IBM DB2 10.5
for Linux, UNIX, and Windows

What's New for DB2 Version 10.5

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IBM
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About this book

This book provides information about the new and changed functionality included in the Version 10.5 release of the DB2® Database for Linux, UNIX, and Windows and DB2 Connect™ products.

Who should use this book

This book is for database administrators, application programmers, and other DB2 database users who want to find out what enhancements are available in DB2 Version 10.5 for Linux, UNIX, and Windows and in DB2 Connect Version 10.5 and what differences exist between Version 10.5 and previous supported versions of those products.

This book provides overview information and does not contain detailed instructions for using the features described. To get additional information, use the references that are provided.


For information about the changed, deprecated, or discontinued functionality in Version 10.5, read Part 2, “What’s changed,” on page 43. This information points out important changes that you need to know before using Version 10.5.

For information about DB2 Connect, read Part 3, “DB2 Connect enhancements and changes summary,” on page 89.

How this book is structured

The following topics are covered:

Part 1: What's New

Chapter 1, “Highlights of DB2 Version 10.5,” on page 3
This chapter describes the product highlights about important new features and enhancements.

Chapter 2, “Product packaging enhancements,” on page 7
This chapter describes the product packaging changes introduced in Version 10.5.

Chapter 3, “Manageability enhancements,” on page 9
This chapter describes the new features and enhancements that help you spend less time managing your databases.

Chapter 4, “Monitoring enhancements,” on page 11
This chapter describes the new features and enhancements that you can use to monitor your database systems.

Chapter 5, “High availability, backup, logging, resiliency, and recovery enhancements,” on page 19
This chapter describes the new features and enhancements that help ensure that your data remains available for your users.
Chapter 6, “Performance enhancements,” on page 21
This chapter describes the new features and enhancements that help ensure the highest performance when you access and update data.

Chapter 7, “SQL compatibility enhancements,” on page 23
This chapter describes the new features and enhancements that help you port existing database applications from other vendors to DB2 Version 10.5 environments.

Chapter 8, “Workload management enhancements,” on page 25
This chapter describes the new workload management features that extend the existing workload management capabilities provided in previous releases.

Chapter 10, “DB2 Text Search enhancements,” on page 33
This chapter describes the new features and enhancements for Net Search Extender.

Chapter 11, “Installation and upgrade enhancements,” on page 35
This chapter describes the new features and enhancements that make it faster to deploy DB2 database products and easier to maintain them.

Chapter 13, “DB2 pureScale Feature enhancements,” on page 39
This chapter describes the new features and enhancements available for support of the DB2 pureScale®.

Part 2: What's changed

Chapter 14, “Administration changes summary,” on page 45
This chapter describes the changes in the existing DB2 functionality related to database administration.

Chapter 15, “Database setup and product installation changes summary,” on page 49
This chapter describes the changes in the existing DB2 functionality related to database setup and product installation.

Chapter 16, “Application development changes summary,” on page 53
This chapter describes the changes in the existing DB2 functionality related to application development.

Chapter 17, “DB2 command and SQL statement changes summary,” on page 57
This chapter describes the changes to DB2 CLP commands, DB2 system commands, and SQL statements to support new capabilities.

Chapter 18, “Deprecated functionality in Version 10.5,” on page 59
This chapter lists the deprecated functionality, which refers to specific functions or features that are supported but are no longer recommended and might be removed in a future release.

Chapter 19, “Discontinued functionality in Version 10.5,” on page 63
This chapter lists features and functionality that are unsupported in Version 10.5.

Chapter 20, “Summary of deprecated and discontinued DB2 functionality in Version 10.5 and earlier releases,” on page 69
This chapter lists features and functionality that have been deprecated or discontinued in DB2 Version 10.5.
Part 3: DB2 Connect enhancements and changes summary

Chapter 21, “DB2 V10.5 enhancements and changes that affect DB2 Connect Server,” on page 91

This chapter describes the enhancements, changed functionality, deprecated functionality, and discontinued functionality in Version 10.5 that affect the functionality and capabilities of DB2 Connect.

Part 4: Appendixes

Appendix A, “Functionality in DB2 features and DB2 product editions,” on page 95

This appendix contains information about functionality that is available in DB2 database product editions and DB2 features.

Appendix B, “Functionality in DB2 features in DB2 Connect product editions,” on page 99

This appendix contains information about functionality that is available in DB2 Connect product editions and DB2 features.

Appendix C, “Overview of the DB2 technical information,” on page 101

This appendix contains information about accessing and using the latest documentation for your DB2 database systems.

Appendix D, “Notices,” on page 107

This appendix contains the legal requirements and limitations related to using the DB2 database product and its documentation.

Highlighting conventions

Topics that are associated with a specific fix pack include an "FPx" prefix at the beginning of the topic title, where x represents a fix pack level.

The following highlighting conventions are used in this book.

<table>
<thead>
<tr>
<th>Style</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Bold</strong></td>
<td>Indicates commands, keywords, and other items whose names are predefined by the system. Commands written in uppercase are CLP commands, whereas commands written in lowercase are system commands.</td>
</tr>
</tbody>
</table>
| *Italics* | Indicates one of the following:  
  - Names or values (variables) that must be supplied by the user  
  - General emphasis  
  - The introduction of a new term  
  - A reference to another source of information |
| **Monospace** | Indicates one of the following:  
  - Files and directories  
  - Information that you are instructed to type at a command prompt or in a window  
  - Examples of specific data values  
  - Examples of text similar to what might be displayed by the system  
  - Examples of system messages  
  - Samples of programming code |
Part 1. What's New

What's New includes information about new functionality included in Version 10.5.

DB2 Version 10.5 for Linux, UNIX, and Windows delivers new capabilities that can help you manage costs and simplify application development.

Chapter 1, “Highlights of DB2 Version 10.5,” on page 3
This chapter describes the product highlights about important new features and enhancements.

Chapter 2, “Product packaging enhancements,” on page 7
This chapter describes the product packaging changes introduced in Version 10.5.

Chapter 3, “Manageability enhancements,” on page 9
This chapter describes the new features and enhancements that help you spend less time managing your databases.

Chapter 4, “Monitoring enhancements,” on page 11
This chapter describes the new features and enhancements that you can use to monitor your database systems.

Chapter 5, “High availability, backup, logging, resiliency, and recovery enhancements,” on page 19
This chapter describes the new features and enhancements that help ensure that your data remains available for your users.

Chapter 6, “Performance enhancements,” on page 21
This chapter describes the new features and enhancements that help ensure the highest performance when you access and update data.

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This chapter describes the new features and enhancements available for support of the DB2 pureScale.
Chapter 1. Highlights of DB2 Version 10.5

IBM® DB2 Version 10.5 for Linux, UNIX, and Windows offers accelerated analytic processing by introducing a new processing paradigm and data format within the DB2 database product. Advantages include significant reductions in time-to-value and increased consumability, which can be achieved through minimal DBA design requirements and reduced query tuning and debugging efforts. Industry-leading compression, large performance gains for analytic queries, and large reductions in performance variation round out the benefits of deploying this technology.

**DB2 column-organized tables**

The DB2 Version 10.5 release introduces compressed column-organized tables for DB2 databases, and includes broad support for data mart (analytic) workloads having complex queries that are commonly characterized by multi-table joins, grouping and aggregation, and table scans over a star schema.

Starting with the DB2 Version 10.5 release, you can create column-organized tables that are stored with column organization. This new capability is in-memory optimized, CPU optimized, and I/O optimized.

The DB2 Version 10.5 release continues to provide industry-leading performance across multiple workloads by combining unique ideas with several of the best technological developments of the past 10 years of database research. BLU Acceleration, a combination of innovations from the IBM Research and Development Labs that simplifies and speeds up reporting and analytics, is initially delivered and is a fully integrated capability in DB2 Version 10.5. Easy to set up and self optimizing, BLU Acceleration eliminates the need for indexes, aggregates, or time consuming database tuning to achieve top performance and storage efficiency. Because it is deeply integrated into DB2 Version 10.5, no SQL or schema changes are required to take advantage of this breakthrough technology.

The DB2 Version 10.5 release provides:

- One setting (`DB2_WORKLOAD=ANALYTICS`) to enable column organization, automated specialized initial memory configuration, page and extent size configuration, space reclamation, and automatic workload management (see System environment variables)
- New syntax for specifying table storage organization on the CREATE TABLE statement (see CREATE TABLE statement)
- A new database configuration parameter (`dft_table_org`) to change the default table organization (see dft_table_org - Default table organization)
- A new `db2convert` utility to convert row-organized tables to column-organized tables (see db2convert - Convert row-organized tables into column-organized tables)
- The `REORG TABLE` command to reclaim storage on column-organized tables (see Space reclamation for column-organized tables)
- Automated workload management, which can significantly improve the performance and system use of workloads with several queries running at once (see Default query concurrency management)
Dynamic list prefetching, a new prefetching type used in query execution plans that access column-organized tables (see Prefetching data from column-organized tables)

Support for NOT ENFORCED primary key and unique constraints, which enables you to avoid performance costs and space requirements when it is known that the data already conforms to the constraint (see Informational constraints), and for ENFORCED primary key and unique constraints on column-organized tables

The following additional enhancements pertain to column-organized tables specifically:

- Semi-join support for queries to reduce the amount of memory that is consumed by large inner tables; in some cases, such queries might run faster. A semi-join is an optimization technique that leverages one or more predicates on the outer table and other inner tables in the query. The combined filtering effect of all eligible predicates is pushed down to one or more large inner tables to reduce memory consumption. The DB2 explain output is extended to indicate whether the inner table of a particular hash join operator is a large inner table for which the semi-join optimization technique will be applied (see EXPLAIN_ARGUMENT table).
- Late decompression operations on compressed data
- Multiplied CPU power that uses SIMD instructions for many operations
- A vector processing engine for processing vectors of column data instead of individual values
- Improved system scaling across cores
- An enhanced caching strategy for buffer pools to substantially reduce I/O
- A smaller footprint for database storage than DB2 Version 10.1
- In-memory optimization for maximal performance
- A system that is unconstrained by main memory size, in which the data being processed can be considerably larger than the RAM

IBM DB2 pureScale Feature enhancements

The DB2 pureScale Feature was first introduced in Version 9.8. V10.5 builds on DB2 pureScale Feature support.

The DB2 pureScale Feature provides extreme capacity and application transparency which exceed even the strictest industry standard. Continued improvements in continuous availability and high availability, the DB2 pureScale Feature tolerates both planned maintenance and component failure with ease. The DB2 Version 10.5 release provides:

- Support for high availability disaster recovery (HADR)
- Increased availability
- Improved workload balancing
- Restore mobility between DB2 pureScale Feature and DB2 Enterprise Server Edition

In addition, V10.5 introduces DB2 pureScale Feature enhancements in high availability, performance, workload management, and installation.

For more information, see Chapter 13, “DB2 pureScale Feature enhancements,” on page 39.
Performance improvements

Continuing to build on prior release performance improvements, V10.5 performance improvements focus on explain information for column-organized tables and extension to the CREATE INDEX statement to create an index containing an expression-based key.

For more information, see Chapter 6, “Performance enhancements,” on page 21.

SQL compatibility

If you work with relational database products other than DB2 products, V10.5 builds on existing functionality, interfaces, and compatibility features to provide additional enhancements that make DB2 products more familiar to you. These enhancements reduce the time and complexity of enabling applications that are written for other relational database products to run quickly in a DB2 environment.

For more information, see Chapter 7, “SQL compatibility enhancements,” on page 23.

Product packaging simplified

Changes to product packaging results in fewer packages, and greater value through more function and features that are included in the base DB2 editions such as warehouse functionality.

For more information, see Chapter 2, “Product packaging enhancements,” on page 7.
Chapter 2. Product packaging enhancements

As IBM data servers continue to evolve, the names and the packaging of the DB2 components change to respond to market needs.

IBM has updated product packaging to provide simplicity through fewer packages, and greater value through more function and features included in the base DB2 editions such as warehouse functionality. The new DB2 Advanced Workgroup Server Edition is the ideal choice for deployment in a departmental, workgroup, or medium-sized business environment. It supports partitioned database environments and DB2 pureScale environments.

The new IBM DB2 Advanced Recovery Feature offers additional tools to protect the mission-critical data that runs your business such as DB2 Recovery Expert, DB2 Merge Backup, and IBM InfoSphere® Optim™ High Performance Unload. The IBM DB2 Advanced Recovery Feature is the only separately-priced feature available in Version 10.5. The functionality of DB2 features available in earlier releases is available in DB2 database product editions.

You can update some DB2 editions to another one by just updating the license file. You do not have to reinstall the DB2 database product. You can also update some DB2 editions to enable DB2 Connect functionality by adding your DB2 Connect license file.

To read about these products and to view the related licensing and marketing information, see the DB2 product page at http://www.ibm.com/software/data/db2/linux-unix-windows.
Chapter 3. Manageability enhancements

Version 10.5 provides enhancements that make it easier to manage DB2 environments, minimize the total cost of ownership (TCO), reduce the impact of performing system management tasks, and extend the capabilities of the autonomic features introduced in previous releases.

New column-organized table option for DB2 databases

Starting with the DB2 Version 10.5 release, you can create column-organized tables that are stored with column organization. DB2 Version 10.5 provides new capabilities for processing vectors of column data instead of individual values. These new capabilities are in-memory optimized, CPU optimized, and I/O optimized.

The DB2 Version 10.5 release introduces encoded column-organized tables for DB2 databases and includes broad support for analytic workloads. These types of workloads have complex queries that are commonly characterized by multi-table joins, grouping and aggregation, and table scans over a star schema.

The DB2 Version 10.5 release offers accelerated analytic processing by introducing a new processing paradigm and data format within the DB2 database product. Advantages include significantly reduced time-to-value and increased consumability, which can be achieved through minimal DBA design requirements and reduced query tuning and debugging efforts. Industry-leading compression, large performance gains for analytic queries, and large reductions in performance variation round out the benefits of deploying this technology.

Column-organized and row-organized tables can coexist in the same database, schema, table space, or query. If an analytic query references a column-organized table, the best performance is typically achieved when all the other referenced tables (if any) are also column-organized.

NOT ENFORCED primary key and unique constraints support added

The DB2 Version 10.5 release adds support for NOT ENFORCED primary key and unique constraints.

This capability enables you to avoid performance costs (primarily in insert, update, and delete operations on the table) and space requirements (associated with enforcing a unique constraint) when it is known that the data already conforms to the unique constraint. These informational constraints help the query optimizer to select optimal data access plans when index access to the data provides no additional benefit.
Chapter 4. Monitoring enhancements

Version 10.5 includes enhancements that make monitoring DB2 database environments more comprehensive with higher granularity of control.

New monitoring metrics for column-organized tables

This topic provides an overview of new monitor elements that help you to understand and tune database server workloads involving queries against column-organized tables.

The DB2 monitor interfaces expose most of the core information that is required to monitor workloads involving queries against column-organized tables. The DB2 Version 10.5 release introduces new monitor elements that are identified in the following sections.

Note: All TEMP and GBP elements are reserved for future use.

Use new monitor elements to assess buffer pool efficiency

A new set of monitor elements enables the monitoring of data page I/O for column-organized tables separately from that of row-organized tables. You can use these monitor elements to understand what portion of the I/O is being driven by access to column-organized tables when a workload impacts both row-organized and column-organized tables. These elements can also help you to tune the system, for example, by helping you to decide whether to place column-organized tables in separate table spaces, or whether to use a separate buffer pool. Note that a column-organized data page contains column data for a column-organized table.

- Counters for total logical and physical column-organized data page reads and pages found:
  - POOL_COL_L_READS
  - POOL_TEMP_COL_L_READS
  - POOL_COL_P_READS
  - POOL_TEMP_COL_P_READS
  - POOL_COL_LBP_PAGES_FOUND
- Counter for column-organized data page writes:
  - POOL_COL_WRITES
- Counters for asynchronous column-organized data page reads and writes and pages found:
  - POOL_ASYNC_COL_READS
  - POOL_ASYNC_COL_READ_REQS
  - POOL_ASYNC_COL_WRITES
  - POOL_ASYNC_COL_LBP_PAGES_FOUND
- Counters for column-organized data page reads per table (and per statement per table, reported through monitor usage lists):
  - OBJECT_COL_L_READS
  - OBJECT_COL_P_READS
  - OBJECT_COL_GBP_L_READS
  - OBJECT_COL_GBP_P_READS
Use new monitor elements to monitor prefetch requests for data in column-organized tables

The prefetch logic for queries that access column-organized tables is used to asynchronously fetch only those pages that each thread will read for each column that is accessed during query execution. If the pages for a particular column are consistently available in the buffer pool, prefetching for that column is disabled until the pages are being read synchronously, at which time prefetching for that column is enabled again.

Although the number of pages that a thread can prefetch simultaneously is limited by the prefetch size of the table space that is being accessed, several threads can also prefetch pages simultaneously.

New monitor elements to measure prefetcher efficiency can help you to track the volume of requests for data in column-organized tables that are being submitted to prefetchers, and the number of pages that prefetchers have skipped reading because the pages were already in memory. Efficient prefetching of data in column-organized tables is important for mitigating the I/O costs of data scans.

- The following monitor elements enable the monitoring of prefetch requests for data in column-organized tables:
  - POOL_QUEUED_ASYNC_COLREQS
  - POOL_QUEUED_ASYNC_TEMP_COLREQS
  - POOL_QUEUED_ASYNC_COLPAGES
  - POOL_QUEUED_ASYNC_TEMP_COLPAGES
  - POOL_FAILED_ASYNC_COLREQS
  - POOL_FAILED_ASYNC_TEMP_COLREQS
  - SKIPPED_PREFETCH_COL_P_READS
  - SKIPPED_PREFETCH_TEMP_COL_P_READS
  - SKIPPED_PREFETCH_UOW_COL_P_READS
  - SKIPPED_PREFETCH_UOW_TEMP_COL_P_READS

Use new monitor elements to measure column data size

A column-organized table is associated with a new table object where the column data is stored.

- The following monitor elements help you to estimate the size of the column data:
  - COL_OBJECT_L_SIZE
  - COL_OBJECT_P_SIZE
  - COL_OBJECT_L_PAGES

The first two elements accurately reflect the logical and physical size of the column-organized data object, but are more expensive to determine (they must calculate the space being used). These elements are reported by the ADMIN_GET_TAB_INFO table function. The COL_OBJECT_L_PAGES element is similar to the existing DATA_OBJECT_L_PAGES element and provides a cheaper
alternative to estimating size (pages * page size), although there are cases in which
this estimate might be inaccurate.

Use new monitor elements for tables

New monitor elements report information about the organization of data in the
table.

- The following new metrics are returned by MON_GET_TABLE:
  - TAB_ORGANIZATION

Use new monitor elements to measure time spent

_Time-spent monitor elements_ provide information about how the DB2 database
manager is spending time processing column-organized tables. The time-spent
elements are broadly categorized into wait times and processing times.

- The following monitor elements are added to the time-spent hierarchy:
  - TOTAL_COL_TIME
  - TOTAL_COL_PROC_TIME
  - TOTAL_COL_EXECUTIONS

The three TOTAL_* metrics count the total time spent in column-organized data
processing across all column-organized processing subagents. TOTAL_COL_TIME
represents total elapsed time over all column-organized processing subagents.
TOTAL_COL_PROC_TIME represents the subset of TOTAL_COL_TIME in which
the column-organized processing subagents were not idle on a measured wait time
(for example: lock wait, IO). TOTAL_COL_EXECUTIONS represents the total
number of times that data in column-organized tables was accessed during
statement execution.

The parent metric of TOTAL_COL_TIME is TOTAL_SECTION_TIME. The parent
metric of TOTAL_COL_PROC_TIME is TOTAL_SECTION_PROC_TIME. The
parent metrics are the same in both the request and activity dimensions.

Use monitor interfaces to get request metrics that are
aggregated along different dimensions

- The following monitor interfaces report request metrics:
  - MON_GET_DATABASE
  - MON_GET_DATABASE_DETAILS
  - MON_GET_WORKLOAD
  - MON_GET_WORKLOAD_DETAILS
  - MON_GET_UNIT_OF_WORK
  - MON_GET_UNIT_OF_WORK_DETAILS
  - MON_GET_SERVICE_SUBCLASS
  - MON_GET_SERVICE_SUBCLASS_DETAILS
  - MON_GET_CONNECTION
  - MON_GET_CONNECTION_DETAILS
  - EVMON_FORMAT_UE_TO_XML
  - MON_FORMAT_XML_METRICS_BY_ROW
  - Unit of Work Event Monitor
  - Statistics Event Monitor
• The following new metrics are returned by all request metrics interfaces:
  - POOL_COL_L_READS
  - POOL_TEMP_COL_L_READS
  - POOL_COL_P_READS
  - POOL_TEMP_COL_P_READS
  - POOL_COL_LBP_PAGES_FOUND
  - POOL_COL_WRITES
  - POOL_COL_GBP_L_READS
  - POOL_COL_GBP_P_READS
  - POOL_COL_GBP_INVALID_PAGES
  - POOL_COL_GBP_INDEP_PAGES_FOUND_IN_LBP
  - POOL_QUEUED_ASYNC_COL_REQS
  - POOL_QUEUED_ASYNC_TEMP_COL_REQS
  - POOL_QUEUED_ASYNC_COL_PAGES
  - POOL_QUEUED_ASYNC_TEMP_COL_PAGES
  - POOL_FAILED_ASYNC_COL_REQS
  - POOL_FAILED_ASYNC_TEMP_COL_REQS
  - TOTAL_COL_TIME
  - TOTAL_COL_PROC_TIME
  - TOTAL_COL_EXECUTIONS

The data type for each of these elements is BIGINT; these elements are reported when the REQUEST METRICS control is set to BASE.

Note: For the MON_GET_DATABASE and MON_GET_DATABASE_DETAILS interfaces, REQUEST METRICS controls only the collection of the TOTAL_COL_TIME, TOTAL_COL_PROC_TIME, and TOTAL_COL_EXECUTIONS elements. The other elements are reported when the OBJECT METRICS control is set to BASE.

Use monitor interfaces to get activity metrics

Activity metrics are a subset of request metrics that are measured during execution of an SQL statement.

