IBM DB2 Universal Database

Release Notes

Version 8.2 (Version 8.1 FixPak 7)

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About the Release Notes

Content:

The release notes contain the latest information for the following DB2®, Version 8 products:

DB2 Universal Database™ Personal Edition
DB2 Universal Database Workgroup Server Edition
DB2 Universal Database Workgroup Server Unlimited Edition
DB2 Universal Database Enterprise Server Edition
DB2 Personal Developer's Edition
DB2 Universal Developer's Edition
DB2 Warehouse Manager
DB2 Warehouse Manager Sourcing Agent for z/OS™
DB2 Data Links Manager
DB2 Net Search Extender
DB2 Spatial Extender
DB2 Intelligent Miner™ Scoring
DB2 Intelligent Miner Modeling
DB2 Intelligent Miner Visualization
DB2 Connect™ Application Server Edition
DB2 Connect Enterprise Edition
DB2 Connect Personal Edition
DB2 Connect Unlimited Edition
DB2 Query Patroller™

Version information:

The most up-to-date documentation is available in the latest version of the DB2 Information Center, which is accessed through a browser. The URL for downloading the latest documentation is provided in the Additional resources section that follows this section.

Revision marks in the DB2 Information Center documentation indicate text that has been added or changed since the PDF information for version 8.1 was originally made available. A vertical bar (|) indicates information that was added at the time that version 8.1 was first released. A numeric indicator, such as a 1 or a 2, indicates that the information was added for the FixPak or level ending in the same number. Examples:

- 1 indicates that the information was added or changed in FixPak 1
- 2 indicates that the information was changed for Version 8.1.2
- 7 indicates that the information was changed for Version 8.2 (Version 8.1 FixPak 7)

Directory paths:

Windows® systems use backslashes (\) to delimit directories in a directory path. UNIX® and Linux systems use forward slashes (/) as delimiters. The Release Notes follow this convention when the information is platform specific. However, when the information is platform independent, you might need to enter the directory path differently than shown. For example, if you have a Windows system, you must enter the directory path using backslashes (\) if the Release Notes show forward slashes (/). Conversely, if you have a UNIX or Linux system, you must enter the directory path using forward slashes (/) if the Release Notes show backslashes (\).

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DB2 Information Integrator:

For information about currently known outstanding issues with DB2 Information Integrator and its associated technologies, including federated systems, SQL replication, Q replication, event publishing, Web services, and metadata management, see the DB2 Information Integrator Release Notes. The DB2 Information Integrator Release Notes are available on the DB2 Information Integrator support Web page at:
http://www.ibm.com/software/data/integration/db2ii/support.html

Additional resources:

The *Data Links Manager Administration Guide and Reference* was updated in PDF form (book number SC27-1221-01) at the time of FixPak 1 and is available for download at the DB2 support site:
http://www.ibm.com/software/data/db2/udb/winos2unix/support.

Documentation for the DB2 Life Sciences Data Connect product is available for download from the IBM software site:
http://www.ibm.com/software/data/db2/lifesciencesdataconnect/

If you want to view the DB2 documentation in HTML format, you can access the DB2 HTML Information Center online from
http://publib.boulder.ibm.com/infocenter/db2help/.

Alternatively, you can install the DB2 HTML Information Center on your system; a *DB2 HTML Documentation* CD image is available for download from the same Web site. Updates are made to the DB2 HTML documentation with every release. For the latest documentation, access the DB2 HTML Information Center online or download the *DB2 HTML Documentation* CD image for installation on your system. PDF documentation is updated less frequently than the HTML Information Center.

More information on the DB2 Development Center and DB2 for z/OS is available at http://www.ibm.com/software/data/db2/os390/spb/.

For the latest information about the DB2 family of products, obtain a free subscription to *DB2 Magazine*. The online edition of the magazine is available at http://www.db2mag.com; instructions for requesting a subscription are also posted on this site.

About this release

New in this release

On the welcome page of the DB2® Information Center you will find a link to the list of new features added in this release. You can see the latest version of the DB2 Information Center through the IBM® Web site at http://publib.boulder.ibm.com/infocenter/db2help/index.jsp

The latest version of the DB2 Information Center can also be installed locally from the DB2 Information Center CD.

In addition to the new features listed in the DB2 Information Center, the following new features have also been added:

New configuration parameters for log file allocation, removal, and archiving

Two new configuration parameters, log archive method 1 (LOGARCHMETH1) and log archive method 2 (LOGARCHMETH2), have been added to handle log file allocation and removal. These parameters cause the database manager to archive log files to a location that is not in the active log path. If both of these parameters are specified, each log file is archived twice. This means that you will have two copies of archived log files in two different locations. These two new configuration parameters replace the user exit (USEREXIT) and log retain enable (LOGRETAIN) configuration parameters, which are still available, but should be used for back level compatibility only.

Three other new configuration parameters, ARCHRETRYDELAY, NUMARCHRETRY, and FAILARCHPATH, have been added so that you can better tune log archiving to meet your needs. If an error occurs when log files are being archived, archiving is suspended for the amount of time specified by the ARCHRETRYDELAY database configuration parameter. You can use the NUMARCHRETRY database configuration parameter to specify the number of times that DB2 UDB is to try archiving a log file to the primary or secondary archive directory. After the specified number of attempts have been made, DB2 UDB tries to archive log files to the failover directory, specified by the FAILARCHPATH database configuration parameter.

Database shared memory region augmented at activation time

At database activation time, DB2 UDB automatically augments the database shared memory region with an overflow buffer. The buffer is used to satisfy peak memory requirements for any heap in the database shared memory region whenever a heap exceeds its configured size. If a heap exceeds its configured size, the data area is expanded as needed until the entire overflow memory area in the database shared memory region is used.

Query Patroller enhancements

In addition to the existing supported platforms, DB2 UDB Version 8.2 introduces 64–bit support for the DB2 Query Patroller™ server on the following platforms:

- Linux IA64
- Windows® Server 2003 64–bit Itanium based systems

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- Windows XP 64–bit Edition

The benefits of 64–bit coverage include more address space for code, variables, shared memory, and buffer pools.

DB2 UDB Workgroup Server Edition and DB2 UDB Workgroup Server Unlimited Edition support DB2 Query Patroller:

DB2 Query Patroller server can now be installed on top of the following DB2 products:

- DB2 UDB Enterprise Server Edition Version 8.1.2 and FixPak 2+
- DB2 UDB Enterprise Server Edition that is later than Version 8.1.2
- DB2 UDB Workgroup Server Edition Version 8.2
- DB2 UDB Workgroup Server Unlimited Edition Version 8.2

KEEP UPDATE LOCKS phrase added

A lock type can be specified for queries that perform updates. This change to a query involving cursors allows FOR UPDATE cursors to take advantage of row blocking. In addition, Repeatable Read (RR) or Read Stability (RS) can be selected when querying a read-only results table so that positioned cursor updates will succeed. The isolation-clause and lock-request-clause cannot be used in a subselect, SQL function, SQL method, or trigger.

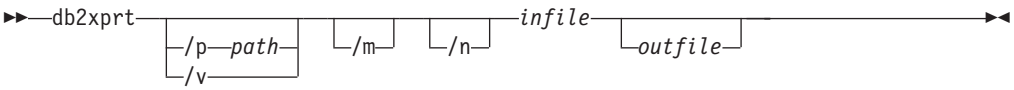
Formatting trap files (Windows)

A new tool, db2xprt.exe, is available to let you format trap files (*.TRP). This tool formats DB2 UDB's binary trap files into a human readable ASCII file. Trap files are located in the instance directory (DB2INSTPROF) by default or in the diagnostic data directory path if the DIAGPATH database manager configuration parameter is set.

Authorization:

You must have access to the DIAGPATH directory.

Command syntax:



Command parameters:

/p *path* A semicolon (;) separated path that points to the location or locations where the binary files and PDB files are located.

/v Displays version information.

/m Formats a memory dump along with the rest of the trap file.

/n Format data without regard to line number information.

infile Specifies the input file.

outfile Specifies the output file.

Setting memory pinning is now available (Linux)

Memory pinning is now available as an option for DB2 UDB Version 8.2 on all Linux architectures. With memory pinning enabled, the database shared memory set is kept in RAM and is not swapped out. This strategy results in better use of memory, and it keeps more memory available for other uses.

Procedure:

To set memory pinning:

1. Ensure your Linux distribution provides the libcap.so library
2. Set the db2set variable DB2_PINNED_BP to YES
3. Stop and start the database engine

The **ipcs -m** command shows shared memory segments with a LOCKED status when any agent is connected to a database in an instance that has been started with this option.

Defining resource policies (AIX, Linux)

DB2 UDB now supports precise configuration of DB2 UDB use of some operating system resources. For example, you can pin each engine EDU to a single logical processor. Such advanced configurations can improve performance in some scenarios. However, these configurations should be attempted only by advanced users who are knowledgeable about their operating environment and its workload. Misconfiguration can result in degraded performance.

A resource policy is defined to describe how DB2 UDB interacts with the operating system. The resource policy typically limits what resources DB2 UDB uses, or it contains rules for assigning specific operating system resources to specific DB2 UDB objects. The extent of resource control varies depending on the operating system.

Table 1. Resource control by platform

Platform	Overview of support
Linux	Restrict a DB2 UDB instance to use only a subset of logical processors on the system.
AIX® 5.2	• Restrict a DB2 UDB instance to use only a subset of logical processors on the system • Define how DB2 UDB objects such as EDUs, buffer pools, and page cleaners are bound to particular resource sets • Configure resource set use at the database level

Defining a resource policy:

The DB2_RESOURCE_POLICY registry variable is used to define a resource policy. This variable can be set to the path of a well formed configuration file.

You might experience several types of failure when configuring a resource policy:

- Hardware or operating system level requirements are insufficient for resource policy configuration.
- Syntax or semantic errors in the policy configuration file.

Any error in configuring a resource policy results in db2start failing.

The operating system requirements for resource policy support are described in the following table.

Table 2. Operating system requirements for resource policy support

Platform	Overview of support
Linux	• SUSE Linux Enterprise Server 8 (or 9) or RedHat Enterprise Linux 3 • SMP hardware
AIX 5.2	• AIX 5.2 running on NUMA capable hardware • The instance owner is granted the CAP_NUMA_ATTACH AIX capability • Set the DB2ENVLIST registry variable to "MEMORY_AFFINITY DATA_SEG_SPECIAL" • Set 'MEMORY_AFFINITY=MCM' and 'DATA_SET_SPECIAL=Y" in your db2profile. • The vmo option *memory_affinity* must be set to 1, and the vmo option *num_spec_dataseg* must be set to at least the maximum number of DB2 agents.

Each DB2 process is bound to a single processor:

The following sample configuration file illustrates one–to–one processor–to–processor binding on AIX and Linux.

```
<RESOURCE_POLICY>
   <GLOBAL_RESOURCE_POLICY>
   <METHOD>CPU</METHOD>
      <RESOURCE_BINDING>
         <RESOURCE>0</RESOURCE>
      </RESOURCE_BINDING>
      <RESOURCE_BINDING>
         <RESOURCE>1</RESOURCE>
      </RESOURCE_BINDING>
   </GLOBAL_RESOURCE_POLICY>
</RESOURCE_POLICY>
```

Each DB2 UDB engine process will be bound to either processor 0 or processor 1. Processor binding of engine processes to processors identified in the policy occurs in a circular round-robin fashion. This policy assumes that the system consists of at least 2 logical processors. Processors are identified by a number from 0 to (n–1) where n is the number of processors on the system.

Note: This binding mechanism should not be used to restrict the processors available for use by a DB2 UDB instance. Instead, consider using the various operating system facilities, such as WLM on AIX, for workload management.

NUMA exploitation:

Topology-based configuration

A topology-based configuration describes the precise binding of DB2 UDB objects to resource manager resource sets.

The following is a sample file for topology-based configuration:

```
<RESOURCE_POLICY>
   <DATABASE_RESOURCE_POLICY>
   <DBNAME>MYDB</DBNAME>
   <METHOD>RSET</METHOD>
   <RESOURCE_BINDING>
```

```
      <RESOURCE>sys/node.02.00000</RESOURCE>
      <DBMEM_PERCENTAGE>25.0</DBMEM_PERCENTAGE>
      <SERVICE_NAME>svnm0</SERVICE_NAME>
      <BUFFERPOOL_BINDING>
         <NUM_CLEANERS>3</NUM_CLEANERS>
         <BUFFERPOOL_ID>4</BUFFERPOOL_ID>
         <BUFFERPOOL_ID>8</BUFFERPOOL_ID>
      </BUFFERPOOL_BINDING>
   </RESOURCE_BINDING>
   <RESOURCE_BINDING>
      <RESOURCE>sys/node.02.00001</RESOURCE>
      <DBMEM_PERCENTAGE>50.0</DBMEM_PERCENTAGE>
      <SERVICE_NAME>svnm1</SERVICE_NAME>
      <BUFFERPOOL_BINDING>
         <NUM_CLEANERS>5</NUM_CLEANERS>
         <BUFFERPOOL_ID>12</BUFFERPOOL_ID>
         <BUFFERPOOL_ID>13</BUFFERPOOL_ID>
      </BUFFERPOOL_BINDING>
      <BUFFER_POOL_BINDING>
         <NUM_CLEANERS>2</NUM_CLEANERS>
         <BUFFERPOOL_ID>32</BUFFERPOOL_ID>
      </BUFFERPOOL_BINDING>
   </RESOURCE_BINDING>
   </DATABASE_RESOURCE_POLICY>
</RESOURCE_POLICY>
```

The following points provide analysis of the preceding sample file:

- A resource policy exists only for the database with name MYDB.
- All agents spawned to service requests that arrive through service port svnm0 are bound to AIX resource set sys/node.02.00000.
- All agents spawned to service requests that arrive through service port svnm1 are bound to AIX resource set sys/node.02.00001.
- Database shared memory is allocated as follows:
  - 25% of the database shared memory set will be allocated from sys/node.02.00000
  - 50% of the database shared memory set will be allocated from sys/node.02.00001
  - The remaining 25% will be striped across all resource sets of the system
- Buffer pools with IDs 4 and 8 use memory from resource set: sys/node.02.00000. Buffer pools with IDs 12, 13, and 32 use memory from resource set: sys/node.02.00001.
- Three page cleaners are created to exclusively service buffer pools with IDs 4 and 8.
- Five page cleaners are created to exclusively service buffer pools with IDs 12 and 13.
- Two page cleaners are created to exclusively service buffer pool with ID 32.

Product fix history

For a list of Authorized Program Analysis Reports (APARs) addressed by this fix pack, visit the following Web page:

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

Known limitations, problems, and workarounds

The following information is the currently known limitations, problems, and workarounds for DB2 Universal Database Version 8.2. The information in this section applies only to the Version 8.2 release of DB2 Universal Database, and its supporting products. Any limitations and restrictions might or might not apply to other releases of the product.

Backward compatibility

Alternate FixPaks (Linux and UNIX)

Prior to DB2® Universal Database Version 8, FixPaks functioned only as updates to installed DB2 Universal Database™ packages or file sets in one fixed location. Essentially, this meant that the installation of FixPaks replaced existing files with the updated ones provided within the FixPaks, and multiple DB2 FixPak levels on a single system was not possible. Now, DB2 UDB (ESE) can exist at multiple fix pack levels in the same system. This feature, supported in production operating environments since Version 8.1.2, is achieved using the following two FixPak types:

regular FixPaks

- Are available not only for ESE, but for all supported DB2 Version 8 products for the related platforms
- Can be installed directly on top of the existing installation either in the `/usr/opt/db2_08_01` directory on AIX® or the `/opt/IBM/db2/V8.1` directory on other platforms

alternate FixPaks

- Can be installed as completely new copies of DB2 Universal Database ESE
- Are installed in a predefined location other than the location used for a regular DB2 Universal Database installation

Notes:

1. You are *not* required to perform a multiple FixPak installation if it is unnecessary for your environment.
2. Starting with IBM® DB2 Universal Database Enterprise Server Edition (ESE) for Linux and UNIX®, Version 8.1.2, fix packs are supported in production operating environments when they are installed as Multiple fix packs.
3. On Linux, alternate FixPaks are available on the following platforms only:
   - x86 (32-bit)
   - S/390® (31-bit)

To update a multiple FixPak instance to a different FixPak level, perform one of the following operations:

- Install the appropriate regular FixPak on the General Availability (GA) installation and update the instance by running **db2iupdt** from the existing GA path.
- Install the appropriate alternate FixPak to its own unique path and update the instance by running **db2iupdt** from this path.

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For further information regarding downloading alternate FixPaks, visit the IBM support site at http://www.ibm.com/software/data/db2/udb/winos2unix/support.

Data Warehouse Center previous server support restrictions

The following limitations exist for previous server support for DB2 Universal Database (DB2 UDB) Enterprise Server Edition Version 8 Data Warehouse Center:

Large Object (LOB) support

- If you are using a warehouse control database on a server that is earlier than DB2 UDB Enterprise Server Edition Version 8 you cannot work with LOBs. You must upgrade the warehouse control database to the correct level, or you can move the control database to the system on which the DB2 UDB Enterprise Server Edition Version 8 warehouse server is installed and use the warehouse control database locally from that system.
- To move LOBs between the Data Warehouse Center and DB2 UDB, you must upgrade to DB2 UDB Enterprise Server Edition, Version 8.

Systems Network Architecture (SNA) support

If you use SNA to connect to your warehouse sources and targets, you must change the configuration to TCP/IP over SNA or use the Windows® NT warehouse agent.

Support for EXPORT and LOAD utilities

The Data Warehouse Center Version 8 LOAD utility does not support a Version 7 target database. If you want to keep your target as a Version 7 database, then you must change the LOAD step to a SQL Select and Insert step. SQL Select and Insert steps use a DELETE* statement followed by SELECT and INSERT statements. SQL Select and Insert steps require the database to log all transactions. As a result, the performance for SQL Select and Insert steps is not as efficient as it is for the EXPORT and LOAD utilities.

Development Center APARs required for SQLJ and SQL Assist support on DB2 UDB for OS/390, Version 6 and DB2 UDB for z/OS, Version 7

When using the Development Center on an Application Development client for DB2 Universal Database Version 8 on Windows or UNIX operating systems, the following APARs need to be installed on the server to enable SQLJ and SQL Assist support:

DB2 UDB for z/OS™, Version 7

- PQ65125 - Provides SQLJ support for building Java™ SQLJ stored procedures
- PQ76858 - Provides SQL Assist support

DB2 UDB for OS/390®, Version 6

- PQ76858 - Provides SQL Assist support

Two versions of SQL Assist are launched from DB2 UDB

You can invoke both version 7 and version 8 of SQL Assist from within DB2 Universal Database, Version 8. You can start version 7 from the DB2 Data Warehouse Center. All other centers start the latest version 8. The product online help has additional information for SQL Assist, Version 7.

Change in Unicode server behavior

In version 7, Unicode servers ignored any graphic code pages sent by applications at connect time and assumed that UCS2 Unicode (code page 1200) was being used. Version 8 Unicode servers now respect the code page sent by the client.

Change in output for the db2move command

In Version 8.2, the summary output generated by the **db2move** command is more descriptive than in earlier versions. This change can cause errors in scripts that analyze the output.

When db2move is executed with the IMPORT option:

Output prior to Version 8.2

```
IMPORT: -Rows read: 5; -Rows committed: 5; Table "DSCIARA2"."T20"
```

Output starting with Version 8.2

```
* IMPORT:  table "DSCIARA2"."T20"
  -Rows read:          5
  -Inserted:           4
  -Rejected:           1
  -Committed:          5
```

When db2move is executed with the LOAD option:

Output prior to Version 8.2

```
* LOAD:  table "DSCIARA2"."T20"
  -Rows read: 5 -Loaded: 4 -Rejected 1 -Deleted 0 -Committed 5
```

Output starting withVersion 8.2

```
* LOAD:  table "DSCIARA2"."T20"
  -Rows read:          5
  -Loaded:             4
  -Rejected:           1
  -Deleted:            0
  -Committed:          5
```

Health registry changes when migrating from DB2 UDB Version 8.2 back to DB2 UDB Version 8.1

Any registry changes made at the DB2 UDB Version 8.2 level are lost when you migrate back to DB2 UDB Version 8.1. The registry reverts to the version 8.1 HealthRules.reg file that contains the settings that existed before you upgraded to DB2 UDB Version 8.2 and started using the settings in the HealthRules2.reg file.

db2diag.log format message enhancements

The db2diag.log file format has been improved in a number of ways for version 8.2. The log file is now easier to read manually and easier to parse in software. The improvements include:

- Each entry has a complete set of header information
- Message and data portions of the logging record are clearly marked, making the logging record easier to use and to understand
- Timestamps with time zone are included for each record
- Each field has a clear field name in uppercase letters
- Header and message field line lengths are restricted to 80 characters
- New fields have been added, most notably a severity-level field to help you find the most important entries

Other changes have been made as well, such as changing the **database** field name to **DB**.

Event records have been added as diagnostic messages to the db2diag.log file. Examples of such events are:

- Updates to the profile registry
- Updates to configuration parameters

Event records have "Event" specified in the **LEVEL** field. Although events are not errors, they might be logged at diagnostic levels higher than 4 (Informational) or 3 (Warning) depending on their importance.

db2set profile registry variables and DB or DBM configuration parameters are now logged

Starting with version 8.2, db2set profile registry updates and DB and DBM configuration parameters and are logged in the db2diag.log file. These messages are logged at high diagnostic levels due to their importance.

The following types of db2set profile registry updates are logged:

Modify
The `db2set` *variableName=value* command yields a db2diag.log entry such as:

```
2004-04-22-19.19.14.156959-240 I79582C286         LEVEL: Event
PID     : 2437242              TID  : 1           PROC : db2set
INSTANCE: db2user              NODE : 000
FUNCTION: DB2 UDB, oper system services, db2set_main, probe:40
CHANGE  : CFG DB2SET: DB2DBDFT: From: "OLDDB" To: "SAMPLE"
```

Delete The `db2set -r` command yields a db2diag.log entry such as:

```
CHANGE  : CFG DB2SET: DB2DBDFT: From: "SAMPLE" To: ""
```

Note: The header information is omitted in the preceding example.

Reset The `db2set variableName=`*value* command yields a db2diag.log entry such as:

```
CHANGE  : CFG DB2SET: Profile registry was reset
```

Note: The header information is omitted in the preceding example.

Examples for DB and DBM configuration parameter updates are

```
CHANGE  : CFG DB SAMPLE: "Maxlocks" From: "10" To: "20"

CHANGE  : CFG DBM: "Diaglevel" From: "3" To: "1"

CHANGE  : CFG DBM: Reset to the system defaults
```

Note: The header information is omitted in the preceding examples.

To find these configuration update messages, use db2diag tool. For example:

- To select all events: **db2diag -level event**
- To select change events: **db2diag -g "changeevent="**

Product compatibility

Microsoft XP fix is needed on 64-bit operating systems

If you are using the Microsoft® XP operating system (2600) configured to use the NETBIOS protocol with the DB2 family of products, you need to obtain a hotfix from Microsoft. Contact Microsoft with the Knowledge Base article number Q317437.

Windows XP operating systems

The Windows XP Home Edition operating system is supported only by DB2 UDB Personal Edition products.

The Windows XP Professional operating system is supported by the following DB2 products:

- DB2 UDB Personal Edition
- DB2 UDB Workgroup Server Edition
- DB2 Connect™ Personal Edition
- DB2 Connect Enterprise Edition

Note: DB2 Connect Enterprise Edition is supported on Windows XP for development or test purposes only. Production environments require Windows 2000 or Windows Server 2003.

Alternative Unicode conversion tables for the coded character set identifier (CCSID) 5039

The Microsoft Japanese Windows Shift-JIS code page is registered as the IBM coded character set identifier (CCSID) 943. However, the Shift-JIS code page on HP-UX platform is registered as CCSID 5039. CCSID 5039 contains characters in the Japanese Industry Standard (JIS) only, and does not have any vendor defined characters. You can use a DB2 UDB database of CCSID 5039 on HP-UX to store Shift-JIS characters, but there will be code page conversion between CCSID 5039 and CCSID 943. When using Microsoft ODBC applications, you might encounter a problem when converting data in CCSID 5039 to Unicode, due to differences between IBM's code page conversion table and Microsoft's code page conversion table.

The following list of characters, when converted from CCSID 5039 to Unicode, will result in different code points depending on which conversion table is used (IBM or Microsoft). For these characters, the IBM conversion table conforms to the Japanese Industry Standard JISX0208 and JISX0221.

Table 3. CCSID 5039 to Unicode code point conversion

Shift-JIS code point (character name)	IBM primary code point (Unicode name)	Microsoft primary code point (Unicode name)
X'815C' (EM dash)	U+2014 (EM dash)	U+2015 (Horizontal bar)
X'8160' (Wave dash)	U+301C (Wave dash)	U+FF5E (Fullwidth tilde)
X'8161' (Double vertical line)	U+2016 (Double vertical line)	U+2225 (Parallel to)
X'817C' (Minus sign)	U+2212 (Minus sign)	U+FF0D (Fullwidth hyphen-minus)

For example, the character EM dash with the CCSID 5039 code point of X'815C' is converted to the Unicode code point U+2014 when using the IBM conversion table, but is converted to U+2015 when using the Microsoft conversion table. This can create potential problems for Microsoft ODBC applications because they would treat U+2014 as an invalid code point. To avoid these potential problems, DB2 UDB provides the alternate Microsoft conversion table from CCSID 5039 to Unicode, in addition to the default IBM conversion table. You need to replace the default IBM conversion table with the alternate Microsoft conversion table. Note that the default IBM conversion table from Unicode to CCSID 5039 matches the Microsoft version.

Replacing the Unicode conversion tables for coded character set (CCSID) 5039 with the Microsoft conversion tables

When you convert from CCSID 5039 to Unicode, the DB2 UDB default code page conversion table is used. If you want to use a different version of the conversion table, such as the Microsoft version, you must manually replace the default conversion table (.cnv) file.

Prerequisites:

Before replacing the existing code page conversion table file in the `sqllib/conv` directory, you should back up the file in case you want to change it back. On UNIX and Linux, the `sqllib/conv` directory is linked to the DB2 UDB installation path.

Restrictions:

For conversion table replacement to be effective, every DB2 UDB client that connects to the same database must have its conversion table changed. Otherwise, the different clients might store the same character using different code points.

