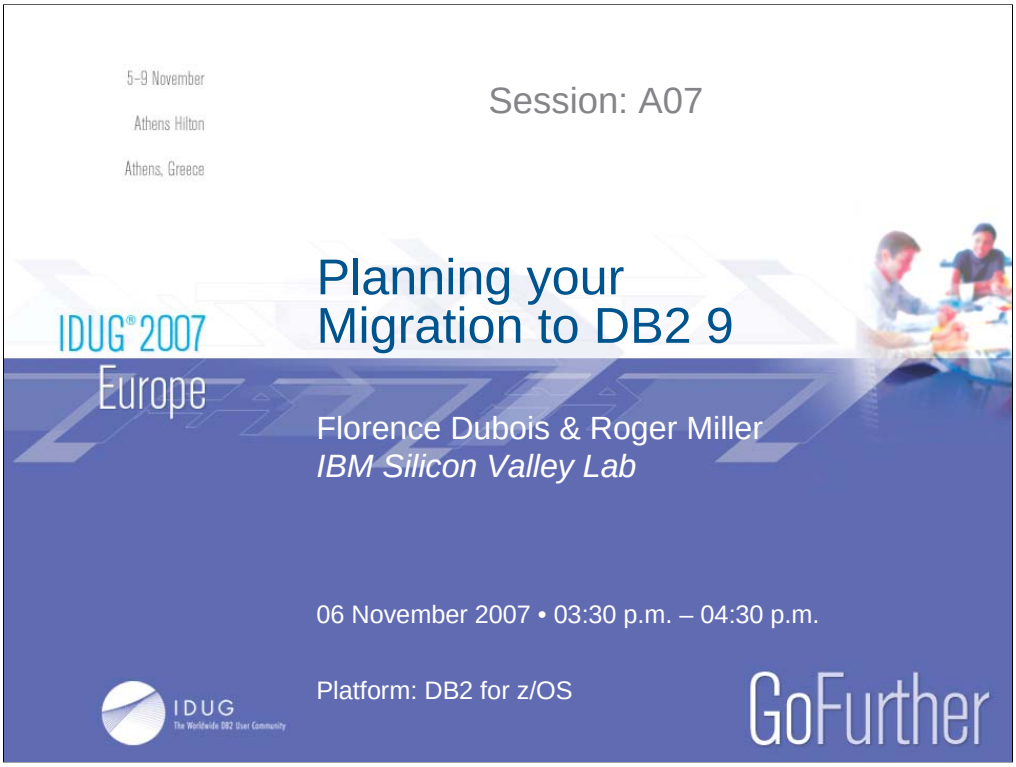

DB2 9 for z/OS has many new features. This presentation will discuss planning to migrate to DB2 9, preparing to use the new functions. We assume that you know DB2 9. We'll emphasize process and recommendations from many other customers, with pointers to more information. The content of this session will 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 & Bryan Paulsen, John Deere; Akira Shibamiya, John Campbell and many others for their insights and presentations on migration. Session numbers (e.g. A12) in this presentation are from this conference or earlier conferences. Many are on the web (see slides 48 – 61).

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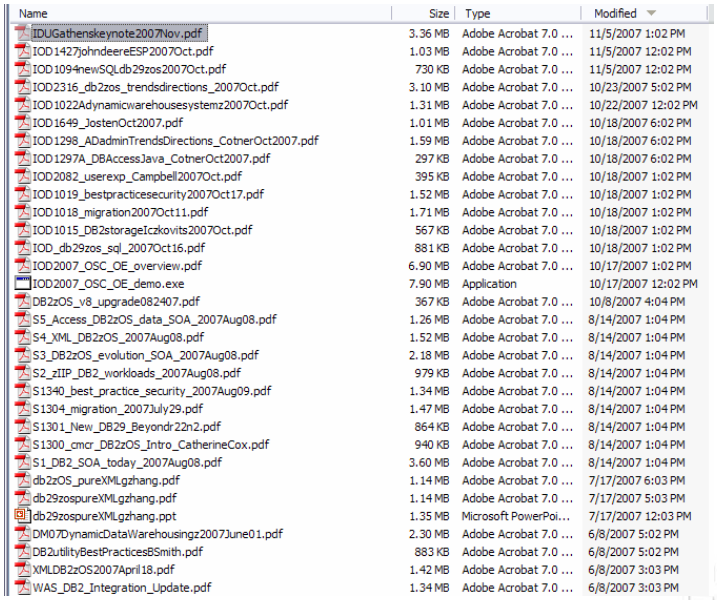
ftp://ftp.software.ibm.com/software/data/db2zos/



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IOD2316_db2zos_trendsdirections_2007Oct.pdf	3.10 MB	Adobe Acrobat 7.0 ...	10/23/2007 5:02 PM
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DB2zOS_v8_upgrade082407.pdf	367 KB	Adobe Acrobat 7.0 ...	10/8/2007 4:04 PM
S5_Access_DB2zOS_data_SOA_2007Aug08.pdf	1.26 MB	Adobe Acrobat 7.0 ...	8/14/2007 1:04 PM
S4_XML_DB2zOS_2007Aug08.pdf	1.52 MB	Adobe Acrobat 7.0 ...	8/14/2007 1:04 PM
S3_DB2zOS_evolution_SOA_2007Aug08.pdf	2.18 MB	Adobe Acrobat 7.0 ...	8/14/2007 1:04 PM
S2_zIIP_DB2_workloads_2007Aug08.pdf	979 KB	Adobe Acrobat 7.0 ...	8/14/2007 1:04 PM
S1340_best_practice_security_2007Aug09.pdf	1.34 MB	Adobe Acrobat 7.0 ...	8/14/2007 1:04 PM
S1304_migration_2007July29.pdf	1.47 MB	Adobe Acrobat 7.0 ...	8/14/2007 1:04 PM
S1301_New_DB29_Beyondr22n2.pdf	864 KB	Adobe Acrobat 7.0 ...	8/14/2007 1:04 PM
S1300_cmcr_DB2zOS_Intro_CatherineCox.pdf	940 KB	Adobe Acrobat 7.0 ...	8/14/2007 1:04 PM
S1_DB2_SOA_today_2007Aug08.pdf	3.60 MB	Adobe Acrobat 7.0 ...	8/14/2007 1:04 PM
db2zOS_pureXMLgzhang.pdf	1.14 MB	Adobe Acrobat 7.0 ...	7/17/2007 6:03 PM
db29zospureXMLgzhang.pdf	1.14 MB	Adobe Acrobat 7.0 ...	7/17/2007 5:03 PM
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DM07DynamicDataWarehousingz2007June01.pdf	2.30 MB	Adobe Acrobat 7.0 ...	6/8/2007 5:02 PM
DB2utilityBestPracticesBSmith.pdf	883 KB	Adobe Acrobat 7.0 ...	6/8/2007 5:02 PM
XMLDB2zOS2007April18.pdf	1.42 MB	Adobe Acrobat 7.0 ...	6/8/2007 3:03 PM
WAS_DB2_Integration_Update.pdf	1.34 MB	Adobe Acrobat 7.0 ...	6/8/2007 3:03 PM

This is the primary DB2 for z/OS ftp server. It has hundreds of presentations, with all of the ones shown (and more) updated in the last two months.

To see the most current files, you can use the ftp server directly with Internet Explorer, then sort by the date modified.

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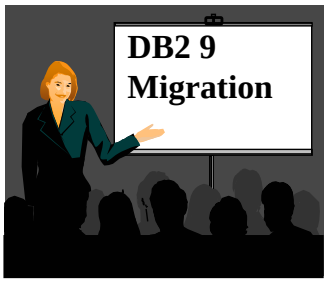
Migration Staging V8 → A12, A13, A03, A05

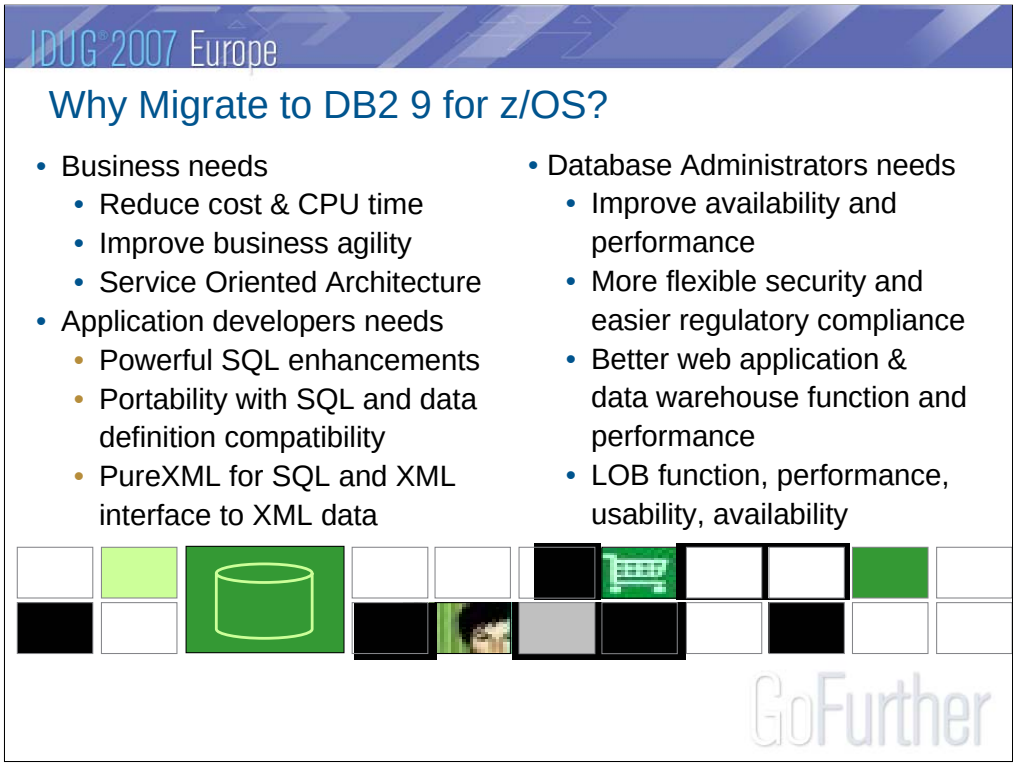
- Planning:
  - Education for planning, Plan to educate
  - Detailed project plan and communications
  - Install prerequisites
  - Find and fix incompatibilities
  - Plan virtual and real storage
  - Plan performance
- Migration: monitoring and tuning
- Implementation
  - Using new improvements to deliver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



GUFurther

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.



DB2 9 has a lot for everyone. Here are some of the highlights.
http://www.ibm.com/software/sw-library/en_US/detail/B379725O64360X47.html

The business needs:

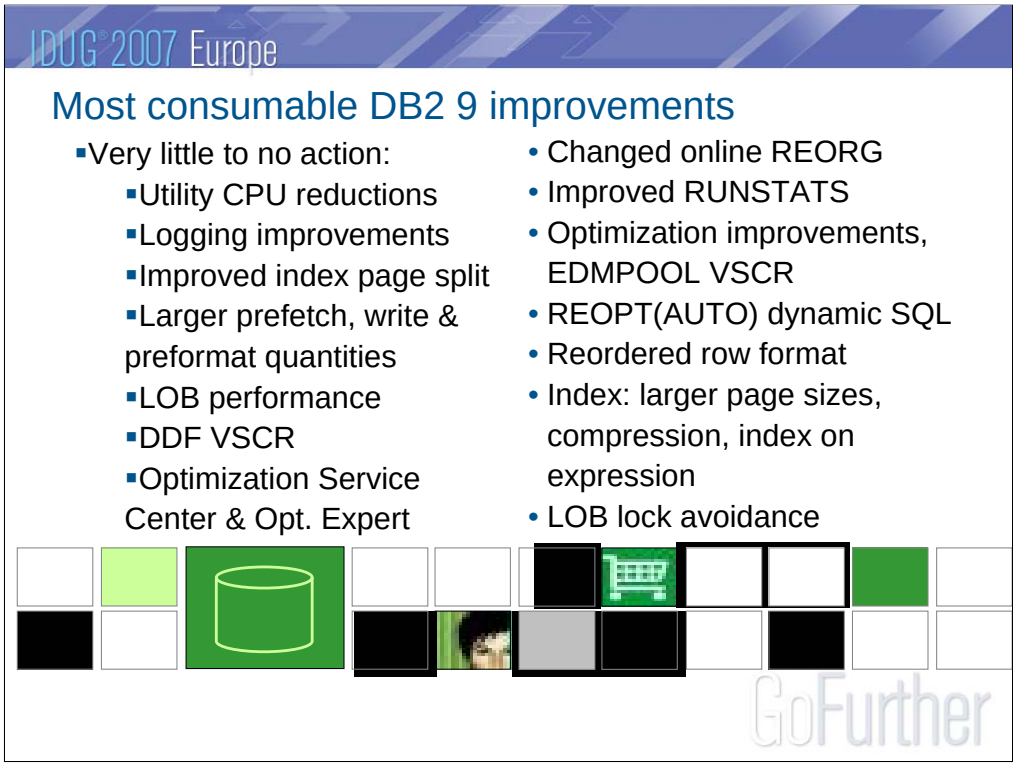
Plug and play CPU cycle reductions: See Performance Topics redbook
Improved business agility with faster implementation cycles
New pureXML™ enables companies to include DB2 9 for z/OS into their SOA and XML application initiatives

Database Administrators (DBAs) need:

Improved database availability and performance including LOB, reorganization, backup and recovery, and partitioning enhancements
More flexible trusted network context and role-based security
Easier and improved DBMS regulatory compliance
Enhancements to improve ERP application and data warehouse functionality and performance

Application Developers need:

Powerful new SQL enhancements including MERGE and TRUNCATE statements, INSERT and EXCEPT set operations, and spatial support for geographical data
Improved SQL and data definition compatibility with other DB2 platforms
PureXML adds a powerful SQL and XML interface to access all XML data stored in DB2 9 for z/OS



Here are some highlights for items that deliver the most quickly and easily:

Very little to no action is required for the utility CPU reductions, logging improvements, improved index page split, larger prefetch, write & preformat quantities, some LOB performance, DDF virtual storage constraint relief.

The next items require some work. Changed online REORG and other utility improvements require process changes and use of SHRLEVEL(CHANGE).

Improved RUNSTATS statistics needs some analysis to determine where the value is greater than the cost of gathering the new statistics.

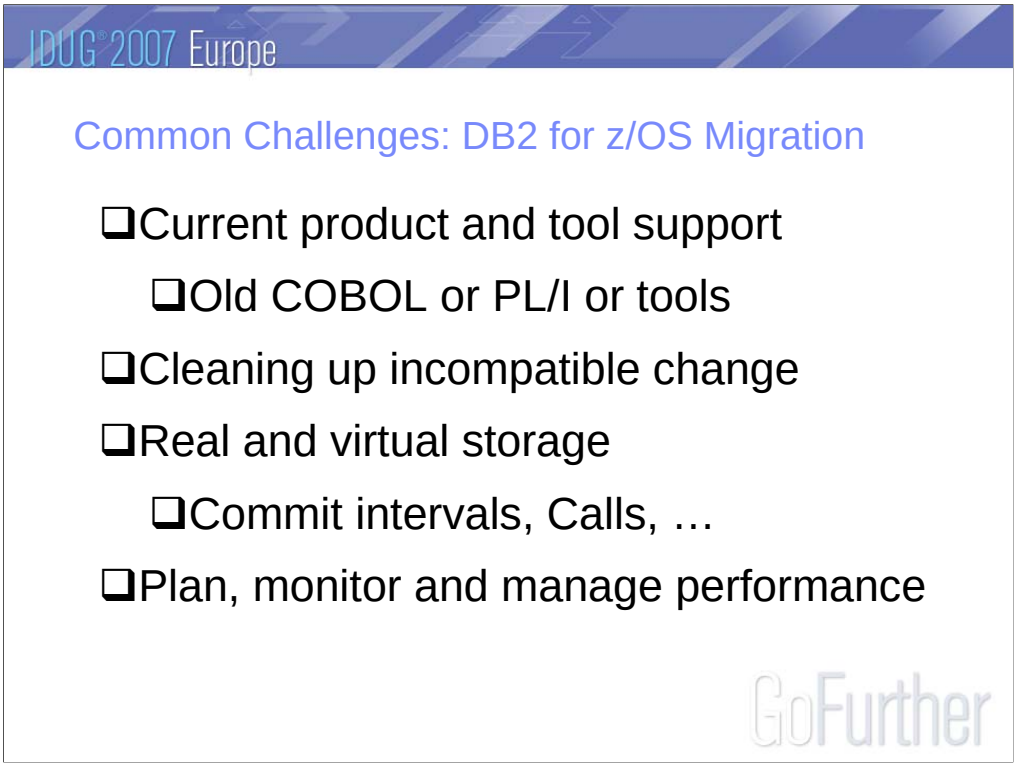
Optimization improvements are automatic for dynamic SQL, but require work to REBIND for static SQL. In both cases, we need baselines to check for regression. REOPT(AUTO) for dynamic SQL needs analysis to be sure the improvement is working. EDMPOOL virtual storage constraint relief also requires a REBIND.