• The following monitor interfaces report activity metrics:
  - MON_GET_ACTIVITY
  - MON_GET_ACTIVITY_DETAILS
  - MON_GET_PKG_CACHE_STMT
  - MON_GET_PKG_CACHE_STMT_DETAILS
  - EVMON_FORMAT_UE_TO_XML
  - MON_FORMAT_XML_METRICS_BY_ROW
  - Activity Event Monitor
  - Package Cache Event Monitor

• The following new metrics are returned by all activity metrics interfaces:
  - POOL_COL_L_READS
  - POOL_TEMP_COL_L_READS
  - POOL_COL_P_READS
  - POOL_TEMP_COL_P_READS
Use monitor interfaces to get database object metrics

Object metrics interfaces report monitor elements for a specific database object or for the entire database.

- The following new metrics are returned by MON_GET_DATABASE, MON_GET_DATABASE_DETAILS, MON_GET_BUFFERPOOL, and MON_GET_TABLESPACE:
  - POOL_COL_L_READS
  - POOL_TEMP_COL_L_READS
  - POOL_COL_P_READS
  - POOL_TEMP_COL_P_READS
  - POOL_COL_LBP_PAGES_FOUND
  - POOL_COL_WRITES
  - POOL_ASYNC_COL_READS
  - POOL_ASYNC_COL_READ_REQS
  - POOL_ASYNC_COL_WRITES
  - POOL_ASYNC_COL_LBP_PAGES_FOUND
  - POOL_COL_GBP_L_READS
  - POOL_COL_GBP_P_READS
  - POOL_COL_GBP_INVALID_PAGES
  - POOL_COL_GBP_INDEP_PAGES_FOUND_IN_LBP
  - POOL_ASYNC_COL_GBP_L_READS
  - POOL_ASYNC_COL_GBP_P_READS
  - POOL_ASYNC_COL_GBP_INVALID_PAGES
  - POOL_ASYNC_COL_GBP_INDEP_PAGES_FOUND_IN_LBP
  - POOL_QUEUED_ASYNC_COL_REQS
  - POOL_QUEUED_ASYNC_TEMP_COL_REQS
  - POOL_QUEUED_ASYNC_COL_PAGES
  - POOL_QUEUED_ASYNC_TEMP_COL_PAGES
  - POOL_FAILED_ASYNC_COL_REQS
  - POOL_FAILED_ASYNC_TEMP_COL_REQS
  - TOTAL_COL_TIME
  - TOTAL_COL_PROC_TIME
  - TOTAL_COL_EXECUTIONS

The data type for each of these elements is BIGINT; these elements are reported when the ACTIVITY METRICS control is set to BASE.
- POOL_QUEUED_ASYNC_TEMP_COL_PAGES
- POOL_FAILED_ASYNC_COL_REQS
- POOL_FAILED_ASYNC_TEMP_COL_REQS
- SKIPPED_PREFETCH_COL_P_READS
- SKIPPED_PREFETCH_TEMP_COL_P_READS
- SKIPPED_PREFETCH_UOW_COL_P_READS
- SKIPPED_PREFETCH_UOW_TEMP_COL_P_READS
The data type for each of these elements is BIGINT; these elements are reported when the OBJECT METRICS control is set to BASE.

• The following new metrics are returned by MON_GET_TABLE:
  - COL_OBJECT_L_PAGES
  - NUM_COLUMNS_REFERENCED
  - OBJECT_COL_L_READS
  - OBJECT_COL_P_READS
  - OBJECT_COL_GBP_L_READS
  - OBJECT_COL_GBP_P_READS
  - OBJECT_COL_GBP_INVALID_PAGES
  - OBJECT_COL_LBP_PAGES_FOUND
  - OBJECT_COL_GBP_INDEP_PAGES_FOUND_IN_LBP
  - SECTION_EXEC_WITH_COL_REFERENCES
  - TAB_ORGANIZATION
This interface reports monitor elements that describe table usage (for example, rows inserted or rows read). Only tables that have been accessed since database activation are reported.

The data type for each of these elements is BIGINT. The TAB_ORGANIZATION and COL_OBJECT_L_PAGES elements are always reported. The other elements are reported when the OBJECT METRICS control is set to EXTENDED.

• The following new metrics are returned by MON_GET_TABLE_USAGE_LIST:
  - OBJECT_COL_L_READS
  - OBJECT_COL_P_READS
  - OBJECT_COL_GBP_L_READS
  - OBJECT_COL_GBP_P_READS
  - OBJECT_COL_GBP_INVALID_PAGES
  - OBJECT_COL_LBP_PAGES_FOUND
  - OBJECT_COL_GBP_INDEP_PAGES_FOUND_IN_LBP
This interface returns one row for each distinct SQL statement (section) that has referenced a table during execution. Information is reported only if a usage list has been created for the table.

The data type for each of these elements is BIGINT; these elements are reported when the OBJECT METRICS control is set to EXTENDED.

• The following new metrics are returned by ADMIN_GET_TAB_INFO:
  - COL_OBJECT_L_SIZE
  - COL_OBJECT_P_SIZE
This interface returns one row for each table and reports monitor elements that describe table properties; all tables are reported, regardless of whether or not they have been accessed.
• The following existing metrics return NULL because they do not apply to column-organized tables:
  – LARGE_RIDS
  – LARGE_SLOTS

Use administrative view interfaces to get hit ratio metrics

Administrative views are predefined views that are built on top of monitor interfaces that perform common calculations on monitor data.
• The following new metrics are returned by MON_BP_UTILIZATION:
  – COL_PHYSICAL_READS
  – COL_HIT_RATIO_PERCENT
  – GBP_COL_HIT_RATIO_PERCENT
This view provides hit ratios for different types of data in the local and global buffer pools.
• The following new metrics are returned by MON_TBSP_UTILIZATION:
  – COL_PHYSICAL_READS
  – COL_HIT_RATIO_PERCENT
  – GBP_COL_HIT_RATIO_PERCENT
This view provides hit ratios for different types of data at the table space level.
• The following metrics (modified to take into account new COL pool metrics) are returned by MON_WORKLOAD_SUMMARY, MON_SERVICE_SUBCLASS_SUMMARY, MON_CONNECTION_SUMMARY, and MON_DB_SUMMARY:
  – TOTAL_BP_HIT_RATIO_PERCENT
  – TOTAL_GBP_HIT_RATIO_PERCENT
These views provide a summary of monitor elements measuring work done by agents and aggregated to different accumulation points (workload, service subclass, connection, and database).

Use administrative procedures to generate reports containing monitor data

The following administrative procedures are updated to include COL pool monitor elements.
• MONREPORT.DBSUMMARY
• MONREPORT.CONNECTION

Use monitor interfaces to get information about the agents executing within a particular service class

The MON_GET_AGENT interface displays information about the agents that are executing within a particular service class. The following changes have been made to account for agents that are performing parallel query processing on column-organized tables:
• AGENT_TYPE: The SMPSUBAGENT type is returned for agents that are processing column-organized tables.
• AGENT_SUBTYPE: The new COLUMNAR subtype is returned to identify SMP agents that are processing column-organized tables.
REQUEST_TYPE: Agents with the COLUMNAR subtype have the same behavior as agents with the DSS or SMP subtype. Specifically, if the subsection number is nonzero, the returned value is `SUBSECTION:subsection_number`; otherwise, the null value is returned.

New fields improve HADR monitoring

Several new fields have been added to the MON_GET_HADR table function and the `db2pd` command with the `-hadr` option.

You can use a number of the new fields to monitor the health of your HADR databases:

- `STANDBY_SPOOL_PERCENT` lets you know how much of your HADR log spooling space is being used.
- `HADR_FLAGS` contains a subset of fields that indicate when assisted remote catchup is occurring or if there are issues with log receipt or retrieval on the standby.
Chapter 5. High availability, backup, logging, resiliency, and recovery enhancements

Version 10.5 includes enhancements that help ensure that your data remains available.

HADR is now supported in a DB2 pureScale environment

DB2 pureScale environments now support DB2 high availability disaster recovery (HADR). This enhancement combines the continuous availability of the DB2 pureScale Feature with the robust disaster recovery capabilities of HADR.

Often, there is a trade-off when you want to meet both your high availability needs and disaster recovery needs with a single product. The DB2 pureScale Feature offers outstanding availability, resilience, and scalability. Among its features are built-in failure detection, recovery automation, and a data sharing architecture, all of which help prevent impacts from most unplanned outages. However, normally you do not distribute DB2 members across different geographic locations, so there is little disaster recovery protection. HADR, in contrast, excels at providing local high availability or remote disaster recovery.

In previous releases, HADR was not supported in DB2 pureScale environments, so if you wanted to provide a disaster recovery solution, you had to deploy another product such as InfoSphere Q Replication or Change Data Capture. Integration of HADR with the DB2 pureScale Feature, however, provides a number of advantages:

- Better synchronization. Both SUPERSYNC and ASYNC synchronization modes are supported in DB2 pureScale environments.
- DDL support. HADR replicates DDL operations.
- Ease of use. HADR is easy to configure and maintain.
- Native takeover support. By using the `TAKEOVER HADR` command, you can perform either a graceful takeover (role switch) or a forced takeover (failover).

DB2 Advanced Copy Services (ACS) scripted interface makes using customer scripts easier

Starting in Version 10.5, custom scripts that implement snapshot backups and restores interface better with DB2, reducing user error and improving monitoring and management of snapshot operations.

If you were performing a snapshot operation you either need to use storage hardware that provides a vendor library to support the DB2 ACS API or to write and provide a custom script that runs the snapshot backup or restore. Writing a custom script has the benefit of providing you with flexibility in the storage device that you use; however, there were some drawbacks in previous DB2 versions:

- Custom scripts can be difficult and error-prone to write, especially in regards to suspending and resuming database operations.
- Custom scripts do not generate a history file entry, so you cannot monitor the progress and success of the snapshot operation.
In V10.5, these trade-offs have been eliminated. The DB2 ACS API is now wrapped in the library for DB2 ACS. The library invokes the customer script to perform the snapshot operation. The DB2 database manager takes over the error-prone actions like issuing the `SET WRITE SUSPEND`, `SET WRITE RESUME`, and `db2inidb` commands at the correct time. At the same time, because the DB2 ACS API is being used, an entry is made in the recovery history file for every snapshot operation, allowing you to monitor successful and unsuccessful backups.
Chapter 6. Performance enhancements

DB2 Version 10.5 contains numerous SQL performance enhancements that continue to make the DB2 data server an industrial-strength data server solution that is suitable for any size of organization.

New explain information for column-organized tables

New explain information is captured to support column-organized table functionality. You can use this information to determine how your application performs when using this new functionality.

DB2 Version 10.5 provides a new CTQ plan operator that represents the transition between column-organized data processing and row-organized data processing.

The steps to capture the explain information for column-organized tables are the same steps that you use for queries against row-organized tables.

- Enable the explain facility by setting the CURRENT EXPLAIN MODE special register as follows:
  
  `db2 SET CURRENT EXPLAIN MODE YES`

- Issue your query against column-organized tables.

- Issue the `db2exfmt` command to format the contents of the explain tables and obtain the access plan. For example:
  
  `db2exfmt -d sample -l -o output.exfmt`

Expression-based indexes improve query performance

Starting with DB2 Version 10.5, you can use an extension to the CREATE INDEX statement to create an index that contains an expression-based key.

Using this expression-based key capability, you can create an index on data that is not stored in a table. When you create an index with an expression-based key, the results of the expression are stored in the index.

An SQL statement that contains a predicate that includes an expression can benefit from an index whose definition includes expression-based keys. With this feature, the database manager can choose from many highly efficient index-based methods to access the data and evaluate the predicate. As a result, performance is improved for queries that contain expressions.

An expression in an index is also useful if the query references the expression in other ways. For example, the query might return that expression in its results, or it might order the result set by that expression.

To benefit from efficient evaluation of expressions that are specified at run time, use an expression-based key, rather than other types of indexes whose keys only consist of one or more table columns.
DB2 pureScale Feature performance enhancement by using explicit hierarchical locking

With explicit hierarchical locking (EHL), table locks supersede row locks or page locks. EHL reduces network traffic to the caching facility (CF) in a DB2 pureScale environment.

EHL makes parent-child relationship between resources that are known to the internal resource lock manager. This type of locking avoids global locking use when no resources are used among the different components of DB2 database server. EHL avoids most communication and data sharing memory usage for data tables, partitioned tables, and partitioned indexes. EHL helps improve performance by removing CF communication.

EHL is critical for the following types of workloads, as they are able to take advantage of this optimization:

- Grid deployments, where each application has affinities to a single member and where most of its data access is only for these particular applications. In a database grid environment, a DB2 pureScale cluster has multiple databases but any single database is accessed only by a single member.
- Partitioned or partitionable workloads where work are directed such that certain tables are only accessed by a single member. Directed access workloads where applications from one member do not access overlapping tables with another member.
- One member configurations, or batch window workloads which use only a single member. A system is set up to have nightly batch processing with almost no OLTP activity. For these systems, all batch work on a table is sometimes performed by a single connection.

EHL is enabled by default in DB2 pureScale environments. DB2 automatically detects workloads that benefit from EHL to improve performance. EHL can also be turned on or off by using the opt_direct_wrkld database configuration parameter.

IBM DB2 pureScale Feature self-tuning memory enhancements

The self-tuning memory feature is now enhanced in DB2 pureScale environment, so that each member has its own independent tuner.

Having an independent tuner on each member has the following benefits:

- The tuning is more reflective of the characteristics of the workload.
- Each STMM tuner is able to react appropriately to changes in available memory on each member.

Also, an independent tuner ensures that memory configurations of each member are tuned to react to the member-specific workloads and resources, which might be different across the members.

The UPDATE STMM TUNING MEMBER stored procedure now accepts the value -2. In new databases, this value is set by default in system table. Setting the value to -2 ensures that STMM tuner is active on all members, which works independently in tuning the memory configuration of each member.
Chapter 7. SQL compatibility enhancements

If you work with relational database products other than DB2 database products, DB2 Version 10.5 contains enhancements that make the DB2 database products more familiar to you. These enhancements reduce the time and complexity of enabling some applications that are written for other relational database products to run in DB2 environments.

Large row size support

Starting with DB2 Version 10.5 row size support is extended allowing you to create a table where its row length can exceed the maximum record length for the page size of the table space.

Rows of table data are organized into blocks called pages which can be four sizes: 4, 8, 16, and 32 kilobytes. All tables created within a table space of a particular size have a matching page size. In previous releases, the maximum number of bytes allowed in a table row was dependant on the page size of the table space. Any attempt to create a table whose row length exceeded the maximum record length for the page size would result in an error (SQLSTATE 54010). For example, in previous releases the following table could not be created in a 4K page size table space because of its large row size.

```
CREATE TABLE T1 (C1 INTEGER, C2 VARCHAR(5000))
```

By extending row size support to allow for the creation of tables containing large rows that exceed the maximum record length for the page size of the table space, the table T1 can be created in a 4K page size table space.

Extended row size support can be used to:
- Migrate tables that have row sizes exceeding 32K to DB2 Version 10.5.
- Improve the performance of applications where the majority of data rows can fit on a smaller page, but the table definition requires a bigger page size.
- Create tables with more VARCHAR or VARGRAPHIC columns. The maximum number of columns is not changing, but the ability to exceed the maximum record length for the page size allows for more columns.

Existing tables can be altered to take advantaged of extended row size support.

Exclude NULL keys from indexes

Starting with DB2 Version 10.5 the new EXCLUDE NULL KEYS clause can be used on the CREATE INDEX statement to reduce the size of sparse indexes.

An index created with the EXCLUDE NULL KEYS clause does not insert a key into the index object when all the columns in the key are null. Excluding null keys can result in improved storage and performance optimization for cases where you do not want queries to access data associated with null keys. For unique indexes, the enforcement of the uniqueness of table data ignores rows where the index key is null.
Chapter 8. Workload management enhancements

Version 10.5 features extend the workload management capabilities provided in previous releases.

Customize workload balancing with member subsetting

In a DB2 pureScale environment, you can now customize the operation of workload balancing by defining member subsets. With member subsets, you can isolate application workloads to a specific set of members. This provides greater flexibility and member-level workload management.

Applications that connect to a database alias that is associated with a member subset balance their workload between the members in the subset. The members included in the subset can be modified dynamically, impacting where the workload of application’s assigned the subset runs in real time.

To manage your workloads at the application level, you can define multiple member subsets in a database. Or for dedicated members in your DB2 pureScale cluster for each database, you can define a single member subset per database.

Using new member subset management routines, you can create, alter, and drop member subset objects. Managing these member subset definitions, you can add or drop members to a member subset, or enable or disable a member subset. You can modify the basis for member load information that is provided to applications in a server list. You can also specify which database alias applications must connect to in order to be assigned to the member subset.

Member subsetting is supported in either a partitioned database environment or a DB2 pureScale environment.
Chapter 9. IBM data server clients and drivers enhancements

Some IBM data server clients and drivers have been enhanced with new and improved features that improve application performance and reliability.

To make use of Version 10.5 features, you must upgrade to a Version 10.5 IBM data server client or driver.

In general, you can use DB2 Version 10.1, Version 9.7 and Version 9.5 clients and drivers for running applications, developing applications, and performing database administration tasks on DB2 Version 10.5. Likewise, you can use Version 10.5 clients and drivers for running applications, developing applications, and performing administrative tasks on DB2 Version 10.1, Version 9.8, Version 9.7, and Version 9.5 servers. However, the functionality available can differ based on the combination of the version levels used on the server and client (or driver).

Common client and driver enhancements

This page contains an enhancement for Version 10.5.

- You can now specify multiple names for the db2dsdriver.cfg file by using the DB2DSDRIVER_CFG_PATH registry variable. Paths and file names are processed in the order of precedence that you specify for this registry variable. For details, see the db2dsdriver.cfg configuration file location and miscellaneous variables.

Call level interface (CLI) driver enhancements

The CLI driver contains a number of major enhancements for Version 10.5.

Review the technical changes and new features that are included in the following Version 10.5 and its fix packs. Each fix pack for a release is cumulative.

- Version 10.5 enhancements

Version 10.5: The CLI driver enhancements for the DB2 High Availability feature

You can now use the SQL_ATTR_OVERRIDE_PRIMARY_AFFINITY connection attribute to specify a new temporary primary member for the client affinities feature without modifying the db2dsdriver.cfg file. See Call Level Interface Guide and Reference Volume 2.

Version 10.5: The CLI driver enhancements for calling stored procedures

The Version 10.5 CLI driver includes the following enhancements for calling a stored procedure:

- You can now specify the SQL_ATTR_STREAM_OUTPUTLOB_ON_CALL attribute on a connection or statement level to stream a stored procedure OUT parameter data that is a LOB or an XML data type. See Call Level Interface Guide and Reference Volume 2 and Call Level Interface Guide and Reference Volume 2.

- You can now issue the batch CALL statement to optimize the network flow when you are calling a stored procedure. To enable the batch CALL statement
support, CLI applications must specify array size with the
SQL_ATTR_PARAMSET_SIZE statement attribute and provide argument data in
form of an array. See Developing User-defined Routines (SQL and External).

Version 10.5: The CLI driver enhancements for connection to
DB2 for i servers

The Version 10.5 product includes the following enhancements to the CLI driver
that is specific for connection to DB2 for i servers:

- The CLI driver can now refresh a cached value of the *USRLIBL value with use
  of the following settings:
  - Setting the SQL_ATTR_CACHE_USRLIBL connection attribute.
  - Setting the CacheUsrLibL db2cli.ini keyword.
  - Setting the CacheUsrLibL db2dsdriver.cfg keyword.


- You can now specify following date, time, decimal format, and separator
  attributes at the environment or connection level when you are connecting to
  DB2 for i servers:
  - SQL_ATTR_DATE_FMT
  - SQL_ATTR_DATE_SEP
  - SQL_ATTR_TIME_FMT
  - SQL_ATTR_TIME_SEP
  - SQL_ATTR_DECIMAL_SEP

See Call Level Interface Guide and Reference Volume 2 and Call Level Interface
Guide and Reference Volume 1.

Version 10.5: General enhancements to the CLI driver

The Version 10.5 product includes the following enhancements to the CLI driver.

- You can now specify the session global variables in the db2dsdriver.cfg file. The
  following conditions must be met for use of the session global variables:
  - The connected database server must be supported by the CLI driver. The CLI
driver supports DB2 for Linux, UNIX, and Windows servers.
  - The session global variables must be specified in the <sessionglobalvariables>
    subsection in the db2dsdriver.cfg file.
  - The global variables that are referenced in the <sessionglobalvariables>
    subsection in the db2dsdriver.cfg file must be created on the database server
    before its use.

See the IBM data server driver configuration file structure topic in Preparation
Guide for DB2 10.1 DBA for Linux, UNIX, and Windows Exam 611.

- You can now specify up to 255 characters for the following db2dsdriver.cfg
  client information keywords:
  - ClientAccountingString
  - ClientApplicationName
  - ClientUserID
  - ClientWorkstationName

See “IBM Data Server driver configuration keywords for the client information”.

- You can now specify up to 255 characters for the following db2cli.ini client
  information keywords:
- ClientAcctStr
- ClientApplName
- ClientUserID
- ClientWrkStnName

See “IBM Data Server driver configuration keywords for the client information”.

- You can now specify up to 255 characters for the following environment and connection attributes:
  - SQL_ATTR_INFO_ACCTSTR
  - SQL_ATTR_INFO_APPLNAME
  - SQL_ATTR_INFO_USERID
  - SQL_ATTR_INFO_WRKSTNNAME


- You can now validate all database and DSN entries in the db2dsdriver.cfg file with the db2cli command. See Command Reference.

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**IBM Data Server Provider for .NET enhancements**

List of new IBM Data Server Provider for .NET features that are included in the DB2 Version 10.5.

- Version 10.5 enhancements

**Version 10.5: Support for Microsoft Entity Framework 5.0 features**

The IBM Data Server Provider for .NET supports the following Microsoft Entity Framework 5.0 features with the use of the IBM Database Add-Ins for Visual Studio product:

- Enum support
- Multiple diagrams per model
- Batch import of stored procedures

For more information, see Developing ADO.NET and OLE DB Applications.