Procedure:

To replace the DB2 UDB default conversion table for converting from CCSID 5039 to Unicode, follow these steps:

1. Copy `sqllib/conv/ms/5039ucs2.cnv` to `sqllib/conv/5039ucs2.cnv`
2. Restart DB2 UDB.

Alternative Unicode conversion tables for the coded character set identifier (CCSID) 954

The IBM coded character set identifier (CCSID) for the Japanese EUC code page is registered as CCSID 954. CCSID 954 is a common encoding for Japanese UNIX and Linux platforms. When using Microsoft ODBC applications to connect to a DB2 UDB database of CCSID 954, you might encounter a problem when converting data from CCSID 954 to Unicode. The potential problem is due to differences between IBM's code page conversion table and Microsoft's code page conversion table. The IBM conversion table conforms to the character names as specified in the Japanese Industry Standard (JIS) JISX0208, JISX0212, and JISX0221.

The following characters, when converted from CCSID 954 to Unicode, will result in different code points depending on whether the IBM or Microsoft conversion table is used.

Table 4. CCSID 954 to Unicode code point conversion

EUC-JP code point (character name)	IBM primary code point (Unicode name)	Microsoft primary code point (Unicode name)
X'A1BD' (EM dash)	U+2014 (EM Dash)	U+2015 (Horizontal Bar)
X'A1C1' (Wave dash)	U+301C (Wave Dash)	U+FF5E (Fullwidth Tilde)
X'A1C2' (Double vertical line)	U+2016 (Double vertical line)	U+2225 (Parallel To)
X'A1DD' (Minus sign)	U+2212 (Minus sign)	U+FF0D (Fullwidth hyphen-minus)
X'8FA2C3' (Broken bar)	U+00A6 (Broken bar)	U+FFE4 (Fullwidth broken bar)

For example, the character EM dash with the CCSID 954 code point of X'A1BD' is converted to the Unicode code point U+2014 when using the IBM conversion table, but is converted to U+2015 when using the Microsoft conversion table. Due to this difference of conversion mapping, you might have two different code points for the same character in a DB2 UDB Unicode database, or in a graphic column of a DB2 UDB 954 database. This can create potential problems for Microsoft ODBC applications because they would treat U+2014 as an invalid code point. To avoid these potential problems, DB2 UDB provides the alternate Microsoft conversion table from CCSID 954 to Unicode, in addition to the default IBM conversion table. You need to replace the default IBM conversion table with the alternate Microsoft conversion table. Note that the default IBM conversion table from Unicode to CCSID 954 matches the Microsoft version.

Replacing the Unicode conversion tables for coded character set (CCSID) 954 with the Microsoft conversion tables

When you convert from CCSID 954 to Unicode, the DB2 UDB default code page conversion table is used. If you want to use a different version of the conversion table, such as the Microsoft version, you must manually replace the default conversion table (.cnv) file.

Prerequisites:

Before replacing the existing code page conversion table file in the `sqllib/conv` directory, you should back up the file in case you want to change it back. On UNIX and Linux, the `sqllib/conv` directory is linked to the install path of DB2 UDB.

Restrictions:

For this to be effective, every DB2 UDB client that connects to the same CCSID 954 database must have its conversion table changed. If your client is Japanese Windows, whose ANSI code page is Shift-JIS (CCSID 943), you will also need to change the DB2 default conversion tables between CCSID 943 and Unicode to the Microsoft version. Otherwise, the different clients might store the same character using different code points.

Procedure:

To replace the DB2 UDB default conversion table for converting from CCSID 954 to Unicode, follow these steps:

1. Copy `sqllib/conv/ms/0954ucs2.cnv` to `sqllib/conv/0954ucs2.cnv`
2. Restart DB2 UDB.

To replace the DB2 UDB default conversion tables for converting between CCSID 943 and Unicode, follow these steps:

1. Copy `sqllib/conv/ms/0943ucs2.cnv` to `sqllib/conv/0943ucs2.cnv`
2. Copy `sqllib/conv/ms/ucs20943.cnv` to `sqllib/conv/ucs20943.cnv`
3. Restart DB2 UDB.

Alternative Unicode conversion tables for the coded character set identifier (CCSID) 943

When using the Microsoft Japanese Windows Shift-JIS code page that is registered as the IBM coded character set identifier (CCSID) 943, you might encounter the following two problems when converting characters between CCSID 943 and Unicode. The potential problem is due to differences between the IBM and Microsoft code page conversion tables. To avoid these potential problems, DB2 UDB provides the alternate Microsoft conversion tables between CCSID 943 and Unicode, in addition to the default IBM conversion tables.

Problem 1:

For historical reasons, over 300 characters in the CCSID 943 code page are represented by two or three code points each. The use of input method editors (IMEs) and code page conversion tables cause only one of these equivalent code points to be entered. For example, the lower case character for Roman numeral one 'i' has two equivalent code points: X'EEEF' and X'FA40'. Microsoft Windows IMEs always generate X'FA40' when 'i' is entered. In general, IBM and Microsoft use the same primary code point to represent the character, except for the following 13 characters:

Table 5. CCSID 943 Shift-JIS code point conversion

Character name (Unicode code point)	IBM primary Shift-JIS code point	Microsoft primary Shift-JIS code point
Roman numeral one (U+2160)	X'FA4A'	X'8754'
Roman numeral two (U+2161)	X'FA4B'	X'8755'
Roman numeral three (U+2162)	X'FA4C'	X'8756'
Roman numeral four (U+2163)	X'FA4D'	X'8757'
Roman numeral five (U+2164)	X'FA4E'	X'8758'
Roman numeral six (U+2165)	X'FA4F'	X'8759'
Roman numeral seven (U+2166)	X'FA50'	X'875A'
Roman numeral eight (U+2167)	X'FA51'	X'875B'
Roman numeral nine (U+2168)	X'FA52'	X'875C'
Roman numeral ten (U+2169)	X'FA53'	X'875D'

Table 5. CCSID 943 Shift-JIS code point conversion (continued)

Character name (Unicode code point)	IBM primary Shift-JIS code point	Microsoft primary Shift-JIS code point
Parenthesized ideograph stock (U+3231)	X'FA58'	X'FA58'
Numero sign (U+2116)	X'FA59'	X'8782'
Telephone sign (U+2121)	X'FA5A'	X'8754'

IBM products such as DB2 UDB primarily use IBM code points, such as X'FA4A' to present the upper case Roman numeral one 'I', but Microsoft products use X'8754' to represent the same character. An Microsoft ODBC application can insert the 'I' character as X'8754' into a DB2 UDB database of CCSID 943, and the DB2 UDB Control Center can insert the same character as X'FA4A' into the same CCSID 943 database. However, ODBC applications can find only those rows that have 'I' encoded as X'8754', and DB2 UDB Control Center can locate only those rows that have 'I' encoded as X'FA4A'. To enable DB2 UDB Control Center to select 'I' as X'8754', you need to replace the default IBM conversion tables between CCSID 943 and Unicode with the alternate Microsoft conversion tables.

Problem 2:

The following list of characters, when converted from CCSID 943 to Unicode, will result in different code points depending on whether the IBM conversion table or the Microsoft conversion table is used. For these characters, the IBM conversion table conforms to the Japanese Industry Standard JISX0208, JISX0212, and JISX0221.

Table 6. CCSID 943 to Unicode code point conversion

Shift-JIS code point (character name)	IBM primary code point (Unicode name)	Microsoft primary code point (Unicode name)
X'815C' (EM dash)	U+2014 (EM dash)	U+2015 (Horizontal bar)
X'8160' (Wave dash)	U+301C (Wave dash)	U+FF5E (Fullwidth tilde)
X'8161' (Double vertical line)	U+2016 (Double vertical line)	U+2225 (Parallel to)
X'817C' (Minus sign)	U+2212 (Minus sign)	U+FF0D (Fullwidth hyphen-minus)
X'FA55' (Broken bar)	U+00A6 (Broken bar)	U+FFE4 (Fullwidth broken bar)

For example, the character EM dash with the CCSID 943 code point of X'815C' is converted to the Unicode code point U+2014 when using the IBM conversion table. However, it is converted to U+2015 when using the Microsoft conversion table. Due to this difference of conversion mapping, you might have two different code points for the same character in a DB2 UDB Unicode database. This can create potential problems for Microsoft ODBC applications because they would treat U+2014 as an invalid code point. To avoid this potential problem, you need to replace the default IBM conversion tables between CCSID 943 and Unicode with the alternate Microsoft conversion tables.

The use of the alternate Microsoft conversion tables between CCSID 943 and Unicode should be restricted to closed environments, where the DB2 UDB clients and the DB2 UDB databases all have a code page of CCSID 943 and are all using the same alternate Microsoft conversion tables. If you have a DB2 UDB client using the default IBM conversion tables, and another DB2 UDB client using the alternate

Microsoft conversion tables, and both clients are inserting data to the same DB2 UDB database of CCSID 943, the same character may be stored as different code points in the database.

Replacing the Unicode conversion tables for coded character set (CCSID) 943 with the Microsoft conversion tables

When you convert between CCSID 943 and Unicode, the DB2 Universal Database (DB2 UDB) default code page conversion tables are used. If you want to use a different version of the conversion tables, such as the Microsoft version, you must manually replace the default conversion table (.cnv) files.

Prerequisites:

Before replacing the existing code page conversion table files in the `sqllib/conv` directory, you should back up the files in case you want to change them back. On UNIX, `sqllib/conv` is linked to the DB2 UDB installation path.

Restrictions:

For conversion table replacement to be effective, every DB2 UDB client that connects to the same database must have its conversion table changed. Otherwise the different clients might store the same character using different code points.

Procedure:

To replace the DB2 UDB default conversion tables for converting characters between CCSID 943 and Unicode:

1. Copy `sqllib/conv/ms/0943ucs2.cnv` to `sqllib/conv/0943ucs2.cnv`.
2. Copy `sqllib/conv/ms/ucs20943.cnv` to `sqllib/conv/ucs20943.cnv`.
3. Restart DB2 UDB.

MVS operating system is not supported

Despite being mentioned in the documentation, the MVS™ operating system is no longer supported by DB2 Universal Database. MVS has been replaced with z/OS.

DB2 UDB for AIX 4.3.3 and 5.1 and above require AIX C++ Version 6 Runtime

DB2 UDB Version 8.1.4 and above for AIX Versions 4.3.3 and 5.1 and above require installation of the AIX C++ Version 6 Runtime libraries on your AIX system. Download the March 2003 C++ Runtime PTF update from the following Web site:

http://www-1.ibm.com/support/docview.wss?rs=0&q=xlC.rte&uid=swg24004427&loc=en_US&cs=utf-8&cc=us&lang=en

Follow the installation instructions given at the previously listed Web site before using DB2 Version 8.1.4 or later.

Backup and restore operations (Linux 390)

Backup and restore operations to and from multiple tape devices might not work if you are using the Linux 390 operating system.

Enabling view docking when accessing the Development Center with Hummingbird Exceed

When accessing the Development Center on UNIX with Hummingbird® Exceed, the XTEST extension version 2.2 must be enabled before you can move and dock views by dragging their title bars within the Development Center.

To enable the XTEST extension:

1. From the Start menu, select **Programs** –> **Hummingbird Connectivity 7.0** –> **Exceed** –> **XConfig**. The XConfig window opens.
2. Optional: If your configuration requires a password, enter the XConfig password.
3. Double click the **Protocol** icon. The Protocol window opens.
4. Select the **X Conformance Test Compatibility** checkbox.
5. In the **Protocol** window, click the **Extensions...** button. The Protocol Extensions window opens.
6. In the Enable Extensions list, select the **XTEST(X11R6)** checkbox.
7. Click **OK**.

Installation, migration, upgrade, and configuration information

Hardware and software requirements

Hardware and software requirements can be viewed at the following Web site:

http://www.ibm.com/software/data/db2/udb/sysreqs.html

Installation notes

On UNIX and Linux platforms, these Installation notes apply to installation of new products only. To apply a FixPak, see the FixPak's Readme.

On Windows platforms, these Installation notes apply to both the installation of new products and the application of FixPaks. If you are applying a FixPak, these Installation notes should be used in conjunction with the FixPak Readme.

Review this entire section before installing DB2 UDB.

Directory path cannot contain blanks (Linux and UNIX)

If the db2setup program is run from a directory whose path includes a blank, the setup will fail with the following error:

```
<file>: not found
```

Place the installable image in a directory whose path does not include spaces.

JDK levels for DB2 UDB (Linux on IA64 and Linux on PowerPC)

When you install version 8.2 of DB2 Universal Database on Linux, the RPM-based installation attempts to install the IBM Java RPM (IBMJava2–SDK-1.4.1.-2.0.i386.rpm).

Note: DB2 UDB on Linux IA64 only supports Java 1.3.1. For the most recent Linux SDK information, see the IBM developer kit for Linux Web page at http://www.ibm.com/developerworks/java/jdk/linux/tested.html.

If a later level of the RPM (such as IBMJava2-SDK-1.5.0.-2.0.i386.rpm) already exists, the back-level RPM is not installed.

However, in this case, the installation leaves the JDK_PATH database configuration parameter pointing to the Java 1.4 path, /opt/IBMJava2-14/. As a result, none of the Java-dependant functionality, including the installation of the DB2 Tools Catalog, will work.

Prerequisite:

You must run the following command as the instance owner.

Procedure:

1. To point DB2 UDB to the correct IBM Developer Kit, run the following command:

   ```
   db2 update dbm cfg using JDK_PATH path
   ```

   where *path* the 1.5 install path, such as /opt/IBMJava2-15.

Uncompressing installation images (Linux and UNIX)

Some installation images are delivered in compressed or gzipped format on the product CDs. Before you can install DB2 UDB from these formats, you need to copy the installation image to a temporary directory and uncompress or gunzip the installation image.

The compressed or gzipped installation images on the CD have the file name PRODUCT.tar.Z or PRODUCT.tar.gz, where PRODUCT is the DB2 product you are installing. For example, if you are installing DB2 Enterprise Server Edition, the compressed image on the relevant CD might be called either ese.tar.Z or ese.tar.gz.

In addition to the software disk requirements, you must have a filesystem with 2 gigabytes of free space to contain the tar.Z or tar.gz file and the uncompressed installation image.

Procedure:

To uncompress the installation images, perform the following steps:

1. Copy the compressed or gzipped installation image to a temporary file system containing at least 2 gigabytes of free space.
2. Change to the directory where you copied the installation image by entering **cd /TMP**, where /TMP represents the directory where you copied the compressed image.
3. If the product has the *.tar.Z extension, enter the following command to uncompress the installation image:

   ```
   zcat PRODUCT.tar.Z | tar -xvf -
   ```

   where PRODUCT is the DB2 product you are installing.
4. If the product has the *.tar.gz extension, enter the following command to uncompress the installation image:

   ```
   gunzip -c PRODUCT.tar.gz | tar -xvf -
   ```

   where PRODUCT is the DB2 product you are installing.

Notes:

a. gunzip is part of the AIX 5L™ default installation setup. If you do not have gunzip, install the rpm.rte fileset from the AIX 5L installation media. The rpm.rte fileset contains gunzip.

b. You can also download gzip for AIX 5L, which includes gunzip, from http://www.ibm.com/servers/aix/products/aixos/linux/rpmgroups.html.

5. To perform the installation using the DB2 Setup wizard, see the *Installing DB2 UDB from installation images (Linux and UNIX)* section.

DB2 UDB does not allow non-English installation path (Windows)

During DB2 UDB installation on Windows, you can enter the directory path for DB2 UDB. However, the directory path name you enter can contain only English characters.

Downloading and uncompressing FixPaks for multiple products (Windows)

Starting with DB2 Version 8 for Windows Fixpak 3, IBM is providing product-specific FixPaks instead of one general FixPak. This change affects only DB2 Version 8 products on Windows platforms.

For example, if you have DB2 UDB Enterprise Server Edition Version 8 and DB2 Spatial Extender Version 8 installed on the same Windows system, you must download the DB2 UDB Enterprise Server Edition FixPak image and the Spatial Extender FixPak image. You must uncompress each image under a common parent directory. All images must be uncompressed for the GUI installation or silent installation to proceed.

For complete FixPak installation instructions, see the latest DB2 UDB FixPak Readme.

Installing DB2 UDB from installation images (Linux and UNIX)

Prerequisites:

Before you start the DB2 Setup wizard:

- Ensure your system meets installation, memory, and disk requirements. See the *Hardware and software requirements* section.
- Ensure you have read the Installation Prerequisites. The file install.txt or install.htm is located on the CD at: */cdrom*/doc/*language*/ where:
  - *cdrom* refers to the mount point
  - *language* refers to the language directory consisting of a five-character code.
- You require root authority to perform the installation.
- The DB2 product CD must be mounted on your system.

Procedure:

If the installation images are delivered in compressed or gzipped format on the product CDs, you must uncompress or gunzip the installation image before you can install DB2 UDB. See the *Uncompressing installation images (Linux and UNIX)* section for details.

To perform the installation using the DB2 Setup wizard, enter the following command:

```
./PRODUCT/db2setup
```

where PRODUCT is the DB2 product you are installing. For example, if you are installing DB2 Enterprise Server Edition, enter ./ese/db2setup.

The installation Launchpad opens. Proceed through the installation panels.

Installing DB2 UDB from installation images (Windows)

Prerequisites:

Before you start the DB2 Setup wizard:

- Ensure your system meets installation, memory, and disk requirements. See the *Hardware and software requirements* section.
- Ensure you have read the Installation Prerequisites. The file install.txt or install.htm is located on the CD at: *x*:\doc*language*\ where:
  - *x* represents the CD drive
  - *language* refers to the language directory consisting of a five-character code.
- You must have a local Administrator user account with the recommended user rights to perform the installation.

To perform the installation using the DB2 Setup wizard, insert the CD into the drive. If enabled, the auto-run feature automatically starts the DB2 Setup launchpad.

Procedure:

If the auto-run feature is not enabled, you can start the DB2 Setup wizard manually:

1. Click **Start** and select the **Run** option.
2. In the **Open** field, enter the following command:

   ```
   x:\setup /i language
   ```

   where:
   - *x:* represents the CD drive
   - *language* is the territory identifier for your language (for example, EN for English).

   The /i language parameter is optional. If it is not specified, the DB2 Setup wizard runs in the same language as your operating system.
3. Click **OK**. The DB2 Setup launchpad opens.

Proceed through the installation panels.

Disk space required for a DB2 UDB response file installation

When you install a DB2 UDB product using a response file, 1 MB of free disk space is required in the etc directory.

If you receive error message DBI1191I during a response file installation, the message indicates there is not enough free disk space in the root directory. This message is misleading. Check the amount of free disk space in the etc directory. A minimum of 1 MB of free disk space is required before re-running the installation.

Restrictions to adding products using the db2setup command (Linux, UNIX)

Once a DB2 product has been installed, additional DB2 products can be added. If you use the **db2setup** command to add products the following recommendations and restrictions apply.

Recommendations:

Both the installed product and the product being added should be at the same code level. For example, DB2 UDB ESE Server Version 8 FixPak 5 is already installed and you want to add the DB2 Information Integrator product. In this case, DB2 Information Integrator should also be at the Version 8 FixPak 5 level.

Restrictions:

- If the DB2 fixpak level is higher than the fixpak level of the product being added, the combination is allowed. However, since the fixpak level of the product being added is lower than the DB2 fixpak level, the DB2 fixpak level must be reapplied after installing the additional product. See the appropriate FixPak Readme for instructions to reapply the fixpak.
- If the DB2 fixpak level is lower than the fixpak level of the product being added, an error is generated. The product being added cannot be at a higher fixpak level than DB2 UDB. In this case, you must first bring DB2 UDB to the appropriate level, then install the additional product. See the appropriate FixPak Readme for instructions.

The following table summarizes the db2setup combinations:

Table 7. db2setup combinations

DB2 fixpak level	Additional product fixpak level	Is this combination permitted?
Version 8 FixPak 3	Version 8 FixPak 3	Yes. This is recommended.
Version 8 FixPak 3	Version 8 GA	Yes, but Version 8 FixPak 3 must be reapplied. See the appropriate FixPak Readme for instructions to reapply the fixpak by going to the DB2 Support Web site.
Version 8 FixPak 3	Version 8 FixPak 5	No. DB2 must first be brought to the higher fix pack level (in this example, Version 8 FixPak 5) before installing the additional product. See the appropriate FixPak Readme for instructions to install the required Version 8 FixPak by going to the DB2 Support Web site.

The DB2 Support Web site address is
http://www.ibm.com/software/data/db2/udb/winos2unix/support

DB2 Web Tools

The application servers supported by DB2 Web Tools for the following languages are required to be compliant with the Servlet 2.3 specification:

- Japanese
- Korean
- Simplified Chinese
- Traditional Chinese
- Russian

- Polish

Binding Query Patroller packages after applying fixpaks

If you have Query Patroller installed, after applying a fixpak and performing all post-fixpak installation tasks, perform the following steps:

1. Log in as a user with DBADM authority.
2. Change to the proper directory:
   - `INSTPATH/bnd` (Linux and UNIX)
   - `INSTPATH\bnd` (Windows)

   where INSTPATH is the DB2 UDB instance path.
3. Run the following commands:

```
db2 connect to dbname
db2 bind @qpserver.lst blocking all grant public
```

Query Patroller installation at FixPak 3 level or later

Query Patroller is a query management system used to control the flow of queries against your DB2 UDB database. In DB2 UDB Version 8.1.2, DB2 Query Patroller became a stand-alone product. It is no longer a component of the DB2 Warehouse Manager.

If you have DB2 UDB Version 8 FixPak 3 or later installed and you install the DB2 Query Patroller™ base or GA version, you must reapply DB2 UDB FixPak 3 or later. Otherwise, the Query Patroller changes are not applied to the DB2 UDB FixPak level you are at.

If you are installing the Query Patroller server, you must also update the DB2 UDB instances after reapplying the DB2 UDB FixPak level. The instances must be restarted after they are updated.

Query Patroller server installation

When you are installing Query Patroller server note the following:

- If you select **Computer usage based** from the **Select the installation type** window using the DB2 Setup wizard, and you select **Server** from the **Select how this computer will be used** window, the Query Patroller Center will not be installed. If you want to install the Query Patroller Center, select either the **Complete** or the **Custom** installation types from the **Select the installation type** window.
- The *DB2 Query Patroller Guide* uses installation panels from the Computer usage based installation type to illustrate how to install Query Patroller server using the DB2 Setup wizard. You do not have to use the Computer usage based installation type to install Query Patroller server. You can use either the Complete or the Custom installation types to install Query Patroller server.
- DB2 Clients which have Query Patroller Client Tools installed must connect to a partition that has the Query Patroller server installed. In a typical partitioned database environment, the Query Patroller server is installed on all partitions, so you can choose any partition to be the coordinator partition and still be able to use the Query Patroller client tools.

Defining a new database partition group in Query Patroller

When you define a new table space during Query Patroller installation in a partitioned environment, you can select an existing database partition group. Alternatively, you can set up a new database partition group for the new table space. If you choose to set up a new database partition group, you can select only one database partition from the list box on the install panel for that new database

partition group. If you want to add additional partitions into the new database partition group, you must add them manually after the installation is complete.

Query Patroller client tools installation

DB2 clients do not require the Query Patroller client tools to be installed on them in order to submit queries to the Query Patroller server.

Recreating beta versions of spatial databases

If you created spatial databases in a beta version of DB2 Geodetic Extender Version 8.2, you must recreate them in the official version of Geodetic Extender Version 8.2.

Installing MDAC files for national language versions of DB2 UDB

If you do not install the national language version of Microsoft Data Access Components (MDAC) 2.7 prior to installing the national language version of DB2 UDB Version 8.2, DB2 Universal Database installs English MDAC files by default. This installation causes the Windows ODBC Data Source Administrator panels to appear untranslated if your operating system is in a language other than English. To fix this problem, install the "MDAC 2.7 RTM - Refresh" bundle from the Microsoft Web site at http://msdn.microsoft.com/data/downloads/updates/default.aspx. Choose the language that you want to install, download the required executable file, and run it. This procedure installs the translated ODBC Data Source Administrator files.

DB2 license policy for DB2 Universal Database Workgroup Server Edition

The Internet license policy is not valid for DB2 Universal Database Workgroup Server Edition. If you require a license for Internet users, you need to purchase DB2 Universal Database Workgroup Server Unlimited Edition.

Installing additional Asian fonts (Linux)

IBM offers additional font packages for Linux that contain additional double-byte character set (DBCS) support for Asian characters. These font packages are necessary with some versions of Linux that install only the fonts required to display the country-specific or region-specific characters.

If you run the **db2setup** command and find missing characters in the DB2 setup wizard interface, it is likely that your Linux system does not have all the necessary fonts installed. To enable the **db2setup** command to properly refer to the fonts embedded in the installation CD, perform the following task:

1. Enter the following command:

   ```
   export JAVA_FONTS=/<cdrom>/db2/<linux_platform>/java/jre/lib/fonts
   ```

   where <cdrom> is the location of the install image and <linux_platform> is a directory name with a *Linux* prefix.
2. Re-run the **db2setup** command.

If you notice missing characters when using the DB2 GUI tools after installation, install the necessary fonts provided with the DB2 product. These fonts can be found in the `fonts` directory on any of the following CDs:

- *IBM Developer Kit, Java Technology Edition (64-bit) for AIX 5L*
- *DB2 Embedded Application Server and applications (XML registry, Web Administration tools and Java distributed debugger)* for your operating system

In the `fonts` directory, there are two typefaces available: Times New Roman WorldType and Monotype Sans Duospace WorldType. For each typeface, there is a country-specific or region-specific font. The following table lists the eight fonts

provided in compressed format in the `fonts` directory.

Table 8. File names for additional Asian fonts

Font typeface	Font file name	Country or Region
Times New Roman WT J	tnrwt_j.zip	Japan and other countries or regions
Times New Roman WT K	tnrwt_k.zip	Korea
Times New Roman WT SC	tnrwt_s.zip	China (Simplified Chinese)
Times New Roman WT TC	tnrwt_t.zip	Taiwan (Traditional Chinese)
Monotype Sans Duospace WT J	mtsansdj.zip	Japan and other countries or regions
Monotype Sans Duospace WT K	mtsansdk.zip	Korea
Monotype Sans Duospace WT SC	mtsansds.zip	China (Simplified Chinese)
Monotype Sans Duospace WT TC	mtsansdt.zip	Taiwan (Traditional Chinese)

Note: These fonts do not replace the system fonts. These fonts are to be used in conjunction with or for use with DB2 Universal Database. You cannot engage in the general or unrestricted sale or distribution of these fonts.

Procedure:

To install an additional Asian font:

1. Unzip the font package.
2. Copy the font package to the `/opt/IBMJava2-141/jre/lib/fonts` directory. You need to create the directory if it does not already exist.
3. Enter the following command:

   ```
   export JAVA_FONTS=/opt/IBMJava2-141/jre/lib/fonts
   ```

As a minimum, you need to install one font of each typeface for your country or region. If you are in China, Korea, or Taiwan, use the country-specific or region-specific versions; otherwise, use the Japanese version of the fonts. If you have space on your system, install all eight fonts.