Optimization Service Center takes some learning, but should be fast for those who have used Visual Explain in the past. See the new redbook, SG24-7421, DB2 9 for z/OS: New Tools for Query Optimization.

Reordered row format requires a REORG in NFM and varying length columns.

Index improvements for larger page sizes, compression, index on expression require database design work to determine where they are applicable. ALTERs, REORGs and creation of new indexes are needed.

LOB lock avoidance requires a quiesce of all subsystems in NFM.



These are the key items that every customer should check first, to see the most common items that slow down a migration to DB2 9. We will discuss each of these points in detail on later slides:

❑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 DB2 9. See details later in this presentation.

❑Cleaning up incompatible changes takes time and a detailed understanding of your shop. Testing is needed.

❑Real and virtual storage may improve a little. Planning is required. REBINDs are required to gain EDM space.

❑Plan and monitor performance, as yours can improve substantially or degrade on migration. Be ready to do the needed work.

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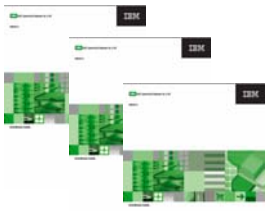
http://publib.boulder.ibm.com/infocenter/imzic/

- ✓Program Directories
- ✓Installation Guide
- ✓Redbooks
- ❑Data Sharing: Planning and Administration
- ❑Application Programming Guide & Reference for JAVA™
- ❑RACF Access Control Module Guide
- ❑ODBC, Spatial, …
- ✓Messages
- ✓Codes
- ✓Administration Guide
- ✓Performance Guide
- ✓Utility Guide and Reference
- ✓Internationalization Guide (Unicode)



GoFurther

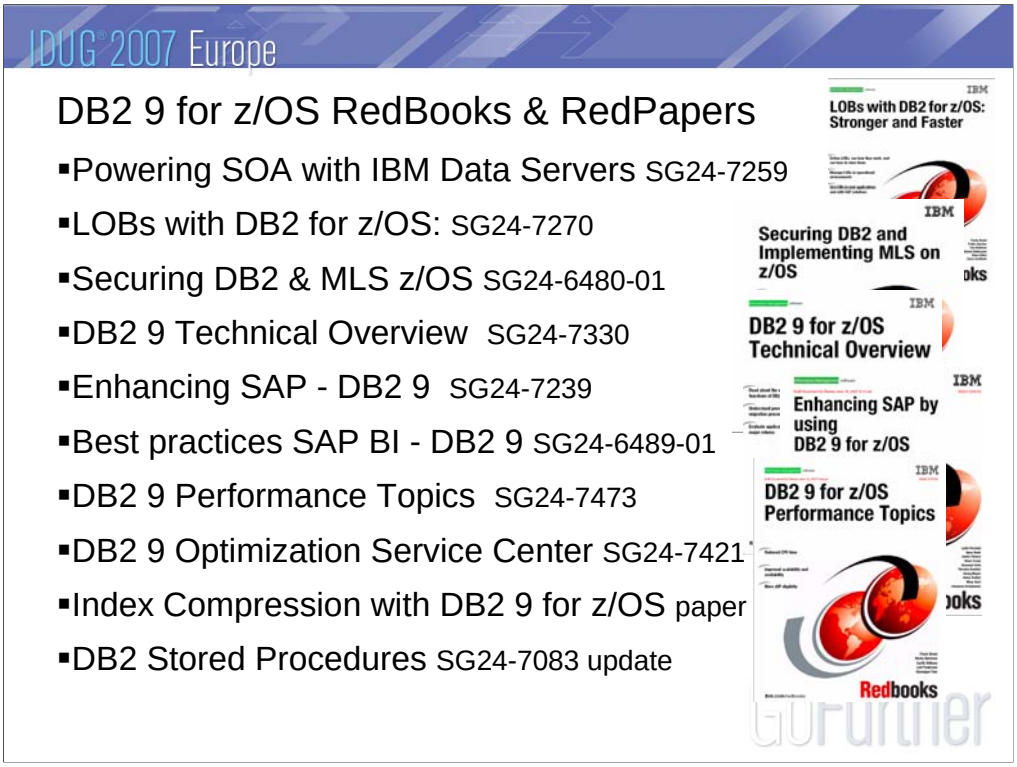
For installation, you need many books. Some are optional, for example the data sharing book is not needed if you don't use data sharing. If you use data sharing, then part of the install process is in that book. The Java install process is in the Java book. If you use RACF access control, then you need the RACF Access Control Module Guide. You can get most of the books from the DB2 Library web page. The books were updated in late October 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/v9books.html

http://www.ibm.com/servers/eserver/zseries/zos/bkserv/r7pdf/

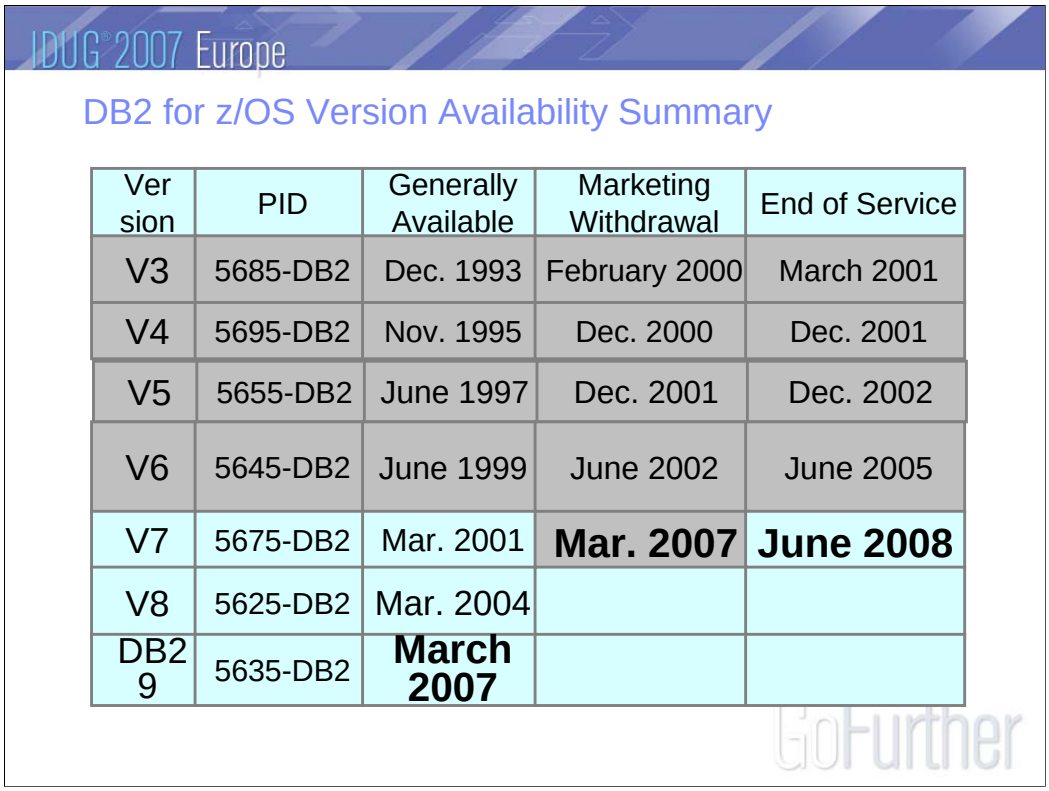
http://www.ibm.com/servers/eserver/zseries/zos/bkserv/r7pdf/mvs.html

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



See the DB2 library for detailed information.
http://www.ibm.com/software/data/db2/zos/library.html
Eight redbooks and one paper with substantial DB2 9 content are on the web, with one more being written now. Check for updates.

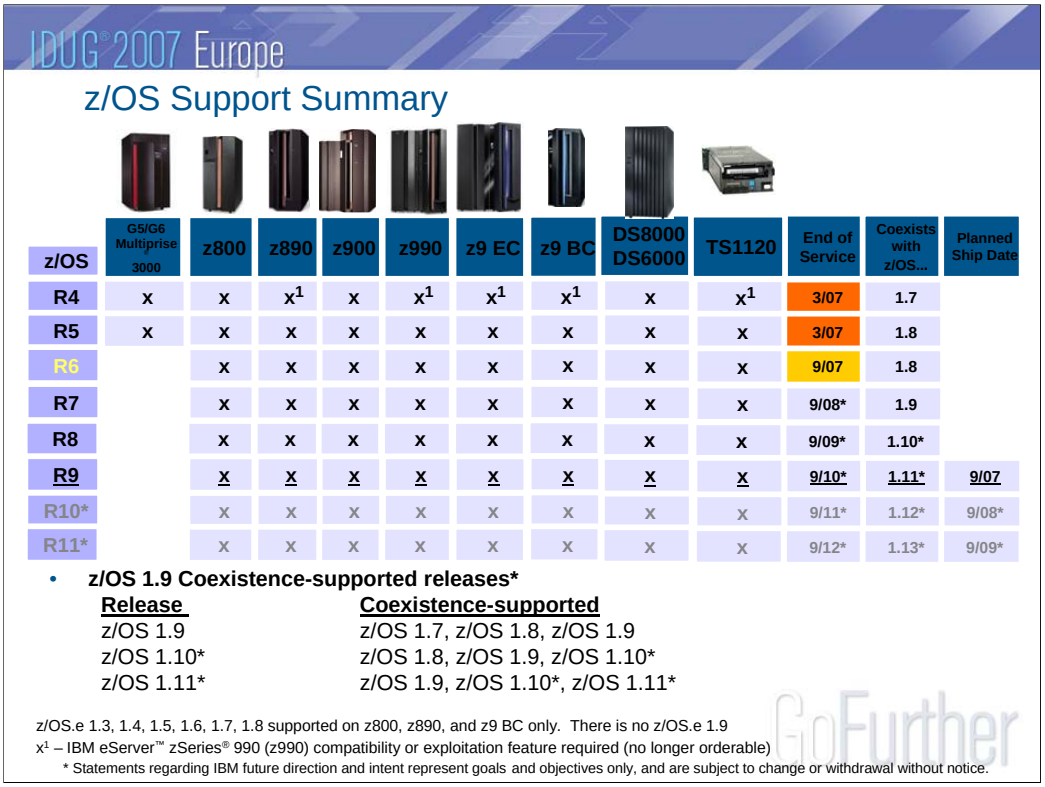
- Powering SOA with IBM Data Servers, SG24-7259
http://www.redbooks.ibm.com/abstracts/SG247259.html
- LOBs with DB2 for z/OS: Stronger & Faster SG24-7270
http://www.redbooks.ibm.com/abstracts/SG247270.html
- Securing DB2 & MLS z/OS, SG24-6480-01
http://www.redbooks.ibm.com/abstracts/sg246480.html
- DB2 9 Technical Overview, SG24-7330 http://www.redbooks.ibm.com/abstracts/SG247330.html
- Enhancing SAP - DB2 9, SG24-7239, http://www.redbooks.ibm.com/abstracts/SG247239.html
- Best practices SAP BI - DB2 9, SG24-6489-01,
http://www.redbooks.ibm.com/abstracts/sg246489.html
- DB2 9 Performance Topics, SG24-7473,
http://www.redbooks.ibm.com/abstracts/SG247473.html
- Index Compression with DB2 9 for z/OS, redpaper REDP4345
http://www.redbooks.ibm.com/abstracts/redp4345.html?Open
- DB2 9 Optimization Service Center, SG24-7421,
http://www.redbooks.ibm.com/abstracts/SG247421.html
- DB2 for z/OS Stored Procedures: CALL & Beyond SG24-7083-01 update being written



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 over 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 DB2 9 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
Click on Support, then on Product Life Cycle.
ibm.com/software/data/db2/zos/support/plc/



This chart summarizes much of the information about z/OS that you need to know. Server and DASD hardware support, end of service dates, coexistence, and planned availability dates are shown here for existing and planned releases through z/OS R9.

z/OS 1.8 was announced and became available in September 2006. 1.8 is required for some DB2 9 function. z/OS 1.9 became available in September 2007.

z/OS 1.6 is out of service as of September 2007. 1.4 and 1.5 are out of service as of March 2007. z/OS (and z/OS.e) 1.7 planned end of service is September 2008*

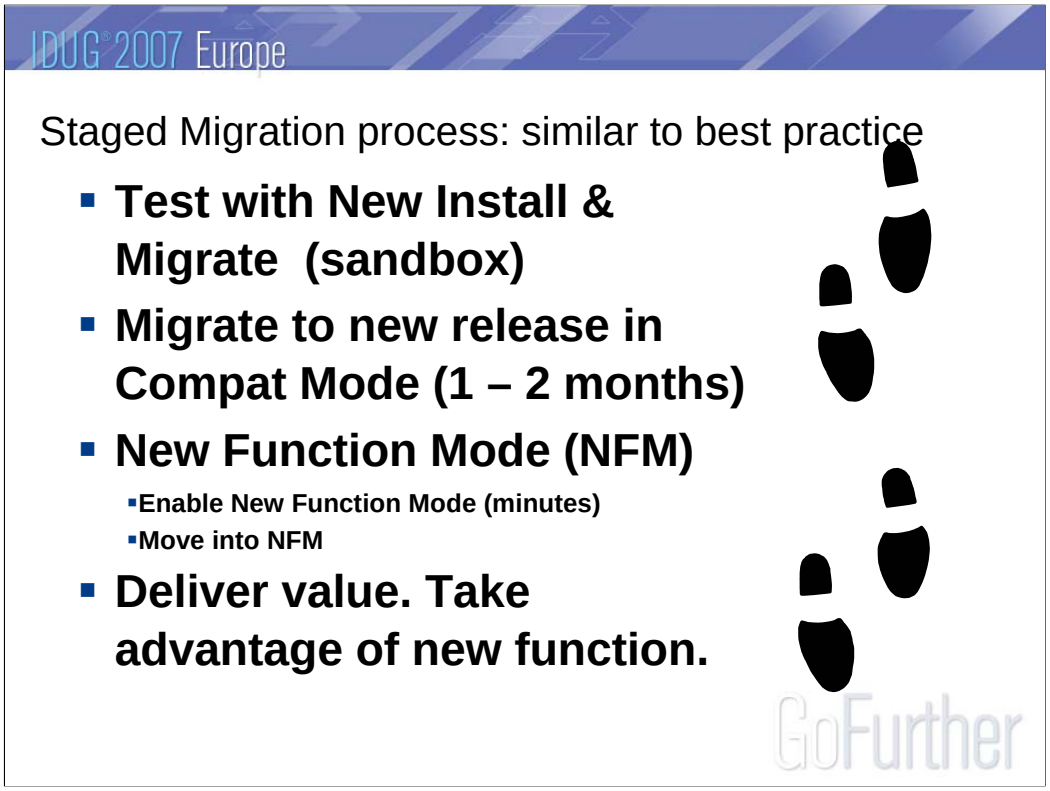
Only service-supported releases can coexist in the same sysplex

* 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

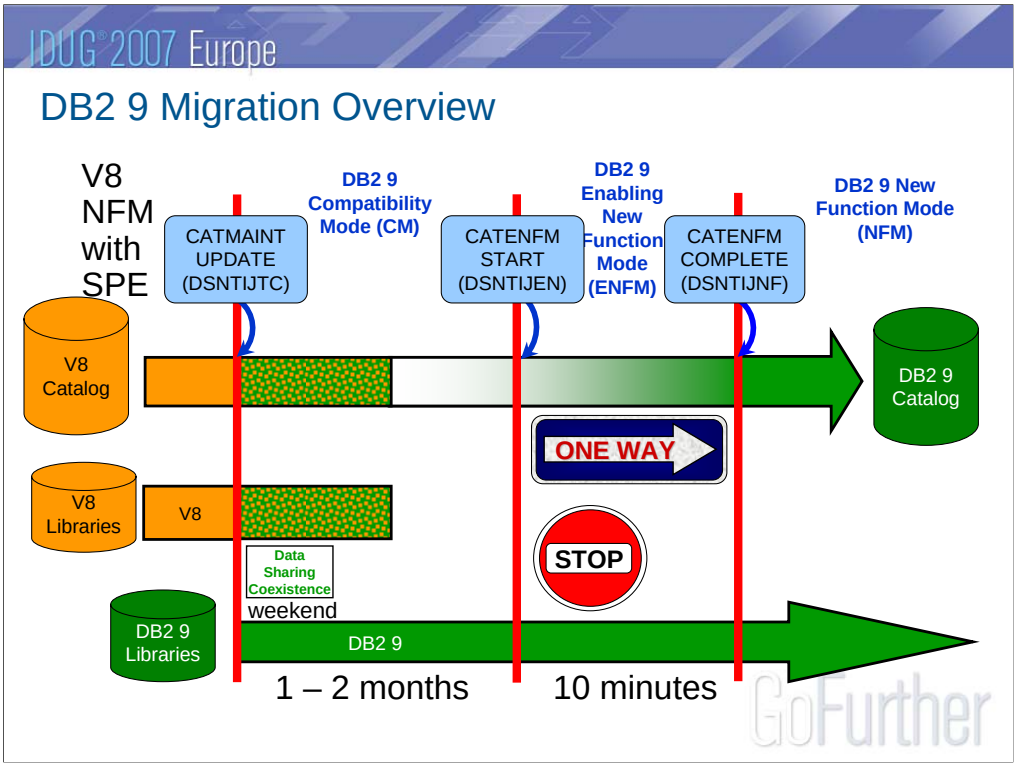


The process of migration will take four major steps.
Use a new install or a migration on a separate subsystem and practice migration there. Test the function you want to use. This will ensure that you are ready to move forward.