**Version 10.5: Support for session global variables**

You can now specify session global variables in the IBM data server driver configuration file. The following conditions apply to the use of session global variables:

- The database server must be DB2 for Linux, UNIX, and Windows server.
- You must specify the session global variables in the <sessionglobalvariables> subsection in the IBM data server driver configuration file.
- Before you connect to the database server, you must create the session global variables.

For more information, see Preparation Guide for DB2 10.1 DBA for Linux, UNIX, and Windows Exam 611.
Version 10.5: Support for client information keywords and properties that are 255 characters in length

The IBM Data Server Provider for .NET supports up to 255 characters for the client information keywords and properties:

- You can now specify up to 255 characters for the following client information keywords in the IBM data server driver configuration file:
  - ClientAccountingString
  - ClientApplicationName
  - ClientUserID
  - ClientWorkstationName
  
  For more information, see “IBM data server driver configuration keywords for client information”.

- You can now specify up to 255 characters for the following DB2ConnectionStringBuilder client information properties:
  - DB2ConnectionStringBuilder.ClientAccountingString
  - DB2ConnectionStringBuilder.ClientApplicationName
  - DB2ConnectionStringBuilder.ClientUserID
  - DB2ConnectionStringBuilder.ClientWorkstationName
  
  For more information, see “DB2ConnectionStringBuilder Properties”.

- You can now specify up to 255 characters for the following DB2Connection client information properties:
  - DB2Connection.ClientAccountingInformation
  - DB2Connection.ClientApplicationInformation
  - DB2Connection.ClientUser
  - DB2Connection.ClientWorkStation
  
  For more information, see “DB2Connection properties”.

JDBC and SQLJ support has been enhanced

The IBM Data Server Driver for JDBC and SQLJ contains a number of major enhancements for Version 10.5.

The following enhancements are available in versions of the IBM Data Server Driver for JDBC and SQLJ that are shipped with DB2 for Linux, UNIX, and Windows.

DB2 V10.5 enhancements

The following IBM Data Server Driver for JDBC and SQLJ enhancements are available in version 3.66 or version 4.16, or later.

Support for retrieval of data from character-based columns

DB2 for Linux, UNIX, and Windows introduces support for an explicit string unit attribute in the definitions of string columns and parameters. In a Unicode database, columns with CHAR, VARCHAR, CLOB, GRAPHIC, VARGRAPHIC, and DBCLOB data types can be defined with a string unit.
The IBM Data Server Driver for JDBC and SQLJ provides corresponding support that allows you to access columns that are defined with string units in your applications:

- New methods DB2ParameterMetaData.getMaxStringUnitBits and DB2ResultSetMetaData.getMaxStringUnitBits, which retrieve the maximum number of bits in a string unit for single-byte and double-byte character data types. For a character column that is defined with OCTETS, these methods return a value of 8. For a character column that is defined with CODEUNITS16, the methods return a value of 16. For a character column that is defined with CODEUNITS32, the methods return a value of 32.
- The java.sql.DatabaseMetaData and java.sql.ParameterMetaData methods return ResultSet columns with information about string unit attributes. Those ResultSet columns are now populated for columns or parameters with string unit attributes.

Enhancements to global transport pool monitoring

The following additional information can be collected about a DB2 for Linux, UNIX, and Windows DB2 pureScale instance and its members, or a DB2 for z/OS® data sharing group and its members:

- Information for the entire data sharing group:
  - The maximum number of pool objects that were created since a global transport pool was created.
  - The number of times that the maxTransportWaitTime value was reached since a global transport pool was created.
  - The number of times that the group IP address was used since a global transport pool was created.
  - The number of times that a member of the data sharing group had a connection timeout when a new connection was established.

- Information for each member of the data sharing group:
  - The maximum number of transports that were in use for the member since a global transport pool was created.
  - The maximum number of transports that allocated to the member since a global transport pool was created.
  - The number of times that the memberConnectTimeout value was reached for the member since a global transport pool was created.
  - The number of times that a read timeout occurred for the member since a global transport pool was created.

New and changed properties

The following Connection and DataSource properties are changed in V10.5:

maxRetriesForClientReroute

For connections to DB2 for z/OS, when enableSysplexWLB is set to true, the default for maxRetriesForClientReroute is now 1. In addition, the meaning of an attempt to access the data sharing group has changed, so the meaning of a retry has changed. Formerly, an attempt to connect was an attempt to connect to one data sharing member, or to the group IP address. With V10.5, a single attempt to access the data sharing group is an attempt to connect to all members except the failed member, and to the group IP address.
The following global configuration properties are new in V10.5:

**db2.jcc.sslConnection**
Specifies whether the IBM Data Server Driver for JDBC and SQLJ uses an SSL socket to connect to the data source. This property provides the default for Connection or DataSource property sslConnection.

**db2.jcc.override.sslConnection**
Specifies whether the IBM Data Server Driver for JDBC and SQLJ uses an SSL socket to connect to the data source. This property overrides the Connection or DataSource property sslConnection.

**db2.jcc.sslTrustStoreLocation**
Specifies the name of the Java truststore on the client that contains the server certificate for an SSL connection. This property provides the default for Connection or DataSource property sslTrustStoreConnection.

**db2.jcc.override.sslTrustStoreLocation**
Specifies the name of the Java truststore on the client that contains the server certificate for an SSL connection. This property overrides the Connection or DataSource property sslTrustStoreConnection.

**db2.jcc.sslTrustStorePassword**
Specifies the password for the Java truststore on the client that contains the server certificate for an SSL connection. This property provides the default for Connection or DataSource property sslTrustStorePassword.

**db2.jcc.override.sslTrustStorePassword**
Specifies the password for the Java truststore on the client that contains the server certificate for an SSL connection. This property overrides the Connection or DataSource property sslTrustStorePassword.

**Enhancements for connections to DB2 for z/OS data servers**

IBM Data Server Driver for JDBC and SQLJ versions 3.66 and 4.16 provide the following enhancements for connections to DB2 for z/OS data servers. For these versions of the driver to work properly with DB2 for z/OS Version 10, a DB2 for z/OS PTF needs to be installed. If the PTF is not installed, connections fail with SQL error -1224. Contact your DB2 for z/OS system administrator to ensure that the PTF is installed.

**Automatic client reroute enhancements**
Non-seamless processing of automatic client reroute for DB2 for z/OS connections is modified to operate more efficiently. When a connection is re-established during non-seamless automatic client reroute, transport allocation is postponed until it is needed.
Chapter 10. DB2 Text Search enhancements

Version 10.5 includes enhancements that extend the Text Search functionality.

DB2 Text Search configuration capabilities

DB2 Text Search now provides enhanced configuration capabilities, as well as indexing and optimization enhancements. These enhanced configuration capabilities apply to all collections.

These improvements include:
• Reduced impact of indexing on search.
• Stronger support for multilingual collections, resulting in more robust capabilities across languages.
• Support for embedded documents, archive files, and compressed files by extracting, concatenating, and indexing their content.
• Enhanced configuration capabilities, including stronger validation and the ability to define system level defaults.

Committing batches for DB2 Text Search

DB2 Text Search now provides more options for finer control of update processing.

In addition to specifying the batch size for a COMMIT operation, you can also determine how many commit cycles should be completed during one update session. You can also specify whether the commit size is based on the number of rows or the time passed (in hours).

The following DB2 Text Search commands have been enhanced to support this functions:
• CREATE INDEX FOR TEXT command
• ALTER INDEX FOR TEXT command
• UPDATE INDEX FOR TEXT command

The following DB2 Text Search stored procedures have also been improved to handle the COMMIT operation for batches:
• SYSTS_CREATE procedure
• SYSTS_ALTER procedure
• SYSTS_UPDATE procedure

Set manual command locks for DB2 Text Search

You can apply administrative operations one at a time to a specific text index. To prevent conflicts, a command lock is automatically sent when an operation starts and is removed when an operation ends. However, text indexes might also be affected by operations that are not managed through DB2 Text Search. For such cases you can now set the command lock manually.

To set a lock manually, use the db2ts SET COMMAND LOCKS command or the SYSPROC.SYSTS_ADMIN_CMD() stored procedure.
- You can issue the command as follows for an index i1:
  
  `db2ts set command locks for index i1 for text`
  
- Alternatively, issue the stored procedure as follows:
  
  `db2 "call sysproc.systs_admin_cmd('set command locks for index i1 for text', 'en_US', ?)"

---

**DB2 Text Search index configuration options**

Two new index configuration options, **INITIALMODE** and **LOGTYPE**, have been added to control update processing.

Use the **INITIALMODE** option to run the initial update immediately when the index is created. You can defer it to the first update operation or skip it altogether. For example, you might use the **INITIALMODE** option if the initial index is created in a separate migration step. See the text search planning section for further guidance.

The **LOGTYPE** setting determines how the log table is managed. The basic option adds triggers to recognize changes. The custom option does not add triggers and requires more measures to identify changes for incremental updates. See the text search planning section for further guidance about options and restrictions.

You must set one of these options when you create an index.
Chapter 11. Installation and upgrade enhancements

Version 10.5 includes enhancements that make it faster to deploy products and easier to maintain them.

If you have a Version 9.7, Version 9.8, or Version 10.1 copy already installed and you want to use DB2 V10.5 instead, you need to upgrade to V10.5. V10.5 is a new version. You cannot apply a fix pack to upgrade from a prior version to V10.5.

To learn about upgrade limitations, possible issues, and other details, see “Upgrade essentials for DB2 servers” in Upgrading to DB2 Version 10.5 and “Upgrade essentials for clients” in Upgrading to DB2 Version 10.5.

Upgrading your DB2 servers and DB2 clients to V10.5 might require that you also upgrade your database applications and routines. To help determine whether you must upgrade, see the “Upgrade essentials for database applications” in Upgrading to DB2 Version 10.5 and “Upgrade essentials for routines” in Upgrading to DB2 Version 10.5 topics.

Install IBM Data Studio web console component with DB2 launchpad

The IBM Data Studio web console installation is integrated with the DB2 Enterprise Server Edition installation launchpad.

In previous releases, you had to download and install the IBM Data Studio web console separately. In DB2 Version 10.5 release, the Installation Manager downloads and installs the IBM Data Studio web console component. Therefore, the process of installing IBM Data Studio is simplified.

Guardium Installation Manager Client installer is included in DB2 server products

The Guardium® Installation Manager (GIM) Client can be optionally installed and configured on a DB2 Server. The GIM Client is used by a remote GIM Server running on a Guardium collector. The GIM Client installs, configures, and updates the Guardium S-TAP® (Software TAP) and other Guardium agents. The Guardium S-TAP and other Guardium agents are in-turn used to monitor database activities.

In DB2 Version 10.5 release, the DB2 installer places the GIM Client installer as a directory under the DB2 installation path.

The DB2 installer does not install or configure the GIM Client on the target systems. The GIM Client must be manually installed and configured on the target systems that uses the GIM Client installer.

Fix pack installation in a DB2 pureScale environment is simplified

In DB2 Version 10.5, you can use the DB2 installFixPack command to update both the DB2 pureScale instance and DB2 Enterprise Server Edition instance types.

The installFixPack command is used to update a DB2 pureScale instance to the latest fix pack. As of DB2 Version 9.8, updating the DB2 software with the latest fix
pack on Linux and UNIX operating systems was a multistep process. The reason was that the process included updating the Tivoli® System Automation and GPFS™ software level updates in addition to the DB2 fix pack updates.

In DB2 Version 10.5 release, the DB2 installFixPack interface is enhanced to update both the DB2 pureScale instance and DB2 Enterprise Server Edition instance types in a single step process.

**Root login settings for the DB2 pureScale Feature installation are simplified**

You can now install and configure the DB2 pureScale Feature without enabling remote root login and passwordless SSH.

In previous releases, installing and configuring the DB2 pureScale Feature required enabling both remote root login and passwordless SSH for root.

In DB2 Version 10.5, enabling the root login settings is no longer required.
Chapter 12. Troubleshooting and problem determination enhancements

DB2 Version 10.5 provides enhancements that make it easier to troubleshoot problems in DB2 environments.

New command parameters enhance troubleshooting

New command parameters are added to the `db2pd` and `db2support` commands.

The following table lists the new command parameters.

*Table 1. Summary of new troubleshooting command parameters. This table displays new troubleshooting command parameters.*

<table>
<thead>
<tr>
<th>Troubleshooting command</th>
<th>New parameter</th>
</tr>
</thead>
<tbody>
<tr>
<td>db2pd</td>
<td><code>detail</code></td>
</tr>
<tr>
<td></td>
<td>This parameter is a new suboption to the <code>db2pd -wlocks</code> command. Use this parameter to display the TableNm, SchemaNm, and AppNode columns for application locks that are being waited on.</td>
</tr>
<tr>
<td></td>
<td><code>-extentmovement</code></td>
</tr>
<tr>
<td></td>
<td>Use this parameter to display the extent movement status of your database.</td>
</tr>
<tr>
<td></td>
<td><code>-membersubsetstatus</code></td>
</tr>
<tr>
<td></td>
<td>Use this parameter to dump the state of member subsets.</td>
</tr>
<tr>
<td></td>
<td><code>-subsetid</code></td>
</tr>
<tr>
<td></td>
<td>Use this parameter to identify a subset.</td>
</tr>
<tr>
<td>db2support</td>
<td><code>-alldbs</code></td>
</tr>
<tr>
<td></td>
<td>Use this parameter to specify that information about all databases that are found in the database directory is collected.</td>
</tr>
<tr>
<td></td>
<td><code>-sg group_name</code></td>
</tr>
<tr>
<td></td>
<td>Use this parameter to collect system-related information about the specified system group.</td>
</tr>
<tr>
<td></td>
<td><code>-su user_name</code></td>
</tr>
<tr>
<td></td>
<td>Use this parameter to collect system-related information about the specified system user.</td>
</tr>
<tr>
<td></td>
<td><code>-wlm</code></td>
</tr>
<tr>
<td></td>
<td>Use this parameter to collect information that is related to WLM issues as part of the optimizer mode with collection level 0 and above.</td>
</tr>
</tbody>
</table>
Chapter 13. DB2 pureScale Feature enhancements

IBM DB2 pureScale Feature was originally introduced in Version 9.8. DB2 Version 10.5 continues to build on DB2 pureScale Feature support.

DB2 V10.5 provides several DB2 pureScale Feature improvement enhancements including increased availability through online topology changes, and restore operations between DB2 pureScale Feature and DB2 Enterprise Server Edition. In addition, V10.5 introduces DB2 pureScale Feature enhancements in high availability, performance, workload management, and installation.

Related concepts:
“Customize workload balancing with member subsetting” on page 25
“HADR is now supported in a DB2 pureScale environment” on page 19
“Fix pack installation in a DB2 pureScale environment is simplified” on page 35
“Root login settings for the DB2 pureScale Feature installation are simplified” on page 36
“DB2 pureScale Feature performance enhancement by using explicit hierarchical locking” on page 22

Increased availability

With the IBM DB2 pureScale Feature, DB2 Version 10.5 increases availability of online topology changes.

With DB2 V10.5, several enhancements improve availability:
• You can now add DB2 members online, without downtime.
• Adding DB2 members offline no longer requires an immediate database backup be taken for a cataloged database to be usable.
• After an add operation, restore backup images and roll forward to different topologies without requiring multiple full database backups
• Restore backup images between an IBM DB2 10.5 Enterprise Server Edition and a DB2 pureScale instance.

When adding new members to a DB2 pureScale instance, DB2 V10.5 eliminates the need for planned downtime maintenance windows. As before, new members are added to a DB2 pureScale cluster through a single command, `db2iupdt`, without the need for stopping the instance. After the successful completion of the `db2iupdt` command, the cataloged databases are immediately available on the new member. You do not need to take a full offline backup of the database for the database to be usable again.

Restoring database and table space backups is made easier. You can:
• Restore a database backup to a DB2 pureScale instance with a different topology.
• Restore of online database backup images that are taken on a DB2 pureScale instance to a DB2 pureScale instance with a superset topology. Restore support includes a rollforward operation through member addition events.
• Restore of table space backup images that are taken on a DB2 pureScale instance to a DB2 pureScale instance with a superset topology. Restore support includes a tablespace rollforward operation through member addition events.
**Restore between DB2 pureScale Feature and DB2 Enterprise Server Edition**

DB2 Version 10.5 introduces the mobility of backup images back and forth between a DB2 Enterprise Server Edition instance and a DB2 pureScale instance.

DB2 Version 10.1 introduced the ability to convert your DB2 Enterprise Server Edition instance to a DB2 pureScale instance. However, several pre-conversion tasks were required. While this manual process is still supported, DB2 V10.5 simplifies the process. With DB2 V10.5, you simply perform an offline database backup, then restore the backup on the DB2 Enterprise Server Edition.

In addition, V10.5 introduces the ability to restore from a DB2 pureScale instance to a DB2 Enterprise Server Edition, which can be useful for your DB2 test environment. You simply perform an offline database backup, restore the backup on the ESE instance, then to support recoverability from that point in time, perform an offline database backup on the ESE instance.

With the ability to backup and restore between a DB2 Enterprise Server Edition instance and a DB2 pureScale instance, you are able to:

- Restore an offline database backup image that was taken on DB2 Enterprise Server Edition to a DB2 pureScale instance, without rollforward support through the transition.
- Restore an offline database backup image that was taken on a DB2 pureScale instance to a DB2 Enterprise Server Edition instance, without rollforward support through the transition.

**Reorganization enhancements make table maintenance easier**

DB2 Version 10.5 includes enhancements that make table maintenance easier.

DB2 Version 10.5 enhances reorganization capabilities in the following ways:

- Inplace (online) table reorganization is now supported in a DB2 pureScale environment.
- Inplace (online) table reorganization is now supported for tables that use adaptive compression.
- Reclaiming extents on insert time clustering (ITC) tables now consolidates sparsely allocated blocks into a smaller number of blocks. This consolidation is done before empty extents are freed.

**Random ordering for index columns alleviates index page contention**

DB2 Version 10.5 adds a type of random ordering for index key columns. Random ordering on index columns helps to alleviate page contention on frequently accessed pages in certain insert scenarios.

This new function focuses specifically on index leaf pages that are accessed frequently in a DB2 pureScale environment.

If rows are added to a table in the order of an index, the last leaf page of the index is frequently accessed. The last leaf page is frequently accessed since every key added to the index is inserted into the page. This situation is most common when there is an index on a timestamp, or identity column with increasing keys.
This problem is further exacerbated in a DB2 pureScale environment, where pages are shared between multiple members. In a DB2 pureScale environment, rather than just having latch contention on the page, the page itself must go back and forth to the cluster caching facility. The cluster caching facility then moves the page to the different members that are updating or inserting into it. This situation leads to a drastic drop in throughput.

When you specify the RANDOM option, values are stored at random places in the index tree. As a result, the number of consecutive insertions on a page decreases. Which in turn, alleviates the issue of page contention. You can use a randomly ordered index to run equality lookups on a specified column. In addition, key columns that are in random order can be used in nonmatching index scans, and index-only access on random key columns is possible. Even though values are stored in random order, you can retrieve the original value of the random key column.

**Online fix pack updates in a DB2 pureScale environment improves availability**

You can now apply online fix pack updates to your DB2 pureScale environment while your DB2 instance remains available. You can use online fix pack updates to apply a fix pack release or a special build.

Starting with DB2 Version 10.5, when you apply an online fix pack update, you can update one database server at a time while the remaining database servers continue to process transactions. After a database server is updated, it can resume processing. This new procedure to apply fix packs provides a way to update your DB2 pureScale instance while maintaining continuous availability.

Prior to Version 10.5, in order to apply a fix pack the DB2 instance had to be offline. This procedure is still supported.
Part 2. What's changed

What's changed includes information about changes in existing functionality from Version 10.1.

DB2 Version 10.5 for Linux, UNIX, and Windows contains changed functionality, deprecated functionality, and discontinued functionality that you should keep in mind when coding new applications or when modifying existing applications.

Being aware of these changes facilitates your current application development and plans to upgrade to Version 10.5.

Changed functionality typically involves changes in default values or an outcome different from what would have occurred in previous releases. For example, an SQL statement that you used in a previous release might produce different results in Version 10.5.

Maintaining application compatibility across releases is a key priority. However, some behavior has to change to take advantage of new and changed functionality in the current release.

The following chapters describe the changed functionality, deprecated functionality, and discontinued functionality in Version 10.5 that can impact existing applications.

Chapter 14, “Administration changes summary,” on page 45
This chapter describes the changes in the existing DB2 functionality related to database administration.

Chapter 15, “Database setup and product installation changes summary,” on page 49
This chapter describes the changes in the existing DB2 functionality related to database setup and product installation.

Chapter 16, “Application development changes summary,” on page 53
This chapter describes the changes in the existing DB2 functionality related to application development.

Chapter 17, “DB2 command and SQL statement changes summary,” on page 57
This chapter describes the changes to DB2 CLP commands, DB2 system commands, and SQL statements to support new capabilities.

Chapter 18, “Deprecated functionality in Version 10.5,” on page 59
This chapter lists the deprecated functionality, which refers to specific functions or features that are supported but are no longer recommended and might be removed in a future release.

Chapter 19, “Discontinued functionality in Version 10.5,” on page 63
This chapter lists features and functionality that are unsupported in Version 10.5.

Chapter 20, “Summary of deprecated and discontinued DB2 functionality in Version 10.5 and earlier releases,” on page 69
This chapter lists features and functionality that have been deprecated or discontinued in DB2 Version 10.5.
For information about changes to DB2 database products and features, see “Functionality in DB2 features and DB2 product editions”. The related licensing and marketing information is available in the DB2 for Linux, UNIX, and Windows home page at http://www.ibm.com/software/data/db2/linux-unix-windows/.
Chapter 14. Administration changes summary

Version 10.5 includes changed functionality that affects how you administer and work with DB2 databases.

Initializing HADR has changed

As of Version 10.5, the steps for initializing your HADR databases have changed. You should now use the `hadr_target_list` configuration parameter even if you are only configuring one standby.

Details

The `hadr_target_list` database configuration parameter was introduced in Version 10.1 to configure multiple HADR standby databases. You could use this parameter to specify up to three standby databases. This parameter was not required for HADR setups that had only one standby database.

As of Version 10.5, in DB2 environments that do not use the DB2 pureScale Feature, you should always set the `hadr_target_list` database configuration parameter as part of initializing your HADR databases, including environments with one standby database. Initialization of HADR without setting the `hadr_target_list` database configuration parameter is deprecated and might be discontinued in a future release. In DB2 pureScale environments, you must set the `hadr_target_list` database configuration parameter to initialize HADR.

