppt	V9 overview PowerPoint



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 zIIP [ibm.com/systems/z/ziip/](http://ibm.com/systems/z/ziip/) II14219 II12836 II10817

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Servers > Mainframe servers > Hardware >

**Mainframe servers**  
 About IBM mainframe  
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 Software  
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**zIIP – Overview**  
 zIIP Getting started  
 Overview | About | Resources |

**Today's corporate data**  
 Data is at the core of every business. But data management can be a big project. It needs to be available globally; it must be kept up in real time, and accessible 24x7. At the same time, it needs to be protected from unauthorized access and to comply with new regulations. The IBM System z™ mainframe family has a strong heritage in data serving, and its architecture is designed for massive data access, whether across the Internet, to storage devices, or to remote backup sites. Scalability, availability, security—these are all core competencies of the mainframe.

**Learn More**  
 → What they are saying about zIIP  
 → Data Serving Press release  
 → Data Serving Roadmap z/OS z/OS website  
 → DB2 V9 for z/OS preview  
 → System z security

**Exciting new features**  
 Earlier this year, IBM extended its mainframes data serving capabilities, delivering a new roadmap for the future of data serving and information on demand, previewing new DB2 function, and introducing a new specialty engine directed toward data serving workloads.

The new specialty engine, the IBM System z9 Integrated Information Processor (IBM zIIP), is now available on the System z9 Enterprise Class (EC) and System z9 Business Class (BC) servers.

**Related links**  
 • Resource Link  
 • Resources for IBM Business Partners  
 • Resources for developers  
 • ShopSystemZ  
 • Printing solutions  
 • ISV software support  
 • IBM Training  
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**We're here to help**  
 IBM Mainframes just got even more cost competitive. Let us show you how with a customized quote.  
 Request a quote  
 or call us at 1-888-SHOP-IBM

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See zIIP information on the web. This web site has the most current information, & pointers to more resources. The zIIP is for customers who are concerned about costs for growth. One big cost reduction is hardware cost, which is much less than a standard processor. The biggest cost reductions are in software, as IBM does not charge for software running on the specialty processors. The zIIP fits some customers very well, but will not apply for all. As a specialty processor, not all work can use the zIIP, which will only process work running under an enclave SRB. Most applications cannot run in SRB mode. The specifics of the software charging need to be considered. Customers must be current on hardware (System z9), current on software (z/OS 1.6 or later, DB2 V8 or later) and have a work load peak using the types of work eligible for zIIP:

Remote SQL processing of DRDA network-connected applications over TCP/IP: These DRDA applications include ERP (e.g. SAP or PeopleSoft), CRM (Siebel), and business intelligence running on other platforms. Remote SQL is expected to provide the primary benefits to customers, as it is commonly part of the peak load. Stored procedures and UDFs run under TCBs, so they are not generally eligible for zIIP, except for the call, commit and result set processing. V9 remote native SQL Procedure Language is eligible for zIIP .

Parallel queries: If the work comes in remotely over DRDA using TCP/IP, then the initial work is eligible as remote work. After the initial time, the parallel processing threads are eligible and can process on the zIIP.

DB2 utility index processing: Functions of the LOAD, REORG and REBUILD DB2 utilities that perform index maintenance are eligible for zIIP. This is not a common peak capacity constraint, but could be useful in reducing CPU charges.

The best way to estimate the eligible work is to apply the needed z/OS and DB2 service, to run your work load and to take measurements. Use DB2 accounting with any product which can provide DB2 accounting reports, such as Omegamon.

Don't you wish you could find all of the different kinds of information about DB2 for z/OS in one place? I think you'll be happy to learn about a new Web page called the DB2 for z/OS Information Roadmap. Information roadmaps are being developed by many IBM product teams in an effort to simplify the lives of users by providing a single place to find all sorts of useful information resources, such as: Product information from the official library IBM Redbooks Articles in a variety of different online publications, including the DB2 Magazine, presentations, support information like answers to frequently asked questions or technotes, web pages with high-level descriptions of different products that DB2 works with and more. We tried to provide a simple way to get to many of the best resources for various tasks. This will be a great resource to people just starting to use a DB2 capability that they haven't yet used.