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

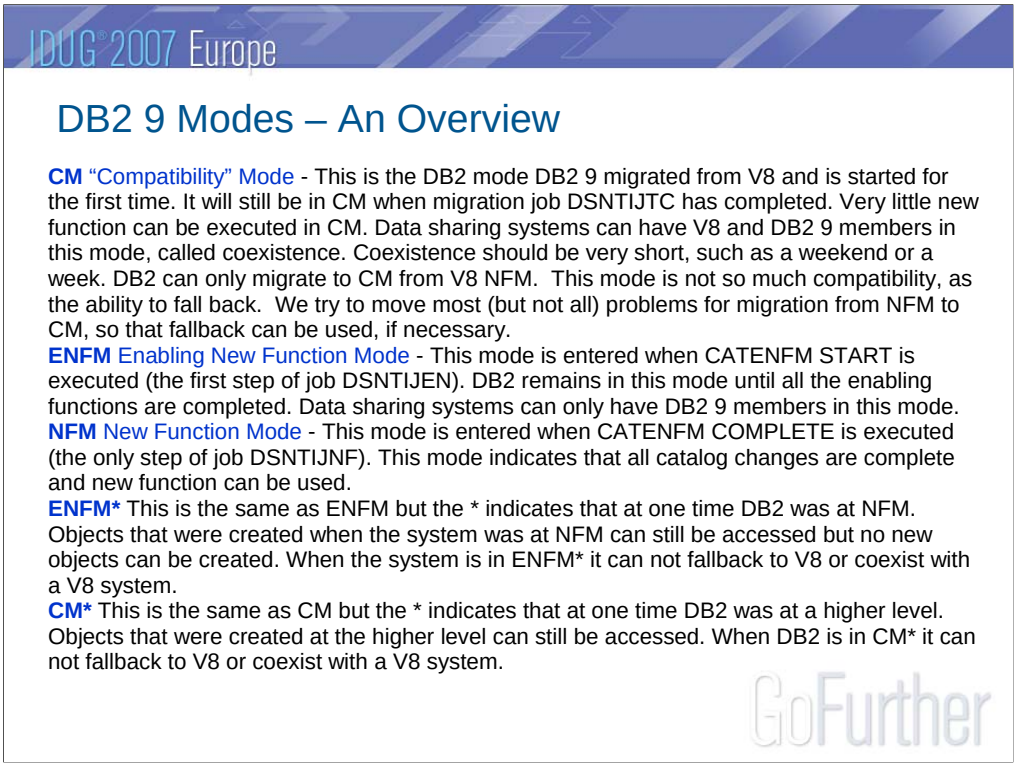
The third step is a few minutes for Enabling New Function Mode (ENFM), typically a one hour process, moving directly to the next, New Function Mode or NFM.

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.



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

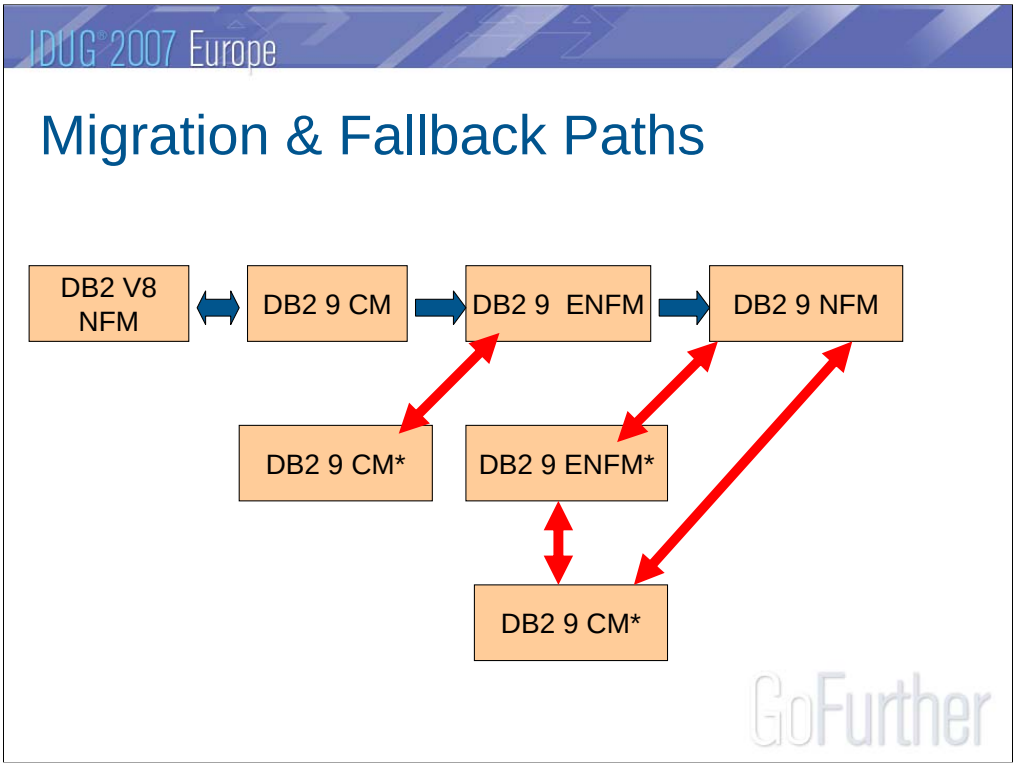
The ONE WAY situation is a bit simpler, with more opportunity to drop back. There are two modes to denote drop back processes. You can drop back from NFM to ENFM as before, but the label for the drop back mode is now ENFM*. It is also possible to drop back from ENFM or NFM to CM*, but not to V8 or to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



DB2 9 builds upon the structure from V8 The modes are almost the same, but DB2 9 clarifies 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. It is possible to move from NFM or ENFM to CM*.

While the first mode is labeled as "Compatibility Mode" or CM, it is not compatible. CM does help with the conversion, but the incompatibilities have been moved to this mode, where possible, since fallback is simple from this stage. This change removed problems in moving to ENFM and NFM.

I think of NFM as New Value Mode, the opportunity to deliver the value of the new version.



CM is the mode when DB2 9 is started for the first time from DB2 V8 New Function Mode (NFM). Limited new function can be executed in CM. This is the only mode that permits fallback to DB2 V8. While this mode is labeled “Compatibility Mode“, CM is not compatible. CM does help with the conversion, but most incompatibilities occur in this mode, where possible, since fallback is simple from this stage.

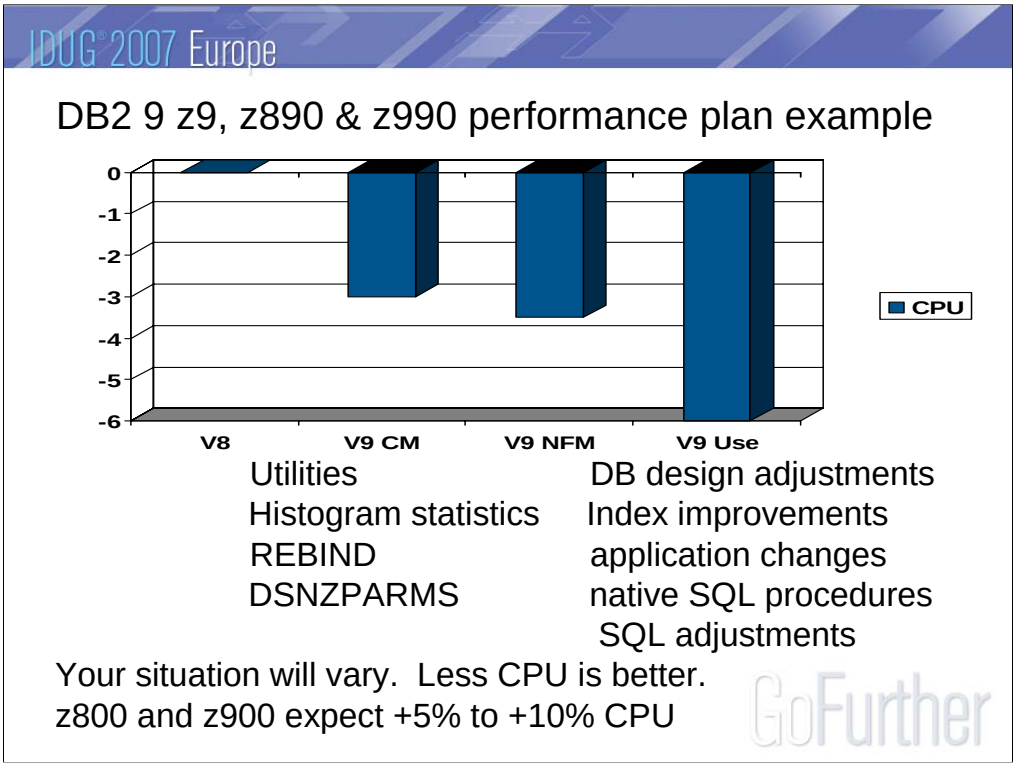
Enabling New Function Mode (ENFM) is the mode that is entered when CATENFM START is executed which is the first step of DSNTIJEN. ENFM can fall back to a “Compatibility Mode” which is identified as CM*.

New Function Mode (NFM) is the mode that DB2 enters once CATENFM COMPLETE is run. This is the only step of job DSNTIJNF. New functions can be used at this time. Fallback can occur to Enabling New Function Mode which will be identified as ENFM* or to “Compatibility Mode” which will be identified as CM*.

Enabling New Function Mode Star (ENFM*) is the same as ENFM but indicates that at one time DB2 was in NFM.

Compatibility Mode Star (CM*) is the same as CM but indicates that at one time DB2 was in either ENFM or NFM. You can not fallback to DB2 V8 from CM*.

DB2 9 migration modes are C, C*, E, E*, or N in message DSN7100I



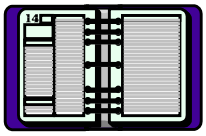
If you have a z9, a z990 or a z890, but this is expected to be a common shape for a DB2 9 performance plan, starting with zero for the V8 baseline. When you first move to DB2 9, total DB2 CPU time generally decreases from 0% to 10% for z9, z890 and z990 customers, shown here with the first step as -3%. Utility CPU reductions help immediately. Some work will be about the same (+/-3%). Start with reorgs and collect improved histogram statistics when useful. The DB2 9 CM performance plan REBINDs the primary packages and adjusts DSNZPARMs. The REBINDs provide most of the improved access paths. On z800 or z900 the initial cpu expectation is +5 to +10%, more if there are many columns, so making adjustments is more important.

In moving to NFM, some additional DSNZPARMS are adjusted and all plans and packages are rebound. The DB2 9 use line takes wider advantage of the DB2 9 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 DB2 9 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

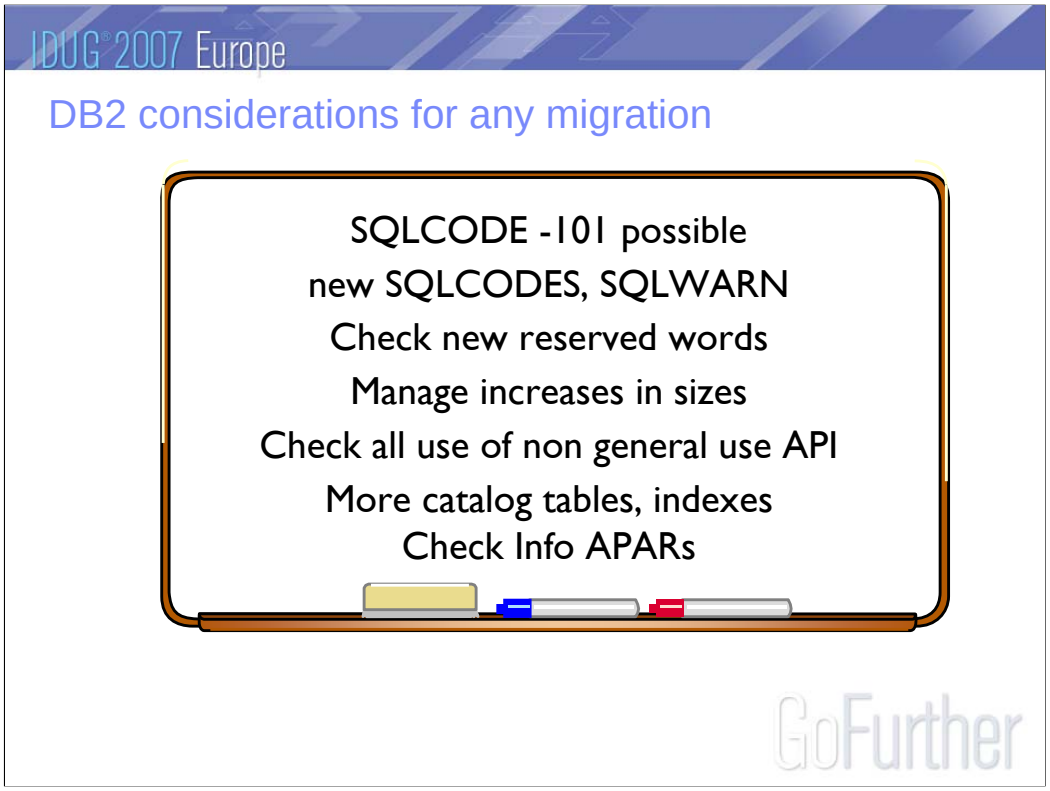
- Short time for data sharing coexistence
- One to two months for compatibility mode
  - Not able to use most new performance
- Short time for enabling new function mode
- Move to new function mode
  - Stage in new function
- Test to QA to Production
  - Better controls for not using new function
  -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



GoFurther

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.



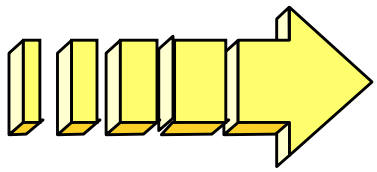
Whenever you move from one release to another, there are some changes to manage. It is possible, but rare to find SQL which processed in the prior release that will not run on the new one. If you have users who test the boundaries, instead of reading the limits, then this is more common. Reserved words 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 DB2 9 migration is II12423.

Some catalog tables grow. There are many more catalog tables and indexes. The concern for V8 was often the long names and Unicode, but the catalog growth for that was generally 10% or less. As you REBIND, the SPT01 and SYSPKAGE table spaces often grow 50%.

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.

Premigration Activity



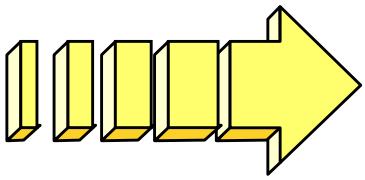
- ✓ Install prerequisite software & service
- ✓ Adjust for incompatibilities (DSNTIJPM)
- ✓ Identify unsupported objects
- ✓ Check new and changed parameters
- ✓ Save critical performance & access path info.
- ✓ Take backup copies

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 V8 BEFORE you start to migrate, especially the APARs for migration and toleration of fallback (PK11129). 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.

Premigration Activity ...



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

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.

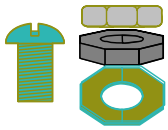
General REBIND advice: When to REBIND depends upon complexity of the SQL, how well tuned the statements are, and your experiences with improvements & regression. For simple cases, a rule of thumb is that the statistics need to change by 10% or 20% or cross a key threshold to make a difference in the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

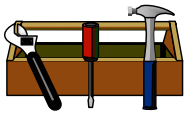
IDUG 2007 Europe

Install Prerequisite Software

- Prerequisites and Functional Needs
  - ✓ All products need to be at proper maintenance level (prior DB2 release too)
    - Migration & Fallback SPE APAR PK11129
    - Ensure that you apply all hiper APARS, PE fixes
    - Use the DB2 Program Directories, the Installation Guide, PSP (preventative service planning), web & Info APAR II12423



- Other software ...Talk to your Vendors
- z/OS R7 R8 R9
- Job DSNTIJPM or DSNTIJP9



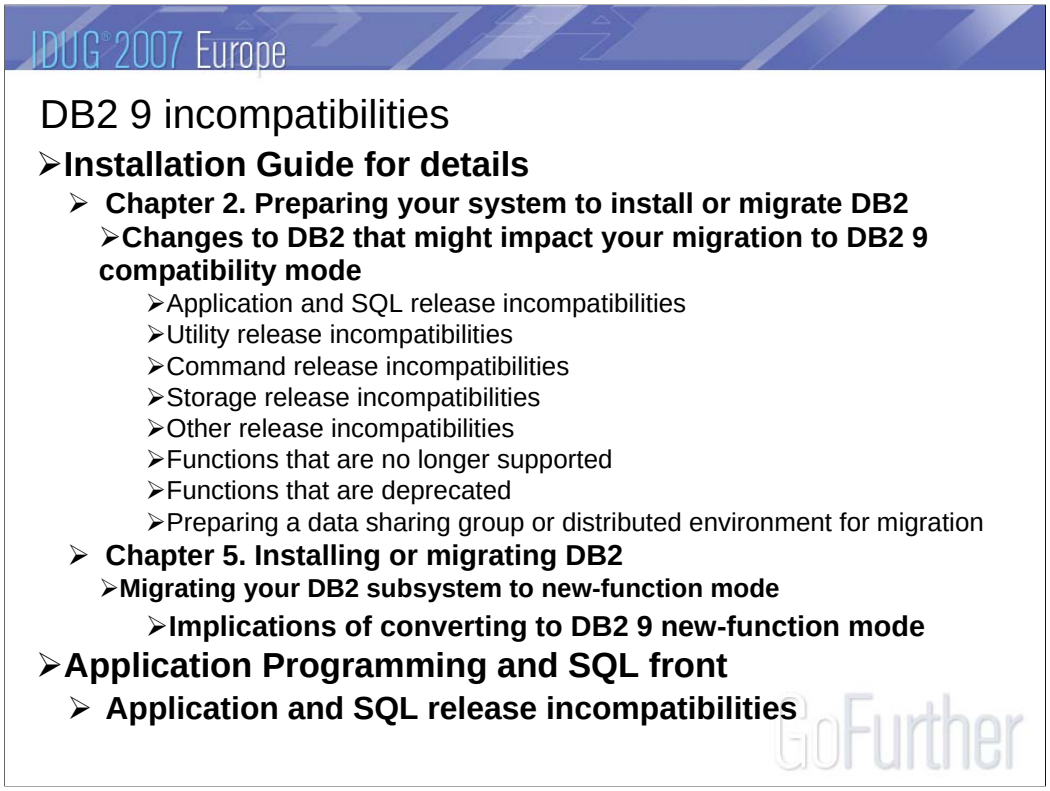
GoFurther

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. z/OS V1R7 is minimum for DB2 9 and the minimum in service today.