Configuring the Development Center to use Java Development Kits (Linux)

In some cases, DB2 UDB does not install a Java Development Kit on the client operating system. To use the Development Center to develop Java stored procedures on these clients, you must point the Development Center to the location of an installed Java Development Kit .

Follow these steps to identify the location of a Java Development Kit:

1. In Development Center, select the **Project** –> **Environment Settings** menu item.
2. In the Environment Settings notebook, select the **Process** node.
3. In the **Java Home** section of the Process page, select the **JDK level** that will be used to build and run Java stored procedures.
4. In the **Directory** field, specify a directory path that exists or is accessible on the client where the selected JDK is installed.

5. If the client computer is used to develop Java stored procedures on multiple DB2 servers, you might need to select additional JDK levels and specify their installed locations, depending on which JDK levels are used by these servers.

On the DB2 server, the Java Development Kit installation might not have linked some Java libraries into the system `/usr/lib` subdirectory. These links are needed to build and run Java stored procedures.

The following example shows how to create the links to a Java Development Kit on a Linux client:

```
 # Setup the links to the .so files
cd /usr/lib
ln -s /opt/IBMJava2-131/jre/bin/libhpi.so
ln -s /opt/IBMJava2-131/jre/bin/libjava.so
ln -s /opt/IBMJava2-131/jre/bin/libjitc.so
ln -s /opt/IBMJava2-131/jre/bin/libxhpi.so
ln -s /opt/IBMJava2-131/jre/bin/libzip.so
ln -s /opt/IBMJava2-131/jre/bin/classic/libjvm.so
```

Creating group and user IDs on United Linux 1.0 and SuSE Linux distributions

To create group and user IDs for a DB2 UDB Version 8.2 installation on United Linux 1.0 and SuSE Linux distributions, use the `groupadd` and `useradd` commands, respectively. The version 8.2 *Installation and Configuration Supplement* incorrectly documents the `mkgroup` and `mkuser` commands to create group and user IDs, respectively.

Help system daemon does not start after installing with the db2_install command (UNIX)

If you are installing the DB2 Information Center on UNIX platforms using the db2_install command, the help system daemon (db2icd) does not start following the installation. You need to manually start the help system daemon or restart your computer to access the documentation.

See the topic titled "DB2 Information Center daemon" in the **Documentation updates | Installation and configuration** section of the *Version 8.2 Release Notes*.

Ready for Tivoli enablement (UNIX)

When you purchase an IBM software product that carries the Ready for Tivoli® logo, you can manage your IBM software products through various Tivoli offerings. The Tivoli products allow you to automatically discover, monitor, and inventory one or more Ready for Tivoli applications.

IBM software products that are Ready for Tivoli can be managed through products such as IBM Tivoli Configuration Manager. IBM Tivoli Monitoring for Databases provides support for all leading databases including DB2 UDB, Oracle, and Informix®.

For additional information, point your browser to the IBM Web site at http://www.tivoli.com/products/tivoli_ready/

Ready for Tivoli Instrumentation and DB2 UDB Version 8:

To install and configure your instrumentation, have your Tivoli administrator do the following:

1. The Tivoli Ready signature file for this DB2 product is named xxx.sys. As of FixPak 4 these signature files will be refreshed per FixPak instead of per version release. Confirm the signature files are installed in the directory:

   ```
   %install DB2DIR%/tivready
   ```

2. Install and configure Tivoli GEM 2.2 Tivoli Ready enablement on all the computers that you intend to monitor. To download Tivoli Ready enablement and detailed installation and use instructions, point your browser to http://www.tivoli.com/support/tme10gem/tivoli-ready
3. Advanced database manageability is achieved through IBM Tivoli Monitoring for Databases. The ITM for Databases product uses the new advanced edition Distributed Monitoring product (called IBM Tivoli Monitoring or ITM) and provides significant enhancement in monitoring capability based on the use of this new monitoring engine. ITM for Databases provides DB2 UDB support through a Proactive Analysis Component (PAC). This PAC is tightly integrated with DB2 UDB and provides an out-of-the-box set of monitors for quick deployment and activation. Custom monitors, thresholds, and tasks can also be defined by the DBA.

   Additional information available at:
   http://www.tivoli.com/products/index/monitor-db/

Information on other Tivoli products is available at:
http://www.tivoli.com/products/index/

Installation image reduction tool (Windows)

The db2iprune command line utility can reduce the size of your DB2 UDB Windows product installation image. The tool is particularly useful for large scale deployments of DB2 UDB. The tool is also useful for embedding DB2 UDB within an application.

The db2iprune tool consists of an input file and an executable file. The input file (.prn), contains a full list of removable components and is used to indicate which features and languages you would like to remove from the installation image. The db2iprune executable file (db2iprune.exe) then removes the cabinet files associated with those features and languages. The result is a new, smaller DB2 UDB image that can be installed using the regular installation methods. Fixpaks are also applied using the regular methods. When the fixpak is installed it detects and updates only the components that were installed using db2iprune.

The db2iprune tool is located in the `\db2\windows\utilities\db2iprune` directory on your DB2 UDB product installation CD. This directory also contains a Readme file. Refer to the db2iprune Readme for detailed instructions on how to use db2iprune.

DB2 Universal Database, Version 8 HTML documentation installation restriction (Windows)

On Windows, do not install the DB2 Universal Database, Version 8 HTML documentation on a workstation or server where a DB2 Universal Database, Version 7 (or earlier) product is already installed. The installer detects the earlier version and removes the earlier product.

Previous installations updated to the latest level (Windows)

If you have a DB2 product that is installed at an earlier Version 8 level, the installation image detects this and updates the product to the latest level.

System requirements for the DB2 .NET Data Provider (Windows)

Before using the DB2 UDB installation program to install the DB2 .NET Data Provider, you must have the .NET Framework already installed on the computer. If the .NET Framework is not installed, the DB2 UDB installation program will not register the DB2 .NET Data Provider.

If DB2 UDB is installed and the .NET Framework is not installed, the DB2 .NET Data Provider is not registered. If the .NET Framework is installed at a later date, you can run the db2nmpreg executable to register the provider. This executable resides in the sqllib\bin directory. There are no parameters.

To register DB2 .NET Data Provider, enter db2nmpreg from any command window.

Installing DB2 Version 8 Clients and DB2 Connect PE as a non-Administrator (Windows)

When installing a DB2 Administration client, DB2 Application Development client, or DB2 Connect Personal Edition, you must update your Windows TCP/IP services file if the following conditions apply:

- The data warehousing feature is selected in the installation setup
- The user ID performing the installation is not a member of the Administrators group on the target computer
- The product is being installed on any one of the following operating systems: Windows NT®, Windows 2000, Windows XP, or Windows Server 2003.

If all of the these conditions apply, the following entries need to be added to the Windows TCP/IP services file:

Table 9. Entries required in Windows TCP/IP services file

Port name	Port number
vwkernel	11000/tcp
vwd	11001/tcp
vwlogger	11002/tcp

Without these entries, the Data Warehouse Center will not function properly.

Migration notes

Migrating DB2 UDB (Windows)

The following steps show the correct order for the migration prerequisites for DB2 UDB on Windows.

Prerequisites:

Before migrating:

1. Review the migration recommendations, restrictions, and space recommendations.
2. Record configuration settings before DB2 migration.
3. Change the diagnostic error level.
4. Verify that databases are ready for DB2 migration.
5. Back up your databases.
6. If you are using replication, you must archive all of the DB2 log files.
7. You must have SYSADM authority.

8. Take the DB2 server offline for DB2 migration.

Migrating DB2 Universal Database when using DataJoiner or replication

If you want to migrate an instance of DataJoiner® or DB2 Universal Database for Linux, UNIX, and Windows on which you are running the Capture or Apply programs for DB2 Universal Database replication, you must prepare to migrate your replication environment before you migrate the DB2 Universal Database or DataJoiner instance. Detailed instructions for carrying out the required preparation are included in the migration documentation for DB2 DataPropagator™, Version 8. You can find migration documentation for DB2 DataPropagator, Version 8 at http://www.ibm.com/software/data/dpropr/.

Migrating a DB2 Version 8 Windows 32–bit database to Windows 64-bit

This topic lists the steps for migrating your 32–bit DB2 Version 8 database on a 32–bit computer to a 64–bit database on a 64–bit Windows operating system.

Prerequisites:

- A 64-bit version of DB2 Version 8 must be installed on your 64-bit computer.
- Ensure that your 32-bit Windows system is running DB2 Version 8.

Procedure:

To migrate to DB2 Version 8 on Windows 64-bit:

1. Backup your DB2 Version 8 databases on your 32-bit Windows system.
2. Restore your DB2 Version 8 backup (created in step #1) on your 64-bit Windows system.

Note: In addition to migrating DB2 UDB from 32-bit systems to 64-bit systems, the following migrations are also possible:

- Migrating between versions of Windows
- Migrating between versions of DB2 UDB
- Migrating everything at once
- Migrating back to 32–bit

Detailed information is available in the following IBM Redbook: Scaling DB2 UDB on Windows Server 2003. This Redbook can be found at the following URL:

http://publib-b.boulder.ibm.com/Redbooks.nsf/RedbookAbstracts/sg247019.html

Migrating XML Extender from previous versions

If you are using an earlier version of DB2 XML Extender, you must migrate each database that is enabled for XML Extender before you use an existing XML-enabled database with the updated XML Extender release. Each new fix pack contains all of the previous fix packs' updates.

Before running the migration program, create a backup of the database.

To migrate an XML enabled database and XML enabled columns, complete the following steps.

1. From the DB2 Command Line, enter:

```
db2 connect to database_name
db2 bind dxxinstall/bnd/@dxxMigv.lst
db2 bind dxxinstall/bnd/@dxxbind.lst
```

where *dxxinstall* is the directory path in which you installed DB2 Universal Database .

2. From the DB2 Command Line, enter:

```
dxxMigv database_name
```

Database migration (HP-UX on IA64)

Database migration is not supported for DB2 UDB for HP-UX on IA64 throughout the Version 8.x releases.

Restoring a Version 7 DB2 backup image to a Version 8 instance is not supported on DB2 UDB for HP-UX on IA64.

Uninstallation information

Uninstalling DB2 UDB silently (Windows)

To remove DB2 products silently using the **msiexec** command:

```
msiexec /x <product_code> /qn
```

where <product code> represents the code for the product you want to remove.

Here is a list of the DB2 product codes:

DB2 Universal Database Enterprise Server Edition (ESE)
{D8F53726-C7AD-11D4-9155-00203586D551}

DB2 Universal Database Workgroup Server Edition (WSE)
{7A28F948-4945-4BD1-ACC2-ADC081C24830}

DB2 Universal Database Express Edition (EXP)
{58169F10-CA30-4F40-8C6D-C6DA8CE47E16}

DB2 Universal Database Personal Edition (PE)
{C0AA883A-72AE-495F-9601-49F2EB154E93}

DB2 Warehouse Manager (WM)
{84AF5B86-19F9-4396-8D99-11CD91E81724}

DB2 Data Links Manager (DLM)
{1D16CA65-F7D9-47E5-BB26-C623A44832A3}

Relational Connect (RCON)
{273F8AB8-C84B-4EE6-85E7-D7C5270A6D08}

DB2 Connect Enterprise Edition (CEE)
{9C8DFB63-66DE-4299-AC6B-37D799A728A2}

DB2 Connect Personal Edition (CPE)
{F1912044-6E08-431E-9B6D-90ED10C0B739}

DB2 Administration Client (ADMCL)
{ABD23811-AA8F-416B-9EF6-E54D62F21A49}

DB2 Application Development Client (ADCL)
{68A40485-7F7F-4A91-9AB6-D67836E15CF2}

DB2 Run-Time Client (RTCL)
{63F6DCD6-0D5C-4A07-B27C-3AE3E809D6E0}

DB2 Run-Time Client Lite (RTLITE)
{07C9CEE7-4529-4E60-95D3-6B6EF6AC0E81}

DB2 Eclipse Documentation (DOCE)
{FE2D4758-041C-4E4E-95B3-529E4E1EAF3E}

DB2 Query Patroller (QP)
{7A8BE511-8DF3-4F22-B61A-AF0B8755E354}

Life Sciences Data Connect (LSDC)
{DD30AEB3-4323-40D7-AB39-735A0523DEF3}

DB2 Cube Views (CUBE)
{C8FEDF8F-84E8-442F-A084-0A0F6A772B52}

DB2 Spatial Extender (SE)
{F6846BF9-F4B5-4BB2-946D-3926795D5749}

Example:

If you want to remove DB2 UDB Enterprise Edition, enter the following command

```
msiexec /x <product_code> /qn
```

The following DB2 product codes are no longer supported in DB2 UDB Version 8.2:

- WMC {5FEA5040-22E2-4760-A88C-73DE82BE4B6E}
- DOC {73D99978-A255-4150-B4FD-194ECF4B3D7C}

Product code for DB2 Information Center removal using a silent uninstall (Windows)

When removing the DB2 Information Center using a silent uninstall on Windows, use the following product code:

```
{FE2D4758-041C-4E4E-95B3-529E4E1EAF3E}
```

Limitations

IMPORT REPLACE does not honor the Not Logged Initially clause

The IMPORT command's REPLACE option does not honor the CREATE TABLE statement's NOT LOGGED INITIALLY (NLI) clause or the ALTER TABLE statement's ACTIVATE NOT LOGGED INITIALLY clause.

If an import with the REPLACE action is performed within the same transaction as a CREATE TABLE or ALTER TABLE statement where the NLI clause is invoked, the import will not honor the NLI clause. All inserts will be logged.

Workaround 1
Delete the contents of the table using the DELETE statement, then invoke the import with INSERT statement.

Workaround 2
Drop the table and recreate it, then invoke the import with INSERT statement.

This limitation applies to DB2 UDB Version 7 and DB2 UDB Version 8.

Data export with ODBC to file warehouse program

The Data export with ODBC to file warehouse program does not support the following Sybase data types:

- BIT
- BINARY
- VARBINARY

Structured types in the Development Center

The Development Center no longer supports the creation of structured types.

Development Center limitations for 64–bit operating systems

Debugging of Java stored procedures against a 64-bit server is not supported by the Development Center. Debugging SQL stored procedures is supported on 64-bit Windows operating systems. Developing OLE DB or XML User Defined Functions is not supported for 64-bit servers.

Development Center (Linux)

You cannot use the Development Center to debug Java stored procedures running on any of the Linux distributions (32–bit, 64–bit, Intel, zSeries®, or iSeries™).

Debugging stored procedures with double quotation marks

The Development Center does not support debugging for any stored procedure with double quotation marks (") in the stored procedure name, schema, or specific name.

Path settings needed to enable Java routines to compile in the Development Center

The Development Center cannot compile Java routines unless it knows where your developer kit versions are installed. Default directories for your developer kit versions are written to your `$HOME/.ibm/db2/dc/DB2DC.settings` file when the Development Center starts for the first time. You can copy these directories into your `$USER.settings` file and modify them with a Unicode editor, or you can create symbolic links to your developer kit directories in the default locations.

Development Center limitations to run and debug Java stored procedures simultaneously

The Development Center does not support running and debugging Java stored procedures simultaneously. In the Development Center, you can either run multiple Java stored procedures at the same time or debug a single Java stored procedure; you cannot run a Java stored procedure while debugging another Java stored procedure. By default, the KEEPFENCED database manager configuration keyword is set to KEEPFENCED=YES as required for debugging SQL stored procedures. When the keyword KEEPFENCED has the default value YES, the routine process is kept active and JVM port conflicts will occur. Java stored procedures will cause a JVM exception and will fail in any of the following circumstances when the default KEEPFENCED=YES database manager configuration setting is used:

- Building a Java stored procedure in the Development Center then debugging it
- One user running a Java stored procedure and another user debugging a Java stored procedure while the initial Java stored procedure is still running

- One user debugging a Java stored procedure and another user running a Java stored procedure while the initial Java stored procedure is being debugged

To work around this limitation, ensure that the KEEPFENCED database manager configuration keyword is set to KEEPFENCED=NO by running the following commands:

```
db2 update dbm cfg using KEEPFENCED NO
db2stop
db2start
```

When KEEPFENCED is set to NO, the db2fmp process will shut down when a Java stored procedure call is finished, and DB2 UDB will start a new db2fmp process to handle the next routine call. This ensures that there will be no existing JVM in debug mode when you start to debug a Java stored procedure.

The KEEPFENCED=YES setting is required to build SQL stored procedures for debugging and to debug SQL stored procedures. When KEEPFENCED=NO, you can still build and execute SQL stored procedures but you cannot debug them.

Cursors in PHP applications

When the PHP interpreter creates a cursor on behalf of an application, it is created by default as a Scrollable Keyset-driven cursor. In certain cases, this might cause unexpected results to be returned. In order to avoid this situation, explicitly specify the "FOR READ ONLY" clause for all SELECT statements that are used to update data. Other alternatives include setting the CLI Configuration parameters "Patch2=6", "Patch2=42", or "DisableKeysetCursor=1". However, each of these might have other consequences. Refer to the *CLI Guide and Reference* documentation for details regarding these configuration keywords.

Four unsupported SQL administrative routines

The following SQL administrative routines are not supported in this release:

- APP procedure
- INSTALLAPP procedure
- SERVER procedure
- UNINSTALLAPP procedure

Bind option limitations for CLI packages

Some bind options might not take effect when binding CLI packages with any of the following list files: `db2cli.lst`, `ddcsmvs.lst`, `ddcs400.lst`, `ddcsvm.lst`, or `ddcsvse.lst`. Because CLI packages are used by CLI, ODBC, JDBC, OLE DB, .NET, and ADO applications, any changes made to the CLI packages affect all applications of these types. Only a subset of bind options are therefore supported by default when binding CLI packages. The supported options are: ACTION, COLLECTION, CLIPKG, OWNER, and REPLVER. All other bind options that impact CLI packages are ignored.

To create CLI packages with bind options that are not supported by default, specify the COLLECTION bind option with a collection ID that is different from the default collection ID, NULLID. Any bind options specified are then accepted. For example, to create CLI packages with the KEEPDYNAMIC YES bind option, which is not supported by default, issue the following command:

```
db2 bind @db2cli.lst collection newcolid keepdynamic yes
```

In order for CLI/ODBC applications to access the CLI packages created in the new collection, set the CurrentPackageSet CLI/ODBC keyword in the `db2cli.ini` initialization file to the new collection ID.

To overwrite CLI packages that already exist under a particular collection ID, perform either of the following actions:

- Drop the existing CLI package before issuing the bind command for this collection ID
- Specify the ACTION REPLACE bind option when issuing the bind command

CLI LOAD restriction for specifying column names

If the INSERT statement supplied to the CLI LOAD utility includes a VALUES clause, target columns cannot be specified. For example, the following statement is supported by CLI LOAD:

```
INSERT into tableA VALUES (?, ?, ?)
```

This statement, however, that specifies target columns is not supported for use with the CLI LOAD utility:

```
INSERT into tableA (col1, col2, col3) VALUES (?, ?, ?)
```

Failures when reporting a successful login during a connection attempt (AIX)

When using OS authentication on AIX, DB2 UDB attempts to report a successful login to AIX upon successful authentication during a connection attempt. Prior to Version 8 FixPak 5, if DB2 UDB was unable to report a successful login, the connection would fail despite the user being authenticated. Starting with Version 8 FixPak 5, the connection is allowed to continue and the failure is logged in the `db2diag.log` file.

SNA support limitations in Version 8

The following support has been withdrawn from DB2 Universal Database Enterprise Server Edition (ESE) Version 8 for Windows and UNIX operating systems, and from DB2 Connect Enterprise Edition (CEE) Version 8 for Windows and UNIX operating systems:

- Multisite update (two-phase commit) capability using SNA cannot be used. Applications that require multisite update (two-phase commit) *must* use TCP/IP connectivity. Multisite update (two-phase commit) using TCP/IP to a host or iSeries database server has been available for several releases. Host or iSeries applications that require multisite update (two-phase commit) support can use the new capability of TCP/IP multisite update (two-phase commit) support within DB2 Universal Database ESE, Version 8.
- DB2 Universal Database ESE or DB2 CEE servers no longer accept client connections using SNA. As of version 8, FixPak 1, DB2 Universal Database allows the 32-bit version of AIX, Solaris Operating Environment, HP-UX, and Windows applications to access host- or iSeries database servers using SNA. This support allows applications access to host or iSeries database servers using SNA, but using only one-phase commit.
- Sysplex support with DB2 Universal Database for z/OS is only available using TCP/IP. Sysplex support is not provided using SNA connectivity.
- Change password support is no longer available using SNA connectivity to host database servers.

- All SNA support will be withdrawn in the next version of DB2 Universal Database and DB2 Connect.

Tools catalog database creation not supported (Linux AMD64)

The creation of the tools catalog database under a 64-bit DB2 UDB instance on Linux (AMD64) is not supported. Do not attempt to create the tools catalog under a 64-bit instance using any of the following methods:

- Installing DB2 UDB
- Updating a 64-bit instance using the **db2isetup** command
- Issuing the **CREATE TOOLS CATALOG** CLP command after the installation is finished.

The creation of the tools catalog database under a 32-bit instance on Linux (AMD64) is supported as of Version 8.1.4.

Tools catalog database creation not supported (AIX, Solaris Operating Environments, and HP-UX)

The creation of the tools catalog is not supported during the installation of DB2 UDB against 64-bit instances on the hybrid 64-bit platforms. The hybrid platforms are:

- AIX
- Solaris Operating Environments
- HP-UX
- Other platforms that support both 32-bit and 64-bit instances

If you want to create a tools catalog against a 64-bit instance, this can be done after the installation of DB2 UDB either through the Command Line Processor using the **CREATE TOOLS CATALOG CLP** command or using the Control Center. You will also need to install a 64-bit IBM Developer Kit for Java for this operation. Refer to the DB2 Administration Server section of the *DB2 Administration Guide* for more details.

Scheduling a warehouse process to run at intervals

When scheduling a warehouse process to run at intervals, you must determine the longest time it takes to run all the production steps in the process and schedule the intervals accordingly. If a process exceeds the scheduled time interval, all subsequently scheduled occurrences of that process will not run and will not be rescheduled.

Load and Import Columns page does not support DBCS characters in IXF files

If you use the Load wizard or Import notebook to set up a load or import from an IXF input file containing DBCS characters, the Columns page will not correctly display the column names contained in the file.

Two-part user ID not supported (Windows ME)

The two-part user ID for the CONNECT statement and ATTACH command, such as `domainname\username`, is not supported on Windows ME.

Minimum display settings for GUI tools

For the GUI tools such as the Control Center to work properly, you must have a screen resolution of at least 800 by 600 and use a display palette of at least 32 colors.

Do not partition Information Catalog Center tables

Tables that the Information Catalog Manager uses must be contained within a single database partition. Numerous methods are available to put the tables within a single partition. The following procedure is one approach that works.

1. Open a DB2 Command Line Processor and issue these commands:
   a. `CREATE DATABASE PARTITION GROUP partition_group_name ON DBPARTITIONNUM partition_number`
   b. `CREATE REGULAR TABLESPACE tablespace_name IN DATABASE PARTITION GROUP partition_group_name MANAGED BY SYSTEM USING ('cname')`

   where *partition_group_name* is the same in both commands.
2. Click Start –> Programs –> IBM DB2 –> Set-up Tools –> Manage Information Catalog Wizard.
3. On the Options page, specify the table space name in the **Table space** field.

Improper display of GB18030 characters in the title bar of a window

If you have characters from the GB18030 Chinese character encoding standard in the title bar of a window, they might appear as questions marks or squares.

Query Patroller limitations when DYN_QUERY_MGMT is disabled

Query Patroller cannot perform the following actions if the database configuration parameter DYN_QUERY_MGMT is disabled:

- Release queries from a held state
- Make a running or queued query run in the background when the query is in the foreground

If you attempt to release a query from held state, or change a foreground query to a background query when DYN_QUERY_MGMT is set to DISABLE, an error message will be displayed and the state of the query will not change. If held queries are scheduled to run and DYN_QUERY_MGMT is disabled at the time they start running, an error message is written to the qpdiag.log file and the queries are left in held state.

Query Patroller result tables now use DB2QPRT schema

Starting with FixPak 5, all new result tables are created in the schema DB2QPRT rather than in the schema of the submitter.

DROPIN privilege on the DB2QPRT schema is granted to operators whose profiles were created prior to installation of FixPak 5 and had either:

- The MONITORING privilege with edit authority
- The HISTORICAL ANALYSIS privilege with edit authority

DROPIN privilege on the DB2QPRT schema is granted the first time Query Patroller creates a result table in this schema.

Operators who are given MONITORING privilege with edit authority or HISTORICAL ANALYSIS privilege with edit authority after the installation of FixPak 5 are also granted DROPIN privilege on the DB2QPRT schema upon creation or update of their profiles.

Health indicator restrictions

The health monitor is unable to execute actions for the *db2.db2_op_status* health indicator if the indicator enters the down state. This state can be caused, for example, when an instance that the indicator is monitoring becomes inactive because of an explicit stop request or an abnormal termination. If you want to have the instance restart automatically after any abnormal termination, you must configure the fault monitor to keep the instance highly available.

Known problems and workarounds

SQL1224 error from DRDA wrapper (AIX)

If a 32-bit DB2 UDB server is run on an AIX system and an application running on the same system has more than one local database connection through the DRDA® wrapper, then the application might get the following error:

```
SQL1822N  Unexpected error code "-1224" received from
data source "W3_SERVER2".
Associated text and tokens are
  func="DriverConnect"
  msg="SQL1224N  A database agent"
SQLSTATE=560BD
```

To avoid this error, put the following entry in the federated configuration file (*instance_directory*/cfg/db2dj.ini):

```
EXTSHM=ON
```

Note: When you add entries to the federated configuration file, you must stop and restart DB2 UDB for the changes to take effect.

Alternately, you can catalog the local DB2 UDB database as being on a TCP/IP node. For example:

```
CATALOG TCPIP NODE my_node REMOTE my_host SERVER 123;
CATALOG DB mydb AT NODE my_node;
CREATE WRAPPER drda;
CREATE SERVER my_server TYPE DB2/UDB VERSION 8 WRAPPER drda
   AUTHORIZATION "my_id" PASSWORD "my_pw"
   OPTIONS(ADD DBNAME 'MYDB');
```

Hotkeys not working in Microsoft Visual Studio .NET Framework 1.1

If your hotkeys are not working in Microsoft Visual Studio .NET Framework 1.1, you can download a hotfix from the Microsoft Web site. You can find the hotfix in the Microsoft Knowledge Base, article Q836745.

The simplified Chinese locale (AIX)

AIX has changed the code set bound to the simplified Chinese locale Zh_CN on:

- AIX Version 5.1.0000.0011 or later
- AIX Version 5.1.0 with maintenance level 2 or later

The code set has been changed from GBK (code page 1386) to GB18030 (code page 5488 or 1392). Since DB2 Universal Database for AIX supports the GBK code set natively and the GB18030 code set via Unicode, DB2 Universal Database will default the Zh_CN locale's code set to ISO 8859-1 (code page 819), and in some operations will also default the locale's territory to the United States (US).