The information roadmap is organized according to different tasks that you might perform, such as migrating, configuring, administering, and debugging. Although the information roadmap is available for Version 8, it is available to anyone with Web access, and many of the resources are relevant and useful to users who aren't yet on Version 8.

I encourage you to check out the new DB2 for z/OS Information Roadmap: <http://www.ibm.com/software/data/db2/zos/roadmap.html>

You can also start from the main DB2 for z/OS web page and click on the Information Roadmap news item or <http://www.ibm.com/software/db2zos>

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DB2 Support Page  
[ibm.com/software/db2zos/support.html](http://ibm.com/software/db2zos/support.html)

Technotes  
 (FAQs)

Presentations

White papers

Redbooks  
 ✓ new books

APARs, CST

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Do you need Answers to Frequently Asked Questions? Product Information? Technical Presentations? Redbooks? White Papers? Support for all of these is on this web page. Click Support on DB2 web pages. From this page, you access roughly 800 Technotes or answers to Frequently Asked Questions, technical presentations from recent conferences, a dozen white papers, and over 50 Redbooks. For more presentations, see the Events page. The Consolidated Service Test (CST) documents IBM recommended service level for a range of z/OS products. To search for the presentation you want, put a word or two into the Additional search terms or Order by date – newest first. There are new and updated redbooks on Powering SOA with IBM Data Servers, LOBs with DB2 for z/OS: Stronger and Faster, V8 Performance Topics, Data Sharing in a Nutshell, Data Integrity, Stored Procedures: Through the Call and Beyond, Design Guidelines for High Performance and Availability, Disaster Recovery, and Security Improvements.

[ibm.com/software/db2zos/support.html](http://ibm.com/software/db2zos/support.html)

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 Library page  
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This is the Library page for Version 8. I clicked Library, and then Version 8 to get here. There are about 40 PDF books and about the same number of books in html or BookManager format. Choose the style you want. I generally download the PDF books to my computer. From this page you can get books on DB2 and QMF, including both the library and program directories. If you need to look for some tools that can be downloaded, such as Estimator or Visual Explain, click on Downloads. You can also get to the new Information Center from here.

Most of the DB2 V8 books were updated in February 2006. Watch this web page and see the dates next to each book for the latest updates.

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**DB2 9 Library page**  
**[ibm.com/software/data/db2/zos/v9books.html](http://ibm.com/software/data/db2/zos/v9books.html)**

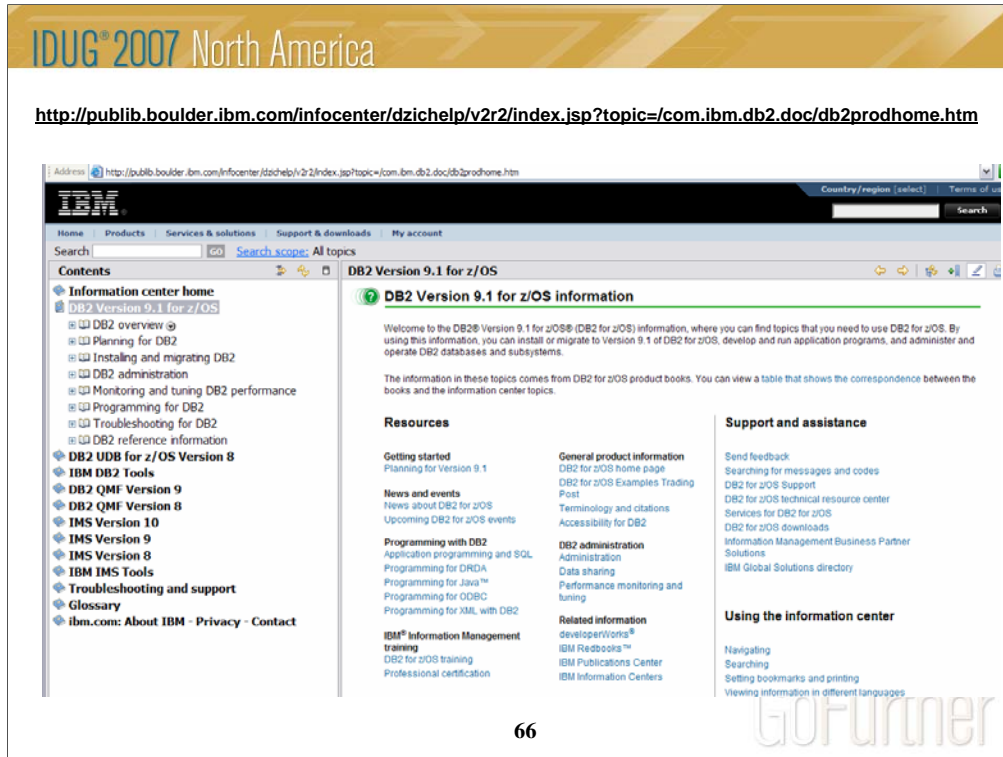
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- Information Center