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

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



For detailed product dependencies and incompatibility descriptions, see
•Application Programming and SQL Guide (APSG)
•Installation Guide
•Program Directories
•Web page for DB2 9 books: http://www.ibm.com/software/data/db2/zos/v9books.html

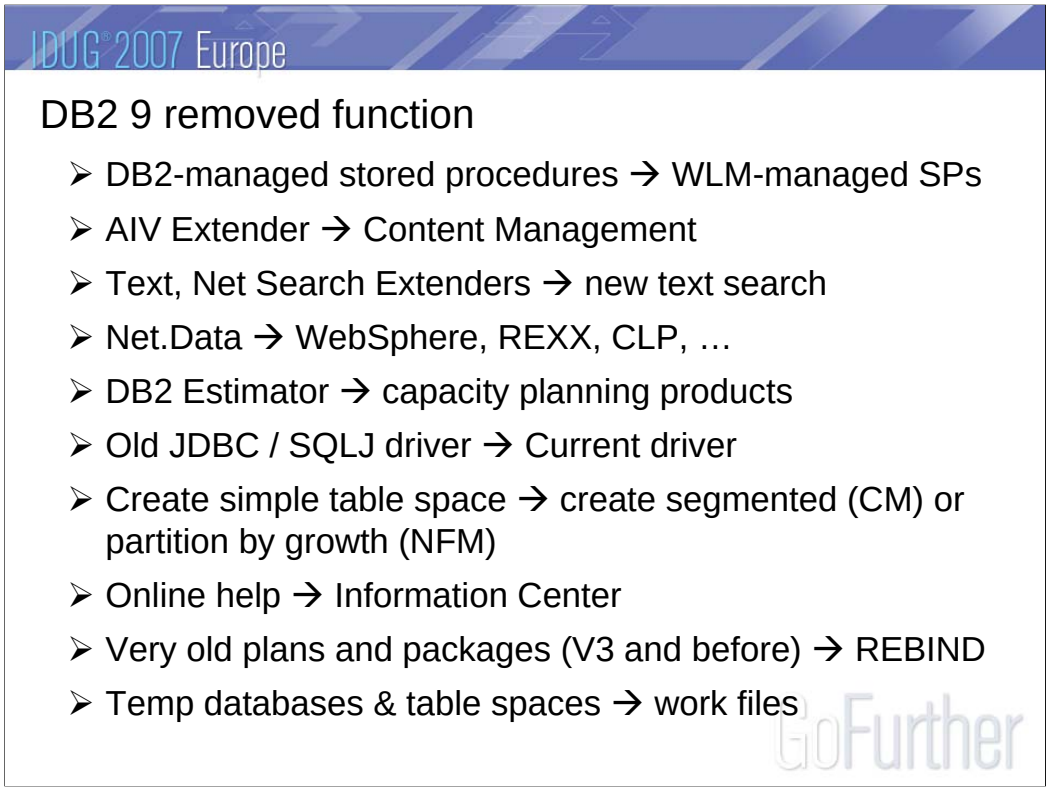
Release incompatibilities are divided into incompatibilities in compatibility mode and incompatibilities in new-function mode and are documented in lists in two separate sections in the Installation Guide. Here are links to the two topics that contain these lists:

Parent topic for compatibility mode incompatibilities:

Changes to DB2® that might impact your migration to DB2 9 compatibility mode:
http://publib.boulder.ibm.com/infocenter/dzichelp/v2r2/index.jsp?topic=/com.ibm.db29.doc.inst/dmigcn2.htm

Parent topic for new-function mode incompatibilities:
http://publib.boulder.ibm.com/infocenter/dzichelp/v2r2/index.jsp?topic=/com.ibm.db29.doc.inst/dmigcn2.htm

Conversion considerations:
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.



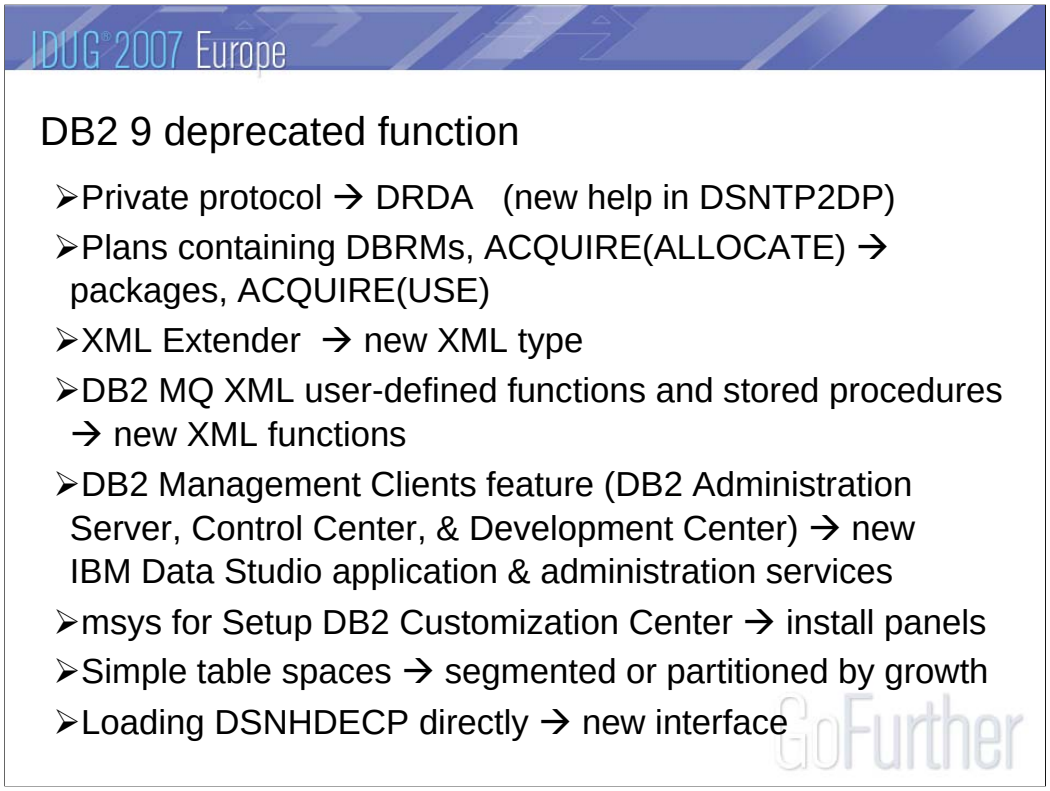
DB2 9 for z/OS supports migration only from V8 NFM. Customers not yet running V8 should plan to migrate to DB2 for z/OS, V8 as preparation for migration to DB2 9. IBM added many data server capabilities in DB2 9 for z/OS and reduced or removed support for some functions: AIV Extender is removed. Text 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. For some situations a scripting language, such as REXX or the Command Line Processor which comes with DB2 9 can provide the needed function. DB2 Estimator, available via Web download for DB2 V8, will not be provided for DB2 9 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 9 for z/OS no longer implicitly creates simple table spaces nor allows customers to create simple table spaces. However, DB2 9 for z/OS continues to support simple table spaces created in previous versions.

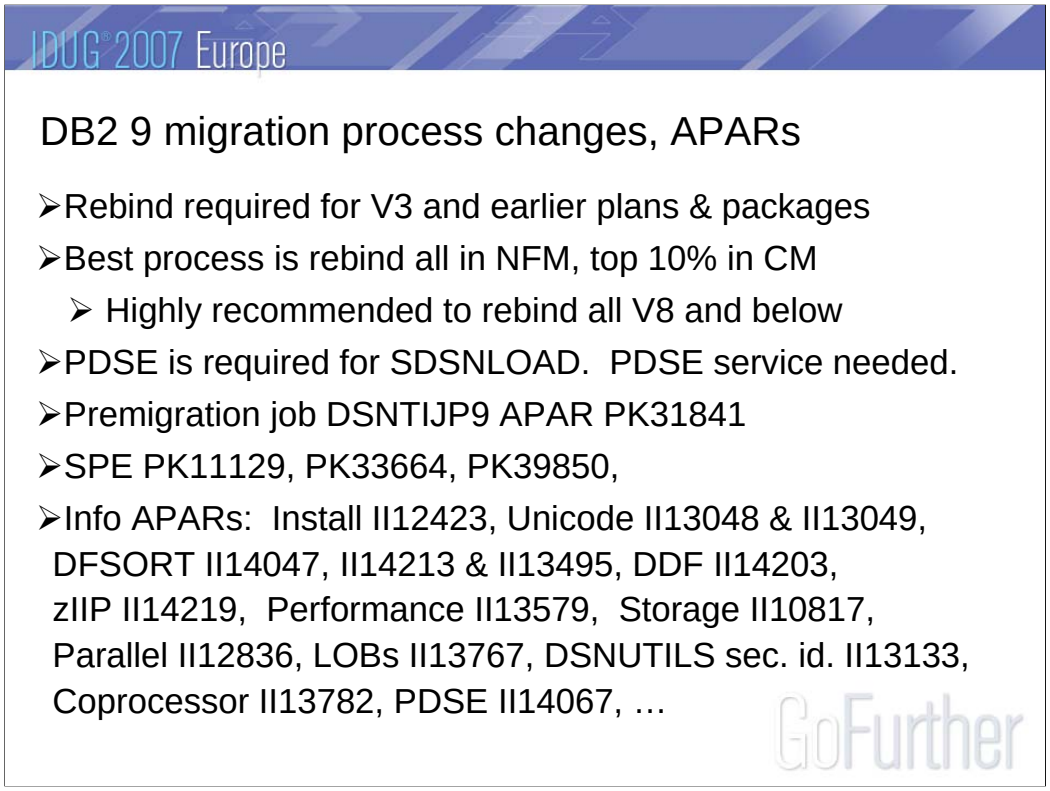
The Online help facility is replaced, replaced by the Information Management Software for z/OS Solutions Information Center (Information Center). JDBC/SQLJ Driver for OS/390 and z/OS support is removed. All Java application programs and Java routines that are currently written to work with the JDBC/SQLJ 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 DB2 9 to benefit from optimizer enhancements. Plans & packages DB2 V3 & before, will be automatically rebound when accessed by DB2 9. See the Installation Guide section “Functions that are no longer supported” for more information and additional items. Temporary databases move to work files, authorization needs to be permitted on the work files.



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.

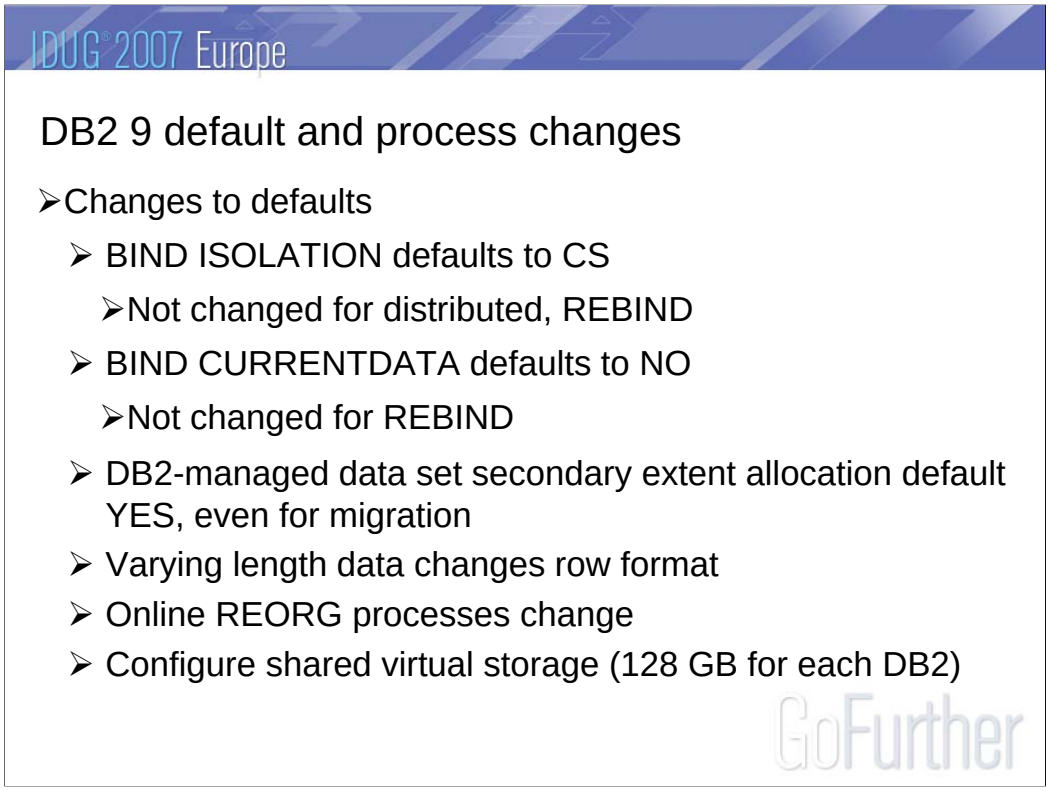
See the Installation Guide section, “Functions that are deprecated” and the announcement material for more information on these changes.
http://www.ibm.com/common/ssi/rep_ca/8/897/ENUS206-098/ENUS206-098.PDF



Plans and packages must be rebound on DB2 9 to benefit from optimizer enhancements. DB2 V3 and earlier plans & packages will be automatically rebound when accessed by DB2 9. A much better process is to rebind all plans on the new version. If there is not adequate time to rebind in DB2 9 CM, see if you can rebind the most frequently accessed packages. If any plans have not been bound on V8, rebind them.

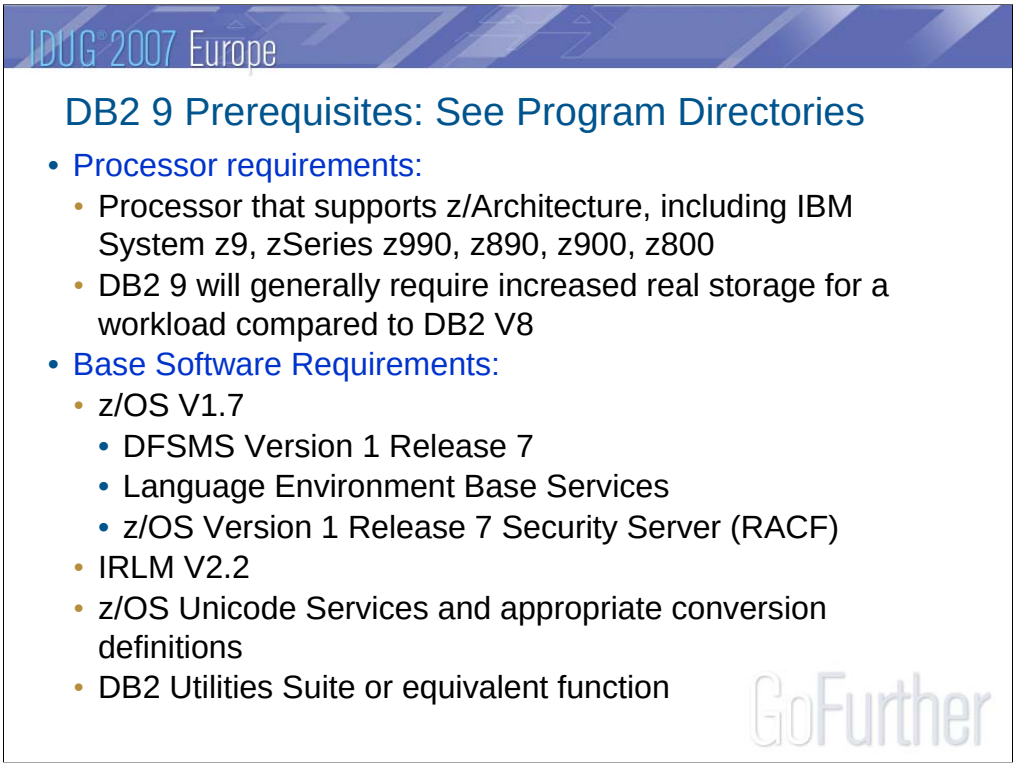
PDSE is documented as required on V8, but some customers noted that a PDS could be used (as long as the largest load module remained under 16MB). The PDSE is the only option for DB2 9, as there are program objects and larger load modules.