To work around this limitation, you have two options:

- You can override the locale's code set from GB18030 to GBK and the territory from US to China (whose territory ID is CN and territory code is 86).
- You can use a different simplified Chinese locale.

If you choose to use the first option, issue the following commands:

```
db2set DB2CODEPAGE=1386
db2set DB2TERRITORY=86
db2 terminate
db2stop
db2start
```

If you choose to use the second option, change your locale from Zh_CN to either ZH_CN or zh_CN. The ZH_CN locale's code set is Unicode (UTF-8), while the zh_CN locale's code set is eucCN (code page 1383).

The simplified Chinese locale (Red Hat Linux)

Red Hat Version 8 and later (including Red Hat Enterprise Linux [RHEL] versions 2.1 and 3) have changed the default code set for simplified Chinese from GBK (code page 1386) to GB18030 (code page 5488 or 1392).

Since DB2 Universal Database for Linux supports the GBK code set natively and the GB18030 code set via Unicode, DB2 Universal Database will default its code set to ISO 8859-1 (code page 819), and in some operations will also default its territory to the United States (US).

To work around this limitation, you have two options:

- You can override the Red Hat default code set from GB18030 to GBK and the territory from US to China (whose territory ID is CN and territory code is 86).
- You can use a different simplified Chinese locale.

If you choose to use the first option, issue the following commands:

```
db2set DB2CODEPAGE=1386
db2set DB2TERRITORY=86
db2 terminate
db2stop
db2start
```

If you choose to use the second option, issue any one of the following commands:

```
export LANG=zh_CN.gbk
export LANG=zh_CN
export LANG=zh_CN.utf8
```

where the code set associated with zh_CN is eucCN or code page 1383, and with zh_CN.utf8 is code page 1208.

Merant Driver Manager incompatibility (UNIX)

There are incompatibilities with Unicode support when the Merant Driver Manager accesses the DB2 ODBC driver on UNIX. These incompatibilities cause the Merant Driver Manager to use Unicode even if the application did not request

Unicode use. This situation can lead to problems with components such as the Data Warehouse Center, Information Catalog Manager, and MQSI, which require the Merant Driver Manager to support non-IBM data sources. You can use an alternate DB2 ODBC driver library without Unicode support enabled until a permanent solution is available.

An alternative DB2 ODBC driver library without Unicode support enabled is included with DB2 UDB Version 8.1 for AIX, HP-UX, and Solaris Operating Environment. To use this alternative library, you must create a copy of it, giving the copy the original DB2 ODBC driver library's name.

Note: The alternative (_36) library contains the Unicode functions required by the DB2 JDBC driver. Using this library allows JDBC applications, including WebSphere® Application Server, to work successfully with DB2 UDB.

To switch to the non-Unicode ODBC library on AIX, HP-UX, or the Solaris Operating Environment, see the following instructions. Because this is a manual process, you must carry it out every time you update your product, including after the application of successive FixPaks or modification levels.

Procedure:

AIX

To create the alternate library on AIX:

1. As the instance owner, shut down all database instances using the **db2stop force** command.
2. Using the DB2 administration server (DAS) instance ID, shut down the DAS instance using the **db2admin stop force** command.
3. Back up the original `db2.o` file in the `/usr/lpp/db2_81/lib` directory.
4. Using root authority, issue the **slibclean** command.
5. Copy file db2_36.o to backup file db2.o, ensuring that ownership and permissions remain consistent. Use the following commands:

```
cp db2_36.o db2.o
-r--r--r-- bin:bin for db2.o
```

To switch back to the original object, follow the same procedure using the backup file instead of the db2_36.o file.

Solaris Operating Environment

To create the alternate library in a Solaris Operating Environment:

1. As the instance owner, shut down all database instances using the **db2stop force** command.
2. Using the DB2 administration server (DAS) instance ID, shut down the DAS instance using the **db2admin stop force** command.
3. Back up the original `libdb2.so.1` file in the `/opt/IBMdb2/V8.1/lib` directory.
4. Copy file `libdb2_36.so.1` to backup file `libdb2.so.1`, ensuring that ownership and permissions remain consistent. Use the following commands:

```
cp libdb2_36.so.1 libdb2.so.1
-r-xr-xr-x bin:bin libdb2.so.1
```

5. Issue the **db2iupdt <instance>** command for each database instance and the **dasupdt <das_instance>** command for the DAS instance.

To switch back to the original object, follow the same procedure using the backup file instead of the libdb2_36.so.1 file.

HP-UX PA-RISC

To create the alternate library on HP-UX PA-RISC:

1. Shut down all database instances using the **db2stop force** command.
2. Shut down the DB2 administration server (DAS) instance using the **db2admin stop force** command.
3. Back up the original `libdb2.sl` file in the `/opt/IBMdb2/V8.1/lib` directory.
4. Copy file `libdb2_36.sl` to backup file `libdb2.sl`, ensuring that the ownership and permissions remain consistent. Use the following command to ensure the consistency:

   ```
   cp libdb2_36.sl libdb2.sl
   -r-xr-xr-x bin:bin for libdb2.sl
   ```

5. Issue the **db2iupdt <instance>** command for each database instance and the **dasupdt <das_instance>** command for the DAS instance.

To switch back to the original object, follow the same procedure using the backup file instead of the libdb2_36.sl file.

HP-UX on IA64

To create the alternate library on HP-UX on IA64:

1. Shut down all database instances using the **db2stop force** command.
2. Shut down the DB2 administration server (DAS) instance using the **db2admin stop force** command.
3. Back up the original `libdb2.so` file in the `/opt/IBMdb2/V8.1/lib` directory.
4. Copy file `libdb2_36.so` to backup file `libdb2.so`, ensuring that the ownership and permissions remain consistent. Use the following command to ensure the consistency:

   ```
   cp libdb2_36.so libdb2.so
   -r-xr-xr-x bin:bin for libdb2.so
   ```

5. Issue the **db2iupdt <instance>** command for each database instance and the **dasupdt <das_instance>** command for the DAS instance.

To switch back to the original object, follow the same procedure using the backup file instead of the libdb2_36.so file.

Other UNIX Operating Systems

Contact IBM Support if you require assistance with DB2 UDB and the Merant Driver Manager on other UNIX operating systems.

NFS APAR IY32512 – Unavailable threads (AIX)

AIX 5 NFS APAR IY32512 might cause the **db2stop** command to stop on systems with a large number of partitions.

On a server that is receiving large numbers of requests for blocking locks on files that are already locked, the lock daemon might become unresponsive. This situation occurs when all available locked threads are allocated to threads that are waiting for the locks to become available, so there is no thread available to pick up the work when the unlock request is made.

When this situation occurs the stopped nodes must be restarted. There is a DB2 UDB workaround for this situation by stopping the nodes one at a time using the NODENUM option of the **db2stop** command.

Data Links server backup fails using Tivoli Storage Manager archive server (AIX, Solaris Operating Environment)

Problem: When installing or migrating to DB2 Data Links Manager, Version 8.2, a Data Links File Manager (DLFM)-initiated backup of Data Links server data to a Tivoli Storage Manager archive server fails. One of the following sets of error messages display, either on-screen or on the installation status report:

```
DLFM129I: Automatic backup of DLFM_DB database has been triggered.
          Please wait for the backup to complete.

DLFM901E: A system error occurred. Return code = "-2062".
          The current command cannot be processed.
          Refer to the db2diag.log file for additional information.
```

— or —

```
DLFM811E: The current DLFM database could not be backed up.
          SQL code = "-2062", Return code = "-2062"

DLFM901E: A system error occurred. Return code = "-2062".
          The current command cannot be processed.
          Refer to the db2diag.log file for additional information.
```

Cause: The DB2 Data Links Manager Installer program failed to set the variables required to use Tivoli Storage Manager as an archive (backup) server for a Data Links server.

Tip: If you want to use Tivoli Storage Manager as an archive server, and you have not yet installed or migrated to DB2 Data Links Manager, Version 8.2, you can prevent this problem from occurring. First, do not use the ″Tivoli Storage Manager″ backup option from the Installer program. Then, manually configure the Data Links Manager Administrator's profile to include the appropriate Tivoli Storage Manager variables, as described in step 2 that follows. After you have completed both tasks, you can proceed with the installation or migration.

Workaround: Perform the following tasks in the order listed.

1. Back up the DLFM database using the following command:

   ```
   db2 backup <dlfm_db><path>
   ```

   where:

   - <dlfm_db>is the name of the DLFM database. By default, the database is called DLFM_DB.
   - <path> is the directory path to the backup storage location of your choice.
2. Manually configure the Data Links Manager Administrator's profile to include the appropriate Tivoli Storage Manager variables. The manual configuration procedure and the required variables are described in the following documentation topics:
   - Using Tivoli Storage Manager as an archive server (AIX)
   - Using Tivoli Storage Manager as an archive server (Solaris Operating Environment)

   You can find these topics either online in the DB2 Information Center, or in the ″System Management Options″ chapter of the *DB2 Data Links Manager Administration Guide and Reference*.

- If you are completing a new installation of DB2 Data Links Manager, Version 8.2, you are finished.
- If you are migrating to DB2 Data Links Manager Version 8.2, rerun the Migration Utility program, **db2dlmmg**.

SQLFLAG (STD) precompiler option error

If the SQLFLAG(STD) precompile option is enabled, it will cause the following error: `Abend C6 occurred while running Precompile program DSNHPC`

Remove the SQLFLAG (STD) precompile option when using the Development Center to create SQL stored procedures to run on DB2 for z/OS, Version 8.

DB2 Connect Custom Advisor

Despite being documented in the *DB2 Connect User's Guide*, the DB2 Connect Custom Advisor is no longer supported in Version 8.2.

Displaying Indic characters in the DB2 GUI tools

If you have problems displaying Indic characters when using the DB2 GUI tools, you might not have the required fonts installed on your system.

DB2 Universal Database has packaged the following IBM TrueType and OpenType proportional Indic language fonts for your use. You can find these fonts in the `font` directory on any of the following CDs:

- *IBM Developer Kit, Java Technology Edition (64-bit) for AIX 5L*
- *DB2 Embedded Application Server and applications (XML registry, Web Administration tools and Java distributed debugger)* for your operating system

These fonts are to be used only in conjunction with DB2 UDB. You cannot engage in the general or unrestricted sale or distribution of these fonts:

Table 10. Indic fonts packaged with DB2 Universal Database

Typeface	Weight	Font File Name
Devanagari MT for IBM	Medium	devamt.ttf
Devanagari MT for IBM	Bold	devamtb.ttf
Tamil	Medium	TamilMT.ttf
Tamil	Bold	TamilMTB.ttf
Telugu	Medium	TeluguMT.ttf
Telugu	Bold	TeleguMTB.ttf

Detailed instructions on how to install the fonts and modify the `font.properties` file can be found in the Internationalization section of the IBM Development Kit for Java documentation.

In addition, the following Microsoft products come with Indic fonts that can be used with DB2 GUI tools:

- Microsoft Windows 2000 operating system
- Microsoft Windows XP operating system
- Microsoft Publisher
- Microsoft Office

GUI tools are not supported for zSeries servers (Linux)

With the exception of the DB2 Setup wizard, the GUI tools will not work on zSeries servers running the Linux operating system. This limitation includes any items normally launched from the Installation launchpad, such as the Quick Tour.

If you want to use the GUI tools with one of these systems, install the administrative tools on a client system with a different system configuration, and use this client to connect to your zSeries server.

Enclose DB2 Information Center search terms within quotation marks if they contain numbers

To get accurate search results in the DB2 Information Center you must enclose search terms that include numbers within quotation marks.

For example, if you search for the following term you will receive no results:

```
1.4.1
```

However, if you enclose the term within quotation marks, you receive the appropriate results:

```
"1.4.1"
```

A search for the following term will return extra topics:

```
DB20000I
```

But a search on the following term works properly:

```
"DB20000I"
```

Information Catalog Center log file not generated when importing tag language files

If an Information Catalog Center log file is not generated when you import tag language files to the Information Catalog Center, perform the following troubleshooting steps:

When running db2icmimport from a command line:

- If output files were not generated (.xml, .out, .err, .log), there is probably an error on the command line. Verify that the first five arguments, which are UserId, Password, Database, Catalog, and Tagfile, are correct. View the syntax by entering the **db2icmimport** command. If this does not solve the problem, modify **db2icmimport** to capture the output of the **db2javit** command by using the -g option to save the output to a file. For example:

  ```
  db2javit -j:com.ibm.db2.common.icm.tag.IcmImport -w: -i:
     -o:"-Xmx128m -Xms32m" -g:"d:\temp\myimport.trc" ...
  ```

- If a log file was not generated, there is usually a parsing error. Look at the .xml file and the .out file. If you can, insert a ″:COMMIT.CHKPID(DEBUG)″ command at the beginning of the tag language file. This command generates debug report messages and checks the .xml and .out files for parsing errors.
- After parsing, errors should appear in the .log file. When the debug report is being generated, look at the .log file and the .out file for information.
- Always check the .err file to see if there is a run time error.

When importing tag language files using the Information Catalog Center GUI:

- When you import tag language files using the GUI interface, no .out or .err files are generated.
- If a .log or .xml file is generated, try to debug by using those files.
- If a .log or .xml file is not generated or does not help, run the import process from a command line to get more information.

Binding Query Patroller packages

If the Query Patroller packages are not bound after applying a fixpak, a user without DBADM authority or proper Query Patroller privileges can encounter the following error when using the Query Patroller Center or Query Patroller command line:

```
SQL0001N - Binding or precompilation did not complete successfully.
```

If you are using the Query Patroller Center, the SQL0001N error is logged in qpdiag.log file. If you are using the Query Patroller command line, the SQL0001N is returned to the console

Auto-bind code exists to initiate automatic binding. However, the automatic binding fails when the connecting user does not have the necessary privileges to execute all statements in the Query Patroller packages. A symptom of this problem is missing folders in the Query Patroller Center.

To avoid this problem, the qpserver.lst packages should be bound manually by a user with DBADM authority or necessary privileges after applying a fixpak.

Unavailability of ports with Query Patroller (Windows)

Submitted queries in Query Patroller might receive SQL code -29007 when there are no more available ports on Windows XP or Windows 2003. The likelihood of this error increases with an increasing number of clients accessing Query Patroller. If this situation happens, set the following registry variables as follows:

```
MaxUserPort=65534
TcpTimedWaitDelay=30
```

and restart your system for the changes to take effect.

Secure environments (Windows)

You might experience file permission problems if you are using DB2 Universal Database on Windows and are not an administrator on the Windows system. If you receive an SQL1035N, SQL1652N, or SQL5005C error message, possible causes and workarounds are shown in the following information:

User does not have sufficient authority on the sqllib directory:

Problem

User receives an SQL1035N or SQL1652N error when trying to open the DB2 CLP or command window. The DB2 Universal Database code (core files) are installed into a directory structure where write privileges are limited, but some DB2 Universal Database tools need to write and create files in the DB2INSTPROF directory.

Workaround

Create a new directory where you can grant users, at minimum, the

MODIFY permission and use either **db2set -g db2tempdir** to point to the new directory, or set the db2tempdir variable in the Windows system environment.

User does not have sufficient authority to write to the sqllib\<instance_dir> directory even though user belongs to SYSADM_GROUP:

Problem

User receives an SQL5005C system error when trying to update the database manager configuration file (update dbm cfg). The user does not have the required NTFS permissions to write to the sqllib*instance_dir* directory even though you have added this user to the SYSADM_GROUP.

First workaround

Grant the users, at minimum, the MODIFY permission on the *instance_dir* directory at the file system level.

Second workaround

Create a new directory where you can grant the user, at minimum, the MODIFY permission. Use the **db2set db2instprof** command to point to the new directory. You will need either to recreate the instance so that the information is stored under the new instance directory specified by db2instprof, or you will need to move the old instance directory to the new directory.

XML Extender sample programs renamed

Some XML Extender sample programs might have the same name as other installed programs. Accidentally invoking another program with the same name as an XML Extender sample program can damage your XML files. The following list shows the old XML Extender sample program names as well as new replacement program names that are less likely to cause conflicts. Make sure you use the new sample program names instead of the old ones to prevent damaging your XML files.

Table 11. Replacement sample programs for XML Extender (Windows)

Old Program (Do not use)	New Program (Use)
insertx.exe	dxxisrt.exe
retrieve.exe	dxxretr.exe
retrieve2.exe	dxxretr2.exe
retrievec.exe	dxxretrc.exe
shred.exe	dxxshrd.exe
tests2x.exe	dxxgenx.exe
tests2xb.exe	dxxgenxb.exe
tests2xc.exe	dxxgenxc.exe

Table 12. Replacement sample programs for XML Extender (UNIX)

Old Program (Do not use)	New Program (Use)
insertx	dxxisrt
retrieve	dxxretr
retrieve2	dxxretr2
retrievec	dxxretrc

Table 12. Replacement sample programs for XML Extender (UNIX) (continued)

Old Program (Do not use)	New Program (Use)
shred	dxxshrd
tests2x	dxxgenx
tests2xb	dxxgenxb
tests2xc	dxxgenxc

Using the new sample programs with the sample sqx files

The source code (.sqx files) for the executables listed previously are located in the `samples\db2xml\c` directory of your installation. The source files are still labeled with their old names. If you make changes to the source code, copy your newly compiled executables (with the old names) to the `sqllib\bin` directory. On Windows platforms, you must make an additional copy, rename it with its new name above, and copy it to the bin directory. Both copies replace the existing files in the bin directory. For example, after compiling your new version of shred.exe, you need to make two copies and replace the files in the bin directory: one labeled shred.exe and the other renamed dxxshrd.exe. On UNIX platforms, you need only to replace the file with the old name with your newly compiled version. If you create new executable files from these samples, you must copy the new files from the `\SQLLIB\samples\db2xml\c\` directory into the `\SQLLIB\bin\` directory, and then make an additional copy, renaming them according to the previous table.

Decomposing documents in XML Extender that contain non unique attribute and element names

You can now decompose documents that contain non-unique attributes or non-unique element names that map to different columns (of the same or different tables) without receiving the DXXQ045E error. The following is an example of an XML document with non-unique attributes and non-unique element names:

```
<Order ID="0001-6789">
       <!-- Note: attribute name ID is non-unique –>
       <Customer ID="1111">
                   <Name>John Smith</Name>
       </Customer>
       <!-- Note: element name Name is non_unique –>
       <Salesperson ID="1234">
              <Name>Jane Doe</Name>
       </Salesperson>
       <OrderDetail>
              <ItemNo>xxxx-xxxx</ItemNo>
              <Quantity>2</Quantity>
              <UnitPrice>12.50</UnitPrice>
       </OrderDetail>
       <OrderDetail>
              <ItemNo>yyyy-yyyy</ItemNo>
              <Quantity>4</Quantity>
              <UnitPrice>24.99</UnitPrice>
       </OrderDetail>
</Order>
```

The accompanying DAD, which maps the duplicate elements and attributes to different columns, looks like this:

```
<element_node name="Order">
  <RDB_node>
    <table name="order_tab" key="order_id"/>
    <table name="detail_tab"/>
    <condition>
```

```
    order_tab.order_id=detail_tab.order_id
  </condition>
</RDB_node>

<!--attribute ID duplicated below, but mapped to a different col—>
<attribute_node name="ID">
  <RDB_node>
    <table name="order_tab" />
    <column name="order_id" type="char(9)"/>
  </RDB_node>
</attribute_node>

<element_node name="Customer">
  <!--attribute ID duplicated above, but mapped to a different col—>
  <attribute_node name="ID">
    <RDB_node>
      <table name="order_tab" />
      <column name="cust_id" type="integer"/>
    </RDB_node>
  </attribute_node>

  <!--element name duplicated below, but mapped to a different col—>
  <element_node name="Name">
    <text_node>
      <RDB_node>
        <table name="order_tab" />
        <column name="cust_name" type="char(20)" />
      </RDB_node>
    </text_node>
  </element_node>
</element_node>

<element_node name="Salesperson">
  <!--attribute ID duplicated above, but mapped to a different col—>
  <attribute_node name="ID">
    <RDB_node>
      <table name="order_tab" />
      <column name="salesp_id" type="integer"/>
    </RDB_node>
  </attribute_node>

  <!--element name duplicated above, but mapped to a different col—>
  <element_node name="Name">
    <text_node>
      <RDB_node>
        <table name="order_tab" />
        <column name="salesp_name" type="char(20)" />
      </RDB_node>
    </text_node>
  </element_node>
</element_node>

<element_node name="OrderDetail" multi_occurrence="YES">
  <element_node name="ItemNo">
    <text_node>
      <RDB_node>
        <table name="detail_tab" />
        <column name="itemno" type="char(9)"/>
      </RDB_node>
    </text_node>
  </element_node>
  <element_node name="Quantity">
    <text_node>
      <RDB_node>
        <table name="detail_tab" />
        <column name="quantity" type="integer"/>
      </RDB_node>
```

```
      </text_node>
    </element_node>
    <element_node name="UnitPrice">
      <text_node>
        <RDB_node>detail_tab" />
          <table name="detail_tab" />
          <column name="unit_price" type="decimal(7,2)"/>
        </RDB_node>
      </text_node>
    </element_node>
  </element_node>
</element_node>
```

The contents of the tables would look like the following sample after the preceding document is decomposed:

```
ORDER _TAB:

ORDER_ID       CUST_ID       CUST_NAME       SALESP_ID       SALESP_NAME
0001-6789      1111          John Smith      1234            Jane Doe

DETAIL_TAB:

ORDER_ID          ITEMNO         QUANTITY          UNIT_PRICE
0001-6789         xxxx-xxxx      2                 12.50
0001-6789         yyyy-yyyy      4                 24.99
```

Note: To map multiple elements and attributes to the same column of the same table, define an alias for the table and use the alias in the DAD <table> element of one of the mappings.

Differences between SNA and TCP/IP when using DB2 Connect

When connecting to an OS/390 system using SNA, the host VTAM® layer automatically flows a commit when a new connection is made. The automatic commit allows the host side thread state to be inactive, and the thread immediately becomes inactive.

However, when connecting to an OS/390 system using TCP/IP, there is no automatic commit. The application itself must flow an explicit commit after the connection to allow the thread to be inactive on the host. Without the explicit commit, the thread is subject to an idle thread time out.

The suggested workaround is to rewrite the application so that it will perform an explicit commit if the connection goes idle after the connection.

Documentation updates

Administration: Implementation

Automatic client reroute considerations for cataloging on a DB2 Connect server

Consider the following two items involving alternate server connectivity with DB2 Connect server:

- The first consideration involves using DB2 Connect server for providing access to a host or iSeries database on behalf of both remote and local clients. In such situations, confusion can arise regarding alternate server connectivity information in a system database directory entry. To minimize this confusion,

consider cataloging two entries in the system database directory to represent the same host or iSeries database. Catalog one entry for remote clients and catalog another for local clients.

- Secondly, the alternate server information that is returned from a target server is kept only in cache. If the DB2 process is terminated, the cache information, and therefore the alternate server information, is lost.

Local system account support (Windows)

Applications running under the context of the local system account (LSA) are supported on all Windows platforms, except Windows ME.

Two-part user ID support

The CONNECT statement and ATTACH command support two-part user IDs. The qualifier of the SAM-compatible user ID is the NetBIOS style name which has a maximum length of 15 characters. This feature is not supported on Windows ME.

Additional information for Kerberos support

Linux prerequisites:

The prerequisites for Linux Kerberos support are inaccurately reported in the documentation. The provided DB2 Kerberos security plug-in is supported with RedHat Enterprise Linux Advanced Server 3.0 with the IBM Network Authentication Service (NAS) 1.4 client.

zSeries and iSeries compatibility:

For connections to zSeries and iSeries, the database must be cataloged with the AUTHENTICATION KERBEROS parameter and the TARGET PRINCIPAL parameter name must be explicitly specified.

Neither zSeries nor iSeries support mutual authentication.

Windows issues:

- Due to the manner in which Windows detects and reports some errors, the following conditions result in an unexpected client security plug-in error (SQL30082N, rc=36):
  - Expired account
  - Invalid password
  - Expired password
  - Password change forced by administrator
  - Disabled account

  Furthermore, in all cases, the DB2 administration log or db2diag.log will indicate "Logon failed" or "Logon denied."
- If a domain account name is also defined locally, connections explicitly specifying the domain name and password will fail with the following error:

  ```
  The Local Security Authority cannot be contacted
  ```

  The error is a result of Windows locating the local user first. The solution is to fully qualify the user in the connection string. For example:

  ```
  name@DOMAIN.IBM.COM
  ```
- Windows accounts cannot include the @ character in their name because the character is assumed to be the domain separator by the DB2 Kerberos plug-in.

- When interoperating with a non-Windows platform, ensure that all Windows domain server accounts and all Windows client accounts are configured to use DES encryption. If the account used to start the DB2 service is not configured to use DES encryption, the DB2 server will fail to accept Kerberos contexts. In particular, DB2 UDB will fail with an unexpected server plug-in error, and will log that the AcceptSecurityContext API returned SEC_I_CONTINUTE_NEEDED (0x00090312L).

  To determine if Windows accounts are configured to use DES encryption, look under **Account properties** in the **Active Directory**. A restart might be required if the account properties are changed.
- If the client and server are both on Windows, then the DB2 service can be started under the local system account. However, if the client and server are in different domains, the connection might fail with an invalid target principal name error. The workaround is to explicitly catalog the target principal name on the client using the fully qualified server host name and the fully qualified domain name, in the following format:

  ```
  host/<server hostname>@<server domain name>
  ```

  For example:

  ```
  host/myhost.domain.ibm.com@DOMAIN.IBM.COM
  ```

  Otherwise, you must start the DB2 service under a valid domain account.

Administration: Performance

New communication registry variable

The DB2TCP_CLIENT_RCVTIMEOUT registry variable has been added in version 8.2.

Table 13. Communications variables

Variable name	Operating systems	Values
Description		
DB2TCP_CLIENT_RCVTIMEOUT	All	Default=0 (not set) Values: 0 to 32767 seconds
Specifies the number of seconds a client waits for data on a TCP/IP receive. There is no timeout if the registry variable is not set or is set to 0. If the TCP/IP receive returns with data before the timeout value has expired, the application proceeds as usual. If the timeout value expires before data is returned, the connection closes. **Note:** This registry variable is applicable to the DB2 Client and the client side of the DB2 Gateway only. It is not applicable to the DB2 Server.		

New performance variable

The DB2_LARGE_PAGE_MEM performance variable has been added in version 8.2.