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Most of the DB2 V8 books were updated in February 2006. Watch this web page and see the dates next to each book for the latest updates.





This is the Information Center, with a wide spectrum of information and access to books for DB2 for z/OS, DB2 tools, QMF, IMS, IMS tools and more. You can get to this page from the Library page, by clicking Information Center. The Information Center provides information across the books and across multiple products.

If you click “Troubleshooting and Support”, then expand under “Searching knowledge base” and click “Web search:...”, you’ll find a helpful Web search page. From this page, you can search IBM support, DeveloperWorks, or even the whole Internet using Google.

## DB2 Cross-Platform SQL Reference

<http://www.ibm.com/developerworks/db2/library/techarticle/0206sqlref/0206sqlref.html>

The screenshot shows the IBM DeveloperWorks website interface. At the top, there is a navigation bar with links for Home, Products, Services & solutions, Support & downloads, and My account. Below this is a search bar and a dropdown menu for 'Country/region [select]'. The main content area features a sidebar with various product categories like developerWorks, eServer, Lotus, Rational, Tivoli, WebSphere, and dW Subscription. The main content area is titled 'The SQL Reference for Cross-Platform Development' and includes a date of June 2002 (Updated September 22, 2004) and a copyright notice for IBM. The page highlights 'New in Version 2!' features, such as support for sequences, a new CURRENT SCHEMA special register, and enhanced support for scalar subselect. A 'GoFurter' logo is visible in the bottom right corner.

This is the old web page for the SQL Reference for Cross-Platform Development. It has three versions of the cross-platform SQL Reference and pointers to the base product SQL Reference books as well. If you want to write programs that work well across the DB2 family, then this is the book to download and use.

These books publish frequently, so you need to choose the one for the proper combination of DB2 platforms and versions.

<http://www.ibm.com/developerworks/db2/library/techarticle/0206sqlref/0206sqlref.html>



## Web Resources: DB2 for z/OS V8 Migration

- [ibm.com/software/db2zos](http://ibm.com/software/db2zos)  
Click on Support and then access the Technotes (Q&A), White Papers & Technical Presentations
- [ibm.com/software/data/db2/zos/v8books.html](http://ibm.com/software/data/db2/zos/v8books.html)
- [ibm.com/servers/eserver/zseries/zos/bkserv/r6pdf/](http://ibm.com/servers/eserver/zseries/zos/bkserv/r6pdf/)
- ftp site for papers, presentations:  
<ftp://ftp.software.ibm.com/software/data/db2zos/>

See specific URLs in the notes below.

consultant, customers why migrate <http://www.ibm.com/software/os/zseries/index.html>  
<http://www.ibm.com/software/os/zseries/webcast/aug31/>  
<http://www.ibm.com/software/os/zseries/ondemand/#dm>

paper on why migrate <ftp://ftp.software.ibm.com/software/data/db2zos/db2v8dbv.pdf>  
value of migration <ftp://ftp.software.ibm.com/software/data/db2zos/Z05.pdf>