The premigration job DSNTIJPM on DB2 9 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 9 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.



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.

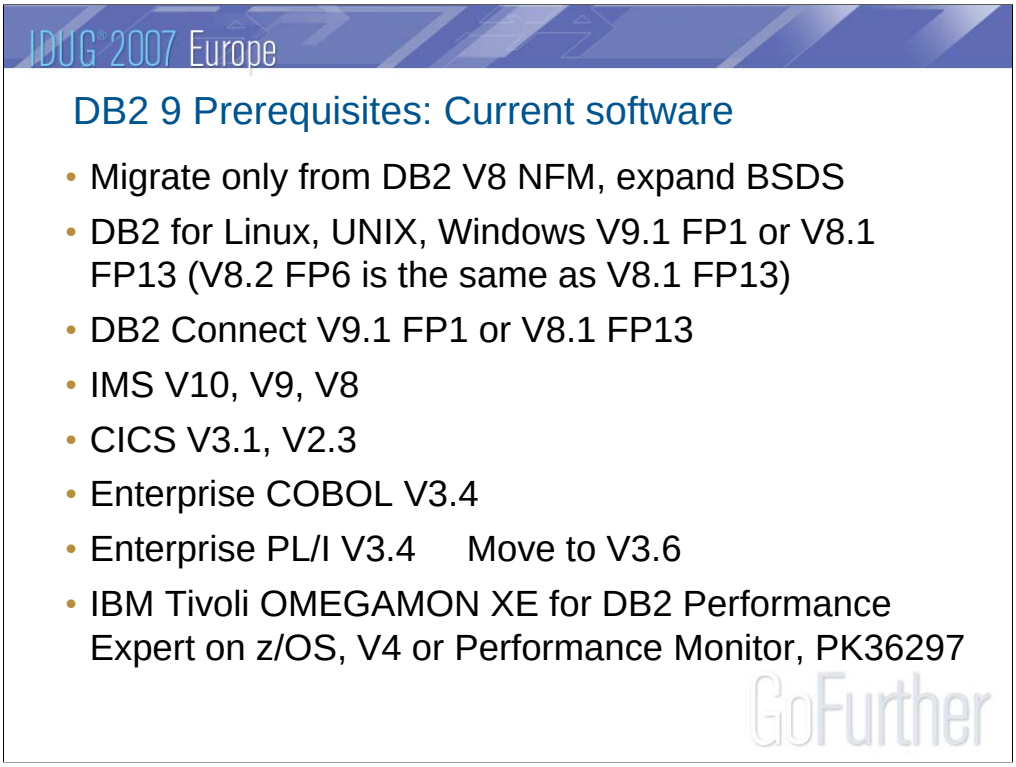
REORG and LOAD REPLACE utilities automatically convert table spaces to a new reordered row format (RRF) if there is no VALIDPROC or EDITPROC. If you use the REORG SHRLEVEL CHANGE utility, you might need to change your operating procedures if you run concurrent REORG TABLESPACE SHRLEVEL CHANGE PART x 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.



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.

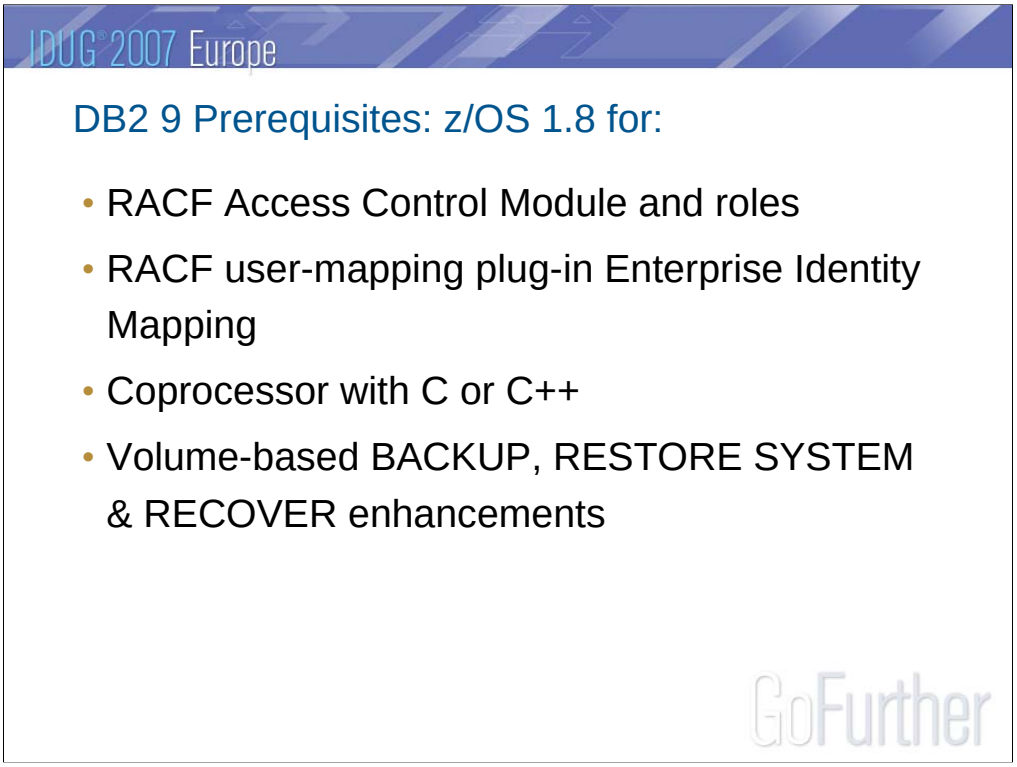


These are the primary changes in levels for DB2 9 over those in DB2 V8. Current products are required, and some of the product levels needed by DB2 V8 are now out of service. The general rule is to stay within the service interval for all products if you want service.

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.

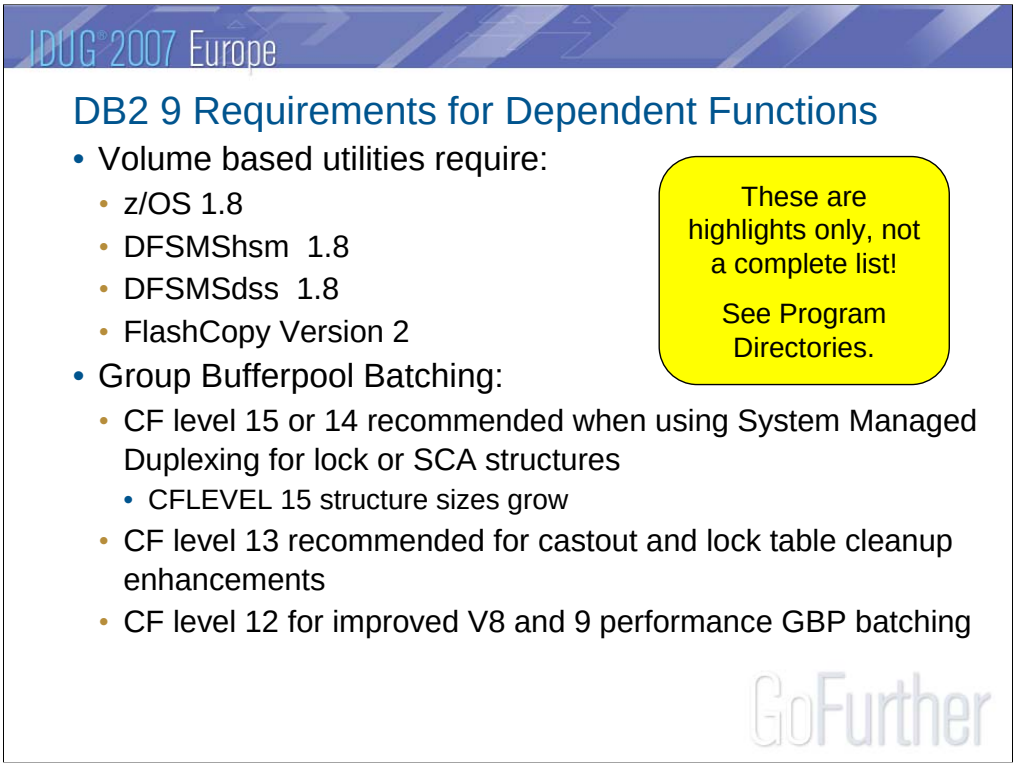


- RACF SAF User-mapping plug-in Enterprise Identity Mapping (EIM) requires z/OS V1.8 with trusted context. See redbook SG24-6480-01 appendix C for more detail on EIM.

- 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.



z/OS V1.8, DFSMShsm, DFSMSdss and FlashCopy V2 is required for DB2 9 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.

CFLEVEL 15 is the current level and is needed for some of the z/OS 1.9 improvements, but it does cause growth in structure sizes. See WSC FLASH01572 for more.

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.

DB2 9 Functional Software Requirements

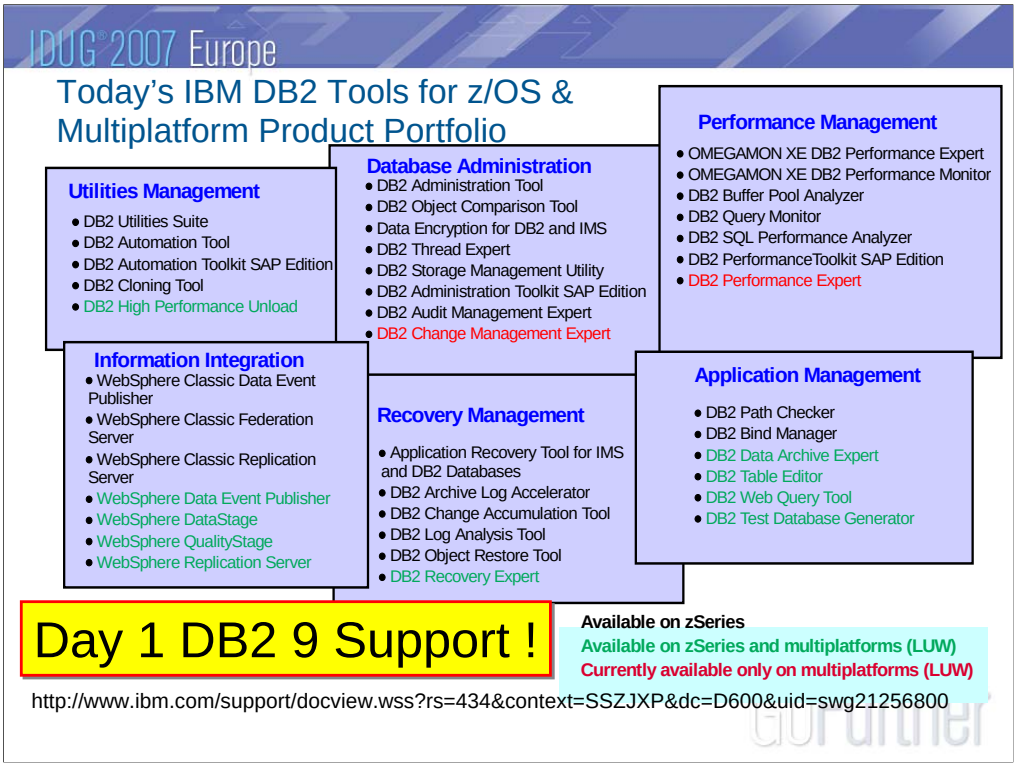
- WebSphere Application Server for z/OS V6.1 for trusted context
- WebSphere MQ for z/OS V6.1
- z/OS XML System Services (z/OS XML) & SDK5
- Java SDK 1.4.2
- DB2 QMF components of DB2 9 for z/OS
- … details in Program Directories on the web

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.

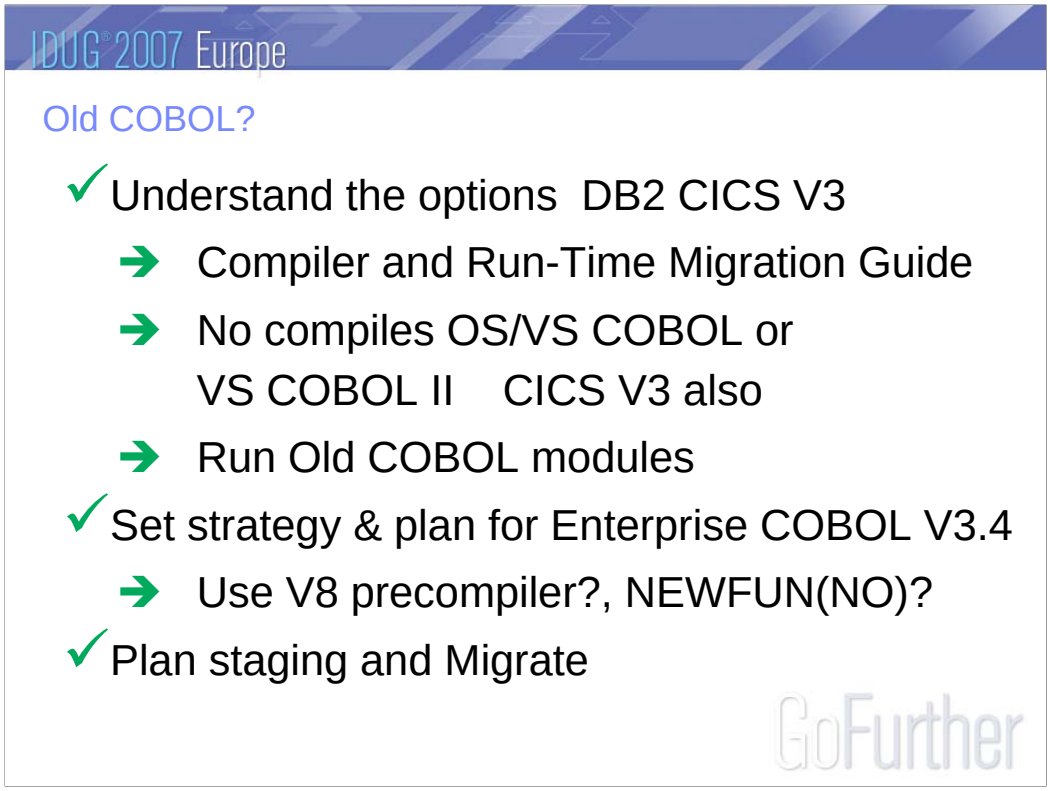
XML System Services (XMLSS). XMLSS requires either z/OS V1.8 or z/OS Version V1.7 with APAR OA16303. In addition, use of XML schemas requires 31-bit SDK for z/OS, Java 2 Technology Edition, Version 5 (5655-N98) (SDK5)

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.

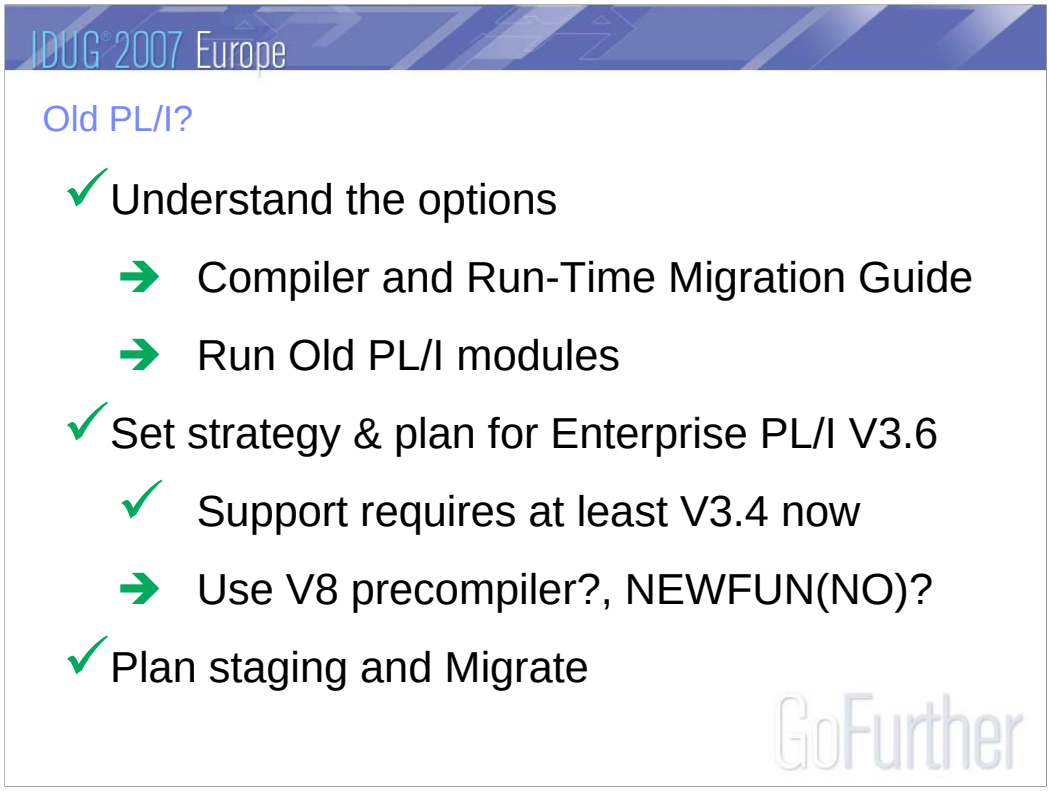


IBM offers a broad portfolio of DB2 Tools for z/OS across numerous functional categories. We continue to fulfill our commitment to provide new tools and enhanced function to meet your requirements. new Tools-- DB2 Recovery Expert for z/OS and DB2 Cloning Tool for z/OS.. We enhanced DB2 SQL Performance 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 they 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 DB2 9.