Table 14. Performance variables

Variable name	Operating systems	Values
Description		
DB2_LARGE_PAGE_MEM	AIX 5.x 64-bit only Linux	Default=NULL Use * to denote that all applicable memory regions should use large page memory, or a comma-separated list of specific memory regions that should use large page memory. Available regions vary by operating system. On AIX 5.x 64-bit, the following regions can be specified: DB, DBMS, or PRIVATE. On Linux, the following region can be specified: DB.

Table 14. Performance variables (continued)

Variable name	Operating systems	Values
Description		

Large page memory is supported only for DB2 UDB for AIX 5L, 64-bit Edition, and DB2 UDB for Linux.
 	
The DB2_LARGE_PAGE_MEM registry variable is used to enable large page support when running on AIX 5.x or any Linux architecture with the appropriate kernel support. This registry variable deprecates the DB2_LGPAGE_BP registry variable, which can only be used to enable large-page memory for the database shared memory region. This can now be enabled by setting DB2_LARGE_PAGE_MEM=DB. Any documentation that mentions enabling large pages with the DB2_LGPAGE_BP registry variable can be treated as synonymous with setting DB2_LARGE_PAGE_MEM=DB.
 	
Large page usage is primarily intended to provide performance improvements to high performance computing applications. Memory access intensive applications that use large amounts of virtual memory may obtain performance improvements by using large pages. To enable DB2 UDB to use large pages, you must first configure the operating system to use large pages.
 	
Enabling large private pages will increase DB2 UDB memory usage by a significant amount, as each DB2 UDB agent will consume at least 1 large page (16MB) of physical memory. To enable large pages for agent private memory on 64-bit DB2 for AIX (the DB2_LARGE_PAGE_MEM=PRIVATE setting), the following conditions must be met, in addition to configuring large pages on the operating system:
• The instance owner must possess the CAP_BYPASS_RAC_VMM and CAP_PROPOGATE capabilities.
• The kernel must support interfaces that allow a process to modify its page size at run time. .
 	
On 64-bit DB2 for AIX, enabling this variable reduces the size of the shared memory segment backing database memory to the minimum requirement. The default is to create a 64 GB segment: see the database shared memory size (*database_memory*) database configuration parameter for more details. This avoids pinning more shared memory in RAM than is likely to be used.
 	
By setting this variable, the ability to dynamically increase the overall database shared memory configuration (for example, to increase the size of buffer pools) will be limited.
 	
On Linux, there is an additional requirement for the availability of the **libcap.so** library. This library must be installed for this option to work. If this option is turned on, and the library is not on the system, DB2 UDB will disable the large kernel pages and continue to function as it would previously.
 	
On Linux, to verify that large kernel pages are available, issue the following command:
`cat /proc/meminfo`
 	
If it is available, the following three lines should appear (with different numbers depending on the amount of memory configured on your machine):
`HugePages_Total: 200`
`HugePages_Free: 200`
`Hugepagesize: 16384 KB`
 	
If you do not see these lines, or if the HugePages_Total is 0, configuration of the operating system or kernel is required.		

Change to default value for DB2_ENABLE_BUFPD registry variable

The default value for the DB2_ENABLE_BUFPD registry variable has been changed to ON.

DB2NTNOCACHE registry variable is deprecated

Functionality previously achieved through DB2NTNOCACHE can be achieved at the table space level by specifying the NO FILE SYSTEM CACHING clause on the CREATE TABLESPACE or the ALTER TABLESPACE statement. Refer to *SQL Reference* for details on usage. The DB2NTNOCACHE registry variable will be removed in a future release.

Explain tables and organization of explain information

Explain tables might be common to more than one user. However, the explain tables can be defined for one user, and aliases can be defined for each additional user using the same name to point to the defined tables. Alternatively, the explain tables can be defined under the SYSTOOLS schema. The Explain facility will default to the SYSTOOLS schema if no other explain tables or aliases are found under the user's session ID for dynamic SQL, or the statement authorization ID for static SQL. Each user sharing the common explain tables must have insert permission on those tables. Read permission for the common explain tables should also be limited, typically to users who analyze the explain information.

Guidelines for capturing explain information

Explain data is captured if you request it when an SQL statement is compiled. Consider how you expect to use the captured information when you request explain data.

Capturing information in the explain tables:

- Dynamic SQL statements:

  Explain table information is captured in any of the following cases:

  – The CURRENT EXPLAIN MODE special register is set to:
    - YES: The SQL compiler captures explain data and executes the SQL statement.
    - EXPLAIN: The SQL compiler captures explain data but does not execute the SQL statement.
    - RECOMMEND INDEXES: The SQL compiler captures explain data and the recommended indexes are placed in the ADVISE_INDEX table, but the SQL statement is not executed.
    - EVALUATE INDEXES: The SQL compiler uses indexes placed by the user in the ADVISE_INDEX table for evaluation. In EVALUATE INDEXES mode, all dynamic statements are explained as if these virtual indexes were available. The SQL compiler then chooses to use the virtual indexes if they improve the performance of the statements. Otherwise, the indexes are ignored. To find out if proposed indexes are useful, review the EXPLAIN results.
    - REOPT: The SQL compiler captures Explain data for static or dynamic SQL statements during statement reoptimization at execution time, when actual values for the host variables, special registers, or parameter markers are available.

  – The EXPLAIN ALL option has been specified on the BIND or PREP command. The SQL compiler captures explain data for dynamic SQL at run time, even if the CURRENT EXPLAIN MODE special register is set to NO. The SQL statement also executes and returns the results of the query.

Additional return codes from db2CfgGet API, collate_info parameter

The collating information parameter can only be displayed using the db2CfgGet API. It **cannot** be displayed through the command line processor or the Control Center.

Configuration Type Database

Parameter Type Informational

This parameter provides 260 bytes of database collating information. The first 256 bytes specify the database collating sequence, where byte “n” contains the sort weight of the code point whose underlying decimal representation is “n” in the code page of the database.

The last 4 bytes contain internal information about the type of the collating sequence. The last 4 bytes of collate_info is an integer. The integer is sensitive to the endian order of the platform. The possible values are:

- **0** – The sequence contains non-unique weights
- **1** – The sequence contains all unique weights
- **2** – The sequence is the identity sequence, for which strings are compared byte for byte.
- **3** – The sequence is NLSCHAR, used for sorting characters in a TIS620-1 (code page 874) Thai database.
- **4** – The sequence is IDENTITY_16BIT, which implements the "CESU-8 Compatibility Encoding Scheme for UTF-16: 8-Bit" algorithm as specified in the Unicode Technical Report #26 available at the Unicode Technical Consortium Web site at http://www.unicode.org.
- **X'8001'** – The sequence is UCA400_NO, which implements the UCA (Unicode Collation Algorithm) based on the Unicode Standard version 4.00, with normalization implicitly set to ON.
- **X'8002'** – The sequence is UCA400_LTH, which implements the UCA (Unicode Collation Algorithm) based on the Unicode Standard version 4.00, and sorts all Thai characters as per the Royal Thai Dictionary order.
- **X'8003'** – The sequence is UCA400_LSK. which implements the UCA (Unicode Collation Algorithm) based on the Unicode Standard version 4.00, and sorts all Slovakian characters properly.

If you use this internal type information, you need to consider byte reversal when retrieving information for a database on a different platform.

You can specify the collating sequence at database creation time.

Administration: Planning

XA function supported by DB2 Universal Database

DB2 Universal Database (DB2 UDB) supports the XA91 specification defined in *X/Open CAE Specification Distributed Transaction Processing: The XA Specification*, with the following exceptions:

- Asynchronous services

  The XA specification allows the interface to use asynchronous services, so that the result of a request can be checked at a later time. The database manager requires that the requests be invoked in synchronous mode.
- Registration

The XA interface allows two ways to register an RM: static registration and dynamic registration. DB2 UDB supports both dynamic and static registration. DB2 UDB provides two switches:

- *db2xa_switch* for dynamic registration
- *db2xa_switch_static* for static registration

- Association migration

  DB2 UDB does not support transaction migration between threads of control.

XA switch usage and location: As required by the XA interface, the database manager provides a *db2xa_switch* and a *db2xa_switch_static* external C variable of type xa_switch_t to return the XA switch structure to the TM. Other than the addresses of various XA functions, the following fields are returned:

Field	Value
name	The product name of the database manager. For example, DB2 for AIX.
flags	For *db2xa_switch* TMREGISTER | TMNOMIGRATE is set Explicitly states that DB2 UDB uses dynamic registration, and that the TM should not use association migration. Implicitly states that asynchronous operation is not supported. For *db2xa_switch_static* TMNOMIGRATE is set Explicitly states that DB2 UDB uses dynamic registration, and that the TM should not use association migration. Implicitly states that asynchronous operation is not supported.
version	Must be zero.

Using the DB2 Universal Database XA switch: The XA architecture requires that a Resource Manager (RM) provide a *switch* that gives the XA Transaction Manager (TM) access to the RM's **xa_** routines. An RM switch uses a structure called xa_switch_t. The switch contains the RM's name, non-NULL pointers to the RM's XA entry points, a flag, and a version number.

UNIX-based systems: DB2 UDB's switch can be obtained through either of the following two ways:

- Through one additional level of indirection. In a C program, this can be accomplished by defining the macro:

  ```
  #define db2xa_switch (*db2xa_switch)
  #define db2xa_switch_static (*db2xa_switch)
  ```

  prior to using *db2xa_switch* or *db2xa_switch_static*.

- By calling **db2xacic** or **db2xacicst**

  DB2 UDB provides these APIs, which return the address of the *db2xa_switch* or the *db2xa_switch_static* structure. This function is prototyped as:

  ```
  struct xa_switch_t * SQL_API_FN  db2xacic( )
  struct xa_switch_t * SQL_API_FN  db2xacicst( )
  ```

With either method, you must link your application with `libdb2`.

Windows NT: The pointer to the *xa_switch* structure, *db2xa_switch*, or *db2xa_switch_static* is exported as DLL data. This implies that a Windows NT application using this structure must reference it in one of three ways:

- Through one additional level of indirection. In a C program, this can be accomplished by defining the macro:

```
#define db2xa_switch (*db2xa_switch)
#define db2xa_switch_static (*db2xa_switch)
```

  prior to using *db2xa_switch* or *db2xa_switch_static*.
- If using the Microsoft Visual C++ compiler, *db2xa_switch* or *db2xa_switch_static* can be defined as:

```
extern __declspec(dllimport) struct xa_switch_t db2xa_switch
extern __declspec(dllimport) struct xa_switch_t db2xa_switch_static
```

- By calling **db2xacic** or **db2xacicst**

  DB2 UDB provides this API, which returns the address of the *db2xa_switch* or *db2xa_switch_static* structure. This function is prototyped as:

```
struct xa_switch_t * SQL_API_FN  db2xacic( )
struct xa_switch_t * SQL_API_FN  db2xacicst( )
```

With any of these methods, you must link your application with `db2api.lib`.

Example C Code: The following code illustrates the different ways in which the *db2xa_switch* or *db2xa_switch_static* can be accessed via a C program on any DB2 UDB platform. Be sure to link your application with the appropriate library.

```
   #include <stdio.h>
   #include <xa.h>

   struct xa_switch_t * SQL_API_FN  db2xacic( );

   #ifdef DECLSPEC_DEFN
   extern __declspec(dllimport) struct xa_switch_t db2xa_switch;
   #else
   #define db2xa_switch (*db2xa_switch)
   extern struct xa_switch_t db2xa_switch;
   #endif
main( )
   {
      struct xa_switch_t *foo;
      printf ( "%s \n", db2xa_switch.name );
      foo = db2xacic();
      printf ( "%s \n", foo->name );
      return ;
   }
```

Activating conversion tables for code pages 923 and 924

The following table contains a list of all the code page conversion table files that are associated with code pages 923 and 924. Each file is of the form XXXXYYYY.cnv or ibmZZZZZ.ucs, where XXXXX is the source code page number and YYYY is the target code page number. The file ibmZZZZZ.ucs supports conversion between code page ZZZZZ and Unicode.

Procedure:

To activate a particular code page conversion table, rename or copy that conversion table file to its new name as shown in the second column.

For example, to support the euro symbol when connecting a 8859-1/15 (Latin 1/9) client to a Windows 1252 database, you need to rename or copy the following code page conversion table files in the sqllib/conv/ directory:

- 09231252.cnv to 08191252.cnv

- 12520923.cnv to 12520819.cnv
- ibm00923.ucs to ibm00819.ucs

Table 15. Conversion table files for code pages 923 and 924

923 and 924 conversion table files in the sqllib/conv/ directory	New name
04370923.cnv	04370819.cnv
08500923.cnv	08500819.cnv
08600923.cnv	08600819.cnv
08630923.cnv	08630819.cnv
09230437.cnv	08190437.cnv
09230850.cnv	08190850.cnv
09230860.cnv	08190860.cnv
09231043.cnv	08191043.cnv
09231051.cnv	08191051.cnv
09231114.cnv	08191114.cnv
09231252.cnv	08191252.cnv
09231275.cnv	08191275.cnv
09241252.cnv	10471252.cnv
10430923.cnv	10430819.cnv
10510923.cnv	10510819.cnv
11140923.cnv	11140819.cnv
12520923.cnv	12520819.cnv
12750923.cnv	12750819.cnv
ibm00923.ucs	ibm00819.ucs

Conversion table files for euro-enabled code pages

The following tables list the conversion tables that have been enhanced to support the euro currency symbol. If you want to disable euro symbol support, download the conversion table file indicated in the column titled ″Conversion table files″.

Arabic:

Database server CCSIDs/CPGIDs	Database client CCSIDs/CPGIDs	Conversion table files
864, 17248	1046, 9238	08641046.cnv, 10460864.cnv, IBM00864.ucs
864, 17248	1256, 5352	08641256.cnv, 12560864.cnv, IBM00864.ucs
864, 17248	1200, 1208, 13488, 17584	IBM00864.ucs
1046, 9238	864, 17248	10460864.cnv, 08641046.cnv, IBM01046.ucs
1046, 9238	1089	10461089.cnv, 10891046.cnv, IBM01046.ucs
1046, 9238	1256, 5352	10461256.cnv, 12561046.cnv, IBM01046.ucs
1046, 9238	1200, 1208, 13488, 17584	IBM01046.ucs

Database server CCSIDs/CPGIDs	Database client CCSIDs/CPGIDs	Conversion table files
1089	1046, 9238	10891046.cnv, 10461089.cnv
1256, 5352	864, 17248	12560864.cnv, 08641256.cnv, IBM01256.ucs
1256, 5352	1046, 9238	12561046.cnv, 10461256.cnv, IBM01256.ucs
1256, 5352	1200, 1208, 13488, 17584	IBM01256.ucs

Baltic:

Database server CCSIDs/CPGIDs	Database client CCSIDs/CPGIDs	Conversion table files
921, 901	1257	09211257.cnv, 12570921.cnv, IBM00921.ucs
921, 901	1200, 1208, 13488, 17584	IBM00921.ucs
1257, 5353	921, 901	12570921.cnv, 09211257.cnv, IBM01257.ucs
1257, 5353	922, 902	12570922.cnv, 09221257.cnv, IBM01257.ucs
1257, 5353	1200, 1208, 13488, 17584	IBM01257.ucs

Belarus:

Database server CCSIDs/CPGIDs	Database client CCSIDs/CPGIDs	Conversion table files
1131, 849	1251, 5347	11311251.cnv, 12511131.cnv
1131, 849	1283	11311283.cnv

Cyrillic:

Database server CCSIDs/CPGIDs	Database client CCSIDs/CPGIDs	Conversion table files
855, 872	866, 808	08550866.cnv, 08660855.cnv
855, 872	1251, 5347	08551251.cnv, 12510855.cnv
866, 808	855, 872	08660855.cnv, 08550866.cnv
866, 808	1251, 5347	08661251.cnv, 12510866.cnv
1251, 5347	855, 872	12510855.cnv, 08551251.cnv, IBM01251.ucs
1251, 5347	866, 808	12510866.cnv, 08661251.cnv, IBM01251.ucs
1251, 5347	1124	12511124.cnv, 11241251.cnv, IBM01251.ucs
1251, 5347	1125, 848	12511125.cnv, 11251251.cnv, IBM01251.ucs
1251, 5347	1131, 849	12511131.cnv, 11311251.cnv, IBM01251.ucs
1251, 5347	1200, 1208, 13488, 17584	IBM01251.ucs

Estonia:

Database server CCSIDs/CPGIDs	Database client CCSIDs/CPGIDs	Conversion table files
922, 902	1257	09221257.cnv, 12570922.cnv, IBM00922.ucs
922, 902	1200, 1208, 13488, 17584	IBM00922.ucs

Greek:

Database server CCSIDs/CPGIDs	Database client CCSIDs/CPGIDs	Conversion table files
813, 4909	869, 9061	08130869.cnv, 08690813.cnv, IBM00813.ucs
813, 4909	1253, 5349	08131253.cnv, 12530813.cnv, IBM00813.ucs
813, 4909	1200, 1208, 13488, 17584	IBM00813.ucs
869, 9061	813, 4909	08690813.cnv, 08130869.cnv
869, 9061	1253, 5349	08691253.cnv, 12530869.cnv
1253, 5349	813, 4909	12530813.cnv, 08131253.cnv, IBM01253.ucs
1253, 5349	869, 9061	12530869.cnv, 08691253.cnv, IBM01253.ucs
1253, 5349	1200, 1208, 13488, 17584	IBM01253.ucs

Hebrew:

Database server CCSIDs/CPGIDs	Database client CCSIDs/CPGIDs	Conversion table files
856, 9048	862, 867	08560862.cnv, 08620856.cnv, IBM0856.ucs
856, 9048	916	08560916.cnv, 09160856.cnv, IBM0856.ucs
856, 9048	1255, 5351	08561255.cnv, 12550856.cnv, IBM0856.ucs
856, 9048	1200, 1208, 13488, 17584	IBM0856.ucs
862, 867	856, 9048	08620856.cnv, 08560862.cnv, IBM00862.ucs
862, 867	916	08620916.cnv, 09160862.cnv, IBM00862.ucs
862, 867	1255, 5351	08621255.cnv, 12550862.cnv, IBM00862.ucs
862, 867	1200, 1208, 13488, 17584	IBM00862.ucs
916	856, 9048	09160856.cnv, 08560916.cnv
916	862, 867	09160862.cnv, 08620916.cnv
1255, 5351	856, 9048	12550856.cnv, 08561255.cnv, IBM01255.ucs

Database server CCSIDs/CPGIDs	Database client CCSIDs/CPGIDs	Conversion table files
1255, 5351	862, 867	12550862.cnv, 08621255.cnv, IBM01255.ucs
1255, 5351	1200, 1208, 13488, 17584	IBM01255.ucs

Latin-1:

Database server CCSIDs/CPGIDs	Database client CCSIDs/CPGIDs	Conversion table files
437	850, 858	04370850.cnv, 08500437.cnv
850, 858	437	08500437.cnv, 04370850.cnv
850, 858	860	08500860.cnv, 08600850.cnv
850, 858	1114, 5210	08501114.cnv, 11140850.cnv
850, 858	1275	08501275.cnv, 12750850.cnv
860	850, 858	08600850.cnv, 08500860.cnv
1275	850, 858	12750850.cnv, 08501275.cnv

Latin-2:

Database server CCSIDs/CPGIDs	Database client CCSIDs/CPGIDs	Conversion table files
852, 9044	1250, 5346	08521250.cnv, 12500852.cnv
1250, 5346	852, 9044	12500852.cnv, 08521250.cnv, IBM01250.ucs
1250, 5346	1200, 1208, 13488, 17584	IBM01250.ucs

Simplified Chinese:

Database server CCSIDs/CPGIDs	Database client CCSIDs/CPGIDs	Conversion table files
837, 935, 1388	1200, 1208, 13488, 17584	1388ucs2.cnv
1386	1200, 1208, 13488, 17584	1386ucs2.cnv, ucs21386.cnv

Traditional Chinese:

Database server CCSIDs/CPGIDs	Database client CCSIDs/CPGIDs	Conversion table files
937, 835, 1371	950, 1370	09370950.cnv, 0937ucs2.cnv
937, 835, 1371	1200, 1208, 13488, 17584	0937ucs2.cnv
1114, 5210	850, 858	11140850.cnv, 08501114.cnv

Thailand:

Database server CCSIDs/CPGIDs	Database client CCSIDs/CPGIDs	Conversion table files
874, 1161	1200, 1208, 13488, 17584	IBM00874.ucs

Turkish:

Database server CCSIDs/CPGIDs	Database client CCSIDs/CPGIDs	Conversion table files
857, 9049	1254, 5350	08571254.cnv, 12540857.cnv
1254, 5350	857, 9049	12540857.cnv, 08571254.cnv, IBM01254.ucs
1254, 5350	1200, 1208, 13488, 17584	IBM01254.ucs

Ukraine:

Database server CCSIDs/CPGIDs	Database client CCSIDs/CPGIDs	Conversion table files
1124	1251, 5347	11241251.cnv, 12511124.cnv
1125, 848	1251, 5347	11251251.cnv, 12511125.cnv

Unicode:

Database server CCSIDs/CPGIDs	Database client CCSIDs/CPGIDs	Conversion table files
1200, 1208, 13488, 17584	813, 4909	IBM00813.ucs
1200, 1208, 13488, 17584	862, 867	IBM00862.ucs
1200, 1208, 13488, 17584	864, 17248	IBM00864.ucs
1200, 1208, 13488, 17584	874, 1161	IBM00874.ucs
1200, 1208, 13488, 17584	921, 901	IBM00921.ucs
1200, 1208, 13488, 17584	922, 902	IBM00922.ucs
1200, 1208, 13488, 17584	1046, 9238	IBM01046.ucs
1200, 1208, 13488, 17584	1250, 5346	IBM01250.ucs
1200, 1208, 13488, 17584	1251, 5347	IBM01251.ucs
1200, 1208, 13488, 17584	1253, 5349	IBM01253.ucs
1200, 1208, 13488, 17584	1254, 5350	IBM01254.ucs
1200, 1208, 13488, 17584	1255, 5351	IBM01255.ucs
1200, 1208, 13488, 17584	1256, 5352	IBM01256.ucs
1200, 1208, 13488, 17584	1386	ucs21386.cnv, 1386ucs2.cnv

Vietnamese:

Database server CCSIDs/CPGIDs	Database client CCSIDs/CPGIDs	Conversion table files
1258, 5354	1129, 1163	12581129.cnv

API Reference

New field for SQLEDBDESC structure

In the sqlecrea API, a new field has been added to support Direct I/O.

Field name
Unsigned char sqlfscaching

Description
File system caching

Values

0	File system caching is ON for the current table space
1	File system caching is OFF for the current table space
other	File system caching is ON for the current table space

Correction to new field in the SQLB-TBSPQRY-DATA structure

A new field, *unsigned char fsCaching*, has been added in the SQLB-TBSPQRY-DATA structure. This new field supports Direct I/O. Although the size of the reserved bit is documented as 32–bit, the correct size is 31–bit.

Application development: Building and Running Applications

Customizing precompile and bind options for SQL procedures

The precompile and bind options for SQL procedures can be customized by setting the instance-wide DB2 registry variable, DB2_SQLROUTINE_PREPOPTS with the command:

```
db2set DB2_SQLROUTINE_PREPOPTS=<options>
```

In addition to the options documented at Version 8.2, the REOPT option is allowed:

```
BLOCKING {UNAMBIG | ALL | NO}
DATETIME {DEF | USA | EUR | ISO | JIS | LOC}
DEGREE {1 | degree-of-parallelism | ANY}
DYNAMICRULES {BIND | RUN}
EXPLAIN {NO | YES | ALL}
EXPLSNAP {NO | YES | ALL}
FEDERATED {NO | YES}
INSERT {DEF | BUF}
ISOLATION {CS | RR | UR | RS | NC}
QUERYOPT optimization-level
REOPT {ALWAYS | NONE | ONCE}
VALIDATE {RUN | BIND}
```

C/C++ compile option required (Linux on PowerPC 64-bit)

The compile option ″-m64″ is required for a 64-bit instance on DB2 UDB for Linux on PowerPC® for building DB2 C/C++ applications and routines.

Compile and link command for Micro Focus COBOL stored procedures (HP-UX)

The compile and link command shown in the DB2 UDB Version 8.2 documentation for building stored procedures using Micro Focus COBOL on HP-UX is incorrect. The compile command contained in the actual script `sqllib/samples/cobol_mf/bldrtn` is correct. The compile and link commands are now combined into one single command, using the `-y` option to specify that the desired output is a shared library.

Minimum supported version of Micro Focus COBOL (HP-UX)

The minimum supported version of the Micro Focus COBOL compiler and run time on HP-UX is *Micro Focus Server Express 2.2 - Service Pack 1* plus Fix Pack *Fixpack22.02_14 for HP-UX PA-RISC 11.x (32/64bit)*. This Fix Pack is available from the Micro Focus Support Line Web site at http://supportline.microfocus.com.

Setting environment variables for Micro Focus COBOL stored procedures (Windows)

In order to run Micro Focus COBOL external routines on Windows, it is necessary to ensure that the Micro Focus COBOL environment variables are permanently set as system variables.

Procedure:

To set environment variables to system variables:

1. Open the Control Panel
2. Select **System**
3. Select the **Advanced** tab
4. Click **Environment Variables**
5. Add the variables to the **System variables** list

Setting the environment variables in the **User variables** list, at a command prompt, or in a script is insufficient.

Application development: Call Level Interface (CLI)

MapBigintCDefault CLI/ODBC configuration keyword

Keyword description:

Specify the default C type of BIGINT columns and parameter markers.

db2cli.ini keyword syntax:

MapBigintCDefault = **0** | **1** | **2**

Default setting:

The default C type representation for BIGINT data is SQL_C_BIGINT.

Usage notes:

MapBigintCDefault controls the C type that is used when SQL_C_DEFAULT is specified for BIGINT columns and parameter markers. This keyword should be used primarily with Microsoft applications, such as Microsoft Access, which cannot handle 8-byte integers. Set MapBigintCDefault as follows:

- 0 - for the default SQL_C_BIGINT C type representation
- 1 - for an SQL_C_CHAR C type representation
- 2 - for an SQL_C_WCHAR C type representation

This keyword affects the behavior of CLI functions where SQL_C_DEFAULT might be specified as a C type, such as `SQLBindParameter()`, `SQLBindCol()`, and `SQLGetData()`.

DescribeOutputLevel CLI/ODBC configuration keyword

Keyword description:

Set the level of output column describe information that is requested by the CLI driver during prepare or describe requests.

db2cli.ini keyword syntax:

DescribeOutputLevel = **0** | **1** | **2** | **3**

Default setting:

Request the describe information listed in level 2 of Table 16 on page 63.