Resolution

Perform all the steps in the initializing HADR task, including setting the `hadr_target_list` database configuration parameter.

If you are creating a new HADR setup, perform all the steps in the initializing HADR task, including setting the `hadr_target_list` database configuration parameter. If your HADR is already set up using the old method (that is, the `hadr_target_list` parameter is empty), see “Enabling multiple standby mode on a preexisting HADR setup”.

HADR log spooling is now enabled by default

HADR log spooling is now enabled by default. The `hadr_spool_limit` database configuration parameter, which specifies log spooling behavior, now has a default setting of `AUTOMATIC`.

Details

Log spooling is enabled for any database that you create in Version 10.5. For existing databases, what happens during an upgrade to Version 10.5 depends on whether or not you are using the DB2 pureScale Feature:

- For DB2 pureScale databases, the `hadr_spool_limit` parameter is set to `AUTOMATIC`. Because HADR was previously not supported with the DB2 pureScale Feature, this change has no impact.
For all other DB2 databases, the value of the `hadr_spool_limit` parameter is not changed.

Introduced in Version 10.1, HADR log spooling allows transactions on the primary to make progress without having to wait for the log replay on the standby. Testing has shown that spooling can significantly reduce any impact that HADR might have on the primary's workload but has a negligible impact on a standby's replay performance.

**Resolution**

If you do not want HADR log spooling to be operational, set the `hadr_spool_limit` database configuration parameter to 0. This parameter takes effect only on the standby. You need to deactivate and reactivate the standby to make it pick up the new value. For the primary, stop HADR, then start HADR to pick up the new value (while keeping the database online) so that when the database becomes a standby, it uses the new value.

To ensure that HADR log spooling can work properly, ensure that you provide adequate disk space for the active log path of the standby database.

### Some database manager configuration parameters have been changed

Version 10.5 contains a number of new and changed database manager configuration parameters.

**Details**

**New database manager configuration parameters**

Due to new features and functionality, Version 10.5 contains a number of new configuration parameters.

<table>
<thead>
<tr>
<th>Parameter name</th>
<th>Description</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>cf_transport_method</code></td>
<td>Network transport method configuration parameter</td>
<td>In DB2 pureScale environments, the <code>cf_transport_method</code> configuration parameter controls what method is used to communication between DB2 members and the cluster caching facility (CF).</td>
</tr>
<tr>
<td><code>curr_eff_arch_level</code></td>
<td>Current effective architecture level configuration parameter</td>
<td>This parameter displays the current effective architecture level (CEAL) at what the instance is operating.</td>
</tr>
<tr>
<td><code>curr_eff_code_level</code></td>
<td>Current effective code level configuration parameter</td>
<td>This parameter displays the current effective code level (CECL) at what the instance is operating.</td>
</tr>
</tbody>
</table>

**Resolution**

Take advantage of enhanced functionality or new features by adopting new functionality through the use of new database manager configuration parameters or new values for existing database manager configuration parameters.

For new database manager configuration parameters or changes to existing database manager configuration parameters that result in DB2 server behavior changes, adjust your existing applications or scripts.
Some registry and environment variables have changed

To support new and changed functionality in DB2 Version 10.5, a number of changes were made to registry and environment variables.

Details

New values for registry variables

The following table shows the registry variables that have new values for Version 10.5 instances:

Table 3. Registry variables with new values

<table>
<thead>
<tr>
<th>Registry variable</th>
<th>New values</th>
</tr>
</thead>
<tbody>
<tr>
<td>DB2_WORKLOAD</td>
<td>For column-organized tables, the new ANALYTICS value enables column organization, automated specialized initial memory configuration, page and extent size configuration, space reclamation, and automatic workload management. Use this setting (prior to creating the database) to establish an optimal default configuration when using the database for analytic workloads.</td>
</tr>
</tbody>
</table>

Changed behaviors

The following table describes the changes to registry variables when you create or upgrade to a Version 10.5 instance:

Table 4. Registry variables with changed behaviors

<table>
<thead>
<tr>
<th>Registry variable</th>
<th>Changed behavior</th>
</tr>
</thead>
<tbody>
<tr>
<td>DB2DSDRIVER_CFG_PATH</td>
<td>You can now use this variable to specify multiple configuration files with different names at the same or different locations. If you do not specify a file name in a path and name pair, the file name defaults to a value of db2dsdriver.cfg. If you do not specify a path name, it defaults to the directory structure for your operating system.</td>
</tr>
</tbody>
</table>

Resolution

Take advantage of enhanced functionality or new features by using new registry variables or new values for registry variables.

For new registry variables or changes to registry variables that result in DB2 server behavior changes, adjust your applications or scripts.

Review the list of deprecated and discontinued registry variables to learn about additional changes that might impact your applications and scripts and determine whether you have to adjust them.
Chapter 15. Database setup and product installation changes summary

Version 10.5 includes changed functionality that affects how you install DB2 database products and setup DB2 databases.

To take advantage of the new features included in the current release, some of the minimum software requirements have been updated. To ensure that your systems are correctly setup, review “Installation requirements for DB2 database products” and “Support for elements of the database application development environment”.

You can upgrade DB2 server or client copies to Version 10.5 from Version 10.1, Version 9.8, or Version 9.7. Version 10.5 is a new release and you cannot apply a fix pack to upgrade from previous releases.

To learn details, limitations of the upgrade process, and possible issues that you need to be aware of, review “Upgrade essentials for DB2 servers” and “Upgrade essentials for clients” in Upgrading to DB2 Version 10.5.

Upgrading your DB2 servers and clients to Version 10.5 might require that you also upgrade your database applications and routines. Review “Upgrade essentials for database applications” and “Upgrade essentials for routines” in Upgrading to DB2 Version 10.5 to help you determine whether there is any upgrade impact.

Changes to database configuration parameters

DB2 Version 10.5 contains a number of new and changed database configuration parameters.

Details

New database configuration parameters

Due to new features and functionality, Version 10.5 contains a number of new database configuration parameters.

Table 5. New Version 10.5 database configuration parameters

<table>
<thead>
<tr>
<th>Parameter name</th>
<th>Description</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>extended_row_sz</td>
<td>Extended row size</td>
<td>This parameter specifies if a table definition can exceed the maximum row length of the page.</td>
</tr>
<tr>
<td>dft_table_org</td>
<td>Default table organization</td>
<td>This parameter specifies whether a user table is created as a column-organized table (value COLUMN) or a row-organized table (value ROW) if neither the ORGANIZE BY COLUMN nor the ORGANIZE BY ROW clause is specified on the CREATE TABLE statement.</td>
</tr>
<tr>
<td>nchar_mapping</td>
<td>National character mapping</td>
<td>This parameter determines the data type mapping for national character string data types in Unicode databases.</td>
</tr>
</tbody>
</table>
### Table 5. New Version 10.5 database configuration parameters (continued)

<table>
<thead>
<tr>
<th>Parameter name</th>
<th>Description</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>opt_direct_wrkld</td>
<td>Optimize directed workload</td>
<td>This database configuration parameter enables or disables explicit hierarchical locking (EHL). It affects the database across the entire DB2 pureScale instance.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>page_age_trgt_gcr</td>
<td>Page age target group crash recovery</td>
<td>This configuration parameter specifies the target duration (in seconds) for changed pages to be kept in the group buffer pool before the pages are persisted to disk or the caching facility. This parameter applies only to DB2 pureScale instances.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>page_age_trgt_mcr</td>
<td>Page age target member crash recovery</td>
<td>This configuration parameter specifies the target duration (in seconds) for changed pages to be kept in the local buffer pool before they are persisted to table space storage, or for DB2 pureScale instances, to table space storage or to the group buffer pool.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>string_units</td>
<td>Default string units</td>
<td>This parameter specifies the default string units that are used when you are defining character data types and graphic data types.</td>
</tr>
</tbody>
</table>

### Changed database configuration parameters

The following database configuration parameters have changed behaviors, new ranges, or new values in Version 10.5.

### Table 6. Database configuration parameters with changed behaviors, new ranges, or new values

<table>
<thead>
<tr>
<th>Parameter name</th>
<th>Description</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>db_mem_thresh</td>
<td>Database memory threshold configuration parameter</td>
<td>In Version 10.5, the default value for db_mem_thresh is changed from 10 to 100 for new (not upgraded) databases.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>hadr_spool_limit</td>
<td>HADR log spool limit configuration parameter</td>
<td>In Version 10.5, the default value for hadr_spool_limit is changed from 0 (disabled) to AUTOMATIC. For more information, see “HADR log spooling is now enabled by default” on page 45.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>hadr_syncmode</td>
<td>HADR synchronization mode for log write in peer state configuration parameter</td>
<td>In Version 10.5, the default value for hadr_syncmode is changed from NEARSYNC to ASYNC for DB2 pureScale databases. For all other database types, the default for hadr_syncmode remains NEARSYNC.</td>
</tr>
</tbody>
</table>
Table 6. Database configuration parameters with changed behaviors, new ranges, or new values (continued)

<table>
<thead>
<tr>
<th>Parameter name</th>
<th>Description</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>hadr_target_list</td>
<td>HADR target list configuration parameter</td>
<td>In Version 10.5, initializing HADR without setting this parameter is deprecated. You should set this parameter regardless of the number of standby databases as part of the initialization process. For more details, see “Initializing HADR has changed” on page 45.</td>
</tr>
<tr>
<td>sortheap</td>
<td>Sort heap size configuration parameter</td>
<td>In Version 10.5, the default value for <code>sortheap</code> is changed from 4,194,303 to 4,294,967,295 for 64-bit platforms.</td>
</tr>
</tbody>
</table>

**Resolution**

Take advantage of enhanced functionality or new features by adopting new functionality through the use of new database configuration parameters or new values for existing database configuration parameters.

For new database configuration parameters or changes to existing database configuration parameters that result in DB2 server behavior changes, adjust your existing applications or scripts.

Review the list of deprecated and discontinued database configuration parameters to determine additional changes that might impact your applications and scripts.
Chapter 16. Application development changes summary

Version 10.5 includes changed functionality that affects how you develop applications.

Also, review deprecated and discontinued functionality to determine whether it affects your existing applications.

Some system catalog views, built-in functions and global variables, built-in administrative routines and views have been added and changed

To support new features in DB2 Version 10.5, database catalog objects such as system catalog views, built-in functions and global variables, built-in administrative routines and views have been added and modified.

Details

System catalog view changes

The following system catalog views have changed in Version 10.5. Most modifications to catalog views consist of new columns, changed descriptions, changed column data types, and increased column lengths.

- SYSCAT.ATTRIBUTES catalog view
- SYSCAT.CHECKS catalog view
- SYSCAT.COLUMNS catalog view
- SYSCAT.CONTROLS catalog view
- SYSCAT.DATATYPES catalog view
- SYSCAT.INDEXCOLUSE catalog view
- SYSCAT.INDEXES catalog view
- SYSCAT.PACKAGES catalog view
- SYSCAT.ROUTINEPARMS catalog view
- SYSCAT.ROUTINES catalog view
- SYSCAT.ROWFIELDS catalog view
- SYSCAT.SERVICECLASSES catalog view
- SYSCAT.STOGROUPS catalog view
- SYSCAT.TABDEP catalog view
- SYSCAT.TABLES has a new column called TABLEORG to indicate the table organization.
- SYSCAT.TABLESPACES catalog view
- SYSCAT.TRIGGERS catalog view
- SYSCAT.VARIABLES catalog view
- SYSCAT.VIEWS catalog view
- SYSSTAT.COLUMNSTATS catalog view
- SYSSTAT.INDEXES catalog view
- SYSSTAT.TABLES catalog view

The following system catalog views have been added in Version 10.5:
Built-in global variable changes
The following built-in global variables have been added:
• NLS_STRING_UNITS global variable

Built-in administrative views and routine changes
The following administrative views and routines have changed in Version 10.5. Most modifications consist of new columns, new values, changed column data types, and increased column lengths:
• ADMINTABINFO administrative view and ADMIN_GET_TAB_INFO table function
• ENV_SYS_INFO administrative view
• MON_BP_UTILIZATION administrative view
• MON_CONNECTION_SUMMARY administrative view
• MON_CURRENT_SQL administrative view
• MON_DB_SUMMARY administrative view
• MON_FORMAT_XML_COMPONENT_TIMES_BY_ROW table function
• MON_FORMAT_XML_METRICS_BY_ROW table function
• MON_FORMAT_XML_TIMES_BY_ROW table function
• MON_GET_APPL_LOCKWAIT table function
• MON_GET_BUFFERPOOL table function
• MON_GET_CONNECTION table function
• MON_GET_CONNECTION_DETAILS table function
• MON_GET_TABLESPACE table function
• MON_GET_SERVICE_SUBCLASS table function
• MON_GET_SERVERLIST table function
• MON_GET_TABLE table function
• MON_GET_TABLESPACE table function
• MON_GET_TABLE_USAGE_LIST table function
• MON_TBSP_UTILIZATION administrative view
• MON_GET_UNIT_OF_WORK table function
• MON_GET_UNIT_OF_WORK_DETAILS table function
• MON_GET_WORKLOAD table function
• MON_GET_WORKLOAD_DETAILS table function
• MON_WORKLOAD_SUMMARY administrative view

The following monitor routines and views have been added:
• “MON_CAPTURE_ACTIVITY_IN_PROGRESS procedure” in Administrative Routines and Views
• “MON_COLLECT_STATS procedure” in Administrative Routines and Views
• “MON_GET_ACTIVITY table function” in Administrative Routines and Views
• “MON_GET_AGENT table function” in Administrative Routines and Views
• “MON_GET_DATABASE table function” in Administrative Routines and Views
• “MON_GET_DATABASE_DETAILS table function” in Administrative Routines and Views
• “MON_GET_INSTANCE table function” in Administrative Routines and Views
• “MON_GET_QUEUE_STATS table function” in Administrative Routines and Views
• “MON_GET_SERVICE_SUBCLASS_STATS table function” in Administrative Routines and Views
• “MON_GET_SERVICE_SUPERCLASS_STATS table function” in Administrative Routines and Views
• “MON_GET_UTILITY table function” in Administrative Routines and Views
• “MON_GET_WORKLOAD_STATS table function” in Administrative Routines and Views
• “MON_GET_WORK_ACTION_SET_STATS table function” in Administrative Routines and Views
• “MON_TRANSACTION_LOG_UTILIZATION administrative view” in Administrative Routines and Views

The following environment routines have been added:
• “ENV_GET_DB2_EDU_SYSTEM_RESOURCES table function” in Administrative Routines and Views
• “ENV_GET_INSTANCE_CODE_LEVELS table function” in Administrative Routines and Views

The following workload management routines have been added:
• “WLM_ALTER_MEMBER_SUBSET procedure” in Administrative Routines and Views
• “WLM_CREATE_MEMBER_SUBSET procedure” in Administrative Routines and Views
• “WLM_DROP_MEMBER_SUBSET procedure” in Administrative Routines and Views

Resolution

Adjust your applications to the changes in existing system catalog objects such as new columns, or modified data type in columns. Also, start using new system catalog objects that provide more comprehensive views or routines, or access to information about new functionality.

Review the list of the “Deprecated SQL administrative routines and their replacement routines or views” in Administrative Routines and Views to determine additional changes that might impact your applications and scripts. To minimize the impact of changes to built-in routines and views, review “Best practices for calling built-in routines and views in applications” in Administrative Routines and Views.

For a list of the data dictionary-compatible views, see the “Data dictionary-compatible views” topic.
Chapter 17. DB2 command and SQL statement changes summary

DB2 Version 10.5 introduces changes to DB2 CLP commands, DB2 system commands, and SQL statements to support new capabilities. Also, some DB2 CLP commands, DB2 system commands, and SQL statements are deprecated or discontinued. These changes can affect your existing database applications or database administration scripts.

Changes to DB2 commands

The following DB2 commands have been changed:

<table>
<thead>
<tr>
<th>DB2 command name</th>
<th>Details about the change</th>
</tr>
</thead>
<tbody>
<tr>
<td>db2cat</td>
<td>The <code>db2cat</code> output now displays information for random ordering of index keys. Since random ordered indexes are extended indexes, <strong>Extend Index Info</strong> is also displayed for any output that is returned by the command.</td>
</tr>
<tr>
<td>db2exfmt</td>
<td>The <code>db2exfmt</code> output now displays information for random ordering of index keys. <strong>R</strong> indicates a column with a RANDOM order. <strong>A</strong> indicates a column with an ASCENDING order. <strong>D</strong> indicates a column with a DESCENDING order. The <code>db2exfmt</code> command now also generates output for queries that access column-organized tables.</td>
</tr>
<tr>
<td>db2expln</td>
<td>The <code>db2expln</code> output now displays information for random ordering of index keys. <strong>Random</strong> indicates a column with a RANDOM order. The <code>db2expln</code> command now also generates output for queries that access column-organized tables.</td>
</tr>
<tr>
<td>db2level</td>
<td>This command now displays the current version and service level for a IBM DB2 pureScale instance. To display the same information for a member, use the <code>db2level</code> command with the <strong>-localMember</strong> parameter. In earlier releases, the <code>db2level</code> command displayed the current version and service level for the member where the command was issued.</td>
</tr>
<tr>
<td>db2look</td>
<td>This command now generates DDL statements to create column-organized tables in addition to row-organized tables.</td>
</tr>
<tr>
<td>db2pd</td>
<td>The <strong>-apinfo</strong> parameter now displays more information about current and past activities of the unit of work (UOW). The <strong>-edus</strong> parameter now also displays the agents that are processing column-organized data. The <strong>showlocks</strong> parameter now displays the TableNm and SchemaNm columns, which indicates the table name and schema name of locks that are being held by applications. To display this information, you must use the <strong>showlocks</strong> parameter with the <strong>-locks</strong> parameter. The <strong>-tablespace</strong> parameter now displays the RSE column to indicate whether the reclaimable space feature is enabled. The <strong>-transactions</strong> parameter now displays the total number of application commits and the total number of application rollbacks.</td>
</tr>
</tbody>
</table>
Table 7. Changed DB2 commands (continued)

<table>
<thead>
<tr>
<th>DB2 command name</th>
<th>Details about the change</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>db2support</code></td>
<td>The <code>-d</code> parameter now supports collection of information from multiple databases. To specify multiple databases, separate the database names with a comma.</td>
</tr>
<tr>
<td><code>LOAD</code></td>
<td>For column-organized tables, automatic statistics collection occurs by default during the <code>LOAD REPLACE</code> command. To explicitly disable automatic statistics collection, specify the <code>STATISTICS NO</code> parameter. Also, during a <code>LOAD REPLACE</code> operation against a column-organized table, the column compression dictionaries are replaced by default.</td>
</tr>
</tbody>
</table>

Changes to SQL statements

The following SQL statements have been changed:

Table 8. Changed SQL statements

<table>
<thead>
<tr>
<th>SQL statement</th>
<th>Details about the change</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>CREATE TABLE</code> statement</td>
<td>New ORGANIZE BY COLUMN and ORGANIZE BY ROW clauses to specify whether the table data is to be stored with column or row organization. If neither of these clauses is specified, the data is stored using the default table organization that is specified by the <code>dft_table_org</code> database configuration parameter. The default table organization is ROW, unless the <code>DB2_WORKLOAD</code> registry variable is set to <code>ANALYTICS</code> prior to creating the database. For more details, see “Creating column-organized tables” in <em>Database Administration Concepts and Configuration Reference</em>.</td>
</tr>
<tr>
<td><code>CREATE INDEX</code> statement</td>
<td>New RANDOM clause to specify a random ordering for the index that is created.</td>
</tr>
</tbody>
</table>

Discontinued DB2 commands or SQL statements

The following DB2 commands or SQL statements are discontinued:

Table 9. Discontinued DB2 commands or SQL statements

<table>
<thead>
<tr>
<th>DB2 command or SQL statement</th>
<th>Details about the change</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>db2IdentifyType1</code></td>
<td>The <code>db2IdentifyType1</code> command was provided to help you convert type-1 indexes to type-2 before upgrading to Version 9.7 because type-1 indexes were discontinued in Version 9.7. In Version 10.5, this command is no longer required because you can only upgrade from Version 9.7 or later releases. Databases in these releases no longer have type-1 indexes.</td>
</tr>
<tr>
<td><code>STATISTICS YES</code> parameter of the <code>LOAD</code> command</td>
<td>The <code>STATISTICS YES</code> parameter of the <code>LOAD</code> command is discontinued. The functionality associated with this parameter has been replaced with the functionality associated to the <code>STATISTICS USE PROFILE</code> parameter.</td>
</tr>
<tr>
<td><code>dynexpln</code></td>
<td>The <code>dynexpln</code> command is discontinued. Use the <code>db2expln</code> command instead of the <code>dynexpln</code> command. The <code>db2expln</code> command provides equivalent functionality because it can process dynamic statements directly.</td>
</tr>
</tbody>
</table>
Chapter 18. Deprecated functionality in Version 10.5

Functionality gets marked as deprecated when a specific function or feature is supported in the current release but might be removed in a future release. In some cases, it might be advisable to plan to discontinue the use of deprecated functionality.

For example, a registry variable might be deprecated in this release because the behavior triggered by the registry variable has been enabled by default in this release, and the obsolete registry variable will be removed in a future release.

**DB2 functionality**

The following DB2 functionality has been deprecated in Version 10.5:

- Initializing HADR without setting hadr_target_list (see “Initializing HADR has changed” on page 45)
- Support in COBOL and FORTRAN for db2DatabaseUpgrade (see “COBOL and FORTRAN language support for the db2DatabaseUpgrade API is deprecated”)
- Some SQL administrative routines are deprecated (see in Administrative Routines and Views)

**Registry variables and configuration parameters**

The following registry variables, and configuration parameters are deprecated in Version 10.5:

- Some registry and environment variables (see “Some registry and environment variables are deprecated” on page 60)
- Some database configuration parameter (see “Some database configuration parameters are deprecated or discontinued” on page 60)

Review each topic to find out more details and to plan for future changes. Review also Chapter 19, “Discontinued functionality in Version 10.5,” on page 63 that might affect your databases and existing applications.