See the tools web site for the release levels and APARs needed for DB2 9.



DB2 9 supports current Enterprise COBOL V3.4. 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, V3.3 in April 2007 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 V3.4 now? Is that the release developers use? Old load modules are not a problem. 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. Programs that use the DB2 9 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



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**:

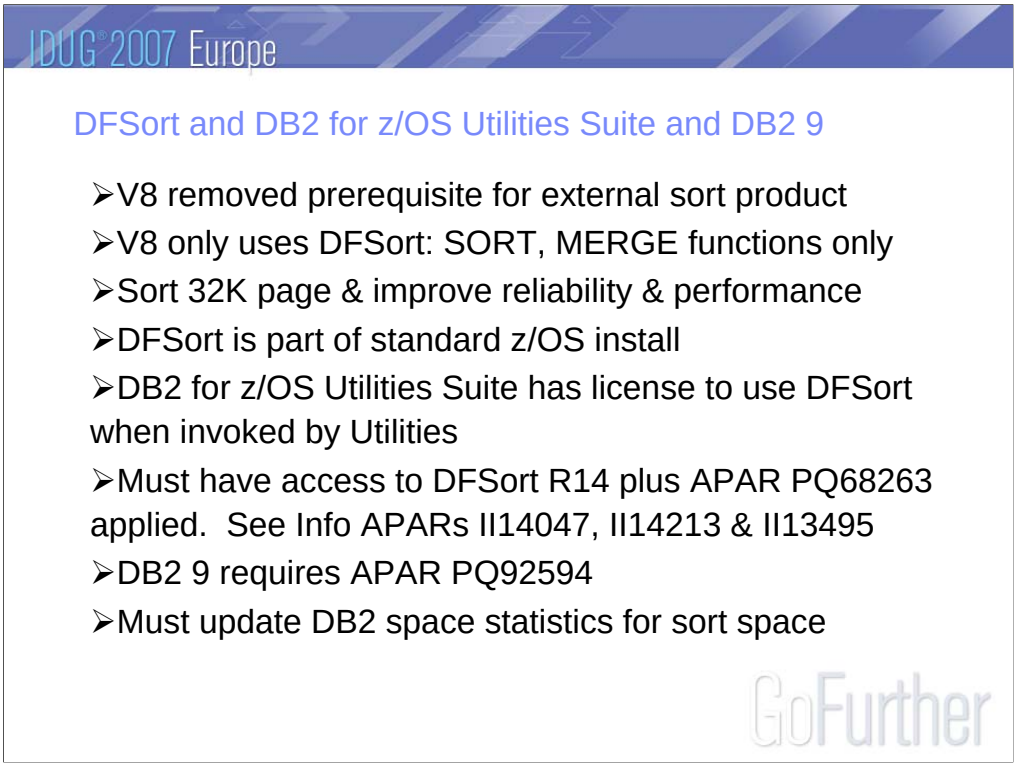
The key resource is the Enterprise PL/I for z/OS Compiler and Run-Time Migration Guide *Version 3 Release 3*, GC27-1458-02. Get it from the web:

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. 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.

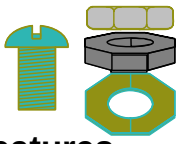
http://www.ibm.com/support/docview.wss?rs=64&context=SSEPEK&dc=DB520&q1=cobol&uid=swg21191789&loc=en_US&cs=utf-8&lang=en



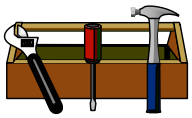
The requirement for an external sort package has been removed. That is to say you do not need a DFSORT license for use by DB2 for z/OS Utilities Suite Version 8. The base DB2 for z/OS has never needed sort. If you use DFSORT for other purposes, then you do need a DFSORT license. You must update the DB2 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.ibmlink.ibm.com/public/applications/publications/cgibin/pbi.cgi?CTY=US&FNC=SRX&PBL=GI10-8566-03#

Install Prerequisite Software



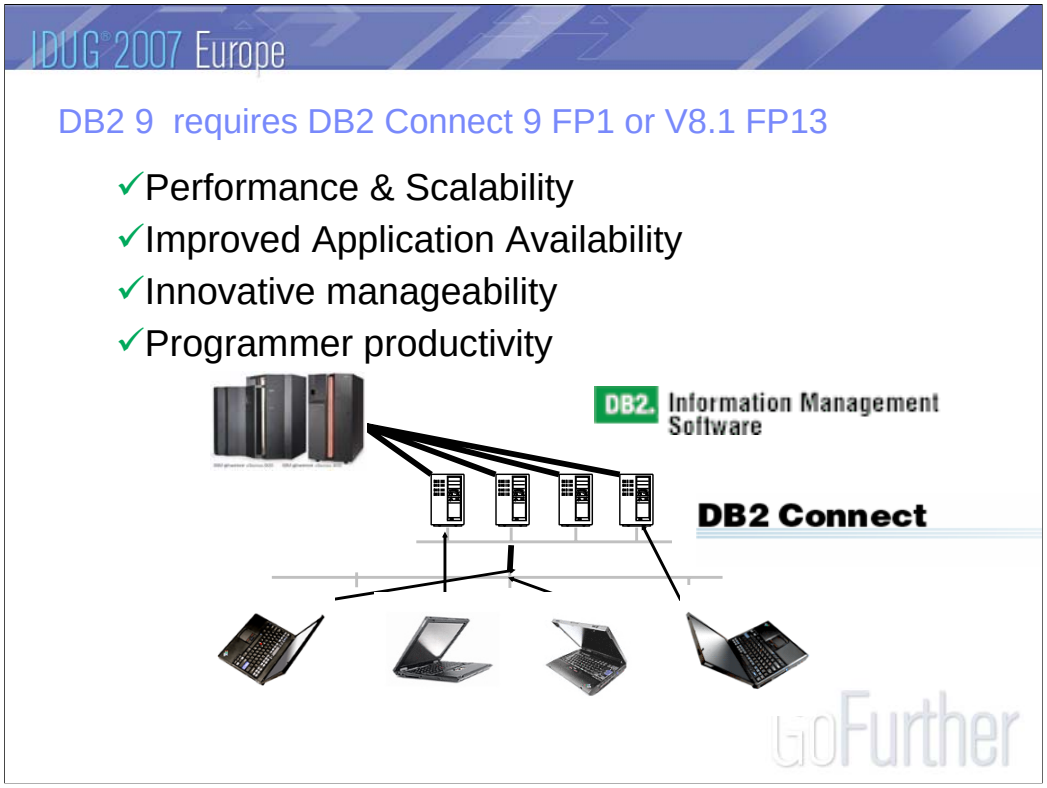
- **Functional Requirements for identified features and functions e.g. DB2 Connect, clients**
  - ✓See What's New in DB2?
  - ✓Program Directories for Details
- **Service Level: IBM Consolidated Service Test**
- **Plan for more frequent service**
  - ✓More current releases = more frequent
  - ✓Refresh 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.
DB2 Connect: See next page and the web.
ibm.com/software/data/db2/db2connect/
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/

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 V8.1 FP13 is the same as V8.2 FP6. 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
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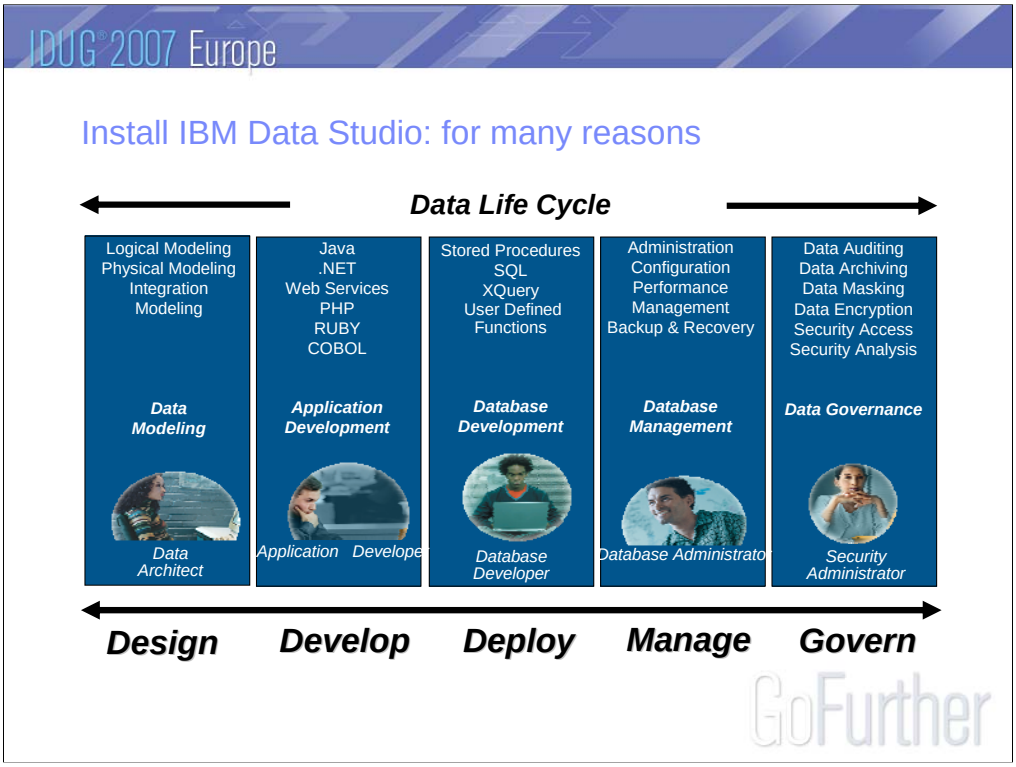


IBM Data Studio is for designers, developers, and administrators who work across the entire data life cycle. Almost every customer will need the tools included with DB2, and many will need the additional ones. See the IBM Data Studio web page for all the changes in IBM Data Studio. Watch closely, as this area is changing fast.

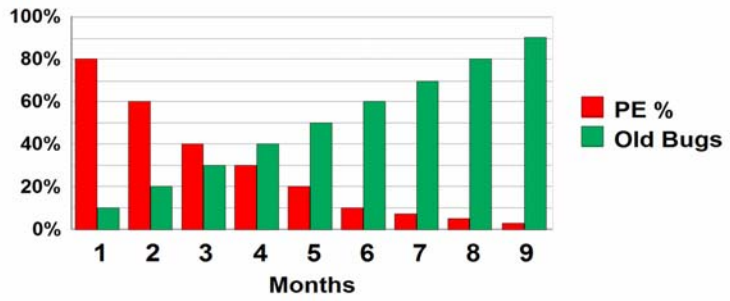
http://www.ibm.com/software/data/studio/

ftp://ftp.software.ibm.com/software/data/db2zos/IOD1298_ADadminTrendsDirections_CotnerOct2007.pdf

IDUG 2007 Europe

How current should we be?

- **Stay reasonably current with DB2 releases & fixes**
- **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**



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 two or three 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

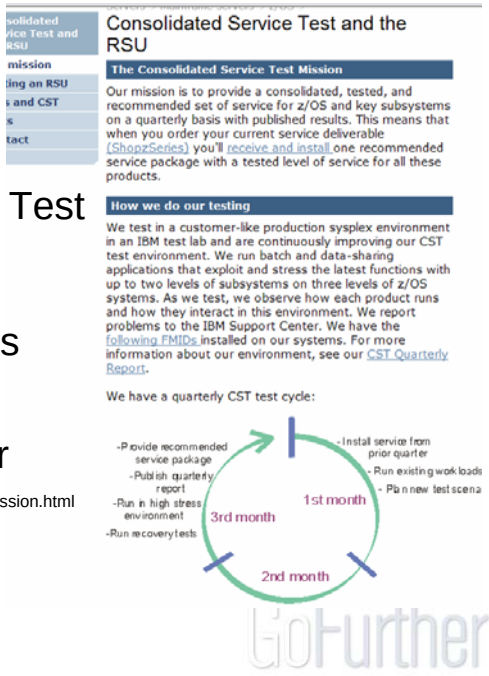
Use Consolidated Service Test Recommended Service

Cross product tested levels

Best practice for service:

two or three per year

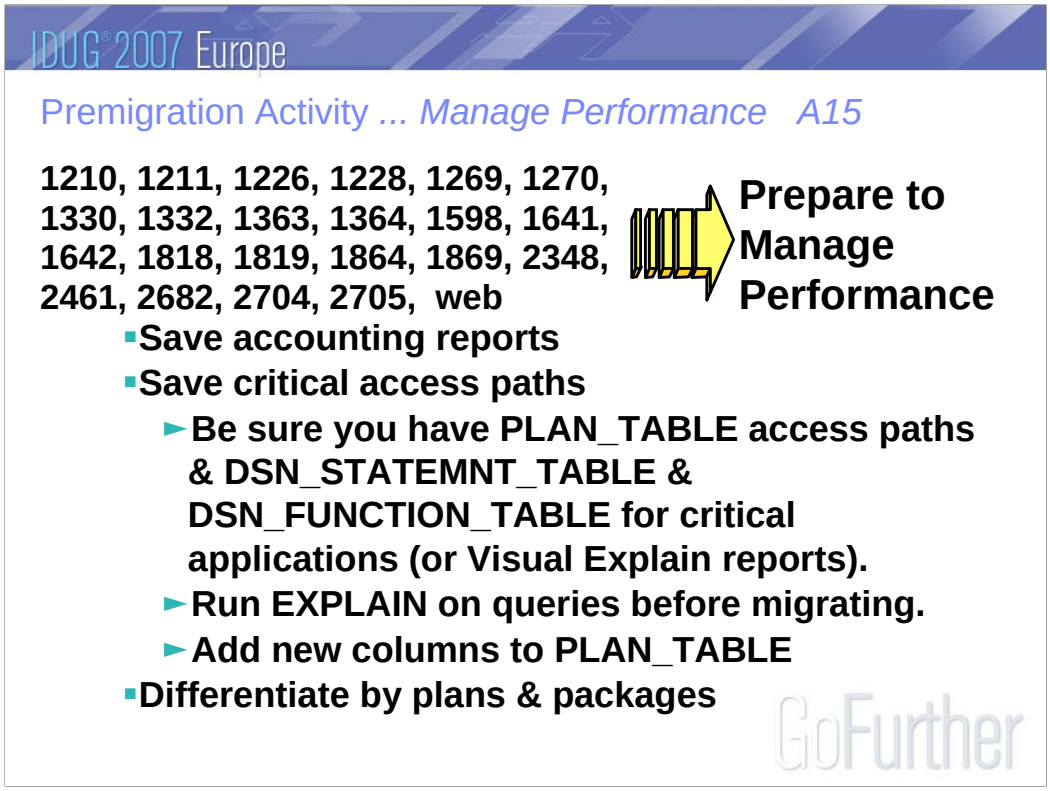
http://www.ibm.com/servers/eserver/zseries/zos/servicetst/mission.html



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.

Effective June 15, 2007, the DB2 for z/OS Version 8 SUP tape is available world-wide for new customer orders. This SUP tape was built differently than prior SUPs, such that its build in May integrated PTFs COR-closed through December 2006, which had also completed a Consolidated Service Test (CST) cycle. Once PTFs complete a CST cycle, they are assigned a Recommended Service Upgrade (RSU) status. Our DB2 for z/OS Version 8 SUP tape contains CST tested PTFs which were marked "RSU 0703" (they completed CST testing in March 2007). This SUP build integrated a total of 964 PTFs (the delta since our December 2005 SUP), which is nearly 1,000 fewer PTFs our new customers need to deal with during their DB2 V8 installation experience. For additional information on CST and RSU, please see: http://www.ibm.com/servers/eserver/zseries/zos/servicetst/mission.html

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.



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 dummy collection, 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.

IDUG 2007 Europe

Practice Three Rs of DB2

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

GoFurther

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.