John Campbell presentations on health checking and on early customer experience.  
<ftp://ftp.software.ibm.com/software/data/db2zos/A01jc.pdf>  
<ftp://ftp.software.ibm.com/software/data/db2zos/G11jc.pdf>  
<ftp://ftp.software.ibm.com/software/data/db2zos/G12jc.pdf>

migration planning <ftp://ftp.software.ibm.com/software/data/db2zos/S1322rma.pdf>

migration planning papers

<ftp://ftp.software.ibm.com/software/db2storedprocedure/db2zos390/techdocs/V8planmigrate.pdf>  
<ftp://ftp.software.ibm.com/software/db2storedprocedure/db2zos390/techdocs/V8migrateprocess.pdf>

Installation Guide, Program Directories and other books

<http://www.ibm.com/software/data/db2/zos/v8books.html>

Migration presentations

<ftp://ftp.software.ibm.com/software/db2storedprocedure/db2zos390/techdocs/OF2.pdf>  
<ftp://ftp.software.ibm.com/software/db2storedprocedure/db2zos390/techdocs/OA2.pdf>  
[ftp://ftp.software.ibm.com/software/data/db2zos/C11\\_FINAL\\_Keemle.pdf](ftp://ftp.software.ibm.com/software/data/db2zos/C11_FINAL_Keemle.pdf)

## What do customers say about DB2 9 V8?



What can you learn?

Gain their experiences.

At conferences, user groups, on the web

<http://www.ibm.com/software/success/cssdb.nsf/CS/LWIS-6ZPLMR?OpenDocument&Site=>

### Univar and DB2 9

[http://www.ibm.com/software/success/cssdb.nsf/CS/LWIS-6ZPLMR?OpenDocument&Site=Business value](http://www.ibm.com/software/success/cssdb.nsf/CS/LWIS-6ZPLMR?OpenDocument&Site=Business%20value)

<http://www.ibm.com/software/os/zseries/index.html#>

<ftp://ftp.software.ibm.com/software/data/db2zos/db2v8dbv.pdf>

<http://www.ibm.com/support/docview.wss?rs=64&context=SSEPEK&uid=swg27005465>

### GAD

<http://www.ibm.com/software/data/db2imstools/news.html>

<http://www.ibm.com/software/os/zseries/webcast/mar1/>

### Deere, system backup / restore and migration process

<ftp://ftp.software.ibm.com/software/data/db2zos/PITR18.pdf>

[ftp://ftp.software.ibm.com/software/data/db2zos/C11\\_FINAL\\_Keemle.pdf](ftp://ftp.software.ibm.com/software/data/db2zos/C11_FINAL_Keemle.pdf)

### Hewitt Associates

<ftp://ftp.software.ibm.com/software/db2storedprocedure/db2zos390/techdocs/OF2.pdf>

### Summary of early customer experiences

<ftp://ftp.software.ibm.com/software/data/db2zos/DB2v8Migration.pdf>

### Health checking

<ftp://ftp.software.ibm.com/software/data/db2zos/G11jc.pdf>

<ftp://ftp.software.ibm.com/software/data/db2zos/G12jc.pdf>

Check Willie Favero's DB2 blog at: <http://blogs.ittoolbox.com/database/db2zos>

NYPD <http://www.ibm.com/innovation/us/adv/special/index.shtml?deepLinkID=crimecenter>

Events for more info ...

IDUG

IBM Tech Conferences

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Presentations

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There are many excellent conferences coming up. Use the Events page to see which one you can attend:

<http://www.ibm.com/software/data/db2/zos/events.html>

If you missed a conference or two, then check for recent presentations from previous conferences. More than 150 presentations are on the web, some with audio as well.