**COBOL and FORTRAN language support for the db2DatabaseUpgrade API is deprecated**

The COBOL and FORTRAN language support for the db2DatabaseUpgrade API is deprecated and might be removed in a future release.

**Details**

The db2DatabaseUpgrade API is still supported in C and Java™ programming languages.

**Resolution**

Start using a supported programming language to continue to call this API before it becomes discontinued. Alternatively, use a DB2 command script that issues the UPGRADE DATABASE command.
Some registry and environment variables are deprecated

There are a number of registry variables that are deprecated in DB2 Version 10.5. Deprecated variables are still available, but you should not use them because they will likely be removed in a future version.

The following table lists deprecated registry and environment variables. They have been replaced by another feature, or the function that they support is obsolete.

Table 10. Registry and environment variables deprecated in Version 10.5

<table>
<thead>
<tr>
<th>Registry or environment variable</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>DB2_EVTMON_EVENT_LIST_SIZE</strong></td>
<td>Setting this registry variable has no effect because of the changes that were made to the underlying event monitor infrastructure in Version 9.7.</td>
</tr>
<tr>
<td><strong>DB2_NCHAR_SUPPORT</strong></td>
<td>This registry variable enables the use of user-defined types called NCHAR, NVARCHAR or NCLOB. These data types are no longer required because all the character length sensitive functions now return the number of characters. Start using the nchar_codeset database configuration parameter to specify the data type mapping for national character string data types in your Unicode databases before this registry variable is discontinued. For more details, see “nchar_mapping - National character mapping configuration parameter”.</td>
</tr>
</tbody>
</table>

Resolution

Start using the replacement feature or function related to the registry variable that is deprecated.

Remove the use of registry variables that are deprecated because the functionality associated with the configuration parameter is obsolete or has been replaced by new functionality.

Some database configuration parameters are deprecated or discontinued

Due to changes in functionality, the introduction of new database configuration parameters, or the removal of support, the following database configuration parameters are either deprecated or discontinued.
Details

The following database configuration parameters are deprecated:

Table 11. Deprecated database configuration parameters

<table>
<thead>
<tr>
<th>Parameter name</th>
<th>Description</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>buffpage</td>
<td>Buffer pool size</td>
<td>This parameter indicated the default buffer pool size for the ALTER BUFFERPOOL or CREATE BUFFERPOOL statements that indicated the value -1 as the size. Use the SIZE parameter for both statements to indicate an explicit value or use the AUTOMATIC value to enable self tuning of the buffer pool.</td>
</tr>
<tr>
<td>softmax</td>
<td>Recovery range and soft checkpoint interval</td>
<td>This parameter determines the frequency of soft checkpoints and the recovery range, which help out in the crash recovery process. Use the page_age_trgt_mcr and page_age_trgt_gcr database configuration parameters, instead of the softmax parameter. · The page_age_trgt_mcr parameter specifies the target duration for changed pages to be retained in the local bufferpool before being persisted to table space storage, or for DB2 pureScale instances, to the group bufferpool. · The page_age_trgt_gcr specifies the target duration for changed pages to be kept in the group buffer pool before being persisted to disk.</td>
</tr>
</tbody>
</table>

The following database configuration parameters are discontinued:

Table 12. Discontinued database configuration parameters

<table>
<thead>
<tr>
<th>Parameter name</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>auto_stats_prof</td>
<td>This configuration parameter is discontinued because automatic statistics profiling is discontinued. For more information, see “Automatic statistics profiling is discontinued” on page 66.</td>
</tr>
<tr>
<td>auto_prof_upd</td>
<td>This configuration parameter is discontinued because automatic statistics profiling is discontinued. For more information, see “Automatic statistics profiling is discontinued” on page 66.</td>
</tr>
</tbody>
</table>

Resolution

Remove the use of database configuration parameters that are deprecated because the functionality associated with the configuration parameter is obsolete or has been replaced by new functionality. Also, remove the use of discontinued database configuration parameters as they do not have the intended effect.

If a replacement database configuration parameter is provided, set it to maintain the intended database behavior.
Chapter 19. Discontinued functionality in Version 10.5

Discontinued functionality is removed in Version 10.5 and is no longer available. You need to make changes if you were using that functionality in previous releases.

DB2 functionality

The following DB2 functionality is discontinued in Version 10.5:

- Agent priority of service classes (see “Agent priority of service classes is discontinued”)
- Some administrative routines (see “Some administrative routines are discontinued” on page 64)
- Support for some operating systems (see “Some operating systems are no longer supported” on page 65)
- Automatic statistics profiling (see “Automatic statistics profiling is discontinued” on page 66)

Commands, command parameters, registry variables, and configuration parameters

The following commands, command parameters, registry variables, and configuration parameters are discontinued in Version 10.5:

- The db2IdentifyType1 command (see “Discontinued DB2 commands or SQL statements” on page 58)
- The dynexp1n command (see “Discontinued DB2 commands or SQL statements” on page 58)
- STATISTICS YES parameter of the LOAD command (see “Discontinued DB2 commands or SQL statements” on page 58)
- Some registry and environment variables (see “Some registry and environment variables are discontinued” on page 67)
- Some database configuration parameters (see “Some database configuration parameters are deprecated or discontinued” on page 60)

Agent priority of service classes is discontinued

Associating each DB2 service class with an agent priority, which controls the relative operating system priority of agents in the service class, is discontinued.

Details

Starting with Version 10.1, you can use the workload manager (WLM) dispatcher to control CPU consumption more effectively and allow higher priority work to consume more CPU resources than lower priority work. The WLM dispatcher provides additional features over agent priority.

In Version 9.5, the agent priority was introduced to assign less system CPU resources to lower priority work and more system CPU resources to higher priority work based on the agent priority of the service class the work ran in. However, this method proved to be only effective for certain types of workloads.

For AIX® and Linux operating systems, you can also use the integration between DB2 service classes and AIX WLM or Linux WLM classes to control the amount of
system resources allocated to each service class.

Resolution

Use the WLM dispatcher in place of the agent priority to control CPU consumption.

Some administrative routines are discontinued

A number of SQL administrative routines are discontinued in Version 10.5. You must use the replacement routines.

Details

The following table shows the SQL administrative routines that are discontinued, the version when the routines were deprecated, their replacement routines or views, and the version when the replacement views or routines became available:

Table 13. Discontinued SQL administrative routines or views and their replacement routines or views for Version 10.5

<table>
<thead>
<tr>
<th>Discontinued routine or view</th>
<th>Deprecated since</th>
<th>New routine or view</th>
<th>Replaced since</th>
</tr>
</thead>
<tbody>
<tr>
<td>SNAPSHOT_AGENT table function</td>
<td>Version 9.1</td>
<td>MON_GET_AGENT table function and MON_GET_CONNECTION table function</td>
<td>Version 10.5 and Version 9.7</td>
</tr>
<tr>
<td>SNAPSHOT_APPL table function</td>
<td>Version 9.1</td>
<td>MON_GET_CONNECTION table function and MON_GET_UNIT_OF_WORK table function</td>
<td>Version 9.7</td>
</tr>
<tr>
<td>SNAPSHOT_APPL_INFO table function</td>
<td>Version 9.1</td>
<td>MON_GET_CONNECTION table function and MON_GET_UNIT_OF_WORK table function</td>
<td>Version 9.7</td>
</tr>
<tr>
<td>SNAPSHOT_BP table function</td>
<td>Version 9.1</td>
<td>MON_GET_BUFFERPOOL table function</td>
<td>Version 9.7</td>
</tr>
<tr>
<td>SNAPSHOT_CONTAINER table function</td>
<td>Version 9.1</td>
<td>MON_GET_CONTAINER table function</td>
<td>Version 9.7</td>
</tr>
<tr>
<td>SNAPSHOT_DATABASE table function</td>
<td>Version 9.1</td>
<td>MON_GET_DATABASE table function and MON_GET_TRANSACTION_LOG table function</td>
<td>Version 10.5</td>
</tr>
<tr>
<td>SNAPSHOT_DBM table function</td>
<td>Version 9.1</td>
<td>MON_GET_INSTANCE table function</td>
<td>Version 10.5</td>
</tr>
<tr>
<td>SNAPSHOT_DYN_SQL table function</td>
<td>Version 9.1</td>
<td>MON_GET_PKG_CACHE_STMT table function</td>
<td>Version 9.7</td>
</tr>
<tr>
<td>SNAPSHOT_FCM table function</td>
<td>Version 9.1</td>
<td>MON_GET_FCM table function</td>
<td>Version 9.7 Fix Pack 2</td>
</tr>
<tr>
<td>SNAPSHOT_FCMNODE table function</td>
<td>Version 9.1</td>
<td>MON_GET_FCM_CONNECTION_LIST table function</td>
<td>Version 9.7 Fix Pack 2</td>
</tr>
<tr>
<td>SNAPSHOT_FILEW procedure</td>
<td>Version 9.1</td>
<td>SNAP_WRITE_FILE procedure</td>
<td>Version 9.1</td>
</tr>
<tr>
<td>SNAPSHOT_LOCK table function</td>
<td>Version 9.1</td>
<td>MON_GET_APPL_LOCKWAIT table function, MON_GET_LOCKS table function, MON_FORMAT_LOCK_NAME table function</td>
<td>Version 9.7 Fix Pack 1</td>
</tr>
</tbody>
</table>
Table 13. Discontinued SQL administrative routines or views and their replacement routines or views for Version 10.5 (continued)

<table>
<thead>
<tr>
<th>Discontinued routine or view</th>
<th>Deprecated since</th>
<th>New routine or view</th>
<th>Replaced since</th>
</tr>
</thead>
<tbody>
<tr>
<td>SNAPSHOT_LOCKWAIT table function</td>
<td>Version 9.1</td>
<td>MON_GET_APPL_LOCKWAIT table function, MON_GET_LOCKS table function, and MON_FORMAT_LOCK_NAME table function</td>
<td>Version 9.7 Fix Pack 1</td>
</tr>
<tr>
<td>SNAPSHOT QUIESCERS table function</td>
<td>Version 9.1</td>
<td>SNAP_GET_TBSP QUIESCER table function</td>
<td>Version 9.1</td>
</tr>
<tr>
<td>SNAPSHOT RANGES table function</td>
<td>Version 9.1</td>
<td>SNAP_GET_TBSP RANGE table function</td>
<td>Version 9.1</td>
</tr>
<tr>
<td>SNAPSHOT STATEMENT table function</td>
<td>Version 9.1</td>
<td>MON_GET_ACTIVITY table function and MON_CURRENT_SQL administrative view</td>
<td>Version 10.5 and Version 9.7 Fix Pack 1</td>
</tr>
<tr>
<td>SNAPSHOT SUBSECT table function</td>
<td>Version 9.1</td>
<td>SNAP_GET_SUBSECTION table function</td>
<td>Version 9.1</td>
</tr>
<tr>
<td>SNAPSHOT SWITCHES table function</td>
<td>Version 9.1</td>
<td>SNAP_GET_SWITCHES table function</td>
<td>Version 9.1</td>
</tr>
<tr>
<td>SNAPSHOT TABLE table function</td>
<td>Version 9.1</td>
<td>MON_GET_TABLE table function</td>
<td>Version 9.7</td>
</tr>
<tr>
<td>SNAPSHOT TBREORG table function</td>
<td>Version 9.1</td>
<td>MON_GETUTILITY table function and SNAP_GET_TAB_REORG table function</td>
<td>Version 10.5 and Version 9.1</td>
</tr>
<tr>
<td>SNAPSHOT TBS table function</td>
<td>Version 9.1</td>
<td>MON_GET_TABLESPACE table function</td>
<td>Version 9.7</td>
</tr>
<tr>
<td>SNAPSHOT TBS CFG table function</td>
<td>Version 9.1</td>
<td>MON_GET_TABLESPACE table function and MON_GET_REBALANCE_STATUS table function</td>
<td>Version 9.7 and Version 10.1</td>
</tr>
<tr>
<td>SNAPSHOT UTIL table function</td>
<td>Version 8</td>
<td>MON_GETUTILITY table function</td>
<td>Version 10.5</td>
</tr>
<tr>
<td>SNAPSHOT UTIL PROG table function</td>
<td>Version 8</td>
<td>SNAPUTIL_PROGRESS administrative view and SNAP_GET_UTIL_PROGRESS table function</td>
<td>Version 9.1</td>
</tr>
<tr>
<td>SQLCACHE_SNAPSHOT table function</td>
<td>Version 9.1</td>
<td>MON_GET_PKG_CACHE_STMT table function</td>
<td>Version 9.7</td>
</tr>
</tbody>
</table>

Resolution

Modify all user-defined objects that are dependent on the discontinued routines. Re-create these objects using the replacement routines or views indicated in Table 13 on page 64. If you upgrade a database that has dependent objects, the UPGRADE DATABASE command drops the discontinued administrative routines and marks the dependent objects inoperative or invalid.

Modify all your applications and scripts and remove all references to these routines or use the replacement routines or views indicated in Table 13 on page 64.

Some operating systems are no longer supported

Starting in DB2 Version 10.5, support for some operating systems has been discontinued.
Details

The following operating systems and Linux distributions are no longer supported:
- Red Hat Enterprise Linux 5.6
- Ubuntu 10.4 LTS
- Windows 2003
- Windows 2003 R2
- Windows 2008
- Windows XP
- Windows Vista

The following architecture is no longer supported:
- POWER4 processor-based systems (DB2 servers and data clients)

User Response

Review the list of supported operating systems and plan to upgrade your DB2 server operating systems before upgrading your DB2 database products.

---

Automatic statistics profiling is discontinued

Automatic statistics profiling is discontinued.

Details

Automatic statistics profiling is discontinued because of its noticeable performance overhead and restrictions. It is not supported in partitioned database environments, federated systems, or databases with intrapartition parallelism enabled or enables collection of section actuals.

The ASP value as a tool name parameter for the SYSINSTALLOBJECTS procedure is also discontinued.

The following tables are also discontinued as they are related to the automatic statistics profiler functionality:
- SYSTOOLS.OPT_FEEDBACK_QUERY
- SYSTOOLS.OPT_FEEDBACK_PREDICATE
- SYSTOOLS.OPT_FEEDBACK_PREDICATE_COLUMN
- SYSTOOLS.OPT_FEEDBACK_RANKING
- SYSTOOLS.OPT_FEEDBACK_RANKING_COLUMN

In earlier releases, you could use automatic statistics profiling to determine recommended parameters for the RUNSTATS command. Also, automatic statistics profiling could detect whether table statistics were outdated.

Statistics profiles for the RUNSTATS command are not affected by this discontinuation and are still fully supported.

Resolution

Discontinue the use of Automatic statistics profiling functionality.
You can use the IBM Data Studio tool to help you determine the best parameters for the **RUNSTATS** command to continue collecting statistics by using statistics profiles or by running the **RUNSTATS** command. The following capabilities can help you get recommendations for statistics collection:

- Statistics Advisor. For more details, see “Generating and acting on recommendations for collecting statistics for database objects that are in the access path for an SQL statement” at http://publib.boulder.ibm.com/infocenter/dstudio/v3r2/topic/com.ibm.datatools.qrytune.sngqry.doc/topics/genrecsstats.html.
- Workload Advisor. This advisor requires an active license for IBM InfoSphere Optim Query Workload Tuner tool. For more details, see “Creating MQTs, using multidimensional clustering, and redistributing data across database partitions” at http://publib.boulder.ibm.com/infocenter/dstudio/v3r2/topic/com.ibm.datatools.qrytune.workloadtunedb2luw.doc/topics/genrecsdsgn.html.
- Task assistant for the **RUNSTATS** command. For more details, see “Database administration commands that you can run from task assistants” at http://publib.boulder.ibm.com/infocenter/dstudio/v3r2/topic/com.ibm.datatools.adm.doc/topics/c_taskassitantcommandsupport.html.

### Some registry and environment variables are discontinued

There are a number of registry variables that are discontinued in Version 10.5. You should remove all references to them.

#### Details

The following registry and environment variables are discontinued in Version 10.5:

**Table 14. Registry variables discontinued in Version 10.5**

<table>
<thead>
<tr>
<th>Registry or environment variable</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>DB2_INDEX_FREE</strong></td>
<td>This registry variable provided the same functionality as the PCTFREE clause in a CREATE INDEX statement. The difference is that <strong>DB2_INDEX_FREE</strong> applies to all indexes that you create and the PCTFREE clause applies to one index. For more details, see CREATE INDEX statement. Setting this registry variable results in an error because the associated functionality is no longer available.</td>
</tr>
<tr>
<td><strong>DB2_TRUSTED_BINDIN</strong></td>
<td>This variable is discontinued because it is no longer supported for improving the performance of query statements containing host variables within an embedded unfenced stored procedure.</td>
</tr>
</tbody>
</table>

#### Resolution

Remove the use of registry variables that are discontinued as they do not have the intended effect. If a replacement registry variable is indicated in Table 14, set it to the proper value to maintain wanted database manager behavior.

### Some database configuration parameters are deprecated or discontinued

Due to changes in functionality, the introduction of new database configuration parameters, or the removal of support, the following database configuration parameters are either deprecated or discontinued.
Details

The following database configuration parameters are deprecated:

Table 15. Deprecated database configuration parameters

<table>
<thead>
<tr>
<th>Parameter name</th>
<th>Description</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>buffpage</td>
<td>Buffer pool size</td>
<td>This parameter indicated the default buffer pool size for the ALTER BUFFERPOOL or CREATE BUFFERPOOL statements that indicated the value -1 as the size. Use the SIZE parameter for both statements to indicate an explicit value or use the AUTOMATIC value to enable self tuning of the buffer pool.</td>
</tr>
<tr>
<td>softmax</td>
<td>Recovery range and soft checkpoint interval</td>
<td>This parameter determines the frequency of soft checkpoints and the recovery range, which help out in the crash recovery process. Use the page_age_trgt_mcr and page_age_trgt_gcr database configuration parameters, instead of the softmax parameter.</td>
</tr>
</tbody>
</table>

The following database configuration parameters are discontinued:

Table 16. Discontinued database configuration parameters

<table>
<thead>
<tr>
<th>Parameter name</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>auto_stats_prof</td>
<td>This configuration parameter is discontinued because automatic statistics profiling is discontinued. For more information, see “Automatic statistics profiling is discontinued” on page 66.</td>
</tr>
<tr>
<td>auto_prof_upd</td>
<td>This configuration parameter is discontinued because automatic statistics profiling is discontinued. For more information, see “Automatic statistics profiling is discontinued” on page 66.</td>
</tr>
</tbody>
</table>

Resolution

Remove the use of database configuration parameters that are deprecated because the functionality associated with the configuration parameter is obsolete or has been replaced by new functionality. Also, remove the use of discontinued database configuration parameters as they do not have the intended effect.

If a replacement database configuration parameter is provided, set it to maintain the intended database behavior.
Chapter 20. Summary of deprecated and discontinued DB2 functionality in Version 10.5 and earlier releases

Due to changes in related functionality, the introduction of new functionality, or the removal of support, some DB2 for Linux, UNIX and Windows functionality that was available in earlier releases has been either deprecated or discontinued.

Review this summary to understand the overall impact of these changes on your environment.

The functionality is grouped by the release in which the deprecation started. The information provided is cumulative: to get the complete list of deprecated functionality for a particular release, also review the information provided for the earlier releases:

- “Functionality deprecated in Version 9.5 or earlier releases” on page 70
- “Functionality deprecated in Version 9.7” on page 76
- “Functionality deprecated in Version 10.1” on page 83
- “Functionality deprecated in Version 10.5” on page 87

Note:
1. Pointers to supplemental information are provided if available.
2. Information about deprecated functionality for add-on features such as Spatial Extender is not included.
3. Information about deprecated registry variables related to functionality not described in other tables is listed separately.

To view the most up-to-date lists of discontinued functionality by DB2 database product release, use the following information:

Table 17. Discontinued functionality by DB2 database product release

<table>
<thead>
<tr>
<th>Release</th>
<th>Links to additional information</th>
</tr>
</thead>
</table>
• See “Some registry and environment variables are discontinued” at http://publib.boulder.ibm.com/infocenter/db2luw/v10r1/topic/com.ibm.db2.luw.wn.doc/doc/i0052379.html |
• See “Some registry and environment variables are discontinued” at http://publib.boulder.ibm.com/infocenter/db2luw/v10r5/topic/com.ibm.db2.luw.wn.doc/doc/i0052379.html |
### Functionality deprecated in Version 9.5 or earlier releases

The following table shows the functionality that is deprecated in Version 9.5 and might be discontinued in Version 10.1 or later releases. The Version 9.5 functionality that was discontinued in Version 9.7 is not shown because it is not present in databases for Version 9.7 or later releases.