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To REBIND or not to REBIND

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

GoFurther

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 to the prior access 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 access paths 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.

http://www.ibm.com/support/docview.wss?rs=64&context=SSEPEK&dc=DB520&q1=package+and+plan&uid=swg21078662&loc=en_US&cs=utf-8&lang=en

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Plan to REBIND packages

- **Old plans and packages have more to gain, less to lose**
- **BIND changes coming for plan stability, to eliminate private protocol and DBRMs bound into plans**
- **CM – how long? Very little new value**
  - **Most optimizations included**
  - **Rebind key packages at least**
- **New function mode**
  - **Adjust database design, applications**
    - **Improved index options: compression, larger page sizes, on expression, New SQL**
    - **Native SQL procedures, more zIIP**
    - **Rebind after changes**
  - **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 access path differences 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). Use a dummy collection for the test bind and save the old package to revert back if needed.

Since most of the improvements in optimization are already functional in CM, most customers bind the key packages and plans during compat mode. If CM 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 CM 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. 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.

http://www.ibm.com/support/docview.wss?rs=64&context=SSEPEK&dc=DB520&uid=swg21078662

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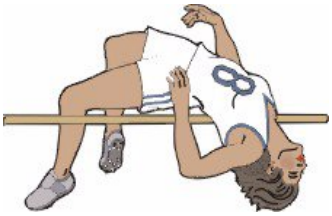
How much room will you get in DBM1?

It depends.

- Estimate 10% to 15%
- 5 EDM pools
- DDF - shared memory

You need to calculate, monitor and manage



GoFurther

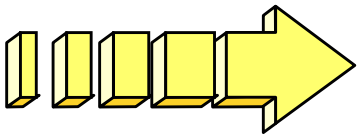
You still need to do the calculations, monitor and manage storage.

DB2 9 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. You need to configure the 128 GB virtual shared area above the 2 GB bar.

EDM virtual storage savings only occur if you rebind packages.

Note that plans containing DBRMs are deprecated. Watch for some improvements in migration techniques for plans containing DBRMs.

Premigration Activity *(continued)*



Deprecated Functions

- **Going, going, but not gone in DB2 9**
- **Convert from private protocol to DRDA**
  - **Bind DBPROTOCOL default is DRDA**
  - **BIND packages at remote locations**
  - **Governor changes: plan to package**
  - **DSNTP2DP tools to help convert**
- **Selective partition locking LOCKPART**

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 DB2 9, 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".

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Migration - data sharing group

- V8 and DB2 9 CM members within 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
- Use Data Sharing book for migration
- Migrate all members before using new function
- Restrict execution of packages & plans bound on new version to migrated members
- Group quiesce in DB2 9 NFM for locking protocol 3 (LOBs)
- CFLEVEL 15, 14, 13, 12 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/pso/cftable.html

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

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Customer Experiences A16

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

GoFurther

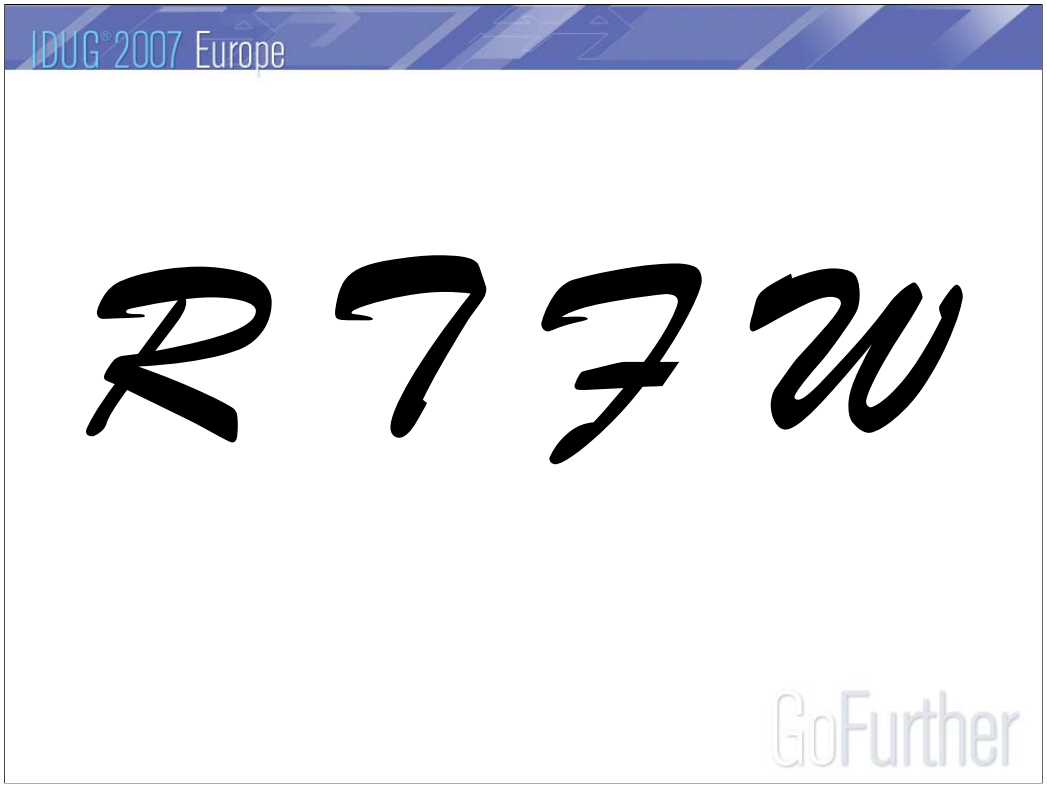
Most of these were mentioned before. They are mentioned again because other customers missed them. Many customer problems dealt with items on the foil titled Premigration Action. Run the premigration job. Check CATMAINT messages.

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



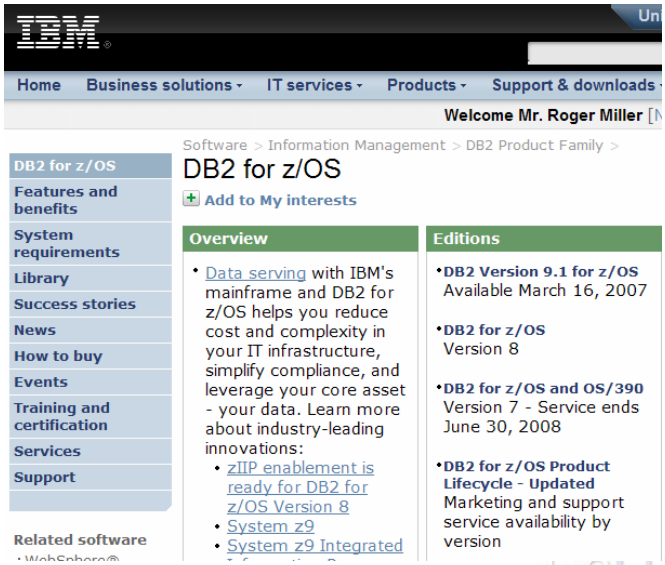
RTFW is the acronym for Read the Friendly Web. Let's take a short walk on the wild, wild web. The problem with the web is not too little information, but rather too much information. The experience is a bit like trying to take a drink from a fire hose. So I'd like to help a bit by narrowing the search 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.

Main DB2 for z/OS Web Page
ibm.com/software/db2zos

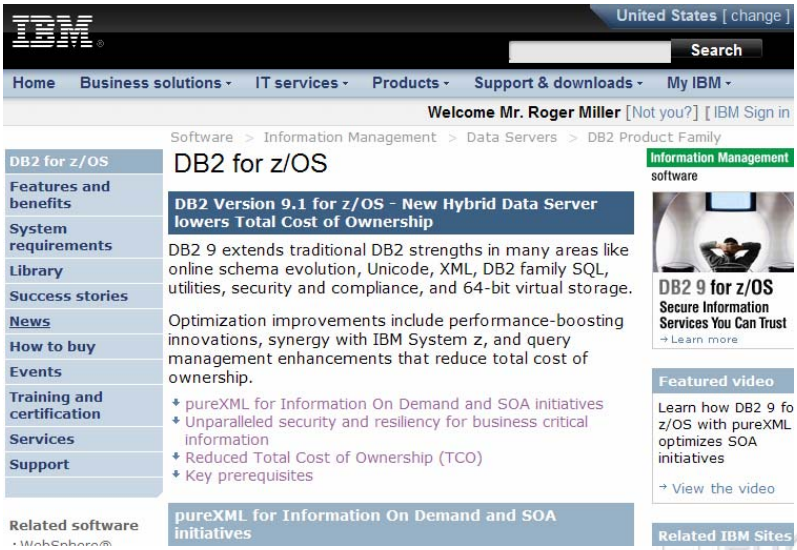
- **Library (books)**
- **Events**
- **Education**
- **Services**
- **Support**
- **V8, DB2 9**
- **Developer Domain**
- **DB2 Magazine**
- **Z9 zIIP**
- **Tools**



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.

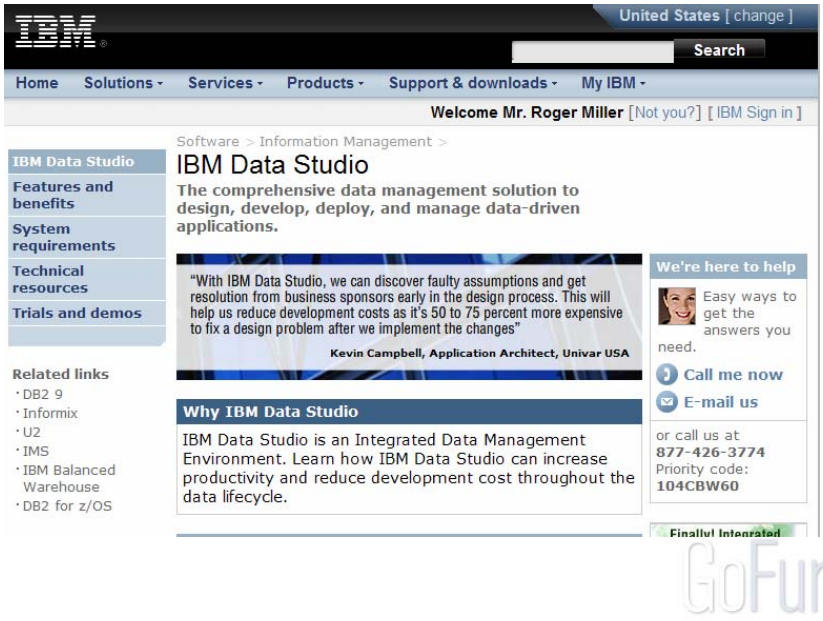
DB2 9 for z/OS Web Page

ibm.com/software/db2zos/db2zosv91.html



This is the new DB2 9 for z/OS web page. Watch this page for the latest information on this new version of DB2. As DB2 became generally available in March 2007, this page continues to have many changes.

http://www.ibm.com/software/data/studio/



See this page for all the changes in IBM Data Studio. Watch closely, as this area is changing fast.

http://www.ibm.com/software/data/studio/

ftp://ftp.software.ibm.com/software/data/db2zos/IOD1298_ADadminTrendsDirections_CotnerOct2007.pdf

zIIP ibm.com/systems/z/ziip/ II14219 II12836 II10817

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. DB2 9 remote native SQL Procedure Language is eligible for zIIP .

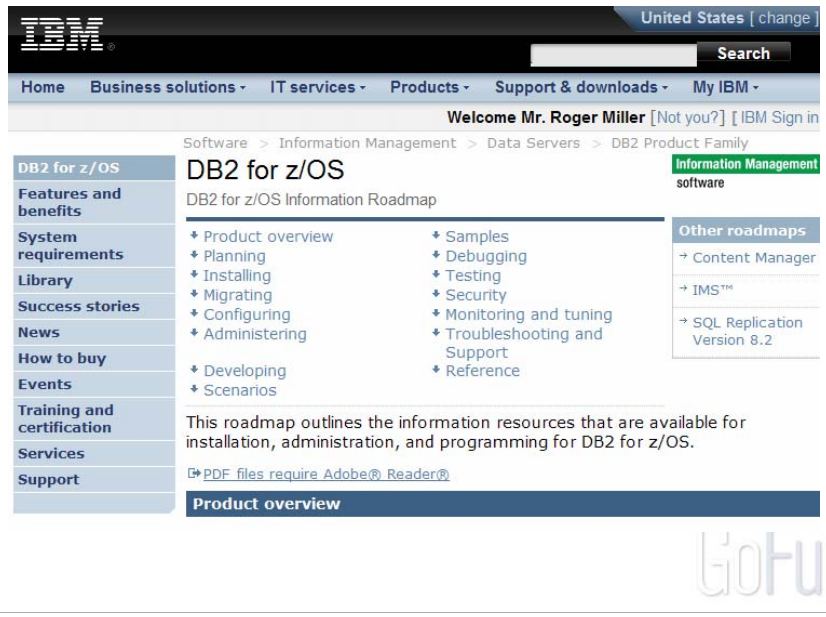
Parallel queries: If the work comes in remotely over DRDA using TCP/IP, then the initial work is eligible as remote work. After the initial time, the parallel processing threads are eligible and can process on the zIIP.

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.

DB2 for z/OS Roadmap Page

ibm.com/software/db2zos/roadmap.html

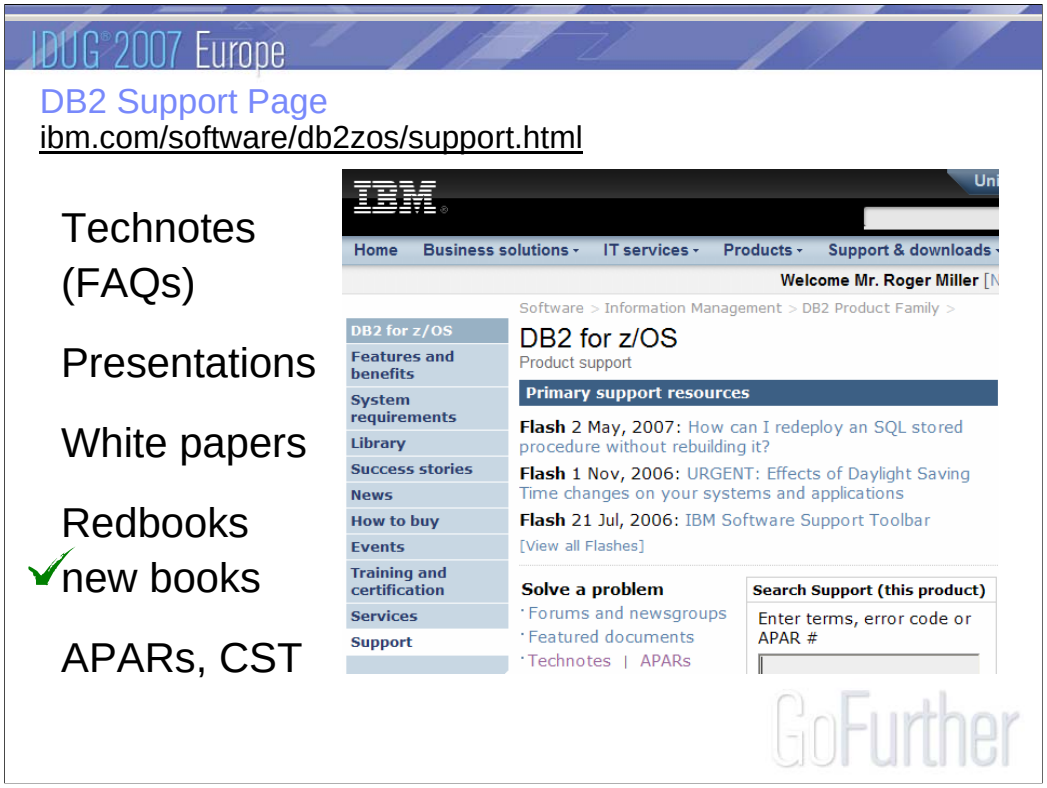


Don't you wish you could find all of the different kinds of information about DB2 for z/OS in one place? I think you'll be happy to learn about a new Web page called the DB2 for z/OS Information Roadmap. Information roadmaps are being developed by many IBM product teams in an effort to simplify the lives 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



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.