Usage notes:

This keyword controls the amount of information the CLI driver requests on a prepare or describe request. By default, when the server receives a describe request, it returns the information contained in level 2 of Table 16 for the result set columns. An application, however, might not need all of this information or might need additional information. Setting the DescribeOutputLevel keyword to a level that suits the needs of the client application might improve performance because the describe data transferred between the client and server is limited to the minimum amount that the application requires. If the DescribeOutputLevel setting is set too low, it might impact the functionality of the application (depending on the application's requirements). The CLI functions to retrieve the describe information might not fail in this case, but the information returned might be incomplete. Supported settings for DescribeOutputLevel are:

- 0 - no describe information is returned to the client application
- 1 - describe information categorized in level 1 (see Table 16) is returned to the client application
- 2 - (default) describe information categorized in level 2 (see Table 16) is returned to the client application
- 3 - describe information categorized in level 3 (see Table 16) is returned to the client application

The following table lists the fields that form the describe information that the server returns when it receives a prepare or describe request. These fields are grouped into levels, and the DescribeOutputLevel CLI/ODBC configuration keyword controls which levels of describe information the CLI driver requests.

Note: Not all levels of describe information are supported by all DB2 servers. All levels of describe information are supported on the following DB2 servers: DB2 for Linux, UNIX, and Windows Version 8 and later, DB2 for z/OS Version 8 and later, and DB2 for iSeries Version 5 Release 3 and later. All other DB2 servers support only the 2 or 0 setting for DescribeOutputLevel.

Table 16. Levels of describe information

Level 1	Level 2	Level 3
SQL_DESC_COUNT SQL_COLUMN_COUNT SQL_DESC_TYPE SQL_DESC_CONCISE_TYPE SQL_COLUMN_LENGTH SQL_DESC_OCTET_LENGTH SQL_DESC_LENGTH SQL_DESC_PRECISION SQL_COLUMN_PRECISION SQL_DESC_SCALE SQL_COLUMN_SCALE SQL_DESC_DISPLAY_SIZE SQL_DESC_NULLABLE SQL_COLUMN_NULLABLE SQL_DESC_UNSIGNED SQL_DESC_SEARCHABLE SQL_DESC_LITERAL_SUFFIX SQL_DESC_LITERAL_PREFIX SQL_DESC_CASE_SENSITIVE SQL_DESC_FIXED_PREC_SCALE	all fields of level 1 and: SQL_DESC_NAME SQL_DESC_LABEL SQL_COLUMN_NAME SQL_DESC_UNNAMED SQL_DESC_TYPE_NAME SQL_DESC_DISTINCT_TYPE SQL_DESC_REFERENCE_TYPE SQL_DESC_STRUCTURED_TYPE SQL_DESC_USER_TYPE SQL_DESC_LOCAL_TYPE_NAME SQL_DESC_USER_DEFINED_ TYPE_CODE	all fields of levels 1 and 2 and: SQL_DESC_BASE_COLUMN_NAME SQL_DESC_UPDATABLE SQL_DESC_AUTO_UNIQUE_VALUE SQL_DESC_SCHEMA_NAME SQL_DESC_CATALOG_NAME SQL_DESC_TABLE_NAME SQL_DESC_BASE_TABLE_NAME

Application development: Programming Client Applications

db2secFreeToken function removed

The db2secFreeToken function (Free memory held by token) is no longer part of the db2secGssapiServerAuthFunctions_1 user authentication plug-in API.

Security plug–ins

If you are using your own customized security plug–in, you can use a user ID of up to 255 characters on a connect statement issued through the CLP or a dynamic SQL statement.

Security plug–in APIs

For the db2secGetGroupsForUser, db2secValidatePassword, and db2secGetAuthIDs APIs, the input parameter, *dbname*, can be null and its corresponding length input parameter, *dbnamelen*, will be set to 0.

Security plug–in naming conventions (UNIX, Linux)

.so is now accepted as a file name extension for user-written security plug–in libraries on all UNIX and Linux platforms.

On AIX, security plug–in libraries can have an extension of *.a* or *.so*. If both versions of the plug–in library exist, the *.a* version is used.

For HP–UX on PA–RISC, security plug–in libraries can have an extension of *.sl* or *.so*. If both versions of the plug–in library exist, the *.sl* version is used.

On all other UNIX and Linux platforms, *.so* is the only supported file name extension for security plug–in libraries.

Restrictions on security plug–in libraries

On AIX, security plug–in libraries can have a file name extension of *.a* or *.so*. The mechanism used to load the plug–in library depends on which extension is used:

Plug–in libraries with a file name extension of *.a*

Plug–in libraries with file name extensions of *.a* are assumed to be archives containing shared object members. These members must be named *shr.o* (32–bit) or *shr64.o* (64–bit). A single archive can contain both the 32–bit and 64–bit members, allowing it to be deployed on both types of platforms.

For example, to build a 32–bit archive style plug–in library:

```
xlc_r -qmkshrobj -o shr.o MyPlugin.c -bE:MyPlugin.exp
ar rv MyPlugin.a shr.o
```

Plug–in libraries with a file name extension of *.so*

Plug–in libraries with file name extensions of *.so* are assumed to be dynamically loadable shared objects. Such an object is either 32–bit or 64–bit, depending on the compiler and linker options used when it was built. For example, to build a 32–bit plug–in library:

```
xlc_r -qmkshrobj -o MyPlugin.so MyPlugin.c -bE:MyPlugin.exp
```

On all platforms other than AIX, security plug–in libraries are always assumed to be dynamically loadable shared objects.

Implicit ending of transactions in stand-alone applications

All application terminations (normal and abnormal) implicitly roll back outstanding units of work, regardless of operating system.

Rerouting DB2 Universal JDBC driver clients

The automatic client reroute feature in DB2 UDB for Linux, UNIX and Windows allows client applications to recover from a loss of communication with the server so that they can continue to work with minimal interruption.

Whenever a server locks up, each client that is connected to that server receives a communication error, which terminates the connection and results in an application error. When availability is important, you should have a redundant setup or failover support. Failover is the ability of a server to take over operations when another server fails. In either case, the DB2 Universal JDBC driver client attempts to reestablish the connection to a new server or to the original server, which might be running on a failover node. When the connection is reestablished, the application receives an SQL Exception that informs it of the transaction failure, but the application can continue with the next transaction.

Restrictions:

- DB2 Universal JDBC driver client reroute support is available only for connections that use the javax.sql.DataSource interface.
- A client application cannot recover from a loss of communication, unless an alternate server location is specified at the server.

Procedure:

Specify the alternate server with the UPDATE ALTERNATE SERVER FOR DATABASE command.

After the database administrator specifies the alternate server location on a particular database at the server instance, the alternate server location is returned back to the client at connect time. If communication is lost, the DB2 Universal JDBC driver can reestablish the connection using the alternate server information that had been returned from the server.

The activeServerListJNDIName DataSource property provides additional client reroute support at the client. The activeServerListJNDIName property has two functions:

- Allows alternate server information to persist across JVMs
- Provides an alternate server location in case the first connection to the database server fails

The activeServerListJNDIName property identifies a JNDI reference to a DB2ActiveServerList instance in a JNDI repository of alternate server information. After a successful connection to the primary server, the alternate server information that is provided by activeServerListJNDIName is overwritten by the information from the server.

Alternate server information received from the DB2 LUW server is stored in transient memory of the driver. If the JNDI store is defined, alternate server information is also updated there. The DB2 Universal JDBC driver attempts to propagate the updated information to the JNDI store after failover.

DB2ActiveServerList is a serializable Java bean with two properties: alternateServerName and alternatePortNumber. getXXX and setXXX methods are defined for each property. The Java bean is as follows:

```
package com.ibm.db2.jcc;
public class DB2ActiveServerList implements java.io.Serializable,
  javax.naming.Referenceable
{
  public String[] alternateServerName;
  public synchronized void
    setAlternateServerName(String[] alternateServer);
  public String[] getAlternateServerName();
  public int[] alternatePortNumber;
  public synchronized void
    setAlternatePortNumber(int[] alternatePortNumberList);
  public int[] getAlternatePortNumber();
}
```

A newly established failover connection is configured with the original DataSource properties, except for the server name and port number. In addition, any DB2 UDB special registers that were modified during the original connection are reestablished in the failover connection.

When a communication failure occurs, the DB2 Universal JDBC driver first attempts recovery to the original server. Reconnection to the original server is called failback. If failback fails, the driver attempts to connect to the alternate location (failover). After a failover or failback connection is reestablished, the driver throws a java.sql.SQLException to the application with SQLCODE -4498, which indicates to the application that a failover or failback occurred and the transaction failed. The application can then retry its transaction.

Procedure for alternate server setup:

Use JNDI to set up the alternate server, following these steps:

1. Set the environment for an initial context by creating a `jndi.properties` file. A sample jndi.properties file is:

   ```
   java.naming.factory.initial=com.sun.jndi.fscontext.RefFSContextFactory
   java.naming.provider.url=file:/tmp
   ```

2. Add the directory that contains the `jndi.properties` file in the CLASSPATH.
3. Create an instance of DB2ActiveServerList, and bind that instance to the JNDI registry. The following sample code creates an instance of DB2ActiveServerList and binds that instance to the JNDI registry:

   ```
   // Create a starting context for naming operations
   InitialContext registry = new InitialContext();
   // Create a DB2ActiveServerList object
   DB2ActiveServerList address = new DB2ActiveServerList();
   // Set the port number and server name for the alternate server
   int[] portNumber = {50000};
   String[] serverName = {"mvs3.sj.ibm.com"};
   address.setAlternateServerName(serverName);
   address.setAlternatePortNumber(portNumber);
   // Bind the DB2ActiveServerList instance to the JNDI registry
   registry.rebind("jdbc/alternate", address);
   ```

4. Assign the logical name of the DB2ActiveServerList object, which contains the alternate server location information, to the activeServerListJNDIName property of the original DataSource.

   The following sample code assigns the logical name of the DB2ActiveServerList object to the activeServerListJNDIName property of the a DataSource instance named datasource:

   ```
   datasource.setActiveServerListJNDIName("jdbc/alternate");
   ```

Customizing the DB2 Universal JDBC driver configuration properties

The DB2 Universal JDBC driver configuration properties let you set property values that have driver-wide scope. Those settings apply across applications and DataSource instances. You can change the settings without having to change application source code or DataSource characteristics.

Each DB2 Universal JDBC Driver configuration property setting is of the following form:

property=value

If the configuration property begins with db2.jcc.override, the configuration property is applicable to all connections and overrides any Connection or DataSource property with the same property name. If the configuration property begins with db2.jcc or db2.jcc.default, the configuration property value is a default. Connection or DataSource property settings override that value.

Procedure:

To set configuration properties:

- Set the configuration properties as Java system properties. Those settings override any other settings.

  For standalone Java applications, you can set the configuration properties as Java system properties by specifying `-Dproperty=value` for each configuration property when you execute the **java** command.
- Set the configuration properties in a resource whose name you specify in the db2.jcc.propertiesFile Java system property. For example, you can specify an absolute path name for the db2.jcc.propertiesFile value.

  For standalone Java applications, you can set the configuration properties by specifying the `-Ddb2.jcc.propertiesFile=path` option when you execute the **java** command.
- Set the configuration properties in a resource named DB2JccConfiguration.properties. A standard Java resource search is used to find DB2JccConfiguration.properties. The DB2 Universal JDBC Driver searches for this resource only if you have not set the db2.jcc.propertiesFile Java system property.

  DB2JccConfiguration.properties can be a standalone file, or it can be included in a JAR file.

  If DB2JccConfiguration.properties is a standalone file, the path for DB2JccConfiguration.properties must be in the CLASSPATH concatenation.

  If DB2JccConfiguration.properties is in a JAR file, the JAR file must be in the CLASSPATH concatenation.

You can set the following DB2 Universal JDBC Driver configuration properties. All properties are optional.

db2.jcc.override.traceFile

Enables the DB2 Universal JDBC Driver trace for Java driver code, and specifies the name on which the trace file names are based.

Specify a fully qualified file name for the db2.jcc.override.traceFile property value.

The db2.jcc.override.traceFile property overrides the traceFile property for a Connection or DataSource object.

For example, specifying the following setting for db2.jcc.override.traceFile enables tracing of the DB2 Universal JDBC Driver Java code to a file named /SYSTEM/tmp/jdbctrace:

```
db2.jcc.override.traceFile=/SYSTEM/tmp/jdbctrace
```

You should set the trace properties under the direction of IBM Software Support.

db2.jcc.sqljUncustomizedWarningOrException
Specifies the action that the DB2 Universal JDBC Driver takes when an uncustomized SQLJ application runs. db2.jcc.sqljUncustomizedWarningOrException can have the following values:

0 The DB2 Universal JDBC Driver does not generate a Warning or Exception when an uncustomized SQLJ application runs. This is the default.

1 The DB2 Universal JDBC Driver generates a Warning when an uncustomized SQLJ application runs.

2 The DB2 Universal JDBC Driver generates an Exception when an uncustomized SQLJ application runs.

Application development: Programming Server Applications

Common language run time (CLR) routine execution control modes (EXECUTION CONTROL clause)

As a database administrator or application developer, you might want to protect the assemblies associated with your DB2 external routines from unwelcome tampering by restricting the actions of routines at run time. DB2 .NET CLR routines support the specification of an execution control mode that identifies what types of actions a routine is allowed to perform at run time. At run time, DB2 UDB can detect if the routine attempts to perform actions beyond the scope of its specified execution control mode, which can be helpful when determining whether an assembly has been compromised.

To set the execution control mode of a CLR routine, specify the optional EXECUTION CONTROL clause in the CREATE statement for the routine. Valid modes are:

- SAFE
- FILEREAD
- FILEWRITE
- NETWORK
- UNSAFE

To modify the execution control mode in an existing CLR routine, execute the ALTER PROCEDURE or ALTER FUNCTION statement.

If the EXECUTION CONTROL clause is not specified for a CLR routine, by default the CLR routine runs using the most restrictive execution control mode, SAFE. Routines that are created with this execution control mode can only access resources that are controlled by the database manager. Less restrictive execution control modes allow a routine to access files on the local file system (FILEREAD or FILEWRITE) or on the network. The execution control mode UNSAFE specifies

that no restrictions are to be placed on the behavior of the routine. Routines defined with UNSAFE execution control mode can execute binary code.

These control modes represent a hierarchy of allowable actions, and a higher-level mode includes the actions that are allowed below it in the hierarchy. For example, execution control mode NETWORK allows a routine to access files on the network, files on the local file system, and resources that are controlled by the database manager. Use the most restrictive execution control mode possible and avoid using the UNSAFE mode.

If DB2 UDB detects at run time that a CLR routine is attempting an action outside of the scope of its execution control mode, DB2 UDB returns an error (SQLSTATE 38501).

The EXECUTION CONTROL clause can only be specified for LANGUAGE CLR routines. The scope of applicability of the EXECUTION CONTROL clause is limited to the .NET CLR routine itself, and does not extend to any other routines that it might call.

Maximum decimal precision and scale in common language run time (CLR) routines

The DECIMAL data type in DB2 UDB is represented with a precision of 31 digits and a scale of 28 digits. The .NET CLR System.Decimal data type is limited to a precision of 29 digits and a scale of 28 digits. Therefore, DB2 UDB external CLR routines must not assign a value greater than (2^96)–1, the highest value that can be represented using a 29 digit precision and a 28 digit scale, to a System.Decimal data type variable. DB2 UDB raises a run time error (SQLSTATE 22003, SQLCODE -413) if such an assignment occurs.

When a routine CREATE statement is executed, if a DECIMAL data type parameter is defined with a scale greater than 28, DB2 UDB raises an error (SQLSTATE 42611, SQLCODE -604).

Command Reference

db2inidb - Initialize a mirrored database command

Do not issue the `db2 connect to` *`database`* command prior to issuing the `db2inidb` *`database`* `as mirror` command.

Attempting to connect to a split mirror database prior to initializing it erases the log files needed for roll forward recovery.

The connect sets your database back to the state it was in when you suspended the database. If the database is marked as consistent at the time of the suspend, DB2 UDB concludes there is no need for crash recovery and empties the logs for future use. If this situation occurs, attempting to rollforward causes a SQL4970 error.

Usage note for the db2iupdt command

Starting with version 8.2, when you update a DB2 UDB instance with the **db2iupdt** command, you must first stop any DB2 processes running against that instance.

db2pd - Monitor and troubleshoot DB2 command

Additional parameters for the **db2pd** command include:

-hadr Reports High Availability Disaster Recovery information. Descriptions of

each reported element can be found in the High availability disaster recovery section of the *System Monitor Guide and Reference* .

-utilities
Reports Utility information. Descriptions of each reported element can be found in the Utilities section of the *System Monitor Guide and Reference* .

New parameter for the db2sqljcustomize command

The db2sqljcustomize command has a new parameter.

db2sqljcustomize - DB2 SQLJ Profile Customizer command:

-storebindoptions
Stores the value of the `-bindoptions` and `-staticpositioned` values in the serialized profile. If these values are not specified when invoking the dbsqljbind tool, the values stored in the serialized profile are used. When the Customizer is invoked with `.grp` file, the values are stored in each individual `.ser` file. The stored values can be viewed using db2sqljprint tool.

New parameter for the sqlj command

The sqlj command has a new parameter.

sqlj - DB2 SQLJ Translator command:

-db2optimize
Specifies that the SQLJ translator generates code for a connection context class that is optimized for DB2 UDB. This option optimizes the code for the user defined context but not for the default context. When you run the SQLJ translator with this option, the DB2 Universal JDBC Driver file `db2jcc.jar` must be in the CLASSPATH for compiling the generated Java application.

ATTACH command

The USER parameter of the ATTACH command specifies the authentication identifier. When attaching to a DB2 UDB instance on a Windows operating system, the user name can be specified in a format compatible with Microsoft Windows NT Security Account Manager (SAM). The qualifier must be a NetBIOS style name, which has a maximum length of 15 characters. For example, `domainname\username`.

RECOVER DATABASE command

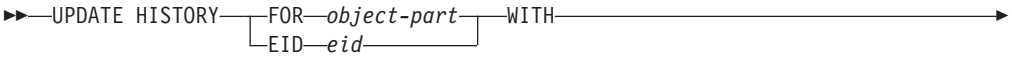
In the Examples section of the RECOVER DATABASE Command for version 8.2 documentation, timestamps are incorrectly formatted as `yyyy:mm:dd:hh:mm:ss`.

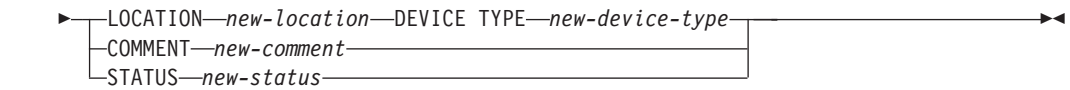
The correct format is `yyyy-mm-dd-hh.mm.ss`

UPDATE HISTORY FILE command

The UPDATE HISTORY FILE command updates the location, device type, comment, or status in a history file entry.

Updated command syntax:





Updated command parameters:

FOR *object-part*
Specifies the identifier for the history entry to be updated. It is a timestamp with an optional sequence number from `001` to `999`.

Note: Cannot be used to update entry status. To update the entry status, specify an EID instead.

STATUS *new-status*
Specifies a new status for an entry. Only backup entries can have their status updated. Valid values are:

A Active. Most entries are active.

I Inactive. Backup images that are no longer on the active log chain become inactive.

E Expired. Backup images that are no longer required because there are more than NUM_DB_BACKUPS active images are flagged as expired.

D Backup images that are no longer available for recovery should be marked as having been deleted.

db2updv8 - Update database to version 8 current level command

This command updates the system catalogs in a database to support the current level in the following ways:

- Introduces new routines shipped with the current database manager
- Catalogs the ODBC/CLI/JDBC schema procedures as trusted procedures to improve performance and scalability
- Fixes two typographical errors in the SYSPROC.SNAPSHOT_QUIESCERS table function's return parameters:
  - OUIESCER_TBS_ID corrected to QUIESCER_TBS_ID
  - OUIESCER_STATE corrected to QUIESCER_STATE
- Fixes LOB columns' column descriptors such that "logged" bit is consistent with the catalog tables
- Creates SYSIBM.SYSREVTYPEMAPPINGS view
- Updates the view definitions for SYSSTAT.COLUMNS and SYSSTAT.TABLES
- Updates the SYSCOLDIST.DISTCOUNT column to be updateable
- Updates the SYSINDEXES.TBSPACEID column such that column flags are not set
- Fixes parameter lengths of 17 table functions. Refer to the *Column expansion for snapshot UDFs* topic in the **Documentation updates | SQL Administrative Routines** section of the*Version 8.2 Release Notes* for a complete listing of functions
- Alters 33 SYSPROC snapshot UDFs to THREADSAFE:
  - SNAPSHOT_DBM
  - SNAPSHOT_FCM
  - SNAPSHOT_FCMNODE
  - SNAPSHOT_SWITCHES
  - SNAPSHOT_APPL_INFO

- SNAPSHOT_APPL
- SNAPSHOT_STATEMENT
- SNAPSHOT_LOCKWAIT
- SNAPSHOT_AGENT
- SNAPSHOT_SUBSECT
- SNAPSHOT_DATABASE
- SNAPSHOT_BP
- SNAPSHOT_LOCK
- SNAPSHOT_TABLE
- SNAPSHOT_DYN_SQL
- SNAPSHOT_TBS
- SNAPSHOT_TBS_CFG
- SNAPSHOT_QUIESCERS
- SNAPSHOT_CONTAINER
- SNAPSHOT_RANGES
- SNAPSHOT_TBREORG
- HEALTH_DBM_INFO
- HEALTH_DBM_HI
- HEALTH_DBM_HI_HIS
- HEALTH_DB_INFO
- HEALTH_DB_HI
- HEALTH_DB_HI_HIS
- HEALTH_TBS_INFO
- HEALTH_TBS_HI
- HEALTH_TBS_HI_HIS
- HEALTH_CONT_INFO
- HEALTH_CONT_HI
- HEALTH_CONT_HI_HIS

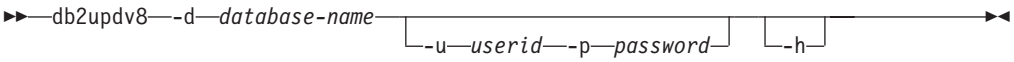
Authorization:

sysadm

Required connection:

Database. This command automatically establishes a connection to the specified database.

Command syntax:



Command parameters:

-d database-name
Specifies the name of the database to be updated.

-u userid
Specifies the user ID.

-p password
Specifies the password for the user.

-h Displays help information. When this option is specified, all other options are ignored, and only the help information is displayed.

Example:

After installing the current level (a FixPak or a new version), update the system catalog in the sample database by issuing the following command:

```
db2updv8 -d sample
```

Usage notes:

1. This command can be used only on a database running DB2 Version 8.1.2 or later. If the command is issued more than once, no errors are reported and each of the catalog updates is applied only once.
2. To enable the new built-in functions, all applications must disconnect from the database and the database must be deactivated if it has been activated.

Data Recovery and High Availability

Cross-platform backup and restore support

DB2 UDB supports cross-platform backup and restore operations. You can restore databases created on a DB2 UDB Version 8 32-bit Windows platform to a DB2 UDB Version 8 64-bit Windows platform, or the reverse. You can restore databases created on a DB2 UDB Version 8 32-bit Linux x86 platform to a DB2 UDB Version 8 64-bit Linux x86-64 or IA64 platform, or the reverse. You can restore databases created on DB2 UDB Version 8 AIX, HP-UX, Linux PPC, Linux zSeries, or the Solaris Operating Environment platforms, in 32-bit or 64-bit, to DB2 UDB Version 8 AIX, HP-UX, Linux PPC, Linux zSeries, or Solaris Operating Environment platforms (32-bit or 64-bit).

Backing up to tape (Linux)

The maximum block size limit for 3480 and 3490 tape devices on Linux is 61 440 bytes

Table 17. Maximum block size limit for 3480 and 3490 tape devices on Linux

Device	Attachment	Block Size Limit	DB2 buffer size limit (in 4-KB pages)
3480	s370	61 440	15
3490	s370	61 440	15

Tivoli Storage Manager

When calling the BACKUP DATABASE or RESTORE DATABASE commands, you can specify that you want to use the Tivoli Storage Manager (TSM) product to manage database or table space backup or restore operation. The minimum required level of TSM client API is Version 4.2.0, except on the following:

- 64-bit Solaris systems which require TSM client API Version 4.2.1.
- 64-bit Windows NT operating systems which require TSM client API Version 5.1.
- 32-bit Linux for iSeries and pSeries™ which requires at minimum TSM client API Version 5.1.5
- 64-bit Linux for iSeries and pSeries which requires at minimum TSM client API Version 5.2.2

- 64-bit Linux on AMD Opteron systems which require a minimum TSM client API Version 5.2.0.
- Linux for zSeries 64-bit which requires a minimum TSM client API Version 5.2.2.

Value restrictions for the HADR local host and local service parameters

When specifying values for the high availability disaster recovery (HADR) local host and local service parameters (HADR_LOCAL_SVC and HADR_REMOTE_SVC) while preparing an **update database configuration** command, the values must be ports that are not in use for any other service. If the parameters are being configured using the UNIX or Linux command line, the values should be also set in the `/etc/services` file.

Additional system requirements for high availability disaster recovery

If you create a table space on the primary database and log replay fails on the standby database because the containers are not available, the primary database does not receive an error message stating that the log replay failed.

To check for log replay errors, you must monitor the db2diag.log and the administration log on the standby database when you are creating new table spaces.

If a takeover operation occurs, the new table space that you created is not available on the new primary database. To recover from this situation, restore the table space on the new primary database from a backup image.

In the following example, table space MY_TABLESPACE is restored on database MY_DATABASE before it is used as the new primary database:

1. `db2 connect to my_database`
2. `db2 list tablespaces show detail`

   Note: Run the **db2 list tablespaces show detail** command to show the status of all table spaces and to obtain the table space ID number required for Step 5.
3. `db2 stop hadr on database my_database`
4. `db2 "restore database my_database tablespace (my_tablespace) online redirect"`
5. `db2 "set tablespace containers for my_tablespace_ID_# ignore rollforward container operations using (path '/my_new_container_path/')"`
6. `db2 "restore database my_database continue"`
7. `db2 rollforward database my_database to end of logs and stop tablespace "(my_tablespace)"`
8. `db2 start hadr on database my_database as primary`

Non-replicated operations for high availability disaster recovery

Version 8.2 documentation states:

BLOBs and CLOBs are not replicated; however, the space for them will be allocated on the standby database.

The statement should read as follows:

Non-logged BLOBs and CLOBs are not replicated; however, the space for them will be allocated on the standby database.

HADR does not support raw logs

High availability disaster recovery (HADR) does not support the use of raw I/O (direct disk access) for database log files. If HADR is started with the START HADR command, or if the database is restarted with HADR configured, and raw logs are detected, the associated command will fail with SQL1768N reason code "9".