**Table 18. Functionality deprecated in Version 9.5 or earlier releases that is discontinued in Version 10.1 or later releases**

<table>
<thead>
<tr>
<th>Functionality</th>
<th>Discontinued in release</th>
<th>Links to additional information</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADD PARTITIONING KEY and DROP PARTITIONING KEY clauses of the ALTER TABLE statement</td>
<td>To be determined</td>
<td>See “ADD PARTITIONING KEY clause of the ALTER TABLE statement is deprecated” at <a href="http://publib.boulder.ibm.com/infocenter/db2luw/v9/topic/com.ibm.db2.udb.rn.doc/doc/c0023217.htm">http://publib.boulder.ibm.com/infocenter/db2luw/v9/topic/com.ibm.db2.udb.rn.doc/doc/c0023217.htm</a> and “DROP PARTITIONING KEY clause of the ALTER TABLE statement is deprecated” at <a href="http://publib.boulder.ibm.com/infocenter/db2luw/v9/topic/com.ibm.db2.udb.rn.doc/doc/c0023216.htm">http://publib.boulder.ibm.com/infocenter/db2luw/v9/topic/com.ibm.db2.udb.rn.doc/doc/c0023216.htm</a></td>
</tr>
<tr>
<td>COLNAMES column in SYSCAT.INDEXES</td>
<td>To be determined</td>
<td>See “COLNAMES column in SYSCAT.INDEXES is deprecated” at <a href="http://publib.boulder.ibm.com/infocenter/db2luw/v9/topic/com.ibm.db2.udb.rn.doc/doc/c0023225.htm">http://publib.boulder.ibm.com/infocenter/db2luw/v9/topic/com.ibm.db2.udb.rn.doc/doc/c0023225.htm</a></td>
</tr>
<tr>
<td>Default function entry points support in external routine libraries</td>
<td>To be determined</td>
<td>See “External routines now require an explicit entry point specification” at <a href="http://publib.boulder.ibm.com/infocenter/db2luw/v9/topic/com.ibm.db2.udb.rn.doc/doc/c0023021.htm">http://publib.boulder.ibm.com/infocenter/db2luw/v9/topic/com.ibm.db2.udb.rn.doc/doc/c0023021.htm</a></td>
</tr>
<tr>
<td>iCheckPending parameter</td>
<td>To be determined</td>
<td>See “Check pending table state is replaced and iCheckPending parameter is deprecated” at <a href="http://publib.boulder.ibm.com/infocenter/db2luw/v9/topic/com.ibm.db2.udb.rn.doc/doc/c0024079.htm">http://publib.boulder.ibm.com/infocenter/db2luw/v9/topic/com.ibm.db2.udb.rn.doc/doc/c0024079.htm</a></td>
</tr>
<tr>
<td>IMPORT command options CREATE and REPLACE_CREATE</td>
<td>To be determined</td>
<td>See “IMPORT command options CREATE and REPLACE_CREATE are deprecated” at <a href="http://publib.boulder.ibm.com/infocenter/db2luw/v9r5/topic/com.ibm.db2.luw.wn.doc/doc/i0052280.html">http://publib.boulder.ibm.com/infocenter/db2luw/v9r5/topic/com.ibm.db2.luw.wn.doc/doc/i0052280.html</a></td>
</tr>
<tr>
<td>logretain and userexit configuration parameter</td>
<td>Version 10.1</td>
<td>See “Some configuration parameters have been deprecated and discontinued” at <a href="http://publib.boulder.ibm.com/infocenter/db2luw/v10r1/topic/com.ibm.db2.luw.wn.doc/doc/i0058741.html">http://publib.boulder.ibm.com/infocenter/db2luw/v10r1/topic/com.ibm.db2.luw.wn.doc/doc/i0058741.html</a></td>
</tr>
</tbody>
</table>
Table 18. Functionality deprecated in Version 9.5 or earlier releases that is discontinued in Version 10.1 or later releases (continued)

<table>
<thead>
<tr>
<th>Functionality</th>
<th>Discontinued in release</th>
<th>Links to additional information</th>
</tr>
</thead>
<tbody>
<tr>
<td>the <strong>-file</strong> option of the <strong>db2flsn</strong> command</td>
<td>To be determined</td>
<td>See “Log control file SQLOGCTL.LFH has been renamed and copied” at <a href="http://publib.boulder.ibm.com/infocenter/db2luw/v9r5/topic/com.ibm.db2.luw.wn.doc/doc/i0051995.html">http://publib.boulder.ibm.com/infocenter/db2luw/v9r5/topic/com.ibm.db2.luw.wn.doc/doc/i0051995.html</a></td>
</tr>
<tr>
<td>LONG VARCHAR and LONG VARGRAPHIC data types</td>
<td>To be determined</td>
<td>See “FP1: LONG VARCHAR and LONG VARGRAPHIC data types have been deprecated” at <a href="http://publib.boulder.ibm.com/infocenter/db2luw/v9/topic/com.ibm.db2.udb.rn.doc/doc/c0024980.htm">http://publib.boulder.ibm.com/infocenter/db2luw/v9/topic/com.ibm.db2.udb.rn.doc/doc/c0024980.htm</a></td>
</tr>
<tr>
<td>Network Information Services (NIS and NIS+) support and related registry variable (Linux and UNIX operating systems)</td>
<td>To be determined</td>
<td>See “Network Information Services (NIS and NIS+) support is deprecated (Linux and UNIX)” at <a href="http://publib.boulder.ibm.com/infocenter/db2luw/v9/topic/com.ibm.db2.udb.rn.doc/doc/c0024980.htm">http://publib.boulder.ibm.com/infocenter/db2luw/v9/topic/com.ibm.db2.udb.rn.doc/doc/c0024980.htm</a></td>
</tr>
<tr>
<td>agentpri configuration parameter</td>
<td>To be determined</td>
<td>See “Some database manager configuration parameters have changed” at <a href="http://publib.boulder.ibm.com/infocenter/db2luw/v9r5/topic/com.ibm.db2.luw.wn.doc/doc/i0052553.html">http://publib.boulder.ibm.com/infocenter/db2luw/v9r5/topic/com.ibm.db2.luw.wn.doc/doc/i0052553.html</a></td>
</tr>
<tr>
<td><strong>app_ctl_heap_sz</strong>, <strong>appgroup_mem_sz</strong>, and <strong>groupheap_ratio</strong> configuration parameters</td>
<td>To be determined</td>
<td>See “Some database configuration parameters have changed” at <a href="http://publib.boulder.ibm.com/infocenter/db2luw/v9r5/topic/com.ibm.db2.luw.wn.doc/doc/i0052508.html">http://publib.boulder.ibm.com/infocenter/db2luw/v9r5/topic/com.ibm.db2.luw.wn.doc/doc/i0052508.html</a></td>
</tr>
<tr>
<td><strong>maxagents</strong> and <strong>maxcagents</strong> configuration parameters</td>
<td>To be determined</td>
<td>See “Some database manager configuration parameters have changed” at <a href="http://publib.boulder.ibm.com/infocenter/db2luw/v9r5/topic/com.ibm.db2.luw.wn.doc/doc/i0052553.html">http://publib.boulder.ibm.com/infocenter/db2luw/v9r5/topic/com.ibm.db2.luw.wn.doc/doc/i0052553.html</a></td>
</tr>
</tbody>
</table>
Table 18. Functionality deprecated in Version 9.5 or earlier releases that is discontinued in Version 10.1 or later releases (continued)

<table>
<thead>
<tr>
<th>Functionality</th>
<th>Discontinued in release</th>
<th>Links to additional information</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>numsegs</code> database configuration parameter</td>
<td>To be determined</td>
<td>See “Some database configuration parameters have changed” at <a href="http://publib.boulder.ibm.com/infocenter/db2luw/v9r5/topic/com.ibm.db2.luw.wn.doc/doc/i0052508.html">http://publib.boulder.ibm.com/infocenter/db2luw/v9r5/topic/com.ibm.db2.luw.wn.doc/doc/i0052508.html</a></td>
</tr>
<tr>
<td><code>query_heap_sz</code> database manager configuration parameter</td>
<td>To be determined</td>
<td>See “Some database manager configuration parameters have changed” at <a href="http://publib.boulder.ibm.com/infocenter/db2luw/v9r5/topic/com.ibm.db2.luw.wn.doc/doc/i0052553.html">http://publib.boulder.ibm.com/infocenter/db2luw/v9r5/topic/com.ibm.db2.luw.wn.doc/doc/i0052553.html</a></td>
</tr>
<tr>
<td>Static data stream snapshot output</td>
<td>To be determined</td>
<td>See “Static data stream snapshot output is deprecated” at <a href="http://publib.boulder.ibm.com/infocenter/db2luw/v9r5/topic/com.ibm.db2.luw.wn.doc/doc/i0052585.html">http://publib.boulder.ibm.com/infocenter/db2luw/v9r5/topic/com.ibm.db2.luw.wn.doc/doc/i0052585.html</a></td>
</tr>
<tr>
<td><code>SNAP_GET_DB_V91</code>, <code>SNAP_GET_DB_V95</code>, and <code>SNAP_GET_DYN_SQL_V91</code> table functions</td>
<td>Version 10.1</td>
<td>See “Some version-suffixed SQL administrative routines have been discontinued” at <a href="http://publib.boulder.ibm.com/infocenter/db2luw/v10r1/topic/com.ibm.db2.luw.wn.doc/doc/i0058675.html">http://publib.boulder.ibm.com/infocenter/db2luw/v10r1/topic/com.ibm.db2.luw.wn.doc/doc/i0058675.html</a></td>
</tr>
<tr>
<td>IBM DB2 Geodetic Data Management Feature</td>
<td>Version 10.1</td>
<td>See “IBM DB2 Geodetic Data Management Feature has been discontinued” at <a href="http://publib.boulder.ibm.com/infocenter/db2luw/v10r1/topic/com.ibm.db2.luw.wn.doc/doc/i0059833.html">http://publib.boulder.ibm.com/infocenter/db2luw/v10r1/topic/com.ibm.db2.luw.wn.doc/doc/i0059833.html</a></td>
</tr>
<tr>
<td>HP-UX 32-bit client support</td>
<td>To be determined</td>
<td>See “FP7: HP-UX 32-bit client support has been deprecated” at <a href="http://publib.boulder.ibm.com/infocenter/db2luw/v9r5/topic/com.ibm.db2.luw.wn.doc/doc/i0058505.html">http://publib.boulder.ibm.com/infocenter/db2luw/v9r5/topic/com.ibm.db2.luw.wn.doc/doc/i0058505.html</a></td>
</tr>
<tr>
<td>DB2 Health Advisor</td>
<td>To be determined</td>
<td>See “FP8: DB2 Health Advisor has been deprecated” at <a href="http://publib.boulder.ibm.com/infocenter/db2luw/v9r5/topic/com.ibm.db2.luw.wn.doc/doc/i0059075.html">http://publib.boulder.ibm.com/infocenter/db2luw/v9r5/topic/com.ibm.db2.luw.wn.doc/doc/i0059075.html</a></td>
</tr>
</tbody>
</table>
The following table shows the registry variables that are deprecated in Version 9.5 and might be discontinued in Version 10.1 or later releases. The Version 9.5 registry variables that were discontinued in Version 9.7 is not shown because it is not present in databases for Version 9.7 or later releases.

**Table 19. Registry variables deprecated in Version 9.5 and possibly discontinued in or a later release**

<table>
<thead>
<tr>
<th>Registry variable</th>
<th>Discontinued in release</th>
<th>Links to additional information</th>
</tr>
</thead>
<tbody>
<tr>
<td>DB2_ALLOCATION_SIZE</td>
<td>To be determined</td>
<td><a href="http://publib.boulder.ibm.com/infocenter/db2luw/v9r5/topic/com.ibm.db2.luw.wn.doc/doc/i0052033.html">See “Some registry and environment variables are deprecated” at</a></td>
</tr>
<tr>
<td>DB2ATLD_PORTS</td>
<td>To be determined</td>
<td><a href="http://publib.boulder.ibm.com/infocenter/db2luw/v9r5/topic/com.ibm.db2.luw.wn.doc/doc/i0052033.html">See “Some registry and environment variables are deprecated” at</a></td>
</tr>
<tr>
<td>DB2_ASYNC_IO_MAXFILOP</td>
<td>Version 10.1</td>
<td><a href="http://publib.boulder.ibm.com/infocenter/db2luw/v10r1/topic/com.ibm.db2.luw.wn.doc/doc/i0052379.html">See “Some registry and environment variables are discontinued” at</a></td>
</tr>
<tr>
<td>DB2_BAR_AUTONOMIC_DISABLE</td>
<td>Version 10.1</td>
<td><a href="http://publib.boulder.ibm.com/infocenter/db2luw/v10r1/topic/com.ibm.db2.luw.wn.doc/doc/i0052379.html">See “Some registry and environment variables are discontinued” at</a></td>
</tr>
<tr>
<td>DB2BPVARS</td>
<td>To be determined</td>
<td><a href="http://publib.boulder.ibm.com/infocenter/db2luw/v9r5/topic/com.ibm.db2.luw.wn.doc/doc/i0052033.html">See “Some registry and environment variables are deprecated” at</a></td>
</tr>
<tr>
<td>DB2_COMMIT_ON_EXIT</td>
<td>To be determined</td>
<td><a href="http://publib.boulder.ibm.com/infocenter/db2luw/v9/index.jsp?topic=/com.ibm.db2.udb.admin.doc/doc/r0004670.htm%23r0004670__depr-rv">See the “Deprecated registry variables in Version 9.1 table” at</a></td>
</tr>
<tr>
<td>DB2_COUNTRY</td>
<td>Version 10.1</td>
<td><a href="http://publib.boulder.ibm.com/infocenter/db2luw/v10r1/topic/com.ibm.db2.luw.wn.doc/doc/i0052379.html">See “Some registry and environment variables are discontinued” at</a></td>
</tr>
</tbody>
</table>
Table 19. Registry variables deprecated in Version 9.5 and possibly discontinued in or a later release (continued)

<table>
<thead>
<tr>
<th>Registry variable</th>
<th>Discontinued in release</th>
<th>Links to additional information</th>
</tr>
</thead>
</table>
Table 19. Registry variables deprecated in Version 9.5 and possibly discontinued in or a later release (continued)

<table>
<thead>
<tr>
<th>Registry variable</th>
<th>Discontinued in release</th>
<th>Links to additional information</th>
</tr>
</thead>
<tbody>
<tr>
<td>DB2_PARTITIONEDLOAD_DEFAULT</td>
<td>To be determined</td>
<td>See “Some registry and environment variables are deprecated” at <a href="http://publib.boulder.ibm.com/infocenter/db2luw/v9r5/topic/com.ibm.db2.luw.wn.doc/doc/i0052033.html">http://publib.boulder.ibm.com/infocenter/db2luw/v9r5/topic/com.ibm.db2.luw.wn.doc/doc/i0052033.html</a></td>
</tr>
<tr>
<td>DB2_PRIORITIES and DB2NTPRICLASS</td>
<td>To be determined</td>
<td>See “Some registry and environment variables are deprecated” at <a href="http://publib.boulder.ibm.com/infocenter/db2luw/v9r5/topic/com.ibm.db2.luw.wn.doc/doc/i0052033.html">http://publib.boulder.ibm.com/infocenter/db2luw/v9r5/topic/com.ibm.db2.luw.wn.doc/doc/i0052033.html</a></td>
</tr>
<tr>
<td>Registry variable</td>
<td>Discontinued in release</td>
<td>Links to additional information</td>
</tr>
<tr>
<td>------------------------</td>
<td>-------------------------</td>
<td>--------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>DB2_VENDOR_INI</td>
<td>To be determined</td>
<td>See “Some registry and environment variables are discontinued” at <a href="http://publib.boulder.ibm.com/infocenter/db2luw/v10r1/topic/com.ibm.db2.luw.wn.doc/doc/i0052379.html">http://publib.boulder.ibm.com/infocenter/db2luw/v10r1/topic/com.ibm.db2.luw.wn.doc/doc/i0052379.html</a></td>
</tr>
</tbody>
</table>

**Functionality deprecated in Version 9.7**

The following table shows the functionality that is deprecated in Version 9.7. If the functionality is discontinued, the table also shows the release where the functionality was discontinued.
<table>
<thead>
<tr>
<th>Functionality</th>
<th>Discontinued in release</th>
<th>Links to additional information</th>
</tr>
</thead>
<tbody>
<tr>
<td>CREATE EVENT MONITOR FOR DEADLOCKS statement and DB2DETAILDEADLOCK event</td>
<td>To be determined</td>
<td>See “CREATE EVENT MONITOR FOR DEADLOCKS statement and DB2DETAILDEADLOCK event monitor have been deprecated” at <a href="http://publib.boulder.ibm.com/infocenter/db2luw/v9r7/topic/com.ibm.db2.luw.wn.doc/doc/i0054715.html">http://publib.boulder.ibm.com/infocenter/db2luw/v9r7/topic/com.ibm.db2.luw.wn.doc/doc/i0054715.html</a></td>
</tr>
<tr>
<td>monitor</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CREATE EVENT MONITOR FOR TRANSACTIONS statement</td>
<td>To be determined</td>
<td>See “CREATE EVENT MONITOR FOR TRANSACTIONS statement has been deprecated” at <a href="http://publib.boulder.ibm.com/infocenter/db2luw/v9r7/topic/com.ibm.db2.luw.wn.doc/doc/i0054716.html">http://publib.boulder.ibm.com/infocenter/db2luw/v9r7/topic/com.ibm.db2.luw.wn.doc/doc/i0054716.html</a></td>
</tr>
<tr>
<td>DB2 Governor</td>
<td>To be determined</td>
<td>See “DB2 Governor and Query Patroller have been deprecated” at <a href="http://publib.boulder.ibm.com/infocenter/db2luw/v9r7/topic/com.ibm.db2.luw.wn.doc/doc/i0054901.html">http://publib.boulder.ibm.com/infocenter/db2luw/v9r7/topic/com.ibm.db2.luw.wn.doc/doc/i0054901.html</a></td>
</tr>
<tr>
<td>Query Patroller</td>
<td>Version 10.1</td>
<td>See “Query Patroller has been discontinued” at <a href="http://publib.boulder.ibm.com/infocenter/db2luw/v10r1/topic/com.ibm.db2.luw.wn.doc/doc/i0058730.html">http://publib.boulder.ibm.com/infocenter/db2luw/v10r1/topic/com.ibm.db2.luw.wn.doc/doc/i0058730.html</a></td>
</tr>
<tr>
<td>IBM DB2 Geodetic Data Management Feature</td>
<td>Version 10.1</td>
<td>See “IBM DB2 Geodetic Data Management Feature has been discontinued” at <a href="http://publib.boulder.ibm.com/infocenter/db2luw/v10r1/topic/com.ibm.db2.luw.wn.doc/doc/i0059833.html">http://publib.boulder.ibm.com/infocenter/db2luw/v10r1/topic/com.ibm.db2.luw.wn.doc/doc/i0059833.html</a></td>
</tr>
<tr>
<td>db2imigr and db2ckmig commands</td>
<td>Version 10.1</td>
<td>See “db2imigr and db2ckmig commands have been discontinued” at <a href="http://publib.boulder.ibm.com/infocenter/db2luw/v10r1/topic/com.ibm.db2.luw.wn.doc/doc/i0058593.html">http://publib.boulder.ibm.com/infocenter/db2luw/v10r1/topic/com.ibm.db2.luw.wn.doc/doc/i0058593.html</a></td>
</tr>
<tr>
<td>MIGRATE DATABASE commands; sqlemgdb and sqlgmgdb APIs</td>
<td>To be determined</td>
<td>See “Instance and database migration commands and APIs have been deprecated” at <a href="http://publib.boulder.ibm.com/infocenter/db2luw/v9r7/topic/com.ibm.db2.luw.wn.doc/doc/i0053793.html">http://publib.boulder.ibm.com/infocenter/db2luw/v9r7/topic/com.ibm.db2.luw.wn.doc/doc/i0053793.html</a></td>
</tr>
<tr>
<td>-s parameter of the db2iupdt command</td>
<td>Version 10.1</td>
<td>See “-s parameter of the db2iupdt command has been discontinued” at <a href="http://publib.boulder.ibm.com/infocenter/db2luw/v10r1/topic/com.ibm.db2.luw.wn.doc/doc/i0058592.html">http://publib.boulder.ibm.com/infocenter/db2luw/v10r1/topic/com.ibm.db2.luw.wn.doc/doc/i0058592.html</a></td>
</tr>
<tr>
<td>Functionality</td>
<td>Discontinued in release</td>
<td>Links to additional information</td>
</tr>
<tr>
<td>---------------</td>
<td>------------------------</td>
<td>---------------------------------</td>
</tr>
<tr>
<td><code>-file</code> parameter of the <code>db2rfpen</code> command</td>
<td>Version 10.1</td>
<td>See “ <code>-file</code> parameter of the db2flsn and db2rfpen commands has been discontinued” at <a href="http://publib.boulder.ibm.com/infocenter/db2luw/v10r1/topic/com.ibm.db2.luw.wn.doc/doc/i0058592.html">http://publib.boulder.ibm.com/infocenter/db2luw/v10r1/topic/com.ibm.db2.luw.wn.doc/doc/i0058592.html</a></td>
</tr>
<tr>
<td><code>-global</code> parameter of the <code>db2trc</code>, <code>db2pd</code>, <code>db2fodc</code>, <code>db2pdcfg</code>, and <code>db2support</code> command</td>
<td>To be determined</td>
<td>See “FP4: The -global parameter for troubleshooting tools has been deprecated” at <a href="http://publib.boulder.ibm.com/infocenter/db2luw/v9r7/topic/com.ibm.db2.luw.wn.doc/doc/i0058858.html">http://publib.boulder.ibm.com/infocenter/db2luw/v9r7/topic/com.ibm.db2.luw.wn.doc/doc/i0058858.html</a></td>
</tr>
<tr>
<td><code>CONVERT</code> parameter of the <code>REORG INDEXES</code> command</td>
<td>Version 9.7</td>
<td>See “Type-1 indexes have been discontinued” at <a href="http://publib.boulder.ibm.com/infocenter/db2luw/v9r7/topic/com.ibm.db2.luw.wn.doc/doc/i0054145.html">http://publib.boulder.ibm.com/infocenter/db2luw/v9r7/topic/com.ibm.db2.luw.wn.doc/doc/i0054145.html</a></td>
</tr>
<tr>
<td>Worksheet Format (WSF) for Import and Export utilities</td>
<td>Version 10.1</td>
<td>See “Worksheet Format (WSF) for Import and Export utilities have been discontinued” at <a href="http://publib.boulder.ibm.com/infocenter/db2luw/v10r1/topic/com.ibm.db2.luw.wn.doc/doc/i0057410.html">http://publib.boulder.ibm.com/infocenter/db2luw/v10r1/topic/com.ibm.db2.luw.wn.doc/doc/i0057410.html</a></td>
</tr>
</tbody>
</table>
| `LIST TABLESPACES` and `LIST TABLESPACE CONTAINERS` commands and related APIs:  
  - `sqlbctsq`  
  - `sqlbfsts`  
  - `sqlbftpq`  
  - `sqlbgtss`  
  - `sqlbmotss`  
  - `sqlbotsq`  
  - `sqlbftpq`  
  - `sqlbstsqs`  
  - `sqlbrcq` | To be determined | See “ `LIST TABLESPACES` and `LIST TABLESPACE CONTAINERS` commands have been deprecated” at http://publib.boulder.ibm.com/infocenter/db2luw/v9r7/topic/com.ibm.db2.luw.wn.doc/doc/i0055001.html |
| `MIGRATE_PRIOR_VERSIONS` and the `CONFIG_ONLY` response file keywords | To be determined | See “Some response file keywords have been deprecated” at http://publib.boulder.ibm.com/infocenter/db2luw/v9r7/topic/com.ibm.db2.luw.wn.doc/doc/i0054093.html |
| `DB2LOADQUERY_TYPE1_INDEXES` and the `DB2REORG_CONVERT` values in certain DB2 API data structures | Version 9.7 | See “Type-1 indexes have been discontinued” at http://publib.boulder.ibm.com/infocenter/db2luw/v9r7/topic/com.ibm.db2.luw.wn.doc/doc/i0054145.html |
### Table 20. Functionality deprecated in Version 9.7 (continued)