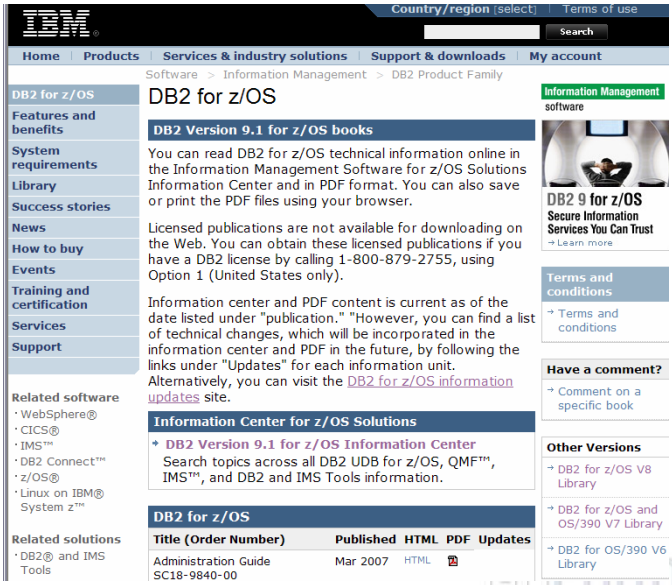
There are new and updated redbooks on Powering SOA with IBM Data Servers, LOBs with DB2 for z/OS: Stronger and Faster, V8 Performance Topics, Data Sharing in a Nutshell, Data Integrity, Stored Procedures: Through the Call and Beyond, Design Guidelines for High Performance and Availability, Disaster Recovery, and Security Improvements.

ibm.com/software/db2zos/support.html

DB2 9 Library page

ibm.com/software/data/db2/zos/v9books.html

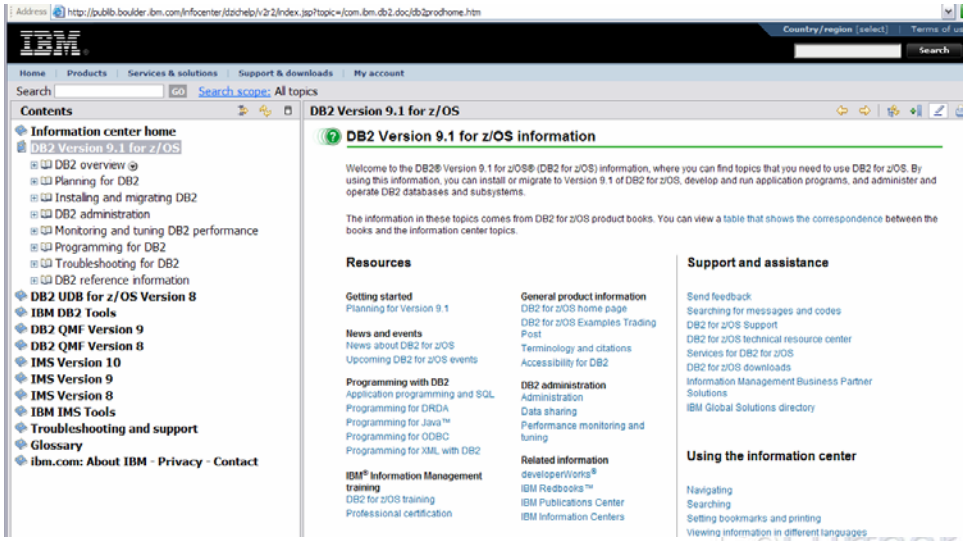
- **Download 30 PDF books**
- **Access html books**
- **DB2 new ✓March 2007**
- **Program Directories**
- **Information Center**



This is the Library page for DB2 9. I clicked Library, and then DB2 9 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.

Watch this web page and see the dates next to each book for the latest updates.

http://publib.boulder.ibm.com/infocenter/dzichelp/v2r2/index.jsp?topic=/com.ibm.db2.doc/db2prodhome.htm

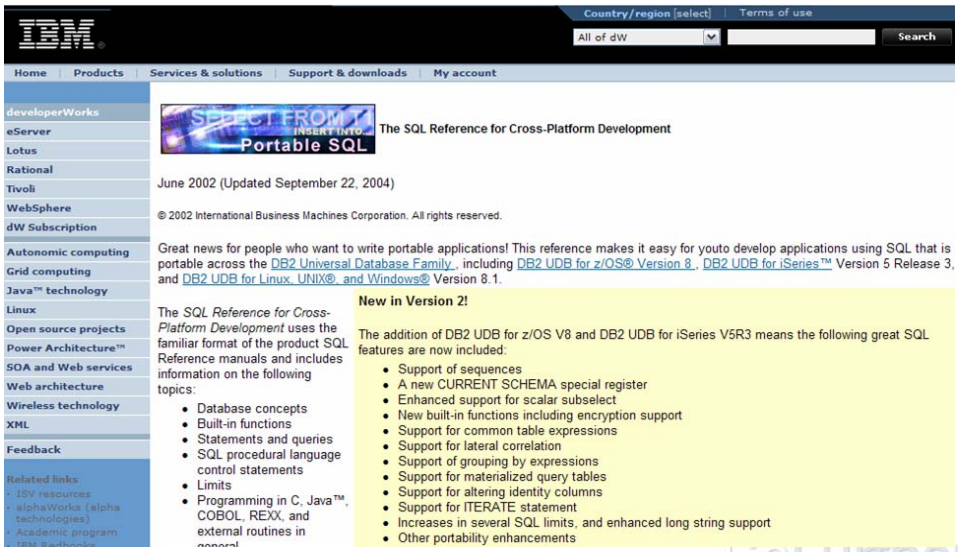


This is the Information Center, with a wide spectrum of information and access to books for DB2 for z/OS, DB2 tools, QMF, IMS, IMS tools and more. You can get to this page from the Library page, by clicking Information Center. The Information Center provides information across the books and across multiple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

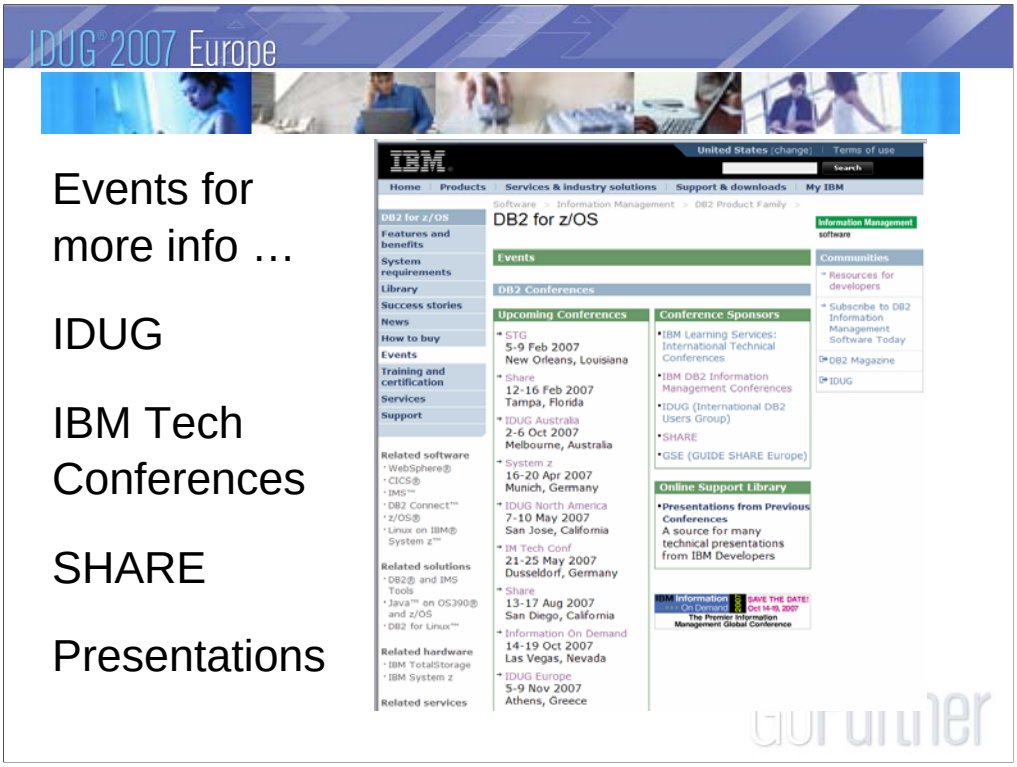
http://www.ibm.com/developerworks/db2/library/techarticle/0206sqlref/0206sqlref.html



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



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. 2008 conferences:

conference	dates	location	web location
IDUG NA	May 18 - 22	Dallas, Texas	www.idug.org
Share	Feb 24 – 29	Orlando, FL	
	Aug 10 - 15	San Jose, CA	www.share.org
IBM IOD Europe	June 2 – 6	Den Haag, Netherlands	
IDUG Europe	Oct 13 - 17	Warsaw, Poland	www.idug.org
IBM IOD NA	Oct 26 – 31	Las Vegas, NV	

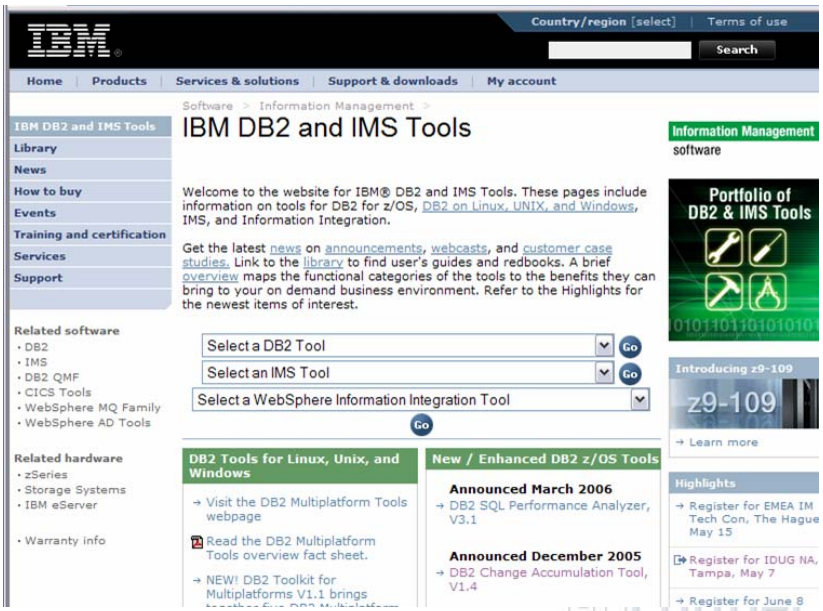
ibm.com/events/InformationOnDemand

IBM Technical Conferences

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

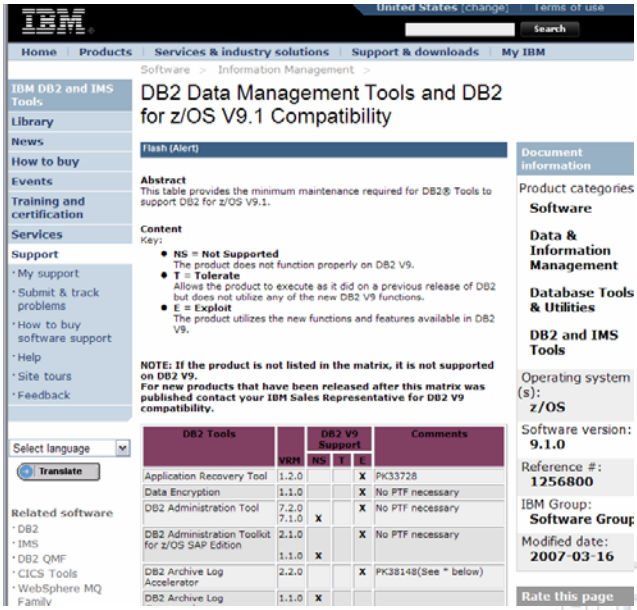
www.ibm.com/software/data/db2imstools/

Click Support For Compati-bility Matrix → → → & V8 or DB2 9



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 DB2 9 or V8 and PTF. Select the item DB2 Data Management Tools and DB2 for z/OS V8.1 or DB2 9 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

Flash (Alert)

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

Content
Key:

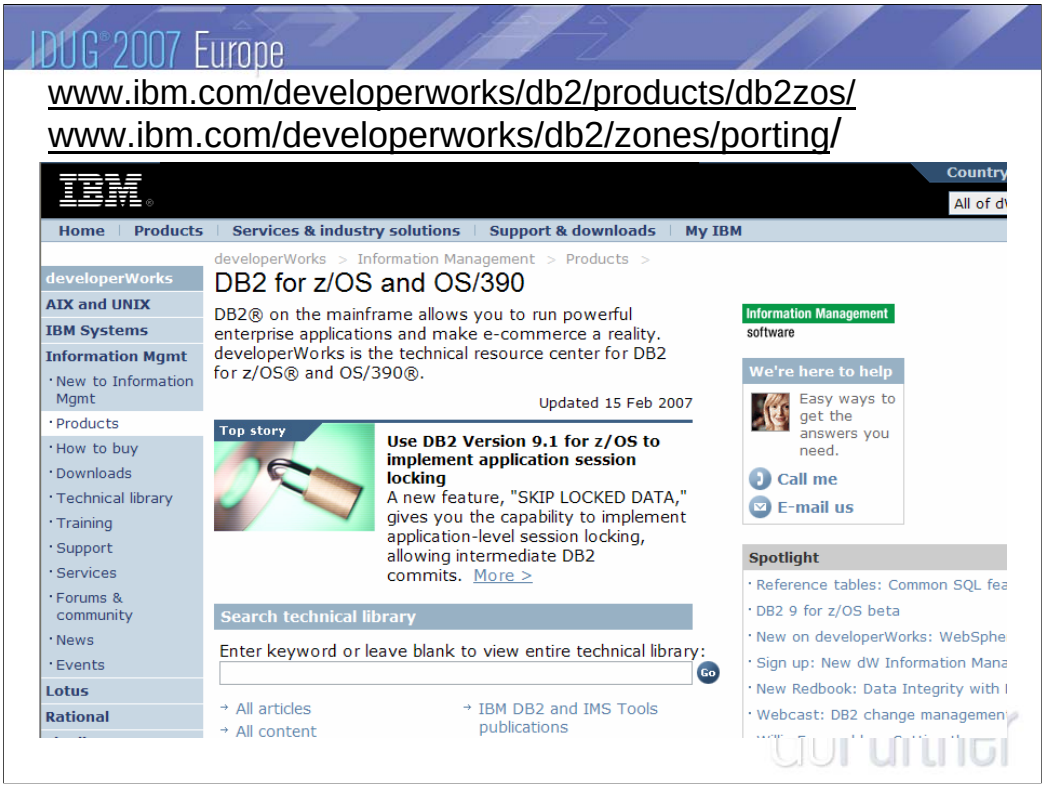
- **NS = Not Supported**
  The product does not function properly on DB2 V9.
- **T = Tolerate**
  Allows the product to execute as it did on a previous release of DB2 but does not utilize any of the new DB2 V9 functions.
- **E = Exploit**
  The product utilizes the new functions and features available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

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

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

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/
www.ibm.com/developerworks/db2/zones/porting/



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 DB2 9 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/

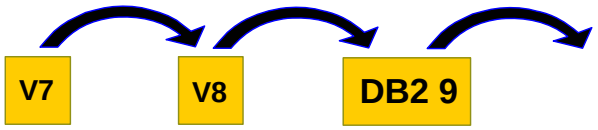
There is also a DeveloperWorks page on DB2 for z/OS.

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

For migration information for specific databases, try

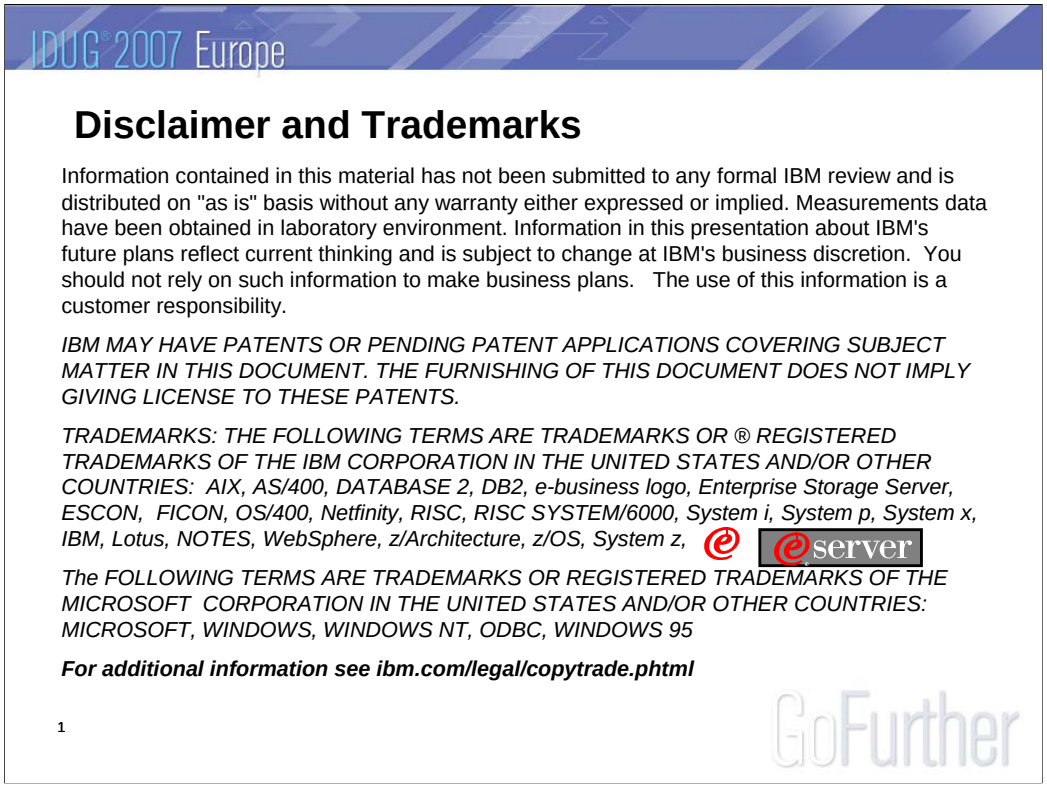
http://www.ibm.com/developerworks/ondemand/migrate/db.html

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

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.



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Session A07

Planning your Migration to DB2 9

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