Data Warehouse Center

Updates to the Business Intelligence tutorial

Verifying that the DWCTBC and TBC_MD databases are registered with ODBC:

In Version 8, the control database, TBC_MD that is used in the tutorial, does not need to be a system ODBC data source. However, the target database or database source DWCTBC must be a system ODBC data source.

Opening the Define Warehouse Source notebook:

The procedure for opening the Define Warehouse Source notebook for the Tutorial Relational Source has changed.

Procedure:

To open the Define Warehouse Source notebook for the Tutorial Relational Source:

1. From the Data Warehouse Center window, right-click the **Warehouse Sources** folder.
2. Click **Define** —> **ODBC** —> **DB2** —> **DB2 Family**.

The Define Warehouse Source notebook opens.

Opening the Define Warehouse Target notebook:

The procedure for opening the Define Warehouse Target notebook has changed.

Procedure:

To open the Define Warehouse Target notebook:

1. From the Data Warehouse Center window, right-click the **Warehouse Targets** folder.
2. Click **Define** —> **ODBC** —> **DB2** —> **DB2 Family**.

The Define Warehouse Target notebook opens.

Setting the purge limit for warehouse log files

The log file holds records until a designated count limit is reached. The default count limit is 1000 records. Typically, each job that you run creates 12 to 15 log records. Set the purge limit to a number that meets your needs by updating the **Purge log when total records equal** field on the Server tab of the Warehouse Properties page.

Data Warehouse Center support for CURSOR load

The DB2 UDB Load step now allows a view or a table to be used as the source to the step, resulting in a LOAD FROM CURSOR.

In order to map columns in the wizard for CURSOR load, the **Map columns based on column positions found in the input file** radio button must be selected.

Unicode warehouse control database migration and limitations

Starting with version 8.2 of the Data Warehouse Center, the warehouse control database must be a Unicode database. If you have a Unicode warehouse control database from a version of the Data Warehouse Center that is before Version 8.2, you still must create a new Unicode control database by using the Warehouse Control Database Management tool.

When you migrate a warehouse control database from a version of the Data Warehouse Center that is before Version 8.2, the Data Warehouse Center Control Database Management tool runs the **db2move** command to move the data to a new Unicode control database. During this process, windows appear that show the progress of the **db2move** command. This migration path only occurs once.

The Data Warehouse Center does not support Unicode on Sybase servers.

Change in date format for Modified column

In the details view of the main Data Warehouse Center window, the format of the date in the **Modified** column has been updated. The date in the **Modified** column is displayed in the format `MM/DD/YYYY` and includes the time. For example, `06/17/2003 2:47:15 PM`. This change in the date format ensures that sorting objects on the **Modified** column functions properly. This update applies to most lists of Data Warehouse Center objects that are shown in the Navigator and Details views, such as:

- Subjects
- Processes
- Warehouse schemas
- Warehouse agent sites
- Programs
- Steps
- Data resources
- Users
- User groups

Defining statistical transformers in the Data Warehouse Center

To perform a statistical transformation of your data, define the statistical transformer that you want to use.

Procedure:

To define statistical transformers:

1. Open the Process Model window.
2. Click the transformer icon and select a transformer from the list of available transformers.
3. Link the transformer that you selected to a warehouse source and warehouse target as required by the rules for that transformer.

Each transformer has specific rules for how it must be linked to a warehouse source and warehouse target. See the documentation for each transformer for more information.

Prerequisite for the iSeries warehouse agent

To use an iSeries warehouse agent for DB2 Warehouse Manager on V5R2 and V5R3 systems, the following PTF is required:

`PTF SI13558`

This database PTF enables the CLI on iSeries to handle Unicode data.

DB2 .NET Data Provider

DB2Connection.ConnectionString property

There is an additional keyword for the DB2Connection.ConnectionString property:

CurrentSchema
The schema to be used after a successful connection. Upon a successful connection, a SET CURRENT SCHEMA statement is sent to the DB2 server. This allows the application to name SQL objects without having to qualify them by a schema name.

DB2 Connect

New security scenario

A new security scenario has been added for APPC connections:

Authentication	GSSPLUGIN
Security	none
Validation	GSS API security plugin mechanism

Corrections to diagrams

The following DB2 Connect Enterprise Edition topics have diagrams that are incorrect:

- Accessing host or iSeries DB2 data using DB2 Connect Enterprise Edition
- Accessing DB2 data from the Web using Java

The following table outlines corrections for diagrams in the ″Accessing host or iSeries DB2 data using DB2 Connect Enterprise Edition″ topic.

Table 18. Corrections for diagrams in the ″Accessing host or iSeries DB2 data using DB2 Connect Enterprise Edition″ topic

Location within the topic	Correction
Legend for all four diagrams	• References to ″DB2 for OS/390 V5R1″ should be ″DB2 for OS/390 V6 or later″. • References to ″DB2 for AS/400® V4R2″ should be ″DB2 for iSeries V5R1 or later″.
First diagram (Figure 1: DB2 Connect Enterprise Edition)	All references to ″APPC″ and ″SNA Communications Support″ are incorrect. SNA/APPC is not supported as an inbound protocol for the DB2 Runtime Client by DB2 Linux, Unix, and Windows servers, including DB2 Connect Enterprise Edition.

The following table outlines corrections for diagrams in the ″Accessing DB2 data from the Web using Java″ topic.

Table 19. Corrections for diagrams in the ″Accessing DB2 data from the Web using Java″ topic

Location within the topic	Correction
Legend	• References to ″DB2 for OS/390 V5R1″ should be ″DB2 for OS/390 V6 or later″. • References to ″DB2 for AS/400 V4R2″ should be ″DB2 for iSeries V5R1 or later″.

Development Center

Restrictions to DB2 Universal type 2 and type 4 drivers

In Version 8.2, support was added to allow users to connect to a DB2 UDB database from within the Development Center using the DB2 Universal Type 2 and Type 4 drivers. However, if you attempt to use one of these drivers to connect to an iSeries server, or to a DB2 UDB server that is Version 8.1 or earlier, you will see the following error message:

```
Connection to <database> failed.
IBM DB2 Universal driver (JCC) not found.
```

Refer to the topic titled ″JDBC drivers″ in the DB2 Information Center for additional information on which drivers to use in order to avoid this error.

GUI Tools

Database unavailable status in the database details pane of the Control Center

You can use the Control Center's details pane to view information about your databases. Selecting a database in the object tree or contents pane displays a summary of its state. In certain situations database information might be unavailable. Some reasons for this unavailability are described in the following table.

Table 20. Reasons for a database status of unavailable

Database status element	Possible reasons for unavailable status
Last backup	• No backups have been performed for the database. • User does not have the required authority to access this information.
Size	• Database is pre-Version 8.2. • User does not have the required authority to access this information.
Capacity	• Database is pre-Version 8.2. • Database has multiple partitions. • User does not have the required authority to access this information.

Table 20. Reasons for a database status of unavailable (continued)

Database status element	Possible reasons for unavailable status
Health	• Health monitor is not turned on. • Timing delay. There is approximately a 5 minute delay from the time a database is activated until its health status is available.
Maintenance	• Database is pre-Version 8.2.

Default write to table output generation (Create Event Monitor)

A **Generate** button has been added to the Output options dialog, which is launched from the Create Event Monitor window. Clicking the Generate button generates the default *write to table output* option. This output is equivalent to the syntax generated by the **db2evtbl** command.

The generated option shows the user which tables and data elements will be included when the event monitor is created. Users can modify the command to suit their needs.

The generated syntax is based on the event monitor name and event types specified in the Create Event Monitor window. Specify the event monitor name and event types before generating the output option syntax.

If the event monitor name or event types change after the generation of the output option, a message displays to remind the user to regenerate the output option before creating the event monitor. If the output option is not regenerated, event tables will be generated based on the event monitor name that was previously specified.

Information Catalog Center

Configuration sample scripts

The `ICCConfig.jacl` and `ICCConfig.properties` sample scripts are provided with the Information Catalog Center for the Web with the DB2 Embedded Application Server. You can use these sample scripts to configure the Information Catalog Center for the Web with WebSphere Application Server 5. These scripts are located in the `sqllib\samples\icweb` directory.

Web server configuration

When configuring the Information Catalog Center for the Web with the DB2 Embedded Application Server, if your metadata contains URLs that access files on the server, you must map the URLs to the correct location by using aliases in the Web server configuration. You must also map the help and copyright links. If you use the DB2 Embedded Application Server, a Web server must be configured correctly and running for these links to work even though you don't need to plug in to a Web server.

Installation and Configuration Supplement

Application server for DB2

The application server for DB2 no longer supports remote administration or stored procedures.

The updated topics are as follows:

Enabling the application server for DB2: Enabling the database does the following:

- Connects to a specified database
- Creates and populates metadata tables
- Updates the DBM CFG parameters, JDK_PATH, and JAVA_HEAP_SZ
- Installs the DB2 Web Services Application.

Procedure:

To enable the application server for DB2 , perform the following:

1. Log on to the DB2 server as **root** on UNIX operating systems, or as a user with **Administrator** privileges on Windows operating systems.
2. For UNIX-based operating systems run the following command:

   ```
   . /db2instance_path/sqllib/db2profile
   ```

   where *db2instance_path* is where the DB2 instance was created.
3. Run one the following commands:
   - For UNIX operating systems:

     ```
     AppServer_install_path/bin/enable.sh
           -db db_alias
           -user db_user
           -password db_password
           -db2path path_to_sqllib
           -instance instance_name
           -easpath path_to_eas
           -fencedid fenced_userid
     ```

   - For Windows operating systems:

     ```
     AppServer_install_path\bin\enable
           -db db_alias
           -user db_user
           -password db_password
           -db2path path_to_sqllib
           -instance instance_name
           -easpath path_to_eas
     ```

     where:
     - *db_alias* is the alias of the database to be enabled.
     - *db_user* is the user id to use when connecting to the database.
     - *db_password* is the password to use with the user id connecting to the database.
     - *path_to_sqllib* is the path to the DB2 instance SQLLIB directory. This path is used to update DB2EAS with the required JAR files.
     - *instance_name* is the name of a DB2 instance.
     - *path_to_eas* is the path to the embedded application server.
     - *fenced_userid* is the user id for the fenced user.

Once the application server for DB2 is enabled, the application server is started automatically.

Starting the application server for DB2 locally: The application server should be started using the fenced user ID for systems creating web services in a .NET environment or running XML Metadata Registry (XMR) only.

Starting the application server for DB2 remotely: This section is removed. The application server for DB2 no longer supports remote administration.

Stopping the application server for DB2 locally: The application server should be stopped using the fenced user ID for systems creating web services in a .NET environment or running XML Metadata Registry (XMR) only.

Stopping the application server for DB2 remotely: This section is removed. The application server for DB2 no longer supports remote administration.

Uninstalling the application server for DB2: This section is removed. The application server for DB2 no longer supports remote administration.

DB2 Embedded Application Server enablement

The enabled database of a DB2 Embedded Application Server must be located in a 32–bit instance Any databases accessed from the DB2 Embedded Application Server can be located in 32–bit or 64–bit instances.

Deploying DB2 Web Tools

Application servers using JDK 1.4 no longer require customization of the CLASSPATH variable during DB2 Web Tools deployment. All dependencies, including those for XML parser and transformer, are now deployed with the web module and are expected to be loaded from the `WEB-INF\lib` directory according to the J2EE specification. This change affects two information topics:

- Deploying DB2 Web Tools on WebLogic application servers
- Deploying DB2 Web Tools on other application servers

The updated topics are as follows:

Deploying DB2 Web Tools on WebLogic application servers: This task describes how to deploy and configure DB2 Web Tools (including the Web Command Center and the Web Health Center) on BEA WebLogic 7.0. These tools run as Web applications on a Web server to provide access to DB2 servers through Web browsers.

Prerequisites:

Before you install DB2 Web Tools on WebSphere, ensure that you have:

- BEA WebLogic 7.0 application server.
- IBM DB2 Administration Client Version 8.
- A Web browser that is compliant with HTML 4.0.

  Note: DB2 Web Tools were tested using Netscape 4.x, Netscape 6.x, Netscape 7.x, Mozilla 1.x, Internet Explorer 5.x, Opera 6.x, Konqueror 3.x (Linux) and EudoraWeb 2.x (Palm OS). Use of certain Web browsers that have not been tested might require an explicit reference to be added in the servlet configuration.

Restrictions:

The following restrictions apply to the DB2 Web Tools deployment:

- Multiple language and code page conversions between the middle tier and DB2 servers are not supported. Although the language for the server is what is used for display, some characters might appear incorrectly.

- In order to see the health alerts for databases, table spaces, and table space containers in the Web Health Center, you need to ensure that the databases are cataloged on the Web application server.
- The use of the Web browser buttons (**Stop**, **Back**, **History**) are not supported while using DB2 Web Tools.
- If you are using Netscape Navigator 4 with DB2 Web Tools, your browser display might not refresh properly . If you experience this problem, you can refresh your display by minimizing the window and then maximizing it. You can also refresh the display by hiding the browser window under another window, and then bringing it to the foreground again.
- To assign your own alias to any DB2 system, instance node, or database, you must explicitly catalog it on the application server using the DB2 Configuration Assistant or the DB2 Control Center.
- During their first startup, the DB2 Web Tools require a significantly longer time to initialize than for subsequent startups. Most of this wait is due to the automatic catalog process. If you do not want to use the automatic catalog functionality, you can shorten the time you must wait by turning the automatic cataloging off through the servlet configuration.

  Note: The servlet configuration parameters are available in the deployment descriptor file `web.xml`. The parameter names and default values are subject to change with each release. Some application servers might allow changes to these parameters, either through their interface or by editing the `web.xml` file directly.
- The output (results) buffer has an absolute maximum size of 1MB when using a desktop or laptop browser, even if it is configured for larger capacity. In the case of PDA Web browsers, the limit is 1KB.
- On Linux, Windows, and UNIX operating systems, the DB2 Web Tools automatically discover and catalog any systems on the same TCP/IP net as the application server. Systems on the same TCP/IP net have the same first three digits in their IP address. The tools try to catalog the DB2 system nodes using the original remote TCP/IP host name. If there is name duplication, the tools assign a unique random name. You must explicitly catalog any other DB2 administration servers on the application server if you want them to be accessible. This includes any servers using TCP/IP that are not on the same TCP/IP net as the application server, as well as any servers that do not use TCP/IP.
- On Linux, Windows, and UNIX operating systems, the DB2 Web Tools attempt to automatically discover and catalog any DB2 instance nodes and databases that reside on cataloged DB2 systems. It is possible to configure a remote instance for multiple communication protocols, therefore, the catalog will contain a separate node entry for each protocol supported by an automatically cataloged instance. If there is name duplication, the tools assign a unique random name.

Procedure:

To install DB2 Web Tools on WebLogic application servers:

1. Deploy the DB2 Web Tools through the WebLogic administrative console by completing the following:
   a. Start the WebLogic administrative console.
   b. Click **domain** –> **deployments** –> **Web Applications** in the left pane of the window.

c. Click the **Configure a new Web Application** link to install DB2 Web Tools Web application.
d. Browse the listing of the file system to locate `Sqllib\tools\web\db2wa.war`.
e. Click on **select** beside the `db2wa.war` file name.
f. Choose a server from the list of available servers to house DB2 Web Tools, select the server and click the arrow to move the server to target servers.

   Note: Preserving the original name **db2wa** is mandatory, as DB2 Web Tools has it hardcoded.
g. Click **Configure and Deploy**.
h. Wait until the application server refreshes the deployment status of the Web application on the selected server. If successful, it should show **Deployed=true**

2. Invoke the DB2 Web Tools Web application, which is located at:

   `http://`*`server_name`*`:`*`app_server_port_number`*`/db2wa`

   For example, `http://`*`server_name`*`:7001/db2wa`.

Deploying DB2 Web Tools on other application servers: This task describes how to deploy and configure DB2 Web Tools (including the Web Command Center and the Web Health Center) on other application servers such as Tomcat 4.0 and Macromedia JRun 4.0. These tools run as Web applications on a Web server to provide access to DB2 servers through Web browsers.

Prerequisites:

Before you install DB2 Web Tools, ensure that you have:

- An application server, such as:
  - Tomcat 4.0 Servlet/JSP Container (http://jakarta.apache.org/tomcat/)
  - Macromedia JRun 4.0
- IBM DB2 Administration Client Version 8.
- A Web browser that is compliant with HTML 4.0.

Restrictions:

The following restrictions apply to the DB2 Web Tools deployment:

- Multiple language and code page conversions between the middle tier and DB2 servers are not supported. Although the language for the server is what is displayed, some characters might appear incorrectly.
- In order to see the health alerts for databases, table spaces, and table space containers in the Web Health Center, you need to ensure that the databases are cataloged on the Web application server.
- The use of the Web browser buttons (**Stop**, **Back**, **History**) are not supported while using DB2 Web Tools.
- If you are using Netscape Navigator 4 with DB2 Web Tools, your browser display might not refresh properly. If you experience this problem, you can refresh your display by minimizing the window and then bringing it back. You can also refresh the display by hiding the browser window under another window, and then bringing it to the foreground again.
- To assign your own alias to any DB2 system, instance node, or database, you must explicitly catalog it on the application server using the DB2 Configuration Assistant or the DB2 Control Center.

- During their first startup, the DB2 Web Tools require a significantly longer time to initialize than for subsequent startups. Most of this wait is due to the automatic catalog process. If you do not want to use the automatic catalog functionality, you can shorten the time you must wait by turning the automatic cataloging off through the servlet configuration.

  Note: The servlet configuration parameters are available in the deployment descriptor file `web.xml`. The parameter names and default values are subject to change with each release. Some application servers might allow changes to these parameters, either through their interface or by editing the `web.xml` file directly.
- The output (results) buffer has an absolute maximum size of 1MB when using a desktop or laptop browser, even if it is configured for more. In the case of PDA Web browsers, the limit is 1KB.
- On Linux, Windows, and UNIX operating systems, the DB2 Web Tools automatically discover and catalog any systems on the same TCP/IP net as the application server. Systems on the same TCP/IP net have the same first three digits in their IP address. The tools try to catalog the DB2 system nodes using the original remote TCP/IP host name. If there is name duplication, the tools assign a unique random name. You must explicitly catalog any other DB2 administration servers on the application server if you want them to be accessible. This includes any servers using TCP/IP that are not on the same TCP/IP net as the application server, as well as any servers that do not use TCP/IP.
- On Linux, Windows, and UNIX operating systems, the DB2 Web Tools attempt to automatically discover and catalog any DB2 instance nodes and databases that reside on cataloged DB2 systems. It is possible to configure a remote instance for multiple communication protocols, therefore, the catalog will contain a separate node entry for each protocol supported by an automatically cataloged instance. If there is name duplication, the tools assign a unique random name.

Procedure:

The following are the procedures for installing DB2 Web Tools using application servers such as Tomcat 4.0 or Macromedia JRun 4.0:

Tomcat 4.0

1. Prepare the Tomcat 4.0 configuration file (CLASSPATH) by completing the following:
   a. Create a new environment/system variable **CATALINA_HOME** to contain the path (root directory) to Tomcat 4.0. For example, `D:\jakarta-tomcat-4.0.3`.

      Note: This step is not mandatory on Windows operating systems, however, **step c** depends on this value having been set or the original path used.
   b. Confirm that the Tomcat Servlet/JSP Container is functional:
      1) Start Tomcat by running **startup.bat** from Tomcat's `bin` directory.
      2) Access the main Web page **http://localhost:8080/** through a Web browser.
2. Deploy the DB2 Web Tools into the Tomcat Servlet/JSP Container by locating the DB2 Web Tools install path (i.e. `Sqllib\tools\web\db2wa.war`) and copying **db2wa.war** into Tomcat's deployment directory (i.e. Tomcat's webapps directory).

3. Invoke DB2 Web Tools on Tomcat Servlet/JSP Container by completing the following:
   a. Open a DB2 Command Window and change the directory to Tomcat's `bin` directory.
   b. Start Tomcat using **startup.bat** and confirm that a new directory (**db2wa**) has been added into the `webapps` directory.

      Note: Running **startup.bat** from a command prompt window would not set DB2PATH. In order to enable DB2PATH being set, the CLASSPATH line needs to be changed to explicitly reference the DB2 installation path rather than the %DB2PATH% environment variable.
   c. The DB2 Web Tools enterprise application is located at **http://localhost:8080/db2wa** and can be accessed with an HTML 4.0 compliant Web browser.

JRun

1. Prepare a new application server for DB2 Web Tools by completing the following tasks:

   Recommendation:

   Creating a new application server is recommended, but not mandatory. For testing purposes, the default server can be used, and only the configuration of the JVM classpath and the deployment is required.
   a. Start the JRun Management Console and login as the administrator of the application server.
   b. Create a new application server using **Create New Server** located at the top right of the main page. Do not change the host name selection from `localhost`.
   c. Enter the new server name (**DB2WebToolsServer**) and click the JRun Server Directory. The value is automatically filled in.
   d. Click the **Create Server** button.
   e. Record the generated values or enter new values for:
      - JNDI Provider URL
      - Web Server Port Number. This would be the value to be used in the URL for the DB2 Web Tools (i.e. `http://localhost:`*`web_server_port_numer`*`/db2wa`)
      - Web Connector Proxy Port Number
   f. Click **update port numbers** if necessary and close the window.
2. Deploy DB2 Web Tools on the JRun application server by completing the following tasks:
   a. Start the application server selected to host DB2 Web Tools Web application (DB2WebToolsServer, default or any other except admin).
   b. Click **Web Applications** and then click **Add**.
   c. Browse the **Deployment File** section to select the `Sqllib\tools\web\db2wa.war` file in the DB2 installation path.
   d. Click **Deploy** and confirm that the context path is `/db2wa`.
   e. Select the application server and confirm that the DB2 Web Tools application appears in the **Web Applications** section. Do *not* click **Apply** on this page.
   f. Select the **Home** link from the upper left panel of the main page.

g. Restart the application server from the **Home** view that contains the DB2 Web Tools (**DB2WebToolsServer**).

The DB2 Web Tools enterprise application is located at http://localhost:*your_web_server_port_numer*/db2wa and can be accessed with an HTML 4.0 compliant Web browser.

Direct I/O on block devices (Linux)

Direct I/O is now supported on both file systems and block devices for distributions of Linux with a 2.6 kernel. Direct I/O on block devices is an alternative way to specify device containers for direct disk access or for raw I/O. The performance of Direct I/O is equivalent to the raw character device method. DB2 UDB enables Direct I/O while opening the table space when the CREATE TABLESPACE statement specifies a block device name for the container path. Previously, the same performance was achieved using the raw I/O method, which required binding the block device to a character device using the **raw** utility.

Table 21. Comparison of direct I/O and raw I/O

Direct I/O (new method)	Raw I/O (old method)

`CREATE TABLESPACE dms1`
`MANAGED BY DATABASE`
`USING (DEVICE '/dev/sda5' 11170736)`
	`CREATE TABLESPACE dms1`
	`MANAGED BY DATABASE`
	`USING (DEVICE '/dev/raw/raw1' 11170736)`

Although the raw I/O method is still supported by DB2 UDB, it has been deprecated and support for it might be removed from future kernels.

Recommendation:

If you want to exploit direct disk access, create your DMS device containers using Direct I/O to avoid future migration issues.

Note: Direct I/O is not supported by DB2 UDB on Linux/390.

DB2 Information Center daemon (Linux, UNIX)

The DB2 Information Center daemon is responsible for the control of the DB2 documentation server. The daemon, which is part of the DB2 Information Center installation, is composed of two files:

- db2icd – the initialization script
- db2ic.conf – the configuration file

These files are installed in the following locations:

AIX /etc/db2icd

/var/db2/v81/db2ic.conf

HP /sbin/init.d/db2icd

/var/opt/db2/v81/db2ic.conf

Solaris Operating Environment

/etc/init.d/db2icd

/var/db2/v81/db2ic.conf

Linux /etc/init.d/db2icd

/var/db2/v81/db2ic.conf

Starting or stopping the Information Center daemon (AIX, Solaris Operating Environment, HP, Linux): The only time you should need to start or stop the daemon manually is when you want to change the configuration variables for the daemon. Normally, the daemon is started at system startup, according to the run levels created during the installation of the DB2 Information Center.

Procedure:

To stop and start the Information Center daemon:

1. Halt the daemon if it is already running. At a command line, enter:
   ```
   INIT_DIR/db2icd stop
   ```
   where *INIT_DIR* is the installation directory of the `db2icd` file listed previously.
2. Change any of the variables for the daemon by editing the `db2ic.conf` file. Currently, you can modify the TCP port number where the documentation is available, and the location of the temporary workspace used by the daemon while it is running.
3. Start the daemon. At a command line, enter:
   ```
   INIT_DIR/db2icd start
   ```
   where *INIT_DIR* is the installation directory of the db2icd file listed previously.

When the daemon starts, it uses the new environment variables.

There is also an option to shut down and restart the daemon immediately. At a command line, enter:

```
INIT_DIR/db2icd restart
```

where *INIT_DIR* is the installation directory of the db2icd file listed previously.

You can check the status of the daemon at any time. At a command line, enter:

```
INIT_DIR/db2icd status
```

where *INIT_DIR* is the installation directory of the db2icd file listed previously. The daemon returns the current status, and displays the ID of the daemon process or processes if it is active.

Response file installation error codes

The following error code is for Windows only and is not applicable to UNIX and Linux operating systems.

3010 The installation is successful, however a system restart is required to complete the installation.

Required user accounts for installation of DB2 servers (Windows)

Increase quotas

The *Increase quotas* user right has been changed to *Adjust memory quotas for a process* on the Windows XP and Windows Server 2003 operating systems.

User rights granted by the DB2 installer - Debug Programs

The DB2 installation program does not grant the Debug Programs user right. The DB2 installer grants the following user rights:

- Act as part of the operating system
- Create token object

- Lock pages in memory
- Log on as a service
- Increase quotas
- Replace a process level token

Asynchronous I/O support (Linux)

Asynchronous I/O (AIO) support is now available on Linux (2.6 and some 2.4 kernels) for raw devices and O_DIRECT file systems. AIO improves page cleaner performance. You can enable or disable AIO on Linux by issuing the **db2set** command.

To use AIO, users must install libaio-0.3.98 or later and have a kernel that supports AIO. Users must also run the **db2set DB2LINUXAIO=true** command and restart DB2 UDB.

Message Reference

ADM message updates

ADM12504E: The description for message ADM12504E incorrectly implies that the instance name on the primary database should match the instance name on the standby database.

ADM12504E

Unable to establish HADR primary-standby connection because the DB2 instance names do not match. Correct the HADR_REMOTE_INST configuration parameter.

It is not a HADR requirement for the instance name on the primary to match the instance name on the standby.