<table>
<thead>
<tr>
<th>Functionality</th>
<th>Discontinued in release</th>
<th>Links to additional information</th>
</tr>
</thead>
<tbody>
<tr>
<td>sqlugrpn API</td>
<td>To be determined</td>
<td>See “sqlugrpn API has been deprecated” at <a href="http://publib.boulder.ibm.com/infocenter/db2luw/v9r7/topic/com.ibm.db2.luw">http://publib.boulder.ibm.com/infocenter/db2luw/v9r7/topic/com.ibm.db2.luw</a> wn.doc/doc/i0054733.html</td>
</tr>
<tr>
<td>sqlugtpi API</td>
<td>To be determined</td>
<td>See “sqlugtpi API has been deprecated” at <a href="http://publib.boulder.ibm.com/infocenter/db2luw/v9r7/topic/com.ibm.db2.luw">http://publib.boulder.ibm.com/infocenter/db2luw/v9r7/topic/com.ibm.db2.luw</a> wn.doc/doc/i0053643.html</td>
</tr>
<tr>
<td><code>db2HistoryCloseScan</code>, <code>db2HistoryGetEntry</code>, <code>db2HistoryOpenScan</code>, and <code>db2HistoryUpdate</code> APIs</td>
<td>Version 10.1</td>
<td>See “Support in COBOL, FORTRAN, and REXX for DB2 APIs that manage database history records has been discontinued” at <a href="http://publib.boulder.ibm.com/infocenter/db2luw/v10r1/topic/com.ibm.db2.luw">http://publib.boulder.ibm.com/infocenter/db2luw/v10r1/topic/com.ibm.db2.luw</a> wn.doc/doc/i0059298.html</td>
</tr>
<tr>
<td><code>details_xml</code> reported in logical data groups</td>
<td>To be determined</td>
<td>See “FP6: Reporting of metrics in details_xml by the statistics event monitor has been deprecated” at <a href="http://publib.boulder.ibm.com/infocenter/db2luw/v9r7/topic/com.ibm.db2.luw">http://publib.boulder.ibm.com/infocenter/db2luw/v9r7/topic/com.ibm.db2.luw</a> wn.doc/doc/i0060390.html</td>
</tr>
<tr>
<td><code>dyn_query_mgm</code> database configuration parameter</td>
<td>Version 10.1</td>
<td>See “Some configuration parameters have been deprecated and discontinued” at <a href="http://publib.boulder.ibm.com/infocenter/db2luw/v10r1/topic/com.ibm.db2.luw">http://publib.boulder.ibm.com/infocenter/db2luw/v10r1/topic/com.ibm.db2.luw</a> wn.doc/doc/i0058741.html</td>
</tr>
<tr>
<td><code>DB2SE_USA_GEOCODER</code></td>
<td>Version 10.1</td>
<td>See “DB2SE_USA_GEOCODER has been discontinued” at <a href="http://publib.boulder.ibm.com/infocenter/db2luw/v10r1/topic/com.ibm.db2.luw">http://publib.boulder.ibm.com/infocenter/db2luw/v10r1/topic/com.ibm.db2.luw</a> wn.doc/doc/i0059643.html</td>
</tr>
<tr>
<td>Subset of Net Search Extender features and commands</td>
<td>To be determined</td>
<td>See “Subset of Net Search Extender features and commands have been deprecated” at <a href="http://publib.boulder.ibm.com/infocenter/db2luw/v9r7/topic/com.ibm.db2.luw">http://publib.boulder.ibm.com/infocenter/db2luw/v9r7/topic/com.ibm.db2.luw</a> wn.doc/doc/i0054683.html</td>
</tr>
</tbody>
</table>
Table 20. Functionality deprecated in Version 9.7 (continued)

<table>
<thead>
<tr>
<th>Functionality</th>
<th>Discontinued in release</th>
<th>Links to additional information</th>
</tr>
</thead>
<tbody>
<tr>
<td>SNAP_GET_TBSP_PART_V91 table function</td>
<td>Version 10.1</td>
<td>See “Some version-suffixed SQL administrative routines have been discontinued” at <a href="http://publib.boulder.ibm.com/infocenter/db2luw/v10r1/topic/com.ibm.db2.luw.wn.doc/doc/i0058675.html">http://publib.boulder.ibm.com/infocenter/db2luw/v10r1/topic/com.ibm.db2.luw.wn.doc/doc/i0058675.html</a></td>
</tr>
<tr>
<td>SNAP_GET_DBM_MEMORY_POOL table function and SNAPDBM_MEMORY_POOL administrative view</td>
<td>To be determined</td>
<td>See “FP5: Some monitoring routines and views are deprecated” at <a href="http://publib.boulder.ibm.com/infocenter/db2luw/v9r7/topic/com.ibm.db2.luw.wn.doc/doc/i0059455.html">http://publib.boulder.ibm.com/infocenter/db2luw/v9r7/topic/com.ibm.db2.luw.wn.doc/doc/i0059455.html</a></td>
</tr>
<tr>
<td>SNAP_GET_DB_MEMORY_POOL table function and SNAPDB_MEMORY_POOL administrative view</td>
<td>To be determined</td>
<td>See “FP5: Some monitoring routines and views are deprecated” at <a href="http://publib.boulder.ibm.com/infocenter/db2luw/v9r7/topic/com.ibm.db2.luw.wn.doc/doc/i0059455.html">http://publib.boulder.ibm.com/infocenter/db2luw/v9r7/topic/com.ibm.db2.luw.wn.doc/doc/i0059455.html</a></td>
</tr>
<tr>
<td>SNAP_GET_AGENT_MEMORY_POOL table function and SNAPAGENT_MEMORY_POOL administrative view</td>
<td>To be determined</td>
<td>See “FP5: Some monitoring routines and views are deprecated” at <a href="http://publib.boulder.ibm.com/infocenter/db2luw/v9r7/topic/com.ibm.db2.luw.wn.doc/doc/i0059455.html">http://publib.boulder.ibm.com/infocenter/db2luw/v9r7/topic/com.ibm.db2.luw.wn.doc/doc/i0059455.html</a></td>
</tr>
<tr>
<td>The following DB2 administration tools: • Activity Monitor • Command Editor • Configuration Assistant • Control Center and associated wizards and advisors • Control Center plug-in extensions • Event Analyzer • Health Center • Indoubt Transaction Monitor • Journal • License Center • Memory Visualizer • Query Patroller Center • Satellite Administration Center • Task Center</td>
<td>Version 10.1</td>
<td>See “DB2 administration tools have been discontinued” at <a href="http://publib.boulder.ibm.com/infocenter/db2luw/v10r1/topic/com.ibm.db2.luw.wn.doc/doc/i0058731.html">http://publib.boulder.ibm.com/infocenter/db2luw/v10r1/topic/com.ibm.db2.luw.wn.doc/doc/i0058731.html</a></td>
</tr>
</tbody>
</table>
The following table shows the registry variables that are deprecated in Version 9.7. If the registry variables are discontinued, the table also shows the release where the registry variables were discontinued.

### Table 21. Registry variables deprecated in Version 9.7

<table>
<thead>
<tr>
<th>Registry variables</th>
<th>Discontinued in release</th>
<th>Links to additional information</th>
</tr>
</thead>
<tbody>
<tr>
<td>DB2_CAPTURE_LOCKTIMEOUT</td>
<td>To be determined</td>
<td>See “Some registry and environment variables are deprecated” at <a href="http://publib.boulder.ibm.com/infocenter/db2luw/v9r7/topic/com.ibm.db2.luw.wn.doc/doc/i0052033.html">http://publib.boulder.ibm.com/infocenter/db2luw/v9r7/topic/com.ibm.db2.luw.wn.doc/doc/i0052033.html</a></td>
</tr>
<tr>
<td>Registry variables</td>
<td>Discontinued in release</td>
<td>Links to additional information</td>
</tr>
<tr>
<td>----------------------------------------</td>
<td>-------------------------</td>
<td>---------------------------------</td>
</tr>
<tr>
<td>DB2_SERVER_ENCALG</td>
<td>To be determined</td>
<td>See “Some registry and environment variables are deprecated” at <a href="http://publib.boulder.ibm.com/infocenter/db2luw/v9r7/topic/com.ibm.db2.luw.wn.doc/doc/i0052033.html">http://publib.boulder.ibm.com/infocenter/db2luw/v9r7/topic/com.ibm.db2.luw.wn.doc/doc/i0052033.html</a></td>
</tr>
<tr>
<td>DB2_USE_DB23CCT2_JROUTINE</td>
<td>Version 10.1</td>
<td>See “Some registry and environment variables are deprecated” at <a href="http://publib.boulder.ibm.com/infocenter/db2luw/v9r7/topic/com.ibm.db2.luw.wn.doc/doc/i0052033.html">http://publib.boulder.ibm.com/infocenter/db2luw/v9r7/topic/com.ibm.db2.luw.wn.doc/doc/i0052033.html</a></td>
</tr>
</tbody>
</table>
Table 21. Registry variables deprecated in Version 9.7 (continued)

<table>
<thead>
<tr>
<th>Registry variables</th>
<th>Discontinued in release</th>
<th>Links to additional information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Query Patroller registry variables:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• DQP_ABORTRESULT</td>
<td></td>
<td>See “Query Patroller has been discontinued” at <a href="http://publib.boulder.ibm.com/infocenter/db2luw/v10r1/topic/com.ibm.db2.luw.wn.doc/doc/i0058730.html">http://publib.boulder.ibm.com/infocenter/db2luw/v10r1/topic/com.ibm.db2.luw.wn.doc/doc/i0058730.html</a></td>
</tr>
<tr>
<td>• DQP_CHILD_WAIT</td>
<td></td>
<td></td>
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<tr>
<td>• DQP_DISKMON</td>
<td></td>
<td></td>
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<tr>
<td>• DQP_EXIT_AN</td>
<td></td>
<td></td>
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<tr>
<td>• DQP_INTERVAL</td>
<td></td>
<td></td>
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<tr>
<td>• DQP_LAST_RESULT_DEST</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• DQP_LOCAL_SERVANTS</td>
<td></td>
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<tr>
<td>• DQP_LOG</td>
<td>Version 10.1</td>
<td></td>
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<tr>
<td>• DQP_LOGMON</td>
<td></td>
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<tr>
<td>• DQP_MAIL</td>
<td></td>
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<tr>
<td>• DQP_MAIL_ACCOUNT</td>
<td></td>
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<tr>
<td>• DQP_MAPI_PASSWORD</td>
<td></td>
<td></td>
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<tr>
<td>• DQP_MAPI_PROFILE</td>
<td></td>
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<tr>
<td>• DQP_NET</td>
<td></td>
<td></td>
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<tr>
<td>• DQP_NOCPU</td>
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<tr>
<td>• DQP_NOEXPLAIN</td>
<td></td>
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<tr>
<td>• DQP_NTIER</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• DQP_PURGEHOURS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• DQP_RECOVERY_INTERVAL</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• DQP_RES_TBLSPC</td>
<td></td>
<td></td>
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<tr>
<td>• DQP_RUNTIME</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• DQP_SERVER</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• DQP_SHARE</td>
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</tr>
<tr>
<td>• DQP_SIBLING_WAIT</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• DQP_STARTUP</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• DQP_TRACEFILE</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Functionality deprecated in Version 10.1

The following table shows the functionality that is deprecated in V10.1. If the functionality is discontinued, the table also shows the release where the functionality was discontinued.

Table 22. Functionality deprecated in V10.1

<table>
<thead>
<tr>
<th>Functionality</th>
<th>Discontinued in release</th>
<th>Links to additional information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Activity monitor routines</td>
<td>To be determined</td>
<td>See “Activity monitor routines have been deprecated” at <a href="http://publib.boulder.ibm.com/infocenter/db2luw/v10r1/topic/com.ibm.db2.luw.wn.doc/doc/i0059660.html">http://publib.boulder.ibm.com/infocenter/db2luw/v10r1/topic/com.ibm.db2.luw.wn.doc/doc/i0059660.html</a></td>
</tr>
</tbody>
</table>
Table 22. Functionality deprecated in V10.1 (continued)

<table>
<thead>
<tr>
<th>Functionality</th>
<th>Discontinued in release</th>
<th>Links to additional information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agent priority of service classes</td>
<td>Version 10.5</td>
<td>See “Agent priority of service classes has been deprecated” at <a href="http://publib.boulder.ibm.com/infocenter/db2luw/v10r1/topic/com.ibm.db2.luw.wn.doc/doc/i0059645.html">http://publib.boulder.ibm.com/infocenter/db2luw/v10r1/topic/com.ibm.db2.luw.wn.doc/doc/i0059645.html</a></td>
</tr>
<tr>
<td>Collations based on the Unicode Standard version 4.0.0</td>
<td>To be determined</td>
<td>See “Collations based on the Unicode Standard version 4.0.0 have been deprecated” at <a href="http://publib.boulder.ibm.com/infocenter/db2luw/v10r1/topic/com.ibm.db2.luw.wn.doc/doc/i0058749.html">http://publib.boulder.ibm.com/infocenter/db2luw/v10r1/topic/com.ibm.db2.luw.wn.doc/doc/i0058749.html</a></td>
</tr>
<tr>
<td>INSTALL_TSAMP response file keyword</td>
<td>To be determined</td>
<td>See “IBM Tivoli System Automation for Multiplatforms (SA MP) is now automatically installed” at <a href="http://publib.boulder.ibm.com/infocenter/db2luw/v10r1/topic/com.ibm.db2.luw.wn.doc/doc/i0059123.html">http://publib.boulder.ibm.com/infocenter/db2luw/v10r1/topic/com.ibm.db2.luw.wn.doc/doc/i0059123.html</a></td>
</tr>
<tr>
<td>Net Search Extender</td>
<td>To be determined</td>
<td>See “Net Search Extender has been deprecated” at <a href="http://publib.boulder.ibm.com/infocenter/db2luw/v10r1/topic/com.ibm.db2.luw.wn.doc/doc/i0058722.html">http://publib.boulder.ibm.com/infocenter/db2luw/v10r1/topic/com.ibm.db2.luw.wn.doc/doc/i0058722.html</a></td>
</tr>
<tr>
<td>DMS permanent table spaces</td>
<td>To be determined</td>
<td>See “FP1: DMS permanent table spaces are deprecated” at <a href="http://publib.boulder.ibm.com/infocenter/db2luw/v10r1/topic/com.ibm.db2.luw.wn.doc/doc/i0060577.html">http://publib.boulder.ibm.com/infocenter/db2luw/v10r1/topic/com.ibm.db2.luw.wn.doc/doc/i0060577.html</a></td>
</tr>
<tr>
<td>SMS permanent table spaces</td>
<td>To be determined</td>
<td>See “SMS permanent table spaces are deprecated” at <a href="http://publib.boulder.ibm.com/infocenter/db2luw/v10r1/topic/com.ibm.db2.luw.wn.doc/doc/i0058748.html">http://publib.boulder.ibm.com/infocenter/db2luw/v10r1/topic/com.ibm.db2.luw.wn.doc/doc/i0058748.html</a></td>
</tr>
<tr>
<td>Subset of version-suffixed SQL administrative routines</td>
<td>To be determined</td>
<td>See “Some version-suffixed SQL administrative routines have been deprecated” at <a href="http://publib.boulder.ibm.com/infocenter/db2luw/v10r1/topic/com.ibm.db2.luw.wn.doc/doc/i0058674.html">http://publib.boulder.ibm.com/infocenter/db2luw/v10r1/topic/com.ibm.db2.luw.wn.doc/doc/i0058674.html</a></td>
</tr>
</tbody>
</table>
### Table 22. Functionality deprecated in V10.1 (continued)

<table>
<thead>
<tr>
<th>Functionality</th>
<th>Discontinued in release</th>
<th>Links to additional information</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>db2IdentifyType1</code> command</td>
<td>Version 10.5</td>
<td>See “<code>db2IdentifyType1</code> command has been deprecated” at <a href="http://publib.boulder.ibm.com/infocenter/db2luw/v10r1/topic/com.ibm.db2.luw.wn.doc/doc/i0059642.html">http://publib.boulder.ibm.com/infocenter/db2luw/v10r1/topic/com.ibm.db2.luw.wn.doc/doc/i0059642.html</a></td>
</tr>
<tr>
<td><code>db2_install</code> command</td>
<td>To be determined</td>
<td>See “<code>db2_install</code> command has been deprecated (Linux and UNIX)” at <a href="http://publib.boulder.ibm.com/infocenter/db2luw/v10r1/topic/com.ibm.db2.luw.wn.doc/doc/i0058736.html">http://publib.boulder.ibm.com/infocenter/db2luw/v10r1/topic/com.ibm.db2.luw.wn.doc/doc/i0058736.html</a></td>
</tr>
<tr>
<td><code>-flushbp</code> parameter of the <code>db2pdcfg</code> command</td>
<td>To be determined</td>
<td>See “<code>-flushbp</code> parameter of the <code>db2pdcfg</code> command has been deprecated” at <a href="http://publib.boulder.ibm.com/infocenter/db2luw/v10r1/topic/com.ibm.db2.luw.wn.doc/doc/i0058772.html">http://publib.boulder.ibm.com/infocenter/db2luw/v10r1/topic/com.ibm.db2.luw.wn.doc/doc/i0058772.html</a></td>
</tr>
<tr>
<td>One column output by the <code>-tcbstat</code> parameter of the <code>db2pd</code> command</td>
<td>To be determined</td>
<td>See “One column output by the <code>-tcbstat</code> parameter of the <code>db2pd</code> command has been deprecated” at <a href="http://publib.boulder.ibm.com/infocenter/db2luw/v10r1/topic/com.ibm.db2.luw.wn.doc/doc/i0058932.html">http://publib.boulder.ibm.com/infocenter/db2luw/v10r1/topic/com.ibm.db2.luw.wn.doc/doc/i0058932.html</a></td>
</tr>
<tr>
<td>Some parameters of the <code>CREATE DATABASE</code> command</td>
<td>To be determined</td>
<td>See “Some parameters of the <code>CREATE DATABASE</code> command have been deprecated” at <a href="http://publib.boulder.ibm.com/infocenter/db2luw/v10r1/topic/com.ibm.db2.luw.wn.doc/doc/i0058750.html">http://publib.boulder.ibm.com/infocenter/db2luw/v10r1/topic/com.ibm.db2.luw.wn.doc/doc/i0058750.html</a></td>
</tr>
<tr>
<td><code>dynexp1n</code> command</td>
<td>Version 10.5</td>
<td>See “<code>dynexp1n</code> command has been deprecated” at <a href="http://publib.boulder.ibm.com/infocenter/db2luw/v10r1/topic/com.ibm.db2.luw.wn.doc/doc/i0058770.html">http://publib.boulder.ibm.com/infocenter/db2luw/v10r1/topic/com.ibm.db2.luw.wn.doc/doc/i0058770.html</a></td>
</tr>
<tr>
<td><code>PRUNE LOGFILE</code> command</td>
<td>To be determined</td>
<td>See “<code>PRUNE LOGFILE</code> command is deprecated” at <a href="http://publib.boulder.ibm.com/infocenter/db2luw/v10r1/topic/com.ibm.db2.luw.wn.doc/doc/i0060625.html">http://publib.boulder.ibm.com/infocenter/db2luw/v10r1/topic/com.ibm.db2.luw.wn.doc/doc/i0060625.html</a></td>
</tr>
<tr>
<td>ALLOW READ ACCESS parameter of the <code>LOAD</code> command</td>
<td>To be determined</td>
<td>See “FP1: ALLOW READ ACCESS parameter of the <code>LOAD</code> command is deprecated” at <a href="http://publib.boulder.ibm.com/infocenter/db2luw/v10r1/topic/com.ibm.db2.luw.wn.doc/doc/i0058771.html">http://publib.boulder.ibm.com/infocenter/db2luw/v10r1/topic/com.ibm.db2.luw.wn.doc/doc/i0058771.html</a></td>
</tr>
<tr>
<td>Functionality</td>
<td>Discontinued in release</td>
<td>Links to additional information</td>
</tr>
<tr>
<td>------------------------------------------------------------------------------</td>
<td>-------------------------</td>
<td>----------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Some options of the REORG INDEXES/TABLE command and parameter values for</td>
<td>To be determined</td>
<td>See “REORG INDEXES/TABLE command parameters and parameter values for related DB2 API data structures have been deprecated or discontinued” at <a href="http://publib.boulder.ibm.com/infocenter/db2luw/v10r1/topic/com.ibm.db2.luw.wn.doc/doc/i0059689.html">http://publib.boulder.ibm.com/infocenter/db2luw/v10r1/topic/com.ibm.db2.luw.wn.doc/doc/i0059689.html</a></td>
</tr>
<tr>
<td>related DB2 API data structures</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Format of the -m and -cf parameters in some commands that manage instances</td>
<td>To be determined</td>
<td>See “Some commands that manage instances have changed” at <a href="http://publib.boulder.ibm.com/infocenter/db2luw/v10r1/topic/com.ibm.db2.luw.wn.doc/doc/i0059122.html">http://publib.boulder.ibm.com/infocenter/db2luw/v10r1/topic/com.ibm.db2.luw.wn.doc/doc/i0059122.html</a></td>
</tr>
<tr>
<td>ALTER DATABASE statement</td>
<td>To be determined</td>
<td>See “ALTER DATABASE statement has been deprecated” at <a href="http://publib.boulder.ibm.com/infocenter/db2luw/v10r1/topic/com.ibm.db2.luw.wn.doc/doc/i0058773.html">http://publib.boulder.ibm.com/infocenter/db2luw/v10r1/topic/com.ibm.db2.luw.wn.doc/doc/i0058773.html</a></td>
</tr>
<tr>
<td>details_xml reported in logical data groups</td>
<td>To be determined</td>
<td>See “FP1: Reporting of metrics in details_xml by the statistics event monitor has been deprecated” at <a href="http://publib.boulder.ibm.com/infocenter/db2luw/v10r1/topic/com.ibm.db2.luw.wn.doc/doc/i0060390.html">http://publib.boulder.ibm.com/infocenter/db2luw/v10r1/topic/com.ibm.db2.luw.wn.doc/doc/i0060390.html</a></td>
</tr>
<tr>
<td>health_mon database configuration parameter</td>
<td>To be determined</td>
<td>See “Some configuration parameters have been deprecated and discontinued” at <a href="http://publib.boulder.ibm.com/infocenter/db2luw/v10r1/topic/com.ibm.db2.luw.wn.doc/doc/i0058741.html">http://publib.boulder.ibm.com/infocenter/db2luw/v10r1/topic/com.ibm.db2.luw.wn.doc/doc/i0058741.html</a></td>
</tr>
<tr>
<td>mincommit database configuration parameter</td>
<td>To be determined</td>
<td>See “Some configuration parameters have been deprecated and discontinued” at <a href="http://publib.boulder.ibm.com/infocenter/db2luw/v10r1/topic/com.ibm.db2.luw.wn.doc/doc/i0058741.html">http://publib.boulder.ibm.com/infocenter/db2luw/v10r1/topic/com.ibm.db2.luw.wn.doc/doc/i0058741.html</a></td>
</tr>
<tr>
<td>ENHANCED_MULTIPLE_DISTINCT setting for DB2_EXTENDED_OPTIMIZATION</td>
<td>To be determined</td>
<td>See “Some registry and environment variables have changed” at <a href="http://publib.boulder.ibm.com/infocenter/db2luw/v10r1/topic/com.ibm.db2.luw.wn.doc/doc/i0052034.html">http://publib.boulder.ibm.com/infocenter/db2luw/v10r1/topic/com.ibm.db2.luw.wn.doc/doc/i0052034.html</a></td>
</tr>
<tr>
<td>SNAPHADR administrative view and SNAP_GET_HADR table function</td>
<td>To be determined</td>
<td>See “Some monitoring interfaces for HADR have been deprecated” at <a href="http://publib.boulder.ibm.com/infocenter/db2luw/v10r1/topic/com.ibm.db2.luw.wn.doc/doc/i0059582.html">http://publib.boulder.ibm.com/infocenter/db2luw/v10r1/topic/com.ibm.db2.luw.wn.doc/doc/i0059582.html</a></td>
</tr>
</tbody>
</table>
The following table shows the registry variables that are deprecated in V10.1. If the registry variables are discontinued, the table also shows the release where the registry variables were discontinued.