<u>conference</u>	<u>dates</u>	<u>location</u>	<u>web location</u>
IDUG NA 2007	May 7 - 10	San Jose, CA	<a href="http://www.idug.org">www.idug.org</a>
Share 2007	Aug 13 - 17	San Diego, CA	<a href="http://www.share.org">www.share.org</a>
IDUG Europe	Nov 5 - 9	Athens, Greece	<a href="http://www.idug.org">www.idug.org</a>
IBM IOD	Oct 14 - 19	Las Vegas, NV	<a href="http://ibm.com/events/InformationOnDemand">ibm.com/events/InformationOnDemand</a>

IBM Technical Conferences

<http://www.ibm.com/services/learning/ites.wss?pageType=page&c=a0001438>

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**IBM Information On Demand 2007**  
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**Why attend:**

- Participate in discussions on the future of Information Management
- Experience the entire Information Management portfolio – Software, Hardware and Services
- Learn how to unlock business value and drive competitive advantage
- Hear how your peers are realizing ROI
- Understand the roadmap to long term strategic advantage
- Learn best practices in your industry
- Receive the best in technical education and free certification testing
- Extensive opportunities for networking with both your peers and industry experts

**IBM Information On Demand 2007**  
**October 14-19, 2007**  
**Las Vegas, Nevada**

- The premier information management event for business and IT executives, managers, professionals, DBA's and developers.
- Select from over 600 sessions: a 2-1/2 day business leadership track with 120 sessions and a 5 day technical track with 480 sessions.
- Latest strategy and product announcements
- Huge Expo Solution Center
- Hands on labs
- One-on-ones with executives and specialists
- Birds of a Feather roundtables

**Act.Right.Now.**  
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IBM Information On Demand 2007 global conference is the premier information management event for business and IT executives, managers, professionals, DBA's and developers. More IBM technical and business solutions content will be in one place than ever before! Select from over 500 sessions: a 2-1/2 day business leadership track with 100 sessions and a 5 day technical track with 500 sessions.

**Why should you attend this conference?**

- Participate in the PREMIER discussion on the future of Information Management
- Experience the entire Information Management software portfolio
- Learn how to unlock business value and drive competitive advantage
- Hear how your peers are realizing ROI
- Understand the roadmap to long term strategic advantage
- Learn best practices in your industry
- Receive the best in technical education and free certification testing
- Extensive opportunities for networking with both your peers and industry experts
- Most of all, by combining individual conferences into one global event, you gain access and exposure to the full breadth of IBM Information Management technologies and experts

The agenda offers the flexibility to easily manage your participation based on your needs. In our huge product Expo Solution Center you can talk to experts about the products, tools, and services you need from IBM and IBM Business Partners to manage your information infrastructure. Meet one-on-one with IBM executives and technical leaders, and attend multiple Birds of a Feather roundtables.

Who should attend? IT Executives, Line of Business Executives, IT Decision Makers, Technical Staff, Developers, DBA's, IBM Business Partners, Consultants, Press and Analysts

[www.ibm.com/software/data/db2imstools/](http://www.ibm.com/software/data/db2imstools/)

Click Support For Compatibility Matrix → → → & V8 or DB2 9

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This is the primary web page for DB2 and IMS tools. If you want to know exactly which levels of each tool work with DB2 for z/OS Version 8 or with DB2 9 for z/OS, then go to the Support page for the tools. You may find the item directly on the Support page. Or click Technotes (FAQs) and search for items that include V9 or V8 and PTF. Select the item DB2 Data Management Tools and DB2 for z/OS V8.1 or V9.1 Compatibility. This table provides the minimum maintenance required for DB2 Tools to support DB2 for z/OS V8. The Support page has a wide range of other detail about these products.

<http://www.ibm.com/support/docview.wss?rs=434&context=SSZJXP&dc=D600&uid=swg21256800>

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

**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	VRS	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
DB2 Archive Log Accelerator	1.1.0	X			
DB2 Archive Log Accelerator	2.2.0		X		PK38148(See " below)
DB2 Archive Log	1.1.0	X			

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This is the resulting page today, looking for the Information Management Tools releases and service needed to work with DB2 9 for z/OS. Note that the matrix lists some levels of tools with an X in the NS or not supported column. See the later version, with an X under T for toleration or under E for exploit or the ability to use those new improvements.