CLP message updates

DB21015E: The Command Line Processor backend process request queue or input queue was not created within the timeout period.

Explanation

Either the values for the DB2BQTRY and DB2BQTIME environment variables need to be increased or the command line processor back-end program ″db2bp″ cannot be started. The ″db2bp″ program must reside in the correct database manager install path and users must have execute permission on the file.

On UNIX platforms, ensure that the file system has enough file blocks and inodes.

User Response

Correct the error and resubmit the command.

DBI message updates

DBI1060E: Invalid package name <″pkg-name″>

Explanation:

An incorrect name has been entered. The package either does not exist or the name has been entered incorrectly.

User Response:

Check to see if the name of the given package exists on the distribution media. If so, examine the name to see if it has been misspelled. All package names should be in lowercase.

SQL message additions

SQL0121N: The target name ″<name>″ is specified more than once for assignment in the same SQL statement.

Explanation

The same target name ″<name>″ is specified more than once as an OUT or INOUT argument of a CALL statement, or in the list of columns of an INSERT statement, the left hand side of assignments in the SET clause of an UPDATE statement, or the left hand side of the assignment statement. The target name identifies a column, SQL parameter, SQL variable, or new transition variable.

Note that this error may occur when updating or inserting into a view where more than one column of the view is based on the same column of a base table.

The statement cannot be processed.

User Response

Correct the syntax of the statement so each name is specified only once.

sqlcode : -121

SQL0270N: Function not supported (Reason code = "<reason-code>")

Explanation

74 Updating a status field in the recovery history file by timestamp is not allowed.

User Response

74 Update the status field in the recovery history file by EID only.

Explanation

75 Automatic statistics collection is not supported on a multiple database partition system, on a system where SMP is enabled, or on a federated system.

User Response

75 Disable automatic statistics collection for this database by setting the database configuration parameters AUTO_STATS_PROF and AUTO_PROF_UPD to OFF.

Or change the system to one that is on a single database partition, where SMP is not enabled, and that is not federated.

SQL0494W: The number of result sets is greater than the number of locators.

Explanation

The number of result set locators specified on the ASSOCIATE LOCATORS statement is less than the number of result sets returned by the stored procedure. The first ″n″ result set locator values are returned, where ″n″ is the number of result set locator variables specified on the SQL statement.

The SQL statement is successful.

User Response

Increase the number of result set locator variables specified on the SQL statement.

sqlcode : +494

sqlstate : 01614

SQL1227N:

Explanation:

Reason code 4

Buffer size entries of PAGE_FETCH_PAIRS must be ascending in value. Also, for 32-bit instances, any buffer size value in a PAGE_FETCH_PAIRS entry cannot be greater than the number of pages in the table or 524287, whichever is lower. For 64-bit instances, any buffer size value in a PAGE_FETCH_PAIRS entry cannot be greater than the number of pages in the table or 2147483674.

SQL1768N: Unable to start HADR. Reason code = "<reason-code>"

Explanation:

9 The database is configured to use raw logs.

User Response:

9 Reconfigure the database to use only file system storage for the log files, instead of using raw i/o (direct disk access) devices. Refer to the discussion of the *logpath* and *newlogpath* database configuration parameters in *Administration Guide: Performance*.

SQL1790W: A default table space could not be found with a page size of at least ″<page size>″.

Explanation

The procedure NNSTAT was not able to create the SYSPROC.FED_STATS table to keep a history of the statement that was run. The table space with sufficient page size (at least ″<pagesize>″) could not be found.

User Response

Ensure that a table space with a page size of at least ″<pagesize>″ exists.

sqlcode: +1790

sqlstate: 01670

SQL1791N: The specified server definition, schema, or nickname object-name does not exist.

Explanation

The procedure NNSTAT accepts a server definition, schema, and nickname as input and one or more of these objects, including object-name, could not be found.

User Response

Specify an existing server definition, schema, or nickname and resubmit the statement.

sqlcode: -1791

sqlstate: 42704

SQL2316W: The Runstats command string for the statistics profile has exceeded the maximum size. The Runstats command string will be truncated to the maximum size and stored in the catalog table SYSIBM.SYSTABLE.

Explanation

The maximum size of the STATISTICS_PROFILE column is 32768 bytes. If the size of the Runstats command string for the statistics profile is greater than this amount, the Runstats command string is truncated to the maximum size.

The utility continues processing.

User Response

Refer to the STATISTICS_PROFILE column in the catalog table SYSIBM.SYSTABLES to review the statistics profile. If the existing statistics profile is not desired, reissue the RUNSTATS utility and specify the UPDATE PROFILE or the UPDATE PROFILE ONLY option to modify the profile. Refer to the RUNSTATS utility documentation for information about the utility options.

SQL3705N: The buffer size parameter specified is not valid. The buffer size must be specified as 0 or be between 8 and 250000 inclusive. For multiple buffers, the total buffer size must not exceed 250000.

SQL20290N: The SQL statement references routine ″<routine-name>″ (specific name ″<specific-name>″) which cannot be run on partition ″<partition-number>″.

Explanation

The routine ″<routine-name>″ (specific name ″<specific-name>″) was called with an invalid partition number ″<partition-number>″.

User Response

Specify -1 for the partition number parameter to run the routine on the current partition.

sqlcode: -20290

sqlstate: 560CA

SQL22025N: An invalid input argument was specified for the reorgchk stored procedure.

Explanation

Only 'T' and 'S' are supported for the first argument of the stored procedure. If 'T' is specified as the first argument, the second argument to the stored procedure must be a fully qualified table name as <schema.table-name>.

User Response

Resubmit with valid input arguments.

SQL27994W: The length of a special register default column is smaller than the target column length. Load may truncate the values corresponding to this column (<column-num>).

Explanation

The clause SESSION_USER, CURRENT_USER, SYSTEM_USER, or CURRENT_SCHEMA has been specified for column ″<column-num>″, but

this column was either defined with a length that is less than 128 bytes (SESSION_USER only) or the column-value inserted into this column may exceed the target length after codepage conversion. Load may truncate the column-value.

User Response

If your system standards would not allow a user ID (SESSION_USER) to exceed the length of the column, then this warning may be ignored. To prevent this warning from occurring, the length of the column must be at least 128 bytes. If codepage conversion resulted in the growth of this register default column, increase the length of the column to accommodate the growth.

Query Patroller

Create Explain tables before running Query Patroller historical data generator

When running the historical data generator for Query Patroller, if the Explain tables do not already exist, the generator will create them for you. However, it is strongly recommended that you create the Explain tables before running the historical data generator. When you create the Explain tables be sure you create them on the same partition. Actively creating the Explain tables on the same partition improves the performance of the Explain facility. This improvement increases the performance of the historical data generator.

Checking Query Patroller log files for historical analysis

If the **Explain Run** column of the Query Activity over Time (Historical Analysis) report shows a status of **Ran unsuccessfully** for a query, historical data has not been generated for that query. Therefore, the query will not appear in any historical analysis reports or graphs. As documented in version 8, to determine why the query was unsuccessful, you can examine the qpuser.log file.

In addition to examining the qpuser.log file, you should examine the qpdiag.log file.

Abnormal shutdown of the historical data generator

If you run the historical data generator and shut it down in an abnormal way, you will receive an error the next time you attempt to run the historical data generator. Examples of abnormal shutdown include:

- DB2 UDB stops unexpectedly
- Issuing a `db2stop force` command
- Issuing a `killdb2` command

When the historical data generator shuts down abnormally, you must issue the following command before attempting to rerun the historical data generator:

```
qp -d database generate historical_data stop
```

where *database* identifies the database that the command is being run against.

Dynamic query class updates

Certain query class operations no longer require Query Patroller to be stopped and restarted to take effect.

In the table that follows, an active query is a query whose status is Running or Queued.

Table 22. Conditions for query class changes to take effect

Nature of change	Conditions for change to take effect
Addition, removal, or update of a query class.	If there are no active queries, changes take effect immediately.
An update to a query class that involves only a change to the **Maximum number of queries**.	Takes effect immediately, even if there are active queries.
An update to a query class that involves only a change to the **Maximum cost of a query**.	If there are active queries, the update takes effect when either: • Query Patroller is stopped and restarted. • There are no more active queries. **Note:** When there is a change pending against **Maximum cost of a query**, subsequent query class updates of any kind will not take effect until one of the two previous conditions is met.
Addition or removal of a query class.	If there are active queries, the addition or removal takes effect when either: • Query Patroller is stopped and restarted. • There are no more active queries.

Nested query behavior

Nested queries cannot be queued. Instead, a nested query will run immediately if it exceeds a threshold that would normally cause it to be queued.

Limitations by SQL statement type

Contrary to previous documentation, the queries with the following statements can be queued:

- Queries containing static SQL with host variables
- Queries containing an identity value function (IDENTITY_VAL_LOCAL) or a sequence value function, such as NEXT VALUE FOR or PREVIOUS VALUE FOR

Resolution limitation when using the Terminal Services Client

When using the Terminal Services Client at resolution 640x480 to connect to a remote desktop that is running the Query Patroller Center, the Submission Preferences window might appear blank. For the Submission Preferences window to display properly, you must use a resolution higher than 640x480.

New group support for query submissions

Starting in version 8.2, DB2 UDB supports user groups beyond operating system groups. Therefore, there is a slight change in the **Submitter Profile to Use** drop-down list in the Query Submission Preferences window of the Query Patroller Center.

If you are logged in, but do not have either DBADM authority or Edit privilege for Query Patroller user administration, you can only add or update a submission preference for yourself. In this case, the **Submitter Profile to Use** drop-down list contains existing submitter profiles of the DB2 UDB groups that you belong to, instead of just the operating system groups that you belong to.

If you are logged in, and have either DBADM authority or Edit privilege for Query Patroller user administration, you can add or update submission preferences for other users. In this case, the **Submitter Profile to Use** drop-down list contains all existing group submitter profiles.

Query Patroller schedule limitations

When working with schedules in the Query Patroller Center, you can use the Schedule window to save schedules to a file and import them later. If you have a schedule that you saved using FixPak 6 or earlier, you cannot import the schedule using version 8.2 or later. This limitation is due to the change in serialization between JDK levels introduced with DB2 UDB version 8.2.

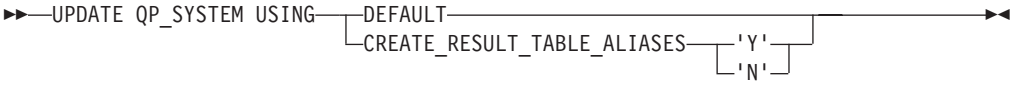
Authorization required to use RUN IN BACKGROUND QUERY command

To run the RUN IN BACKGROUND QUERY command, you must be the submitter who submitted the query originally.

Creating an alias for a result table

As of Query Patroller Version 8.1 FixPak 5, Query Patroller stopped creating result tables in the schema that matched the authorization ID of the submitter of the query. Instead, Query Patroller started creating result tables in a common DB2QPRT schema. To allow result tables to be referenced using the schema of the submitter, Query Patroller Version 8.2 introduces an option to automatically create an alias for each new result table that Query Patroller creates. The result table is created in the DB2QPRT schema and the alias is created in a schema that matches the submitter's authorization ID.

To turn this option on or off, issue the UPDATE QP_SYSTEM command with the CREATE_RESULT_TABLE_ALIASES option:



Removing orphaned result table aliases: Aliases created with CREATE_RESULT_TABLE_ALIASES option are automatically dropped when a result table is dropped. However, there are two situations in which a result table may be dropped without the corresponding alias being dropped.

- When the result table is dropped manually without using the `qp` command line or Query Patroller Center.
- When the result table is dropped using the `qp` command line or Query Patroller Center under the authority of an operator who is not the submitter of the query and does not have DBADM authority.

To clean up aliases that have no corresponding result tables, a new command, REMOVE RESULT_TABLE_ALIASES, has been created. This command is automatically executed whenever result tables are purged as part of the Query Patroller scheduled result table purging process. The REMOVE RESULT_TABLE_ALIASES command obtains the list of aliases to purge using the following query:

```
with a as (select tabschema, tabname from syscat.tables
           where type = 'A' and tabname like 'QUERY%_RESULTS'),
     t as (select tabname from syscat.tables
```

```
          where type = 'T' and tabname like 'QUERY%_RESULTS')
  select all tabschema, tabname from a
  where not exists (select * from t where t.tabname=a.tabname)
```

Prerequisites:

You must have DBADM authority.

Procedure:

1. Issue the REMOVE RESULT_TABLE_ALIASES command

This command removes all aliases that exist after having their corresponding result tables dropped. The aliases were originally created by Query Patroller for result tables.

Command syntax:

Note: For information about entering Query Patroller commands using the command line interface, and general syntax for Query Patroller commands, see the Query Patroller command line interface.

Quick Beginnings

Verifying that your databases are ready for migration

The following prerequisites section is documented in the 8.2 version of the topic that explains how to verify that your databases are ready for migration:

Prerequisites

Ensure that the migration.log file, found in the instance owner's home directory, contains the following text: Version of DB2CKMIG being run: VERSION 8.

This prerequisite is in fact a post-migration step performed at the end of the procedure.

Common Criteria certification for DB2 UDB

The authoritative information for DB2 UDB configurations that have been certified for Common Criteria can be found at http://niap.nist.gov/cc-scheme

Spatial Extender

Verifying the Spatial Extender installation

The runGseDemo sample program can be used to become familiar with application programming for DB2 Spatial Extender. For a description of the steps that the sample program takes to create a spatially-enabled database and perform spatial analysis on data in that database, refer to the topic titled "The DB2 Spatial Extender sample program". This topic is in the Information Center and the *Spatial Extender and Geodetic Extender User's Guide and Reference*.

DB2 Spatial Extender provides another sample program, seBankDemoRunBankDemo, that demonstrates how to add spatial capabilities to an existing information system.

For more information about both sample programs, see the README files in the following directories:

Windows

```
~\sqllib\samples\spatial
~\sqllib\samples\spatial\bank
```

Linux and UNIX

```
~/sqllib/spatial
~/sqllib/spatial/bank
```

SQL Administrative Routines

Column expansion for snapshot UDFs

The size of some VARCHAR and CLOB columns in snapshot UDFs have changed to match the maximum database object name standards.

Table 23. Expanded columns for UDFs

UDF		
Column name	**Existing column definition**	**Updated column definition**
SYSFUN.SQLCACHE_SNAPSHOT		
DB_NAME	VARCHAR(8)	VARCHAR(128)
STMT_TEXT	CLOB(64K)	CLOB(16M)
SNAPSHOT_APPL_INFO		
APPL_NAME	VARCHAR(255)	VARCHAR(256)
APPL_ID	VARCHAR(32)	VARCHAR(128)
AUTH_ID	VARCHAR(30)	VARCHAR(128)
CLIENT_NNAME	VARCHAR(20)	VARCHAR(128)
CLIENT_PRDID	VARCHAR(20)	VARCHAR(128)
INPUT_DB_ALIAS	VARCHAR(20)	VARCHAR(128)
CLIENT_DB_ALIAS	VARCHAR(20)	VARCHAR(128)
DB_NAME	VARCHAR(8)	VARCHAR(128)
DB_PATH	VARCHAR(256)	VARCHAR(1024)
EXECUTION_ID	VARCHAR(20)	VARCHAR(128)
CORR_TOKEN	VARCHAR(32)	VARCHAR(128)
TPMON_CLIENT_USERID	VARCHAR(20)	VARCHAR(256)
TPMON_CLIENT_WKSTN	VARCHAR(20)	VARCHAR(256)
TPMON_CLIENT_APP	VARCHAR(20)	VARCHAR(256)
TPMON_ACC_STR	VARCHAR(100)	VARCHAR(200)
SNAPSHOT_STATEMENT		
CURSOR_NAME	VARCHAR(31)	VARCHAR(128)
CREATOR	VARCHAR(32)	VARCHAR(128)
PACKAGE_NAME	VARCHAR(20)	VARCHAR(128)
STMT_TEXT	CLOB(64K)	CLOB(16M)
SNAPSHOT_LOCKWAIT		
TABLE_NAME	VARCHAR(35)	VARCHAR(128)

Table 23. Expanded columns for UDFs (continued)

UDF		
Column name	**Existing column definition**	**Updated column definition**
TABLE_SCHEMA	VARCHAR(32)	VARCHAR(128)
APPL_ID_HOLDING_LK	VARCHAR(32)	VARCHAR(128)
SNAPSHOT_DATABASE		
INPUT_DB_ALIAS	VARCHAR(8)	VARCHAR(128)
DB_NAME	VARCHAR(8)	VARCHAR(128)
DB_PATH	VARCHAR(256)	VARCHAR(1024)
SNAPSHOT_BP		
BP_NAME	VARCHAR(20)	VARCHAR(128)
DB_NAME	VARCHAR(8)	VARCHAR(128)
INPUT_DB_ALIAS	VARCHAR(8)	VARCHAR(128)
DB_PATH	VARCHAR(256)	VARCHAR(1024)
SNAPSHOT_LOCK		
TABLE_NAME	VARCHAR(35)	VARCHAR(128)
TABLE_SCHEMA	VARCHAR(32)	VARCHAR(128)
SNAPSHOT_TABLE		
TABLE_NAME	VARCHAR(35)	VARCHAR(128)
TABLE_SCHEMA	VARCHAR(32)	VARCHAR(128)
SNAPSHOT_TBREORG		
TABLE_NAME	VARCHAR(35)	VARCHAR(128)
TABLE_SCHEMA	VARCHAR(32)	VARCHAR(128)
SNAPSHOT_SUBSECT		
STMT_TEXT	CLOB(64K)	CLOB(16M)
SNAPSHOT_DYN_SQL		
STMT_TEXT	CLOB(64K)	CLOB(16M)
HEALTH_DBM_INFO		
SERVER_INSTANCE_NAME	VARCHAR(8)	VARCHAR(128)
HEALTH_DBM_HI		
SERVER_INSTANCE_NAME	VARCHAR(8)	VARCHAR(128)
HEALTH_DBM_HI_HIS		
SERVER_INSTANCE_NAME	VARCHAR(8)	VARCHAR(128)
HEALTH_DB_INFO		
DB_NAME	VARCHAR(8)	VARCHAR(128)
INPUT_DB_ALIAS	VARCHAR(8)	VARCHAR(128)
DB_PATH	VARCHAR(256)	VARCHAR(1024)
HEALTH_DB_HI		
DB_NAME	VARCHAR(8)	VARCHAR(128)
HEALTH_DB_HI_HIS		
DB_NAME	VARCHAR(8)	VARCHAR(128)

Table 23. Expanded columns for UDFs (continued)

UDF		
Column name	**Existing column definition**	**Updated column definition**
HEALTH_DB_HIC		
DB_NAME	VARCHAR(8)	VARCHAR(128)
HEALTH_DB_HIC_HIS		
DB_NAME	VARCHAR(8)	VARCHAR(128)

Note: The definition of STMT_TEXT for the SNAPSHOT_DYN_SQL, SNAPSHOT_STATEMENT, SNAPSHOT_SUBSECT, and SQLCACHE_SNAPSHOT routines has expanded to CLOB(16M) to allow for future expansion only. Actual output of the statement text data will continue to be truncated at 64K.

SQL Reference

CONNECT statement

When connecting to Windows Server explicitly, the TO *authorization-name* or the USER *host-variable* can be specified using the Microsoft Windows NT Security Account Manager (SAM)-compatible name. The qualifier must be a NetBIOS style name, which has a maximum length of 15 characters. For example, 'Domain\User'.

Schema used by the Explain facility

The Explain facility uses the following IDs as the schema to use in qualifying the explain tables to populate:

- The session authorization ID for dynamic SQL
- The statement authorization ID for static SQL

The schema can be associated with a set of explain tables, or aliases that point to a set of explain tables under a different schema.

If no explain tables are found under the schema, the Explain facility checks for explain tables under the SYSTOOLS schema and attempts to use them.

String representations of datetime values

Time strings:

A string representation of a time is a string that starts with a digit and has a length of at least 4 characters. Trailing blanks may be included; a leading zero may be omitted from the hour part of the time, and seconds may be omitted entirely. If seconds are omitted, an implicit specification of 0 seconds is assumed. Thus, 13:30 is equivalent to 13:30:00.

Valid string formats for times are listed in the following table. Each format is identified by name and associated abbreviation.

Table 24. Formats for String Representations of Times

Format Name	Abbreviation	Time Format	Example
International Standards Organization[2]	ISO	hh.mm.ss	13.30.05

Table 24. Formats for String Representations of Times (continued)

Format Name	Abbreviation	Time Format	Example
IBM USA standard	USA	hh:mm AM or PM	1:30 PM
IBM European standard	EUR	hh.mm.ss	13.30.05
Japanese Industrial Standard Christian Era	JIS	hh:mm:ss	13:30:05
Site-defined	LOC	Depends on the territory code of the application	–

Starting with Version 8.2, "AM" and "PM" can be represented in lowercase or uppercase.

System monitor

Decoupled applications list without connection concentrator enabled

It is possible to see decoupled applications when issuing the **list applications** command even without connection concentrator enabled.

Progress monitoring of the run time rollback process

Progress monitoring of run time rollback provides progress information of rollback events using application snapshots. Rollback events are of two types:

Unit of work rollback
Includes explicit (user invoked) and implicit (forced) rollback of the entire transaction.

Savepoint rollback
Includes statement and application level savepoints. Nested savepoints are considered a single unit, using the outermost savepoint.

The information provided is the start time of the rollback event, the total work to be done, and completed work. The work metric is bytes.

Total Work units is the range in the log stream that needs to be rolled back for the transaction or savepoint.

Completed Work units shows the relative position in the log stream that has been rolled back.

Updates to Completed Work are made after every log record is processed. Updates are not performed evenly because log records vary in size.

Sample output from GET SNAPSHOT FOR ALL APPLICATIONS command:

```
           Application Snapshot

Application handle         = 6
Application status         = Rollback Active
      Start Time           = 02/20/2004 12:49:27.713720
      Completed Work       = 1024000 bytes
      Total Work           = 4084000 bytes

           Application Snapshot
```

```
Application handle         = 10
Application status         = Rollback to Savepoint
      Start Time           = 02/20/2004 12:49:32.832410
      Completed Work       = 102400 bytes
      Total Work           = 2048000 bytes
```

Note: If rollback is not active during a snapshot, then rollback elements will not be displayed.

XML Extender

Configuring MQ XML UDFs with XML Extender

You must configure and enable MQ XML user–defined functions (UDFs) before you can use them.

Prerequisites:

Install the UDFs by following the procedure in the ″Installing DB2 WebSphere MQ functions″ topic, which is found either in the Information Center or the *IBM DB2 Information Integrator Application Developer's Guide*.

Procedure:

To configure and enable MQ XML UDFs with XML Extender:

1. Open a DB2 command prompt window.
2. Connect to the database that will use the MQ XML UDFs by entering the following command:

   ```
   db2 connect to <database>
   ```
3. Change to the `bnd` directory within the path where you installed DB2, such as:
   - SQLLIB/bnd (Linux, UNIX)
   - C:\Program Files\IBM\SQLLIB\bnd (Windows)
4. Bind the database to XML Extender using the following command:

   ```
   db2 bind @dbxxbind.lst
   ```
5. Bind the database for XML Extender to use the MQ XML UDFs using the following command:

   ```
   db2 bind mqxml.bnd
   ```
6. Bind the database to the CLI using the following command:

   ```
   db2 bind @db2cli.lst
   ```

XML Extender environment variable DB2DXX_MIN_TMPFILE_SIZE

DB2 XML Extender can place large documents in temporary files to avoid using a great amount of memory during processing. On systems with large amounts of physical memory, you can avoid moving documents to temporary files, reducing the amount of Input/Output activity. The environment variable DB2DXX_MIN_TMPFILE_SIZE instructs XML Extender to use memory buffers, instead of temporary files, for processing documents smaller than the specified value. The variable is applicable only on the server. If multiple physical nodes participate in a partitioned environment, the variable can be set differently on each node, accurately reflecting the amount of memory installed on each computer. If the environment variable is not set, documents larger than 128 KB will automatically be placed into temporary files during processing. Documents smaller than 128 KB will be processed in memory.

DB2XML.XMLVarchar UDT redefinition

You can redefine the user-defined type (UDT) DB2XML.XMLVarchar up to 32 KB. To change the size of an XMLVarchar UDT, create the UDT before you enable the database for XML Extender.

For more information, see *DB2 XML Extender Administration and Programming*.

Appendix A. DB2 UDB FixPak CD directory structure

Windows operating systems

The files on the FixPak CD are located as follows:

Table 25. Windows files

Files	Location
DB2 product files:	x:\db2
Installation Prerequisites:	x:\doc\<language>\install.txt
Installation Prerequisites (HTML):	x:\doc\<language>\install.htm
License files:	x:\db2\license
Release Notes:	x:\doc\<language>\release.txt
Release Notes (HTML):	x:\doc\<language>\db2ir\index.htm

where:

- `x:` refers to your CD drive
- `<language>` refers to the language directory, consisting of a five-character code that corresponds to one of the languages in Table 27

UNIX operating systems

The files on the FixPak CD are located as follows

Table 26. UNIX files

Files	Location
DB2 product files:	/cdrom/db2
Installation Prerequisites:	/cdrom/doc/<language>/install.txt
Installation Prerequisites (HTML):	/cdrom/doc/<language>/install.htm
License files:	/cdrom/db2/license
Release Notes:	/cdrom/doc/<language>/release.txt
Release Notes (HTML):	/cdrom/doc/<language>/db2ir/index.htm

where:

- `/cdrom` refers to your mount point
- `<language>` refers to the language directory, consisting of a five-character code that corresponds to one of the languages in Table 27

The following table outlines the language directory names and their corresponding languages.

Table 27. Directory names and their corresponding languages

Directory	Language
ar_AA	Arabic

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Table 27. Directory names and their corresponding languages (continued)

Directory	Language
bg_BG	Bulgarian
cs_CZ	Czech
da_DK	Danish
de_DE	German
el_GR	Greek
en_US	English
es_ES	Spanish
fi_FI	Finnish
fr_FR	French
hr_HR	Croatian
hu_HU	Hungarian
it_IT	Italian
iw_IL	Hebrew
ja_JP	Japanese
ko_KR	Korean
nl_NL	Dutch
no_NO	Norwegian
pl_PL	Polish
pt_BR	Brazilian Portuguese
pt_PT	Portuguese
ro_RO	Romanian
ru_RU	Russian
sk_SK	Slovak
sl_SI	Slovenian
sv_SE	Swedish
tr_TR	Turkish
zh_CN	Simplified Chinese
zh_TW	Traditional Chinese

Notes:

1. The directory names might appear in uppercase or lowercase letters, depending on your operating system.
2. All of the directories in the preceding list might not appear on this CD because all language directories are not available on all CDs.
3. Starting with Version 8.2, the Installation Notes are a section in the Release Notes.

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