Table 23. Registry variables and settings that are deprecated in V10.1

<table>
<thead>
<tr>
<th>Registry variables</th>
<th>Discontinued in release</th>
<th>Links to additional information</th>
</tr>
</thead>
<tbody>
<tr>
<td>DB2_LIKE_VARCHAR</td>
<td>To be determined</td>
<td>See “Some registry and environment variables have been deprecated” at <a href="http://publib.boulder.ibm.com/infocenter/db2luw/v10r1/topic/com.ibm.db2.luw.wn.doc/doc/i0052033.html">http://publib.boulder.ibm.com/infocenter/db2luw/v10r1/topic/com.ibm.db2.luw.wn.doc/doc/i0052033.html</a></td>
</tr>
</tbody>
</table>

Functionality deprecated in Version 10.5

The following table shows the functionality that is deprecated in V10.5. If the functionality is discontinued, the table also shows the release where the functionality was discontinued.

Table 24. Functionality deprecated in V10.5

<table>
<thead>
<tr>
<th>Functionality</th>
<th>Discontinued in release</th>
<th>Links to additional information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Support in COBOL and FORTRAN for db2DatabaseUpgrade</td>
<td>To be determined</td>
<td>See “COBOL and FORTRAN language support for the db2DatabaseUpgrade API is deprecated” at <a href="http://publib.boulder.ibm.com/infocenter/db2luw/v10r5/topic/com.ibm.db2.luw.wn.doc/doc/i0060820.html">http://publib.boulder.ibm.com/infocenter/db2luw/v10r5/topic/com.ibm.db2.luw.wn.doc/doc/i0060820.html</a></td>
</tr>
<tr>
<td>Some SQL administrative routines are deprecated</td>
<td>To be determined</td>
<td>See “Deprecated SQL administrative routines and views” at <a href="http://publib.boulder.ibm.com/infocenter/db2luw/v10r5/topic/com.ibm.db2.luw.sql.rtn.doc/doc/r0023171.html">http://publib.boulder.ibm.com/infocenter/db2luw/v10r5/topic/com.ibm.db2.luw.sql.rtn.doc/doc/r0023171.html</a></td>
</tr>
<tr>
<td>softmax database configuration parameter</td>
<td>To be determined</td>
<td>See “Some database configuration parameters are deprecated or discontinued” at <a href="http://publib.boulder.ibm.com/infocenter/db2luw/v10r5/topic/com.ibm.db2.luw.wn.doc/doc/i0058741.html">http://publib.boulder.ibm.com/infocenter/db2luw/v10r5/topic/com.ibm.db2.luw.wn.doc/doc/i0058741.html</a></td>
</tr>
</tbody>
</table>

The following table shows the registry variables that are deprecated in V10.5. If the registry variables are discontinued, the table also shows the release where the registry variables were discontinued.
Table 25. Registry variables and settings that are deprecated in V10.5

<table>
<thead>
<tr>
<th>Registry variables</th>
<th>Discontinued in release</th>
<th>Links to additional information</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>To be determined</td>
<td>See “Some registry and environment variables are deprecated” at <a href="http://publib.boulder.ibm.com/infocenter/db2luw/v10r5/topic/com.ibm.db2.luw.wn.doc/doc/i0052033.html">http://publib.boulder.ibm.com/infocenter/db2luw/v10r5/topic/com.ibm.db2.luw.wn.doc/doc/i0052033.html</a></td>
</tr>
</tbody>
</table>
Part 3. DB2 Connect enhancements and changes summary

In V10.5, DB2 Connect product capabilities have been enhanced and changed.

Chapter 21, “DB2 V10.5 enhancements and changes that affect DB2 Connect Server,” on page 91

This chapter describes the enhancements, changed functionality, deprecated functionality, and discontinued functionality in Version 10.5 that affect the functionality and capabilities of DB2 Connect.

Related concepts:
Part 2, “What's changed,” on page 43
Chapter 21. DB2 V10.5 enhancements and changes that affect DB2 Connect Server

Because of the common functionality shared between DB2 database products and DB2 Connect Server, some of the DB2 V10.5 enhancements and changes affect the capabilities of DB2 Connect Server.

The following V10.5 enhancements and changes affect the DB2 Connect Server functionality.

Product packaging enhancements
- Simplified packaging Chapter 2, “Product packaging enhancements,” on page 7)

Installation and upgrade enhancements
- Data Studio web console integration “Install IBM Data Studio web console component with DB2 launchpad” on page 35

Troubleshooting and problem determination enhancements
- New command parameters enhance troubleshooting “New command parameters enhance troubleshooting” on page 37

Deprecated functionality
- COBOL and FORTRAN language support for the db2DatabaseUpgrade API “COBOL and FORTRAN language support for the db2DatabaseUpgrade API is deprecated” on page 59

Discontinued functionality
- Agent priority of service classes “Agent priority of service classes is discontinued” on page 63
- Automatic statistics profiling “Automatic statistics profiling is discontinued” on page 66
- Some operating systems no longer supported “Some operating systems are no longer supported” on page 65
Part 4. Appendixes
Some functionality is available in only certain DB2 database product editions.

The table indicates which functionality is included in a DB2 product edition.

**Note:** This table is for informational purposes only. For details of entitlement, rights and obligations, refer to the license agreement for your DB2 product.

**Table 26. Functionality in DB2 features and DB2 database product editions**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Adaptive Compression and classic row compression</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Change data capture replication with two other DB2 LUW servers</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Compression: backup</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Connection concentrator</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Continuous Data Ingest</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>DB2 Advanced Copy Services (using Tivoli Storage FlashCopy® Manager)</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>DB2 column-organized tables functionality</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>Yes*</td>
<td>Yes*</td>
</tr>
<tr>
<td>DB2 Governor</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>DB2 pureScale functionality</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>DB2 Recovery Expert</td>
<td>IBM DB2 Advanced Recovery Feature</td>
<td>IBM DB2 Advanced Recovery Feature</td>
<td>IBM DB2 Advanced Recovery Feature</td>
<td>IBM DB2 Advanced Recovery Feature</td>
<td>IBM DB2 Advanced Recovery Feature</td>
<td>IBM DB2 Advanced Recovery Feature</td>
</tr>
<tr>
<td>DB2 Merge Backup</td>
<td>IBM DB2 Advanced Recovery Feature</td>
<td>IBM DB2 Advanced Recovery Feature</td>
<td>IBM DB2 Advanced Recovery Feature</td>
<td>IBM DB2 Advanced Recovery Feature</td>
<td>IBM DB2 Advanced Recovery Feature</td>
<td>IBM DB2 Advanced Recovery Feature</td>
</tr>
<tr>
<td>Federation with DB2 LUW and Informix® Data Server data sources</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Federation with DB2 LUW and Oracle data sources</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>Yes*</td>
<td>Yes*</td>
<td>Yes</td>
</tr>
<tr>
<td>---------------------------------------------------</td>
<td>---------------</td>
<td>--------------------</td>
<td>------------------------------</td>
<td>------------------------------</td>
<td>---------------------------------------</td>
<td>---------------------------------------</td>
</tr>
<tr>
<td>High availability disaster recovery</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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<tr>
<td>IBM Data Studio</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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<tr>
<td>IBM InfoSphere Data Architect</td>
<td>No</td>
<td>No</td>
<td>No</td>
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<tr>
<td>IBM InfoSphere Data Architect</td>
<td>No</td>
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<td>No</td>
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<td>Yes</td>
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<tr>
<td>IBM InfoSphere Data Architect</td>
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<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>IBM InfoSphere Optim Configuration Manager</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
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<tr>
<td>IBM InfoSphere Optim Configuration Manager</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
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<tr>
<td>IBM InfoSphere Optim pureQuery® Runtime</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
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<td>Yes</td>
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<tr>
<td>IBM InfoSphere Optim Query Workload Tuner</td>
<td>No</td>
<td>No</td>
<td>No</td>
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<td>Yes</td>
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<tr>
<td>IBM InfoSphere Optim High Performance Unload</td>
<td>IBM DB2 Advanced Recovery Feature</td>
<td>IBM DB2 Advanced Recovery Feature</td>
<td>IBM DB2 Advanced Recovery Feature</td>
<td>IBM DB2 Advanced Recovery Feature</td>
<td>IBM DB2 Advanced Recovery Feature</td>
<td>IBM DB2 Advanced Recovery Feature</td>
</tr>
<tr>
<td>IBM Mobile Database</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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<tr>
<td>IBM Mobile Database Sync</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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<tr>
<td>Label-based access control (LBAC)</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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<tr>
<td>Materialized query tables (MQTs)</td>
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<td>No</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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<tr>
<td>Multidimensional clustering (MDC) tables</td>
<td>No</td>
<td>No</td>
<td>No</td>
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<td>Yes</td>
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<tr>
<td>Multi-Temperature Storage</td>
<td>No</td>
<td>No</td>
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<td>Net Search Extender</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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<tr>
<td>Online reorganization</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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<td>Yes</td>
</tr>
<tr>
<td>Oracle Compatibility</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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<tr>
<td>Partitioning - partitioned database environment</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
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<tr>
<td>Partitioning - Table partitioning</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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<tr>
<td>pureXML® storage</td>
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<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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<tr>
<td>Q Replication with two other DB2 LUW servers</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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</table>
Table 26. Functionality in DB2 features and DB2 database product editions (continued)

<table>
<thead>
<tr>
<th></th>
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<tr>
<td>Query parallelism</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Replication tools</td>
<td>Yes&lt;sup&gt;3&lt;/sup&gt;</td>
<td>Yes&lt;sup&gt;4&lt;/sup&gt;</td>
<td>Yes&lt;sup&gt;4&lt;/sup&gt;</td>
<td>Yes</td>
<td>Yes&lt;sup&gt;4&lt;/sup&gt;</td>
<td>Yes&lt;sup&gt;4&lt;/sup&gt;</td>
<td>Yes</td>
</tr>
<tr>
<td>Row and column access control (RCAC)</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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<td>Spatial Extender</td>
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<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>SQL Replication between DB2 LUW and Informix Data Server</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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<tr>
<td>Time Travel Query</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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<tr>
<td>IBM Tivoli System Automation for Multiplatforms</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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<td>Workload management</td>
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<td>No</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Note:
1. DB2 Express Edition including DB2 Express Edition Fixed Term License
2. This functionality is available only by using the SQL Warehouse tool (SQW).
3. DB2 Advanced Enterprise Server Edition includes 10 InfoSphere Data Architect user licenses.
4. Replication tools except the Replication Center are available on all supported operating systems. The Replication Center is available only on Linux and Windows operating systems.
Appendix B. Functionality in DB2 features in DB2 Connect product editions

Some functionality is available in only certain DB2 Connect product editions. In some cases, the functionality is associated with a particular DB2 feature.

The table indicates which functionality is included in a DB2 Connect product edition. If the functionality is not applicable to the DB2 Connect products, the value “Not applicable” is specified.

Table 27. Functionality in DB2 Connect product editions

<table>
<thead>
<tr>
<th>Functionality</th>
<th>DB2 Connect Personal Edition</th>
<th>DB2 Connect server editions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adaptive Compression</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Advanced Copy Service</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Compression: backup</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Compression: Data</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Compression: Index</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Compression: Temp table</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Compression: XML</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Connection concentrator</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Continuous Data Ingest</td>
<td>No</td>
<td>No</td>
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<tr>
<td>Database partitioning</td>
<td>No</td>
<td>No</td>
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<tr>
<td>DB2 Governor</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Heterogeneous Federation</td>
<td>No</td>
<td>No</td>
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<tr>
<td>High availability disaster recovery</td>
<td>No</td>
<td>Yes</td>
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<tr>
<td>Homogeneous Federation</td>
<td>No</td>
<td>Yes</td>
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<tr>
<td>Homogeneous Q Replication</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>IBM Data Studio</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>IBM InfoSphere Optim Performance Manager Extended Edition</td>
<td>No</td>
<td>No</td>
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<tr>
<td>IBM InfoSphere Optim pureQuery Runtime</td>
<td>No</td>
<td>Yes ^2</td>
</tr>
<tr>
<td>Label-based access control (LBAC)</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Materialized query tables (MQT)</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Multidimensional clustering (MDC) tables</td>
<td>No</td>
<td>Yes</td>
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<tr>
<td>Multi-Temperature Storage</td>
<td>No</td>
<td>No</td>
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<tr>
<td>Online reorganization</td>
<td>No</td>
<td>No</td>
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<tr>
<td>DB2 pureScale</td>
<td>No</td>
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<tr>
<td>pureXML storage</td>
<td>No</td>
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<tr>
<th>Functionality</th>
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<th>DB2 Connect server editions</th>
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<tr>
<td>Query parallelism</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Replication tools</td>
<td>No</td>
<td>Yes¹</td>
</tr>
<tr>
<td>Scan Sharing</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Spatial Extender</td>
<td>No</td>
<td>Yes</td>
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<tr>
<td>Time Travel Query</td>
<td>Yes</td>
<td>Yes</td>
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<tr>
<td>Table partitioning</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Tivoli System Automation</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Workload management</td>
<td>No</td>
<td>Yes</td>
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</tbody>
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**Note:**
1. IBM InfoSphere Optim Performance Manager Extended Edition is a follow-on to Performance Expert. IBM InfoSphere Optim Performance Manager Extended Edition helps optimize the performance and availability of mission-critical databases and applications.
3. Replication tools except the Replication Center are available on all supported operating systems. The Replication Center is available only on Linux and Windows operating systems.
Appendix C. Overview of the DB2 technical information

DB2 technical information is available in multiple formats that can be accessed in multiple ways.

DB2 technical information is available through the following tools and methods:
• DB2 Information Center
  – Topics (Task, concept and reference topics)
  – Sample programs
  – Tutorials
• DB2 books
  – PDF files (downloadable)
  – PDF files (from the DB2 PDF DVD)
  – printed books
• Command-line help
  – Command help
  – Message help

Note: The DB2 Information Center topics are updated more frequently than either the PDF or the hardcopy books. To get the most current information, install the documentation updates as they become available, or refer to the DB2 Information Center at ibm.com.

You can access additional DB2 technical information such as technotes, white papers, and IBM Redbooks® publications online at ibm.com. Access the DB2 Information Management software library site at http://www.ibm.com/software/data/sw-library/.

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DB2 technical library in hardcopy or PDF format


Although the tables identify books available in print, the books might not be available in your country or region.
The form number increases each time a manual is updated. Ensure that you are reading the most recent version of the manuals, as listed below.

**Note:** The DB2 Information Center is updated more frequently than either the PDF or the hard-copy books.

### Table 28. DB2 technical information

<table>
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<th>Form Number</th>
<th>Available in print</th>
<th>Availability date</th>
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<tbody>
<tr>
<td>Administrative API Reference</td>
<td>SC27-5506-00</td>
<td>Yes</td>
<td>July 28, 2013</td>
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<tr>
<td>Administrative Routines and Views</td>
<td>SC27-5507-00</td>
<td>No</td>
<td>July 28, 2013</td>
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<tr>
<td>Call Level Interface Guide and Reference</td>
<td>SC27-5511-00</td>
<td>Yes</td>
<td>July 28, 2013</td>
</tr>
<tr>
<td>Call Level Interface Guide and Reference</td>
<td>SC27-5512-00</td>
<td>Yes</td>
<td>July 28, 2013</td>
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<tr>
<td>Command Reference</td>
<td>SC27-5508-00</td>
<td>Yes</td>
<td>July 28, 2013</td>
</tr>
<tr>
<td>Database Administration Concepts and</td>
<td>SC27-4546-00</td>
<td>Yes</td>
<td>July 28, 2013</td>
</tr>
<tr>
<td>Configuration Reference</td>
<td>SC27-5529-00</td>
<td>Yes</td>
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<tr>
<td>Developing ADO.NET and OLE DB Applications</td>
<td>SC27-4549-00</td>
<td>Yes</td>
<td>July 28, 2013</td>
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<tr>
<td>Developing Embedded SQL Applications</td>
<td>SC27-4550-00</td>
<td>Yes</td>
<td>July 28, 2013</td>
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<tr>
<td>Developing Java Applications</td>
<td>SC27-5503-00</td>
<td>Yes</td>
<td>July 28, 2013</td>
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<tr>
<td>Developing Perl, PHP, Python, and Ruby on</td>
<td>SC27-5504-00</td>
<td>No</td>
<td>July 28, 2013</td>
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<tr>
<td>Rails Applications</td>
<td>SC27-5505-00</td>
<td>Yes</td>
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<td>Developing RDF Applications for IBM Data</td>
<td>SC27-5501-00</td>
<td>Yes</td>
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<tr>
<td>Servers</td>
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<tr>
<td>Getting Started with Database Application Development</td>
<td>GI13-2084-00</td>
<td>Yes</td>
<td>July 28, 2013</td>
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<th>Name</th>
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<tr>
<td>Getting Started with DB2 Installation and Administration on Linux and Windows</td>
<td>GI13-2085-00</td>
<td>Yes</td>
<td>July 28, 2013</td>
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<tr>
<td>Installing DB2 Servers</td>
<td>GC27-5514-00</td>
<td>Yes</td>
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<tr>
<td>Installing IBM Data Server Clients</td>
<td>GC27-5515-00</td>
<td>No</td>
<td>July 28, 2013</td>
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<tr>
<td>Message Reference Volume 1</td>
<td>SC27-5523-00</td>
<td>No</td>
<td>July 28, 2013</td>
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<tr>
<td>Message Reference Volume 2</td>
<td>SC27-5524-00</td>
<td>No</td>
<td>July 28, 2013</td>
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<tr>
<td>SQL Procedural Languages: Application Enablement and Support</td>
<td>SC27-5502-00</td>
<td>Yes</td>
<td>July 28, 2013</td>
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<tr>
<td>SQL Reference Volume 1</td>
<td>SC27-5509-00</td>
<td>Yes</td>
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<td>SQL Reference Volume 2</td>
<td>SC27-5510-00</td>
<td>Yes</td>
<td>July 28, 2013</td>
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<tr>
<td>Troubleshooting and Tuning Database Performance</td>
<td>SC27-4548-00</td>
<td>Yes</td>
<td>July 28, 2013</td>
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<td>Upgrading to DB2 Version 10.5</td>
<td>SC27-5513-00</td>
<td>Yes</td>
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<td>What’s New for DB2 Version 10.5</td>
<td>SC27-5519-00</td>
<td>Yes</td>
<td>July 28, 2013</td>
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<td>XQuery Reference</td>
<td>SC27-5522-00</td>
<td>No</td>
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Table 29. DB2 Connect-specific technical information

<table>
<thead>
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<th>Name</th>
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<th>Availability date</th>
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<tr>
<td>DB2 Connect Installing and Configuring DB2 Connect Servers</td>
<td>SC27-5517-00</td>
<td>Yes</td>
<td>July 28, 2013</td>
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</tbody>
</table>
Displaying SQL state help from the command line processor

DB2 products return an SQLSTATE value for conditions that can be the result of an SQL statement. SQLSTATE help explains the meanings of SQL states and SQL state class codes.

Procedure

To start SQL state help, open the command line processor and enter:

```
? sqlstate or ? class code
```

where `sqlstate` represents a valid five-digit SQL state and `class code` represents the first two digits of the SQL state.

For example, `? 08003` displays help for the 08003 SQL state, and `? 08` displays help for the 08 class code.

Accessing different versions of the DB2 Information Center

Documentation for other versions of DB2 products is found in separate information centers on ibm.com®.

About this task

For DB2 Version 10.1 topics, the DB2 Information Center URL is http://pic.dhe.ibm.com/infocenter/db2luw/v10r1.

For DB2 Version 9.8 topics, the DB2 Information Center URL is http://pic.dhe.ibm.com/infocenter/db2luw/v9r8/.

For DB2 Version 9.7 topics, the DB2 Information Center URL is http://pic.dhe.ibm.com/infocenter/db2luw/v9r7/.

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