[www.ibm.com/developerworks/db2/products/db2zos/](http://www.ibm.com/developerworks/db2/products/db2zos/)  
[www.ibm.com/developerworks/db2/zones/porting/](http://www.ibm.com/developerworks/db2/zones/porting/)

IDUG® 2007 North America  
 developerWorks > Information Management > Products >  
**DB2 for z/OS and OS/390**  
 DB2® on the mainframe allows you to run powerful enterprise applications and make e-commerce a reality. developerWorks is the technical resource center for DB2 for z/OS® and OS/390®.  
 Updated 15 Feb 2007

**Top story**  
**Use DB2 Version 9.1 for z/OS to implement application session locking**  
 A new feature, "SKIP LOCKED DATA," gives you the capability to implement application-level session locking, allowing intermediate DB2 commits. [More >](#)

**Search technical library**  
 Enter keyword or leave blank to view entire technical library:

→ All articles                      → IBM DB2 and IMS Tools publications  
 → All content

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There is extensive help for applications and porting to DB2 on the web, with suggestions for the process and many resources, including a migration toolkit. The dramatically improved DB2 family compatibility in DB2 for z/OS V7, V8 and V9 makes porting to DB2 for z/OS from other platforms much easier.

<http://www.ibm.com/developerworks/db2/products/db2zos/>

<http://www.ibm.com/developerworks/db2/zones/porting/>

Here is the URL for the main DeveloperWorks page

<http://www.ibm.com/developerworks/db2/>

There is also a DeveloperWorks page on DB2 for z/OS.

<http://www.ibm.com/developerworks/db2/products/db2zos/>

For migration information for specific databases, try


<http://www.ibm.com/developerworks/ondemand/migrate/db.html>



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## Chris Munson Roger Miller

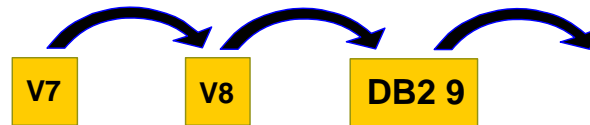
IBM Silicon Valley Lab

Speaker e-mail address



DB2 for z/OS Version 8 and 9 (V8 and V9) have many new features. This presentation will discuss planning for migration to V8 and V9, preparing to use the new functions. We assume that you know DB2 V8 and V9. We'll emphasize process and recommendations from many other customers, with pointers to more information. The content of this session will focus on the tasks of the person who plans or installs DB2. Systems programmers and database administrators generally perform this task, but there is work for all DB2 users.

## Migration Path: DB2 V7 to DB2 9



Objectives? Time? Availability? Do you need fallback?  
 Data Sharing Coexistence? Outage permitted? How long?  
 When to migrate? Version in service?

Option 1: V8 stage 2 – 3 months, stabilize & move

Option 2: Unload application, definitions & data; Load

Option 3: V8 on weekend then to DB2 9

Fallback only to V8 → no fallback, no coexistence

DO NOT skip steps

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Do you want to migrate from V7 to DB2 9? We have a number of questions to ask. V8 provided a massive reengineering of the DB2 structure, memory and catalog, so it is particularly difficult to skip. The first question is the objective in terms of time you expect to save, need for availability and safety. If you need data sharing coexistence, then V7 to DB2 9 is not an option. In essence, if you need fallback, V7 to DB2 9 is not an option, since the only fallback would be to V8. Fallback to a version you have not run might not be an improvement. The next questions are timing and service. DB2 9 became generally available March 2007. When would you be ready to migrate to it? DB2 V7 goes out of service June 2008. The best option, option 1 would be to move to V8, stabilize and adjust, move into NFM for a few months at least, and then migrate to DB2 9. If an application, the definitions and data can be unloaded and reloaded, then you can skip versions. You don't have subsystem coexistence or fallback. So option 2 takes more work and requires more testing, but the migration can be more granular, if your applications permit. An option that we cannot recommend is a fast jump from V7 to DB2 9. You do not have migration or coexistence. Our experience from other customer situations is that skipping migration steps can cause significant problems. In short, the safest process, by far, is the one tested by years of work in the lab and thousands of customer experiences. You can choose your own path, but the shortcut can sometimes be the longest way.